FOREVER YOUNG? THE COSTS OF PREPARATION FOR RETIREMENT

Vera Maria Amaro Nunes

Tese submetida como requisito parcial para obtenção do grau de

Doutoramento em Psicologia

Área de especialidade.....Psicologia Económica.

2014

ISPA
INSTITUTO UNIVERSITÁRIO
CIÊNCIAS PSICOLÓGICAS, SOCIAIS E DA VIDA

FOREVER YOUNG? THE COSTS OF PREPARATION FOR RETIREMENT

Vera Maria Amaro Nunes

Tese orientada por Prof. Doutor Marc Scholten

(Universidade Europeia)

Co-orientada por Prof. Doutor Daniel Read

(Warwick Business School, University of Warwick)

Tese submetida como requisito parcial para obtenção do grau de

Doutoramento em Psicologia

Área de especialidade…….Psicologia Económica

2014

Tese apresentada para cumprimento dos requisitos necessários à obtenção do grau de Doutor em Psicologia na área de especialização de Psicologia Cognitiva realizada sob a orientação de Prof. Doutor Marc Scholten, apresentada no ISPA – Instituto Universitário no ano de 2014.

Apoio Financeiro de Fundação para a Ciência e Tecnologia (FCT).[1]

[1] O presente trabalho foi financiado pelo Programa Operacional Potencial Humano (POPH) da Fundação para a Ciência e Tecnologia (SFRH/BD/66489/2009).

AGRADECIMENTOS

Em primeiro lugar, gostaria de agradecer ao Prof. Doutor Marc Scholten pela sua orientação, críticas, paciência e amizade com que me acompanhou desde que o conheço, e especialmente ao longo dos últimos cinco anos de trabalho. Também gostaria de expressar o meu apreço ao Prof. Doutor Daniel Read pelas suas ideias desafiantes e sugestões que foram essenciais para a melhoria do meu trabalho.

Quero expressar a minha gratidão a outras pessoas cuja ajuda e cooperação ao longo deste projeto foram, para mim, de valor inestimável. À Prof.ª Doutora Manuela Faia Correia e ao Dr. Francisco Garcia dos Santos, agradeço a disponibilidade e ajuda no recrutamento de participantes para os meus estudos. Ao Prof. Doutor João Marôco, agradeço a paciência com as minhas intermináveis perguntas e dúvidas sobre SPSS durante o curso Análise Estatística Avançada. Gostaria também de expressar os meus agradecimentos aos meus colegas de doutoramento Francisco, Sofia e Ivo, cujas perspetivas foram uma constante fonte de inspiração.

Á minha família, amigos e colegas de trabalho, agradeço o apoio e incentivo que todos me foram dando ao longo destes últimos cinco anos.

Quero expressar o meu mais profundo agradecimento ao meu marido pelo seu amor, apoio e paciência imensa (a qual geralmente não é muita...), pelos seus ensinamentos, ajuda excecional e olhar crítico em assuntos relacionados com Economia. Nas suas próprias palavras, durante estes últimos anos, aprendeu quase tanto como eu no que respeita a muitos dos aspetos psicológicos abordados nesta tese.

Um agradecimento muito especial à minha querida amiga Inês - sem a qual este projeto poderia não existir - pelo seu apoio constante e incentivo, por me ouvir quando as coisas não estavam a ir bem e, principalmente, por me fazer rir.

Quero também agradecer à minha irmã, que já não está entre nós, por ter feito o possível para que eu nunca parasse de trabalhar na minha tese, ao longo dos difíceis quatro anos da sua doença grave e mortal.

Gostaria também de expressar o meu apreço a todos os participantes dos meus estudos, sem os quais este projeto não existiria.

Finalmente, agradeço ao ISPA, e em especial à Prof.ª Doutora Teresa Garcia-Marques, por me terem permitido, apesar das dificuldades e adversidades dos últimos anos, concluir este projeto.

AKNOWLEDGMENTS

First and foremost, I would like to thank my adviser Prof. Doutor Marc Scholten for his guidance, critics, patience and friendship with which he has accompanied me since I know him, and especially through the last five years. I also want to express my appreciation to my co-adviser Prof. Doutor Daniel Read for his challenging ideas and suggestions, which were essential to the improvement of my work.

I would like to express my gratefulness to several other people whose help and cooperation through the last five years were invaluable to me. To Prof.ª Doutora Manuela Faia Correia and Dr. Francisco Garcia dos Santos, I thank for their availability and help in recruiting participants for my studies. To Prof. Doutor João Marôco, I thank the patience with my endless questions and doubts about SPSS in the course Análise Estatística Avançada. I also express my thanks to Francisco, Sofia and Ivo, my fellow PhD students, whose insights were so very inspiring.

To my family, friends and work colleagues, I thank for the support and encouragement they all have given me through these last five years.

I want to express my deepest appreciation to my husband for his love, support and colossal patience (usually not much…). I also thank him for his teachings, exceptional help and critic eye in matters related to Economics. In his own words, during these last years, he learned almost as much as I did concerning many of the psychological aspects addressed in this thesis.

I very special thanks to my dear friend Inês - without whom this project might not exist - for her steady support and encouragement, for listening when things were not going so well and, especially, for making me laugh.

I also want to thank my sister, no longer among us, for making sure I never stopped working in my thesis, all through the difficult four years of her serious and deathly disease.

I would also like to express my appreciation to all the participants, since without them this project would not come to be.

Finally, I am indebted to ISPA, and in particular to Prof.ª Doutora Teresa Garcia-Marques, for allowing me to conclude this project despite the hardships and adversities of the latest years.

Palavras-chave:

Poupança para a reforma; Custos psicológicos; Impaciência; Linguagem

Key words:

Retirement savings; Psychological costs; Impatience; Language

Categorias de Classificação da tese

3000 Social Psychology

3040 Social Perception and Cognition

2300 Human Experimental Psychology

2340 Cognitive Processes

RESUMO

A conjugação do aumento da expectativa de vida e da diminuição das pensões de reforma tem levado trabalhadores de todo o mundo a assumir uma maior responsabilidade relativamente às suas poupanças para a reforma. Diversas pesquisas mostram que mesmo um pequeno grau de planeamento resulta numa melhor situação económica na reforma, mas que o grau de planeamento da reforma continua baixo. Uma possível explicação reside na existência de custos de planeamento. Propomos que estes custos resultam, entre outros aspetos, da escassez de tempo, da complexidade dos produtos financeiros, de falta de conhecimentos financeiros e de habilidades específicas, como numeracia, e de ansiedade e stresse associados às decisões financeiras.

Assim, os nossos principais objetivos foram demonstrar que os custos psicológicos de planeamento da reforma afetam o planeamento e as poupança, e investigar a sua relação com outras variáveis importantes neste âmbito, tais como motivação, valência afetiva e perspetiva temporal. Assumindo que o comportamento de poupança é em grande medida orientado pela impaciência, pretendíamos também explorar um possível efeito do contexto de reforma e do grau de referência ao tempo futuro das linguagens na impaciência.

Os nossos resultados mais importantes são que os custos psicológicos de preparação para a reforma emergem como uma variável que pode afetar a forma como as pessoas tomam as suas decisões de reforma e deve ser tomada em consideração de forma a superar as dificuldades que sentida no planeamento da reforma. As mulheres parecem ter mais dificuldade em planear a reforma e estar particularmente em risco de não conseguir manter o padrão de vida durante a reforma, aspeto que é de grande importância se considerarmos que as mulheres tendem a viver mais tempo do que os homens. Verificámos que a motivação para a reforma e fatores como perspetiva temporal futura e valência afetiva associada à reforma desempenham um papel importante, e também sugerem que as pessoas que apresentam elevados custos psicológicos apresentem uma maior sensibilidade ao contexto da reforma. Finalmente, os nossos resultados sugerem a existência de um efeito do contexto da reforma e da situação de trabalho no grau de impaciência das pessoas, e dão suporte parcial ao efeito do grau de referência ao tempo futuro das linguagens na impaciência.

Os programas de educação financeira desenvolvidos para melhorar o planeamento da reforma e a poupança podem ser úteis, dando conhecimento sobre aspetos financeiros e de planeamento, mas frequentemente as pessoas não possuem condições para aproveitar ao máximo essa informação. Para serem eficazes, estes programas devem visar a redução dos reais custos psicológicos de preparação para a reforma sentidos pelas pessoas e ser ajustáveis, em alguma medida, a diferenças individuais em aspetos como a motivação, valência afetiva, género, situação de trabalho e perspetiva temporal.

Em conclusão, é claramente necessária mais informação sobre estas questões, mas acreditamos que, se as características individuais forem tomadas em consideração e se se tentarem reduzir os custos psicológicos de preparação para a reforma, estes programas podem ser verdadeiros facilitadores do planeamento e poupança para a reforma e, consequentemente, conduzir a uma melhor qualidade de vida durante a reforma.

ABSTRACT

The combination of increasing life expectancy and declining of retirement pensions is leading workers all around the world to take on a much higher responsibility for their retirement savings. Research shows that even a small amount of retirement planning results in a better economical situation in retirement, but a very low extent of retirement planning has been found. A possible explanation for this situation resides in the existence of planning costs. In our view, these costs may derive, among other aspects, from lack of time to plan, complexity of financial products, lack of financial knowledge and of specific skills, like numeracy, and anxiety associated with financial decisions. Therefore, the main objectives of this work were to demonstrate that psychological costs of retirement planning may significantly affect retirement planning and savings, to investigate the relationship between these costs and other variables with an important role in the retirement planning activity, such as retirement motivation, retirement affective valence and time perspective. Assuming savings behavior to be guided by impatience degree, we also intended to explore a possible effect of retirement context, and of language's future time reference, on impatience.

Our most important results are that psychological costs of retirement preparation emerge as a variable that can affect how people make their retirement decisions and must be addressed to overcome the difficulties people feel in planning their retirement. Women seem to feel more difficulty in planning retirement and are particularly at risk of not being able to maintain their living standard in retirement, which is of sizeable importance when we consider that women tend to live longer than men. We also found that retirement motivation and factors such as future time perspective and retirement affective valence play an important role in retirement planning, and that people with high psychological costs may present a heightened sensitivity to retirement context. Finally, our results suggest an effect of retirement context and work status in people's impatience, and give partial support to time preference sensitivity to degree of future time reference in languages.

Financial education programs developed to enhance retirement planning and savings can be helpful by offering financial and planning knowledge, but people often do not take full advantage of this kind of information. We consider that, in order to be effective, these programs should also aim at the reduction of the actual psychological costs of retirement preparation perceived by people and be adjustable, at least in some measure, to differences in aspects like retirement motivation, retirement affective valence, gender, work status and time perspective.

In conclusion, more information about these issues is needed but we believe that, if taking into account individual characteristics and attempting to reduce the psychological costs of retirement preparation, these programs might become true facilitators of retirement savings and planning and, therefore, lead to a better quality of life in retirement.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

Chapter 1

Saving for Retirement

An increasing life expectancy and low fertility characterize the European demographic situation, and are causing a drastic change the population's age structure: A substantial decline in the working population and a substantial increase in retired individuals is expected for the next four decades (Münz, 2007). Projections for the next 50 years predict a small change of 2.9% in the EU total population, from 501.8 million in 2010 to 516.5 million by 2060, but a 74.4% change for persons aged 65 or more, from 87.5 million in 2010 to 152.6 million by 2060. In the Portuguese population, the expected change is of 71.2%: From 1.9 million of persons aged 65 or more in 2010 to 3.3 million by 2060 (Eurostat, 2011). US Census Bureau's projections estimate that the number of Americans with 65 year of age or more is to increase from 35 million in 2000 to 78 million until 2050, and the number of Americans aged 85 and above will rise from 4 million Americans in 2000 to almost 18 million by the year 2050, although many demographers believe these projections are underestimated. This could mean that many millions of older people will move under the poverty line (Schneider, 1999).

Simultaneously to this scenario, defined benefit pensions are already declining, social security government programs face insolvency in one country after another, and workers all around the world are being increasingly asked to take on a much higher degree of responsibility for their retirement savings, regarding the saving's amount but also the way their savings are invested (Hershey, Henkens, & van Dalen, 2006; Lusardi, 2002; Lusardi & Mitchell, 2007b). Reforms and changes in government policies are leading to major changes in social security and retirement systems (Hershey et al., 2006) and debates have been taking place about the privatization of social security and on whether or not to fully shift responsibility for retirement savings decisions to the workers (Lusardi, 2002).

Research in the retirement planning domain suggests that those who have planned even a little their retirement find themselves in a considerably better economical retirement situation than those who did not (Lusardi & Mitchell, 2007a), and this is a central aspect in our research premises. We will next propose reasons why retirement planning presents itself

as so important and state motives that may justify why it does not happens as often as it could and should.

Planning is a conceptual activity that anticipates and regulates behavior. It is only one of multiple strategies available to solve a problem or handle a situation and, therefore, is optional (Scholnick & Friedman, 1987). However, the available strategies may differ in their accuracy, in the processing requirements and in the amount of time they demand (Ellis & Siegler, 1997). Research suggest that, regarding retirement, those who have planned tend to find themselves in a better economic situation during retirement years than those who did not (Lusardi & Mitchell, 2007a), so the planning strategy seem to give good results in this area.

Derived from this relation between planning and financial security, several researchers suggests that the best part of the importance of planning could be due to the fact that planning activities might facilitate the determination of when and how much one needs to allocate to a retirement savings plan (Hershey, Jacobs-Lawson, McArdle, & Hamagami, 2007; Lusardi, 1999, 2003; Lusardi & Mitchell, 2006). Another related explanation is forwarded by Ameriks, Caplin and Leahy (2003). The authors explain the effects of planning on savings based on self-control: If individuals do not possess enough self-control to save their money, planning permits them to exert a better control over expenses or consumption, and therefore improve their ability to save.

Yet, many of those who should already be planning for their retirement are not (Lusardi, 2003) and this low extent of planning may have a major economic effect on European countries in the next decades since, as mentioned, many social security government programs are already near insolvency, benefit pensions are steadily declining, and Europe faces a predicted rise of over 70% in people with more than 64 years until 2060. These three factors combined could mean that in fifty years' time countless older people could be living in poverty. Therefore, in our view, it is imperative to find ways to stimulate and increase retirement planning behavior.

But why aren't people planning for their retirement as they should? When multiple strategies to solve a problem or handle a situation are available, the strategy selection involves tradeoffs among different properties. So, in order to understand when people do and do not plan, the costs of planning should be considered as well as its benefits, when compared with other strategies (Ellis & Siegler, 1997). And when we do, it seem clear that the decision of whether or not to plan may be influenced by the fact that planning itself has costs that the

planner may sometimes be unwilling to incur. Moreover, even the adherence to a plan previously made may have its costs, since it limits the grasping of new opportunities (Ellis & Siegler, 1997). Clearly more information needs to be gathered about the real difficulties people feel in what concerns planning for retirement (Lusardi, 2002), and about the situational and personal factors that influence individual's predisposition to plan and save for their retirement (Hershey et al., 2006; Hershey, Jacobs-Lawson, McArdle, & Hamagami, 2007). That is what we propose to do with this research.

We consider costs of planning to be an important but overlooked and understudied aspect of the retirement preparation process, and we intend to show they play an important role in the degree of retirement planning that takes place. This issue becomes especially important when we consider the prospects of ageing and increased longevity of the European population (Hershey et al., 2006) and what this means in terms of social security retirement pensions. Relating to these retirement planning costs aspects like resource availability (e.g. income), task complexity (e.g. complexity of pension plans and too many choice options) and familiarity with the context, knowledge base and motivation degree, along with factors like emotions and time perspective, which may influence planning, should not be ignored (Ellis & Siegler, 1997; Scholnick & Friedman, 1987). So, we will take these aspects consideration in our analysis of retirement planning and savings, and we shall address them in more detail further ahead, when presenting the theoretical planning models.

We will next present our research goals. However, before stating them, we need to very briefly define a few main concepts. All these concepts will be further detailed as we present research findings from literature. As mentioned before, the planning activity may be associated with psychological costs that the planner may, or may not, be willing to incur. These psychological costs may arise, among others, from the lack of specific skills, knowledge or time needed to make good decisions. Other variables included in our research that we need to define at this moment as constructs that may have an effect on the degree of planning and savings are a person's time preference, time perspective, the language's future time reference, and retirement affective valence. Time preference can be viewed as the value that is placed on a delayed outcome, in comparison with a closer or immediate one. Concerning time perspective, we will define it as a subjective and frequently non-conscious way in which a person relates to time, which may contribute to time preference. In particular, future time perspective (FTP) reflects a general orientation towards the future. Time

perspective is mediated by cognitive processes, including the language in which these processes take place. Languages are a natural contributor to time preference, as a consequence of the language's future time reference (FTR). FTR is the degree to which future tense, indicating the location of a situation at a time subsequent to the present moment, is fully grammatically expressed, only partly grammatically expressed or not grammatically expressed at all. Further ahead we will present arguments to support why this may happen. Regarding retirement affective valence, it consists in the affective valence associated with the prospect of retirement.

We believe that all of these aspects, together with others we will next state when presenting our goals, are of great importance and should be considered when trying to gather more information about the difficulties people feel in what concerns planning for retirement, and about the situational and personal factors that influence individual's predisposition to plan and save for their retirement. So, in a context of an expected substantial increase in retired individuals for the next four decades, and of accentuated decline of defined benefit pensions and social security government programs insolvency, our research has four broad objectives:

I. The first is to demonstrate that psychological costs of retirement planning can be a significant factor that may affect behavioral constructs like retirement planning and savings (Hershey et al., 2007; Lusardi, 1999, 2003; Lusardi & Mitchell, 2006), and to investigate the relationship between these costs and other variables that have an important role in the planning activity, according to Friedman and Scholnick's (1997) planning model, and to Hershey's (2004) version of that model;

II. In view of intercultural differences found in the retirement savings domain (Hershey et al., 2006; Hershey, Henkens, & van Dalen, 2010a, 2010b; van Dalen, Henkens, & Hershey, 2010), our second objective is to study aspects like motivation, affect, time perspective and knowledge, as well as several demographic indicators, regarding retirement planning and savings;

III. Assuming that savings behavior is guided by a person's time preference (Finke, 2005), the third objective of this research is to investigate the relationship between impatience and other relevant variables in the domain of retirement planning and savings, in addition to the effect of retirement context

on impatience and its relation with the perception of psychological costs of retirement planning;

IV. Finally, our fourth objective is to investigate if time preference can be sensitive to characteristics of the language utilized (Chen, 2011, 2013), both in a neutral and in a retirement context, and to explore possible relations between delay, magnitude and sign, as well as age, and effect of language on impatience.

These goals are further detailed at the end of this chapter and, following them, we will present a brief summary of the objectives for each of the studies presented in chapters two, three, four and five.

According to the planning model we choose as theoretical basis for the planning behavior – Hershey's (2004) revision of the Friedman and Scholnick's (1997) planning model, which will be detailed further ahead – cultural and environmental factors like peer rules and income are distal determinants of savings and investing behavior, while psychological components like individual traits (e.g. FTP), emotions (e.g. retirement affective valence), retirement knowledge and retirement goals and motivation are considered more proximal ones. Task characteristics relate to the influence of factors like task complexity that are, as we will argue, linked to psychological costs of retirement preparation. Finally, demographic variables are considered proxies for the psychological basis of savings and investing behavior. Grounded in this theoretical foundation, our main results and contributions are that psychological costs of retirement preparation emerge as an important variable that can affect how people make their retirement decisions and must be addressed when trying to overcome the difficulties people feel in planning for their retirement. We also showed that, besides psychological costs, retirement motivation and factors such as FTP and retirement affective valence have an important role to play in the retirement planning process, and should be taken into account when conceiving intervention and financial education programs. These programs, with the purpose of improving financial literacy and retirement planning knowledge, and thus facilitate retirement planning and savings, no doubt can be helpful but people frequently do not take full advantage of the benefits of this kind of information. In order to be effective, they should also aim at the reduction of the psychological costs of retirement preparation and be adjustable in at least some measure to individual differences. For example, our results suggest that women in particular tend to feel a much greater difficulty in planning retirement and are especially at risk of not being able to

maintain their living standard in retirement. This result is of great importance if we consider that women tend to live longer than men.

Also in accordance with our results, both psychological costs and income affect retirement affective valence. However, our presupposition is that a negative affective valence associated with retirement can also derive from a negative vision of old age, frequently regarded as unpleasant and worrisome, or from fear of not being productive anymore and becoming a burden to others. So, our proposal is that when targeting people with a negative retirement affective valence, programs should start by dealing with the possible causes of such negative and probably biased conceptualizations of retirement and only then address the issues related with retirement planning. If focused on attempting to reduce the actual psychological costs perceived by people, and taking into account characteristics such as retirement affective valence, gender, work status and time perspective, these intervention and enhanced financial education programs could, in fact, become facilitators of retirement savings and planning and, therefore, lead to a better quality of life in retirement.

This research results also emphasize an effect of retirement context and work status in people's impatience and point to the possibility of a heightened sensitivity to retirement context by people with high psychological costs. Finally, our results give some degree of support to time preference sensitivity to the degree of FTR in the language utilized.

The remainder of this chapter is structured as follows. We will first discuss the relationship between retirement planning and intertemporal choice, detail the concept of planning and present a planning model that will be our theoretical guideline for research. Some of the model components will be later detailed and related to research results in the domain of retirement savings, namely time perspective, motivation, affect, and knowledge. Next, several types of possible planning costs will be submitted, grounded in their respective theoretical perspectives.

We will then present important demographic variables that have been studied in the domain of retirement savings, and discuss how these have been hypothesized to function as proxies for the psychological basis of savings behavior, relating them to psychological variables, and presenting research findings collected from literature supporting this view.

Finally, we will raise the issue of inter-cultural differences in retirement planning and propose that these differences can be partly due to language, referring to cross-linguistic

differences in the time dimension and presenting related research findings. This chapter will end with the presentation of our goals for this research followed by the summary of the objectives for each study.

Planning for retirement.

According to Scholnick and Friedman (1987), the activity of planning consists in:

> A set of complex conceptual activities that anticipate and regulate behavior. Planning relies on representation of the environment, anticipation of solutions to problems, and then monitoring of strategies to see whether they meet the problem and follow the plan. To plan is to act simultaneously on three levels: In the reality of a problem, in accordance with an imagined scheme, and in the role of mediator between the scheme and the behavior. (p.1)

Therefore, from this perspective, the concept of retirement planning implies not just deciding how much to save, but also the actual savings of predetermined amounts, their investment and deciding when these savings are to be spent. Consequently, planning for retirement involves making several intertemporal choices: Deciding when and how much to save, for how long to invest one's savings, and where - meaning with what return rate and risk. We shall next review the broader aspects of intertemporal choice.

Intertemporal choice. By definition, an intertemporal choice is a decision that involves tradeoffs between costs and benefits that occur in different moments in time, and time discounting encompasses "any reason for caring less about a future consequence, including factors that diminish the expected utility generated by a future consequence, such as uncertainty or changing tastes" (Frederick, Loewenstein, & O'Donoghue, 2002, p. 352). Time preference can be viewed, then, as the value that is placed on a delayed outcome in comparison with a more immediate one (Chapman, 2005). In the discounted utility (DU) model, and in several other psychological models of intertemporal choice, it is usually assumed that people discount utility or value over time (Frederick et al., 2002). In the DU model it is also assumed that intertemporal choices are made by comparing the discounted values of the options under consideration (Read, 2004; Scholten & Read, 2010), although this discounting concerns specifically the objective time length and not a subjective perception of its length (Zauberman, Kim, & Malkoc, 2008). People who discount future changes in utility less have a lower rate of time preference, and will be more likely to prefer choices that reflect

a less impatient time orientation, "whether they are choosing to save for retirement or to avoid [smoking] cigarettes" (Finke, 2005, p. 113). However, the savings behavior in particular is considered to be most strongly guided by an individual's personal future discount rate, since it involves the deliberate reduction of present consumption with the intent to increase expected future consumption (Finke, 2005). Thus, we propose that certain aspects that influence a person's personal future discount rate will have an effect in the savings behavior and, therefore, in the planning of retirement. Further ahead we will debate some of these aspects, such as context and language characteristics.

Returning to planning as a central aspect of retirement welfare, we will next present a general planning model and its components and processes, applying it to the specificities of retirement planning, followed by an adaptation of this model to the area of financial planning for retirement, which will be our theoretical guideline for research.

Planning Models: Cognition, Knowledge and Motivation

Because retirement planning is viewed as a desirable behavior that does not always happen, we will now look in more detail at the theoretical components and processes of planning in general.

Friedman and Scholnick's planning model.

Friedman and Scholnick (1997) have developed a very comprehensive planning model where planning is viewed as a complex set of mental and behavioral operations with the purpose of solving a problem or reaching a goal. These operations are a consequence of the interplay of diverse cognitive and motivational processes that are, in turn, influenced by various aspects of context. The model considers a planning sequence, integrating the representation of the problem, the setting of goals, the decision to plan, the planning strategy and its execution, monitoring and eventual adjustment.

In their model there are four main contributing components: Cultural factors, environmental factors, task characteristics and psychological influences. The cultural influences pertain to aspects like family or peer group rules relating to the attractiveness of planning, whereas environmental factors consider the influence of resources availability, like

income. Task characteristics relate to the influence of factors like task complexity, familiarity with the context, and the existence or absence of external aid.

In what concerns the psychological components, the model considers as basic components aspects like working memory, processing capacity, attention and self-regulation (Friedman & Scholnick, 1997). Other psychological variables considered by the model as essential to the planning activity are the ones that can affect the basic psychological components previously mentioned, such as knowledge base, emotions, values and goals. These are the cognitive, individual and motivational variables that interest us in the context of this research. In what concerns motivation, the existence of prior goals is considered a very important aspect of planning and, by definition, planning takes place on different levels and involves different activities, but all of them are goal-directed (Scholnick & Friedman, 1987).

Knowledge base provides a good example of how these variables can influence the use of the essential psychological components in the model. Supposing that knowledge base is insufficient, if the individual considers that too much time to search for information is needed, he or she may be unwilling (or unable) to gather the necessary information to plan. So, whatever the attention level, working memory or processing capacity the individual possesses to begin with, planning will not occur. Stress is another good example: In an individual with cognitive capabilities and even motivation, high levels of stress may lead to the abandonment of planning (Friedman & Scholnick, 1997).

Formulating a plan for retirement. When faced with the need to solve a problem or reach a goal, if a ready-made strategy is not available, a motivated individual who values thoughtful decision will formulate a course of action, and then execute and monitor it (Scholnick & Friedman, 1987). In the specific case of financial retirement planning, the problem to solve, or the stressor, may come from a change in environment, as it happens - and has been slowly happening all around the world - when responsibility for retirement savings is shifted toward the worker, or by the perception of an insufficient retirement pension provided by the Social Security pension plans, because rules of pension calculus have changed, by awareness of an economic crisis, or even because of the news about the near insolvency of social security systems in several countries. Specific financial and retirement related knowledge may be an important part of the skills and knowledge base needed for retirement savings planning, and the existence of clear retirement goals may be a significant part of the motivational component.

Hershey's revision of Friedman and Scholnick's planning model. Hershey (2004) simplified and adapted the above model, developed by Friedman and Scholnick (1997), to the area of financial planning for retirement. Hershey (2004) considers psychological influences such as individual traits, cognitive aspects and motivation as proximal determinants of investing behavior, and argues that task characteristics heavily influence the financial planning degree. An example of the latter is the availability of investment options. Financial resources and economic forces are another strong influence, at the level of the environmental factors in Friedman and Scholnick's (1997) model, where Hershey (2004) includes income, sources of support (such as information gained from other persons) and, at a broader level, economic patterns and trends. Regarding cultural forces, the author includes the same variables as Friedman and Scholnick (1997) do: Societal, family and peer group rules. He considers that, collectively, these four factors represent the influences that will determine the degree of planning, saving and investing for retirement.

Concerning psychological components, and more specifically to individual traits, a highlight is given to future time perspective and, regarding cognitive characteristics, knowledge about finance and investing is emphasized, among others features. In regard to motivational factors, financial and retirement goals as well as affect are all pointed out as important aspects in the model. Since these psychological components are relevant aspects to our research, we will now detail the ones we intend to investigate and why.

Time perspective.

Regarding the psychological components of the above planning models, among the individual traits focus is given to future time perspective. Time perspective can be conceptualized from a personality or from a cognitive perspective. From a personality perspective, time orientation is seen as a personality trait that precedes cognitive constructs, having a more distant influence on behavior (Gupta, Hershey, & Gaur, 2012), and is deemed as fundamental to the expression of cognitive states and behaviors (Hershey et al., 2007). From this point of view, predisposition for planning mainly arises from the individual's degree of future time perspective (Padawer, Jacobs-Lawson, Hershey, & Thomas, 2007).

From a cognitive perspective - which will be our view - time perspective is regarded as a perceptual dimension that influences individuals view of the world, their goals, decisions, and plans (Nuttin, 1984, as cited in Gupta et al., 2012). It is seen as a subjective and frequently non-conscious way in which a person relates to time, and as a fundamental

dimension in the psychological construction of time that emerges from the cognitive process whereby the continual flow of human experience is partitioned and assigned to distinct time frames of past, present and future, that help give order, coherence and meaning to life events (Boyd & Zimbardo, 2005; Zimbardo & Boyd, 1999).

Some aspects of the way people deal with time are constrained by their perception of the world around them (Boroditsky, 2001), and they are usually specified in language through the use of spatial metaphors to talk about time, importing a relational structure from space and applying to time (Boroditsky, 2000). So, people seem to rely on space to represent time, but the way they do this changes across languages and cultures, since it depends on several aspects like the existing spatial representations and spatiotemporal metaphors, but it also depends on people's individual disposition, namely their time perspective (Boroditsky, Fuhrman, & McCormick, 2011).

Five types of time perspective have been identified: Future, Past-Positive, Present-Fatalistic, Present-Hedonistic, and Past-Negative, and at least some of them can and should co-exist, in different degrees, in each person (Zimbardo & Boyd, 1999). For instance, although future time perspective (FTP) is usually associated with healthy psychological functioning (Zimbardo & Boyd, 1999), too much emphasis on the future and too little in the present can cause the failure to notice some important hedonistic aspects of life that can only be experienced in the present, possibly leading to later regrets (Boyd & Zimbardo, 2005; Wittmann & Paulus, 2009b). In Appendix A we present a brief summary of what each of the five types implies, to further clarify what time perspective globally means, since it can sometimes be confounded with time preference itself.

Future time perspective. FTP reflects a general future orientation, dominated by an effort in reaching future objectives, goals and rewards, and is characterized by planning (Zimbardo & Boyd, 1999). Several findings suggest that future orientation predicts the tendency to plan and save. FTP and self-reported financial preparedness for retirement are positively associated (Hershey & Mowen, 2000), and individuals with a short planning horizon present a lower net worth, and expect a lower income from personal savings in retirement (Lusardi, 1999). FTP is considered to be related to work motivation in general (Seijts, 1998), and is a predictor of retirement savings (Jacobs-Lawson & Hershey, 2005) and of retirement goal clarity (Hershey et al., 2007). Research showed that individuals with a high FTP engage more easily in activities requiring planning, such as preventative health behaviors

(Rothspan & Read, 1996) and other research found that the planning horizon affects decisions about participation in retirement plans as well as the size of contributions (Munnell, Sundén, & Taylor, 2001/2002). Taken together, these findings strongly suggest an important role for future orientation on retirement planning and savings behavior. Therefore, it is expectable that individuals with higher FTP will be more likely than others to set goals, better plan and save for their retirement.

Since time perspective implies the individual's systematic tendency or bias to overemphasize one or more specific temporal frames (Zimbardo, Keough, & Boyd, 1997), intertemporal decision making may be affected by it. For example, impatient individuals seem to be much more present oriented than less impatient ones (Wittmann & Paulus, 2008, 2009a; Zimbardo & Boyd, 1999).

Savings behavior is considered to be guided by an individual's intertemporal choice (Finke, 2005) and there seems to be some relation between time perspective and intertemporal choice. A significant inverse correlation was found (Adams & Nettle, 2009) between the discount parameter in a hyperbolic discount function (Mazur, 2001; Mazur & Biondi, 2009), and the score obtained on future orientation measured by the Zimbardo's Time Perspective Inventory (Zimbardo & Boyd, 1999).

Demographic indicators such as age, sex, income, marital status, and education have all been conceptualized as proxies for the expression of time perspective (Padawer et al., 2007). Hershey and Mowen (2000) found that only 23% of the variance in FTP was accounted for by personality traits like conscientiousness and emotional stability which, in their view, suggests the possibility of FTP being influenced by contextual factors. If conceived as a perceptual dimension, it is feasible that FTP may be susceptible or sensitive to a great number of influences. Mood effects on time perspective - as well as on time perception - have been discovered, showing that people in a positive mood tend to be more future oriented, and that positive mood leads to time underestimation, whereas negative mood leads to time overestimation, differences that could be due to different degrees of attention paid to time interval in each of these moods (Hornik, 1992). Higher FTP has also been associated with being male, being older, with higher income and higher education, but interactions among sex, age, and level of education, suggest that an interconnection among variables may be responsible for its expression (Padawer et al., 2007). Other research found time perspective

to be predicted by income, and the explanation conveyed was that a lower income could lead to a shorter future horizon due to a day-to-day financial management (Hershey et al., 2007).

In sum, FTP is one of the psychological components highlighted in both planning models presented above and research results suggest an important role for FTP on savings behavior and also that it may susceptible, in some degree, to external influences. Hence, FTP represents a potentially important factor in driving people to plan more for their retirement.

Retirement motivation and affect.

As mentioned before, the existence of goals may be an important part of the motivational component of planning (Friedman & Scholnick, 1997) and several empirical findings are in agreement with this proposal. In regard to motivational factors, Hershey (2004) refers financial and retirement goals, as well as affect.

Goals. Setting goals for the future and more specifically for retirement or old age, like wanting to maintain economic well-being, which could go under the heading of financial goals, but also health goals, and leisure goals like travel, appear consistently and positively related with retirement financial planning (Hershey et al., 2007; Petkoska & Earl, 2009), and all of them imply savings. Financial goal strength and retirement savings contributions are also positively related (Neukam & Hershey, 2003), and planning degree is predicted by goal clarity (Stawski, Hershey, & Jacobs-Lawson, 2007). People who practiced goal-setting exercises in retirement planning seminars also expected their planning and saving activities in the subsequent 12 months to be higher than people who did not perform these exercises (Hershey, Mowen, & Jacobs-Lawson, 2003).

A link between age and retirement goal clarity was predicted - but not verified - by Hershey and colleagues (2007) based on the work of Cantor (2003), who argues that different tasks are socially encouraged in different moments of life and, therefore, individuals are expected to pursue particular goals at certain ages. However, other research found that goal clarity is accounted for by age (Stawski et al., 2007).

Retirement affective valence. Some researchers consider retirement affect could be a component of retirement planning: A measure of how "exciting, fun, interesting, [and] appealing" planning one's the retirement can be (Hershey & Mowen, 2000, p. 691), but no relation was found between retirement affect and the degree of financial preparedness. Regarding motivational factors in the planning model, Hershey (2004) refers to affect as well

as financial and retirement goals. However, as we will present next, retirement affect may have other implications and in our view should be distinguished from retirement motivation.

Research made in 1999, in Norway, showed a very favorable view of retirement for most respondents (78%) (Jonsson & Andersson, 1999), but more recently, in Argentina, the majority presented an unfavorable view (Feijóo, 2006). There could be several explanations for this: For instance, there could be cultural differences, or perhaps the influence local or global economics crisis. Another possible explanation has to do with a negative view in some cultures (e.g. Canada and USA) regarding older workers, which may affect perception of retirement, and also retirees in terms of low self-esteem and dissatisfaction with their life, even though the work force is clearly aging (Tougas, Lagacé, Sablonnière, & Kocum, 2004). Also, ageing by itself is frequently regarded as unpleasant and worrisome or even frightening, and it may be associated with sickness so, also from this point of view, having to deal with retirement issues can involve some psychological costs (Sundén, 2008). Although a negative vision of old age is not new, it never before played a role like the one it does in nowadays western societies: Just looking at the USA expenditure in anti-ageing compounds tells us there is "a massive social dread of old age" (Gilleard & Higgs, 2000, p. 134). This contemporary ageism has serious economic, social and psychological effects and is even represented in several institutional practices that view old age as an equivalent of poverty and closeness to death (Gilleard & Higgs, 2000).

If to some people retirement may be viewed as a deserved rest from a lifetime of work, the moment to fulfill a number of postponed plans (like doing voluntary work, traveling, spending time with grandsons, etc.), for others it may be considered an undesirable situation, and there may be psychological costs inherent to having to think about it (Lusardi, 2003). Being retired can be associated with fear of not being productive anymore (Haro & López, 2012) and becoming a burden to others (Feijóo, 2006). Thus, the prospect of retirement may be, for many different reasons, associated with a more positive or a more negative affective valence.

Intervention and enhanced financial education programs can be facilitators of retirement savings and planning but, in order to be efficacious, they should address the real problems perceived by people and have some degree of adjustment to their individual differences (Hershey et al., 2007; Lusardi & Mitchell, 2007b). We intend to show that

retirement affective valence represents an individual characteristic that should be taken into account when conceiving this kind of programs.

Financial knowledge base.

The changing pension landscape combined with the widespread low level of knowledge about pensions has prompted policy makers and employers around the world (e.g. USA and Sweden) to provide more information about pension plans. For instances, information has been provided through information campaigns and financial education programs at the workplace. However, people may not fully appreciate the benefits of collecting this kind of information while they expect public pension system to provide adequate benefits (Sundén, 2008), if not previously sensitized to the importance of the matter.

Knowledge of financial planning for retirement. This type of knowledge can have a strong effect on retirement saving decisions (Jacobs-Lawson & Hershey, 2005). Individuals only experience the retirement process once and therefore they do not have the possibility of learning by doing (Sundén, 2008). In accordance with this view, retirees reported they should have gained more knowledge about retirement savings and investments, or gotten more professional help (Loewenstein, Prelec, & Weber, 1999). Research demonstrates that knowledge of financial planning for retirement is positively related to retirement planning activities and financial saving practices (Hershey & Mowen, 2000; Jacobs-Lawson & Hershey, 2005), and those who have higher financial knowledge are considered more likely to make retirement savings contributions (Hershey et al., 2007). Financial planning knowledge and financial planning activity have both been found as predictors of reported savings, while financial planning knowledge and retirement goal clarity are predictors of financial planning activity level (Hershey et al., 2007). The author's proposed explanation is that knowledge about financial issues is associated with familiarity with financial planning activities, and that having clear goals for retirement would facilitate the assessment of retirement financial needs.

Other empirical findings are in line with these results. Savings contributions are predicted by planning activities and income (Stawski et al., 2007). Also, expert financial planners and trained novices make better investment decisions than novices with no training (Hershey & Walsh, 2000/2001), and households indicating they obtained specialized financial advice report higher retirement savings (Mitchell & Moore, 1998).

What influences the degree of financial planning knowledge. The degree of financial planning knowledge appears in literature as being predicted by FTP, retirement goal clarity, gender and income (Hershey et al., 2007). Other empirical findings are in accordance with these results, namely FTP has previously been found to be a predictor of both financial planning knowledge and retirement affect (Hershey & Mowen, 2000), and women presented lower scores on measures of financial knowledge and literacy (Gustman & Steinmeier, 2005; Lusardi & Mitchell, 2008). The rationale explaining these relations is that a) acquiring knowledge about finances is more likely with a high future orientation because people will want to be able to support themselves in retirement, b) defining clear retirement goals will create the need to acquire more knowledge about finances in order to achieve them, and c) those with higher income may have more reasons to gain financial knowledge because they have more investment possibilities (Hershey et al., 2007).

Financial literacy. The OECD's definition of financial literacy (also frequently referred in literature as financial knowledge or financial education) is a complex one. Financial literacy is:

> The process by which financial consumers / investors improve their understanding of financial products and concepts and, through information, instruction and/or objective advice, develop the skills and confidence to become aware of (financial) risks and opportunities, to make informed choices, to know where to go for help, and to take other effective actions to improve their financial well-being and protection (OECD, 2010).

However, financial literacy can also be viewed simply as "an individual's ability to obtain, understand and evaluate the relevant information necessary to make decisions with an awareness of the likely financial consequences" (Mason & Wilson, 2000, p. 31). There seems to be a positive link between financial literacy and savings behavior (Hilgert, Hogarth, & Beverly, 2003), and also with financial retirement planning (Lusardi & Mitchell, 2007a). Returning to the example given above about the impact of an insufficient knowledge base in planning ability, in the case of low financial literacy, far too much time may be needed in search of financial information for retirement planning, because the knowledge base may be insufficient.

A question is raised in what concerns the measurement of financial literacy by self-assessment versus performance tests. Some speak of a tendency to overstate the financial

knowledge one possesses (Hung, Parker, & Yoong, 2009), but the trend towards overestimation of knowledge is not unusual and has been demonstrated not only on financial matters but also on a wide range of knowledge and skills: Actual and self-assessed knowledge are ordinarily correlated (Hung et al., 2009). And indeed a strong correlation between results obtained by both measurement strategies has been found (Lusardi & Mitchell, 2009).

Numeracy. It is usually assumed that numeracy is a prerequisite for financial literacy (Coben, Dawes, & Lee, 2005), and some recent research showed that there is, in fact, a high correlation between these two variables (Noon & Fogarty, 2007). Numeracy can be defined as the ability to process basic probabilities and numerical or mathematical concepts (Lipkus, Samsa, & Rimer, 2001; Peters, 2008; Peters et al., 2006) or, more simply, as the individual's mathematical proficiency (Reyna & Brainerd, 2007). Again retuning to the example given above, in the case of low numeracy retirement planning may require a longer time, because the skills needed to plan are not developed enough.

Assuming people with high financial literacy have a good understanding of financial products and the skills to make informed choices, being aware of opportunities and associated risks, and assuming numeracy as a prerequisite, when confronted with an intertemporal choice, these people will want to calculate interest rates, know variances and acquire other financial information, and will most probably be able to compare the choices presented to them with other options available in the market, known from memory. Therefore, concerning time preference, it is expectable that these people present a lower level of impatience.

According to Ellis and Siegler (1997), most research about the activity of planning itself has been done through very simple approaches, instead of incorporating more complex aspects like assessing the costs and benefits of planning when comparing the planning strategy with other possibilities of solving a problem. At the same time, the planning models usually applied to analyze retirement savings planning frequently assume there are no costs of planning and this, according to Lusardi (2003), may lead to a simplistic analysis of retirement savings planning. Also, the differences in the way people assess and evaluate the necessary information and in the way they overcome the difficulties encountered in defining their savings plans are usually not taken into consideration (Lusardi, 2003). Therefore, failing to consider these aspects may result in an analysis of retirement savings planning too detached from reality and having no real applicability.

We will next see how, according to the planning models presented, these costs may appear in the planning process.

Planning costs.

As we mentioned before, a possible explanation for the low level or absence of retirement planning is that planning has costs which the planner may be unwilling to accept (Ellis & Siegler, 1997). These costs may have a considerable weight and be perceived as high enough to inhibit planning altogether (Lusardi, 2003). Therefore, a high perception of these costs may ultimately lead to reduced retirement savings.

Time is generally viewed as a scarce commodity, so there may be costs of spending time making retirement planning decisions that could be spent with other purposes (Loewenstein, 1999), and time spent in retirement planning tasks can itself be perceived as a cost and weighted against the benefits of the outcomes (Wittmann & Paulus, 2008). From this viewpoint, it could be said that, by postponing things like planning, saving and investing for retirement until later, people are actually trying to gain some time. Also, the perception of a period of money unavailability - consisting in the time lapse until the funds invested are available - could also be felt as an immediate cost. Another perspective on planning costs is that, since "investment means reducing consumption early to increase it later" (Read & Roelofsma, 2003, p. 140), by committing one's money to retirement savings, there is an obvious cost of postponing present consumption against the benefit of having increased funds once retirement time arrives.

Even small perceived costs may negatively affect retirement planning, savings and investment (Lusardi, 2003). As we will detail ahead, according to O'Donoghue and Rabin (1999a, 1999b) costs do not really need to be very high for postponement to take place.

Procrastination. It is considered as an voluntary postponing of an intended course of action, even though postponing is not expected to be beneficial to the individual (Gupta et al., 2012; Steel, 2007), and shows a negative relationship with FTP (Gupta et al., 2012).

Through a hyperbolic discounting model, O'Donoghue and Rabin (1999a, 1999b) were able to theoretically demonstrate that procrastination in savings for retirement could arise as a simple consequence of present biased preferences. Because individuals will tend to keep postponing actions that involve immediate costs until later, and since even very little immediate costs may lead to inaction, preference for immediate gratification can lead people

to sacrifice much of future consumption in favor of present consumption, leaving very little savings for retirement (Laibson, 1997; O'Donoghue & Rabin, 1999a, 1999b).

If the costs involved are perceived as high enough, many people who have the intention to plan for retirement will simply not do it, or will merely go on thinking that "one of these days I must start saving for retirement" but they never do. They postpone and will keep postponing the moment to start, even though their prospective savings will probably be smaller and smaller as time goes by. But, although people may postpone the task because of its high costs, the postponement of retirement planning could itself be perceived as a cost, since elevated levels of procrastinating cognitions are associated with increased levels of psychological distress, anxiety and stress (Flett, Stainton, Hewitt, Sherry, & Lay, 2012; Gupta et al., 2012).

P***sychological costs of retirement preparation.***

In the words of Loewenstein (1999, p. 1), when trying to prepare for retirement, we may "not know enough to choose among the options presented to us, lack the time or motivation to attempt to make good choices, or fear that bad decisions will haunt us in the future, tingeing our decision making with feelings of anxiety and anticipatory regret". In sum, if individuals don't have enough knowledge, have low motivation, if time is a scarce resource, and they are overwhelmed with multiple alternatives, result may be stress and anxiety, fear of mistakes, and they may very easily make bad decisions, try to postpone or simply give up.

Many of the retirement investment decisions, if not all, can be viewed as intertemporal choices and, in this context, when larger benefits involve longer waits, time can be felt as a decision making cost (Wittmann & Paulus, 2008). These authors consider that the "perception of time as lasting too long is associated with too high of a cost, which leads to the selection of alternatives with more immediate outcomes" (2008, p. 7). Therefore, in the case of gains or positive outcomes, perceived time delays can themselves be felt and viewed as costs, and weighed against the benefits of the outcomes. And, depending on factors such as mode of reference to time in choice options, time delays can be associated with higher or lower costs. For example, when time duration is made more accessible, people become more sensitive to it, and so changes in the attention given to time duration could influence subjective time estimations and have an effect on intertemporal choices people make (Zauberman et al., 2008).

Having many choice options is favorable when people know what they are doing, but can be detrimental if they have insufficient knowledge. Too much option choices can inflict costs, and these may exceed benefits when the choices require knowledge that individuals do not have (Loewenstein, 1999). A good example of this is what happened with the choice of health plans in the US market: The offer is staggering for most people, and there are huge differences among the plans offered. Those who carefully research the offer are able to gain sizable benefits, but evidence suggests very few do (McCarthy & Tchernis, 2009). Search costs may be an important aspect in this type choice: Assuming all individuals can comprehend the characteristics of the available health plans, understanding all the details and components of the alternatives takes time and money and, for many of them, it may be too costly (McCarthy & Tchernis, 2009).

The lack of financial retirement knowledge may be related to the fact that learning about pensions plan is difficult, and the complexity of pension plans "makes the costs of collecting information appear greater than the benefits of understanding the plans" (Sundén, 2008, p. 325). Furthermore, acquiring knowledge about retirement planning can involve psychological costs derived from the association between retirement and old age, which is frequently viewed as unpleasant and worrisome (Sundén, 2008).

Beyond adding to the time costs already mentioned, too many choice options can also generate psychic costs and error costs (Loewenstein, 1999). Psychic costs concern to feelings of anxiety and regret associated with decision making. Anxiety is often experienced at the moment time decision is taken, and tends to be more intense when individuals believe they don't have enough knowledge in that field. Anticipatory regret results from the fear of having made a bad decision, and regret is felt if decisions really turned out badly, with people feeling worse when they are directly responsible by such decisions (Loewenstein, 1999). Besides the fact that time is a scarce resource, it is conceivable that excessive time demanded by an activity like retirement planning can also impose psychic costs. As the availability of time decreases, individuals may become anxious and doubt they are using their time in the best manner, sorrowful about the things they were not able to do, or guilty about neglecting family and friends (Loewenstein, 1999). Increased levels of anxiety and stress can lead to a selective allocation of attention to the information perceived as threatening in some way (Lonigan, Vasey, Phillips, & Hazen, 2004; Mogg, Mathews, Bird, & Macgregor-Morris, 1990).Therefore, it is plausible to assume that someone who perceives high psychic costs

associated to retirement planning, could become very sensitive to the retirement theme altogether.

Error costs refer to the propensity to make bad decisions when people do not have enough knowledge. Loewenstein (1999) mentions several types of common errors that intensify when people are overburden: They a) reduce the number of choice options, b) use simple decision rules, c) try to avoid choice by postponing or choosing subjective default options, and d) tend to be driven by short-term gratification and costs perception.

As stated before, costs may be important and perceived as high enough to inhibit retirement planning (Lusardi, 2003), and thus ultimately lead to reduced retirement savings. Therefore, based on above assessments of the costs that planning may present (Loewenstein, 1999; Lusardi, 2002, 2003; McCarthy & Tchernis, 2009; Sundén, 2008) and on planning models and their characteristics (Ellis & Siegler, 1997; Friedman & Scholnick, 1997; Hershey, 2004; Scholnick & Friedman, 1987), we believe a high perception of these costs may be related to the aspects we will enumerate below:

1. Lack of specific skills: Numeracy and planning experience;
2. Lack of time: Time to search, to gather knowledge and investment delays;
3. Low levels of knowledge and information. Concerning the Hershey's (2004) adaptation and of Friedman and Scholnick's (1997) planning model, this could be related to retirement knowledge, included in the psychological components, one of the four factors that represent the influences that determine the degree of planning, saving and investing for retirement. When there is low level of information, the need to acquire more financial information may require too much time or too high an effort, constituting one of these dissuasive costs;
    a. Therefore, the degree of financial literacy possessed, affecting the need to acquire general financial information (e.g., interest calculations), could affect planning costs;
    b. Retirement planning knowledge, affecting the need to collect specific financial information, must bear heavily on planning costs (e.g. types of savings plans);

4. Overwhelming offer and complexity of financial investment products. This is another view of the costs involved, related to the large offer of financial retirement products from were to choose: The bigger the offer, the greater the costs at time, error and psychic levels (Loewenstein, 1999). Regarding Hershey's (2004) planning model, this could be related to task characteristics, another of the four contributing factors, were task complexity is included;

5. Feelings of anxiety and anticipatory regret associated with financial investment decisions. Anxiety can be experienced when a financial decision is made, especially if individuals feel they lack knowledge, and anticipatory regret is associated with fear of making a bad decision that will, in the future, lead to real regret (Loewenstein, 1999). Concerning the Hershey's (2004) planning model, this could again be related to the psychological components, were emotions are included;

6. Postponement of financial investment decisions. As we have mentioned, people may procrastinate because of the perceived costs associated with the task, but the postponement of retirement planning could also be felt like a cost, since increased levels of psychological distress, anxiety and stress are associated with high levels of procrastinatory cognitions (Flett et al., 2012; Gupta et al., 2012).

Acquiring knowledge about retirement planning can involve psychological costs derived from the association between retirement and old age, frequently viewed as unpleasant and worrisome (Sundén, 2008), and it is reasonable to assume this could lead to a negative retirement affective valence. Nonetheless, since retirement affect in literature presented no relation to the degree of financial preparedness (Hershey & Mowen, 2000), it was not considered as contributing directly to psychological costs of retirement preparation.

We believe that intervention programs and enhanced retirement education focusing on reducing psychological costs of retirement preparation could be facilitators of retirement savings and planning (Lusardi & Mitchell, 2007b) but, in order to have efficacy, these programs must address the actual costs perceived by people and be conceived to adjust to individual differences (Hershey et al., 2007; Lusardi & Mitchell, 2007b).

Time costs and the perception of time.

In an intertemporal choice larger benefits usually involve longer waits and therefore time can also be felt as a decision making cost (Wittmann & Paulus, 2008). However, it is possible that individuals make intertemporal choices not as a function of objective time but of their perception of time duration, and in that case their estimate of duration will have an effect on intertemporal decisions (Wittmann & Paulus, 2009b) and in their rate of time preference. For this reason, the subjective perception of time has recently received some attention (Wittmann & Paulus, 2009a) and some authors even propose that these distortions in time perception are the real cause of the hyperbolic and dynamically inconsistent intertemporal choice behavior (Takahashi, 2009). Actually, exponential discounting over subjective time, for example, logarithmic time-perception, is equivalent to hyperbolic discounting over objective time (Scholten & Read, 2010; Takahashi, 2005, 2006, 2009). Furthermore, some measures of participants' perception of anticipated time length showed that nonlinear functions, such as log and power functions, had a better fit than a linear one, since the changes in estimation of time duration are smaller than the corresponding changes in objective time (Kim & Zauberman, 2009; Zauberman et al., 2008). The results obtained in these investigations suggest a diminishing sensitivity to longer anticipated time length and an overall time contraction. Another line of research has suggested that people may be much less sensitive to the impact of future time than they are to other dimensions like money, and that the little future time sensitivity they have is relatively fragile and very easily influenced (Ebert & Prelec, 2007). So, it seems possible that changes in the degree of attention given to the time attribute may influence the subjective time estimations people make, by making the time horizon more or less accessible, and also their discounting pattern.

Demographic indicators and financial investment.

Economists and sociologists have long focused in the way demographic variables are related to investing behavior and the findings suggest this kind of information provides some insight (Hershey, 2004). Demographic indicators such as age, gender, income and education degree have been found as important in predicting differences in retirement savings: Income is used as an indicator of resources and, although age and income are often related, age and gender may represent different cultural influences (Hershey et al., 2007). But it is probable that these demographic variables function as proxies for the psychological basis of investor behavior (Hershey, 2004) and, therefore, these indicators should always be considered in

conjunction with more psychological aspects, like motivation, financial knowledge and literacy and future time perspective, since these may establish a bridge between the demographic indicators and behavioral constructs such as retirement planning effort and perceived savings (Hershey et al., 2007).

Demographic variables. Income presents a large influence over the probability of resource allocation for retirement savings purposes (Hershey et al., 2007), and it is not surprising that income and age have a positive relation (DeNavas-Walt, Proctor, & Lee, 2006; DeNavas-Walt, Proctor, & Smith, 2012). Several studies have showed that earning a higher income (Bassett, Fleming, & Rodrigues, 1998), being older (Bassett et al., 1998; Petkoska & Earl, 2009), being male (Quick & Moen, 1998), having a higher education (DeVaney & Su, 1997), are all related to a higher degree of retirement financial planning. Being older and being male is also associated with higher retirement savings (Glass & Kilpatrick, 1998; Hurd & Wise, 1989). Men are also usually more involved in investing than women (Hershey et al., 2007; Lusardi & Mitchell, 2008; Seguino & Floro, 2003). Income and gender, along with financial planning activity and financial planning knowledge, have all been found as predictors of reported savings (Hershey et al., 2007). Other empirical findings are in agreement with these results: Income and planning activities predict savings contributions, and goal clarity is accounted for by age (Stawski et al., 2007). Income was also found to be a predictor of retirement goal clarity (Hershey et al., 2007).

Establishing a link with the intertemporal choice domain, time preference may depend on the participant's age however, to Read and Read (2004), middle aged people seem to discount less that either older and younger people, but for Warner and Pleeter (2001), older people discount less than anyone else. Time preference may also depend on the participant's gender and education (Warner & Pleeter, 2001): Those with higher education and, in some cases, women, present lower discount rates (are less impatient). It is worth mention that the study conducted by Warner and Pleeter involved a sample of over 60.000 participants in a real life situation (a military downsizing program) and is, thus, "particularly compelling in terms of credibility of reward delivery, magnitude of stakes, and number of subjects" (Frederick et al., 2002, p. 385).

Work status is not a variable frequently studied in what concerns retirement planning or intertemporal choice. In economics, labor force is usually classified in three categories: Employed (workers and working-students, whether self-employed or otherwise), unemployed,

and economically no-work (students, retired and unemployed not searching for work) (Eurostat, 2013). Simplifying this division, we have in one hand the work group, and on the other hand, the no-work group. We assume people on the first group have a regular income (receive a salary or, for the self-employed, generate income) and people in the second group do not, although being without work may be a temporary situation, and some may be receiving an unemployment subsidy. We suspect there may be differences in impatience between them considering that the explanation forwarded for the relation between income and time perspective was that a lower income could lead to a shorter future horizon due to a day-to-day money management (Hershey et al., 2007) and also that impatient individuals seem to be more present oriented than more patient ones (Wittmann & Paulus, 2008, 2009a; Zimbardo & Boyd, 1999).

Cultural and contextual differences in retirement planning

There seem to be some differences in the way people face issues and make decisions related with retirement savings in different countries. Hershey et al. (2006) studied people in the Nederland and in USA, and their results showed that Dutch were much less involved in retirement planning activities than Americans, yet had higher perceived savings. According to the authors, this apparent contradiction can be explained on the one hand by the fact that pension obligations in Nederland are fulfilled through a fixed percentage of the worker's pay and, on the other hand, by Dutch workers retirement income being mainly shouldered by the state and by their employer (as also happens in Portugal in most cases). However, in the USA the responsibility for retirement saving has mainly shifted to individual workers and, even though Americans seemed more involved in retirement planning than the Dutch, in recent years many Americans reached retirement with almost no savings at all (Lusardi & Mitchell, 2007a).

In a more recent study, published in 2010, the perceived savings adequacy across Dutch and American workers was found to be about the same, with nearly half of the respondents, in both countries, believing they had saved enough for retirement (van Dalen, Henkens, & Hershey, 2010). One of the factors that seems to influence this perception is future orientation, though it seems to be more important in the United States than in Nederland, since Dutch rely on their pension funds and seem to leave most of the thinking

about retirement to managers (Hershey, Henkens, & van Dalen, 2010a). Another study published in 2010 analyzed data from 23 European countries, showing Portugal in the third place among the countries where respondents had the highest levels of future income worry. The UK was very near the scale midpoint, and Nederland among the four countries where respondents were less worried about future income. In what concerns self-reported savings, Nederland was among the top six countries, UK was four places below, and Portugal among the last six (Hershey, Henkens, & van Dalen, 2010b). So, it seems that Dutch actually worry less but believe they save more for retirement than British, and much more than the Portuguese.

Could the differences also be due to language? The differences in these countries economies, concerning aspects such as interest or inflation rates, and in demographic variables such as income and education degree, and even cultural differences, certainly contribute to these results. According to Wang, Rieger and Hens (2009), who studied time discounting in 45 countries, the cross-country differences found in time preference, usually associated with the savings behavior (Finke, 2005), do not appear to be fully explained considering only economic variables as interest or inflation rates, but rather seem to be associated with cultural difference.

It is usual and implicitly assumed that time preference is a stable individual-differences variable meaning that, although different people discount the future at different rates, each person is rather consistent in applying his or her discount rate to different decisions, including hypothetical decisions presented in questionnaires to access their time preference (Chapman, 2005; Wang et al., 2009). Research does seem to back up this assumption to some extent, with a strong significant correlation when tests were repeated after one week, and a weak but significant test-retest reliability after one year (Chapman, 2005; Chapman et al., 2001; Simpson & Vuchinich, 2000). However, the same methods and techniques were used in these cases. At the same time, as we shall see next, research on context and framing effects suggests that time preference may be much more pliable.

Research in the intertemporal area has shown that time preference is often dependent on the context and framing of the options and of the delays presented, and there is also ample evidence that it can be affected by several task-related aspects, like the method by which discounting choices are presented and elicited (Read, Frederick, Orsel, & Rahman, 2005; Tesch & Sanfey, 2008), although, in what concerns methods, some animal experiments

showed the same results using either fixed immediate rewards or fixed delayed rewards methods (Green, Myerson, Shah, Estle, & Holt, 2007).

For instance, discounting rates can change when participants' attention is shifted toward or away from the delay, greater discounting rates were found for smaller rewards, and gains are usually discounted more than losses (Read, 2004; Tesch & Sanfey, 2008). These variations in impatience regarding amount sizes, and between gains and losses, concern some of the more well recognized and strong empirical findings in the area of intertemporal choice, known as magnitude effect and sign effect (Frederick et al., 2002; Read, 2004). This means people usually exhibit less impatience regarding larger amounts, and losses. People are also usually less impatience regarding larger delay. This refers to another important and robust effect known as the delay effect, meaning the value of outcomes is discounted less for longer delays than for shorter ones (Frederick et al., 2002; Read, 2004). The date/delay framing effect occurs when delays are framed as future dates versus regular time delays: The discount rates are much lower in the former than in the latter case. According to Read et al. (2005), it seems probable that people have an intuitive impression of how long the time intervals in question are, but believe that those impressions may change with different framings. Several possible explanations for this effect are presented by Read et al. (2005), and among them there are two interesting hypotheses in the context of the present research: The attention-focusing hypothesis and the differential time estimation hypothesis. The first one implies that the framing itself may influence the degree of attention allocated to the timing of a future outcome in comparison with the one allocated to its value. The second one proposes that, more than merely diminishing the impact of temporal distance, framing may lead to the actual underestimation of the delay interval.

In sum, the characteristics of choice options, the way choices are presented, different choice frames and contexts, and the method by which discount rates are elicited, may all affect the degree of discounting. So, we may ask in what measure the different languages spoken in these countries could also contribute to explain differences in savings and time discounting. Chen (2011, 2013) believes that certain characteristic of language could influence speakers' intertemporal choices. The author compared different individuals that spoke different languages but shared other characteristics like the same demographics, family structure, and country of birth and residence, and evaluated behaviors such as savings, exercising, and abstaining from smoking. He also looked at the effects of these behaviors,

such as retirement savings and long-run health, and his results suggest that speakers of languages with certain characteristics save less per year, hold less retirement wealth, smoke more, are more likely to be obese, and suffer from worse long-run health. As we will show next, the differences between the languages concern their degree of future time reference.

Language and time.

Traditionally, tense is considered a grammatical category of verbs (Dahl & Velupillai, 2005) and refers to the absolute location in time of an action or event. The grammatical aspect of a verb is a grammatical category that defines the temporal flow, and refers to how an action or event is to be viewed with respect to time, rather than to its actual location in time. Therefore, time may be grammatically encoded through the use of tense or a combination of tense and aspect, but location in time can also be made by the use of lexicalized concepts like temporal adverbs and particles, or spatiotemporal metaphors (Jarvis & Pavlenko, 2008).

Cross-linguistic differences in the time dimension.

For example, in languages such as English, temporality can be encoded grammatically, but languages such as Mandarin depend on lexical and discursive means and have no grammatical devices to establish time location (Comrie, 1985). There are also differences in the tense systems, so that different languages create different links between time and events, and so obligatory linguistic differentiation may affects speakers' awareness of some aspects and degree of attention paid to them (Jarvis & Pavlenko, 2008).

Future time reference in European languages.

Future tense indicates location of a situation at a time subsequent to the present moment (Comrie, 1985). Still, there is some controversy around the existence of future tense as a category in linguistic theory, since many languages do not have a clear grammatical distinction between future and present, and several have no grammatical distinction at all (Comrie, 1985). Verbs display morphological variation that often include inflectional differences between forms reflecting temporal distinctions (Dahl & Velupillai, 2005), and a good example in English is the inflectional difference between the present tense form *throw* and the past tense form *threw*, which is made only by a vowel change.

Dutch, English and Portuguese. Inflectional future is commonly used in Romance[2] languages, such as Portuguese, Spanish and French, but future time reference (FTR) tends to be left ungrammaticalized or only partly grammaticalized in several other European languages (Dahl, 2000). For instance, there is a total absence of inflectional futures in all Germanic and Finno-Ugrian languages, where English and Dutch are both included, and in most of the Slavic ones[3], and there is a tendency not to distinguish present and future time reference in a systematic way (Dahl, 2000).

Although in most Germanic languages there is widespread use of present tenses as the normal verb form used to indicate future time reference (Comrie, 1985; Dahl, 2000), in this respect, English is relatively isolated in the Germanic area, since it normally has obligatory marking of FTR (Dahl, 2000). Traditional grammar usually presents English as having a future tense, namely the form using the modal auxiliaries *will* or *shall* and the citation form of the verb, as in *John will leave tomorrow*, where future tense makes a clear prediction about some future state of affairs (Comrie, 1985). This is the most common way of expressing future time in English, but there are a few others (Leech & Svartvik, 2002).

Dutch, however, is included by Dahl (2000) in what he refers to as the "futureless area" (p. 325). Since both the English and the Dutch tense systems contain various and rather similar verbal means of referring to the future, Beheydt (2005) compared FTR between these two languages. In both Dutch and English, means of establishing post-present domains such as the tense *will/shall* vs. *zullen* + infinitive, the tense forms *be going to* vs. *gaan* + infinitive and the present tense are available. However, in Dutch, globally, the present tense is shown to be the most common means of referencing to future time, even though there seems to be some sociolinguistic and regional variation and also some deviation between spoken (more informal) and written (more formal) language.

Language effects on thought.

In the cognitive sciences there was a widespread view, for a long time, of language as essentially innate. Chomsky (1968) maintained that all human languages share properties of organization and structure called linguistic universals. This leads to the view of language's syntax as fundamentally universal and innate (Levinson, 2003), as well as semantics, given by

[2] Romance languages are a group of eleven living languages that belong to the Italic branch of the Indo-European family descended from Latin (Blake, 2009).
[3] Also, according to (Dahl, 2000), for some more peripheral parts of Romance and for the non-Slavic languages in the Balkans.

an innate ‘‘language of thought’’(Fodor, 1975, p. 65). At present, huge variations have been found across languages (e.g. some have several tenses while others have none) and only trivial linguistic universals like all spoken languages having vowels were found (Levinson, 2003). Since "spatial categories in language could be direct projections of shared innate conceptual categories" (Levinson, 2003, p. 30), if the major properties of language were innate, we should expect small (or none) semantic variation in the spatial conceptual domain. But there is no evidence of this (Levinson, 2003). Although sharing the most basic cognitive processes, the language people speak - meaning that particular linguistic coding - may grant or restrict access to certain concepts, and facilitate or obstruct specific cognitions (Levinson, 2003). Hunt and Agnoli (1991) state that languages, by providing differential support to cognition, vary in the level of cognitive challenge posed to speakers. Therefore, languages that differ in ambiguity may impose different cognitive burdens on speakers and promote different cognitive styles (Hunt & Agnoli, 1991).

To Vygotsky, thought was not merely expressed but completed in words, being restructured when transformed into speech (Vygotsky, 1934/1962, 1934/1987), and he perceived speaking and thinking as two dynamically related processes (John-Steiner, 2007). Slobin (2003) presented an hypothesis called ‘‘thinking for speaking’’, based on Benjamin Whorf’s proposal of a relationship between language and thought (John-Steiner, 2007). Language can affect thought through the characteristics that are available for coding in the language the speaker is using, fitting the conceptualizations being made (Slobin, 1996). This may direct attention to the elements of the experience that are ordinarily encoded in that particular language (Casasanto et al., 2004).

Summing up, different languages would make us to pay attention to different aspects, biasing speakers of different languages in their experience while speaking (Boroditsky, 2001), and habits built while thinking for speaking are likely to arise even when people are not specifically encoding information to speak (Casasanto et al., 2004). It is also conceivable that, through inner speech, language may influence thinking (Gentner & Goldin-Meadow, 2003).

Concepts like "space" and "time" are abstract ideas usually and routinely employed by average speakers of languages in interpreting their daily experiences. These concepts could, to some extent, be shaped by the structure of particular languages (Lucy, 1992; Whorf, 1943), through grammatical patterns that, by making obligatory semantic distinctions, could induce corresponding categories in habitual thought (Levinson, 2003). Therefore, the main influence

of language should be in these concepts because speakers would appropriate their "language patterns as guides to the nature of reality" (Lucy, 1992, p. 46).

Languages affect how time is learned, represented, or reasoned about. Several researchers have been trying to understand the relationship between languages and they way how time is learned, represented, or reasoned about (Alloway & Corley, 2004; Boroditsky, 2000, 2001; Boroditsky et al., 2011; Casasanto et al., 2004; Chen, 2007; January & Kako, 2007; Tse & Altarriba, 2008). Some results suggest, for instance, that speakers of tense languages may be quicker to think about time than speakers of tenseless languages (Alloway & Corley, 2004). And although some aspects of time are constrained by our physical experience of the world and may be universal across cultures and languages, other non-observable aspects may be free to vary across languages, and our conceptions of them may be shaped by the way we talk about them: "Does time move horizontally or vertically? Does it move forward or back, left or right, up or down? Does it move past us, or do we move through it?" (Boroditsky, 2001, p. 4). Though these aspects are not physically experienced, they are usually specified in language through the use of spatial metaphors to talk about time, causing relational structure to be imported from space to time that may be used even when not explicitly processing a spatiotemporal metaphor, through a habit of thought (Boroditsky, 2000).

Language effects on intertemporal choice.

Because languages have differences in how much they require their speakers to indicate the future timing of events when speaking about them, Chen (2011, 2013) considers that this characteristic of language could also influence speakers' intertemporal choices. As already mentioned, his study compared different individuals that spoke different languages but shared other characteristics, and evaluated behaviors such as savings, exercising, and abstaining from smoking, and looked at the cumulative effects of these behaviors, namely retirement savings and long-run health. His results suggest that speakers of strong-FTR languages (like Portuguese) save less per year, hold less retirement wealth, smoke more, are more likely to be obese, and suffer from worse long-run health. Going further, Chen (2011, 2013) suggests that the FTR of a country's language has a significant effect on that countries aggregate savings rate.

Pertaining to cultural clusters, Wang et al. (2009) found that Germanic-Nordic cluster is far more likely to wait (88%) than cultural clusters like Anglo (66% to 70%), followed by

Latin America and Latin Europe (52% to 59%). Concerned that the correlations found could be derived from cultural values or traits coincident with language differences, Chen (2011, 2013) looked at the results of several waves of the World Values Survey, where respondents were asked about their savings behavior, the language they spoke at home, and the degree to which savings and thrift are important values to teach their children. Based on the results, the author concluded that, although both a language's FTR and the degree to which a person thinks savings is an important value predict savings behavior, those effects are completely independent suggesting that the language effects operate through a channel that is independent of conscious attitudes towards savings.

This approach suggests that the language's FTR may indeed influence the speakers' intertemporal choices. But if the effect could be shown in a within-subjects research, with people living in the same country and, therefore, sharing the same economic context, this could more persuasively show that languages may have an effect for which culture is not responsible. We believe this could be achieved in a research with bilinguals.

Research goals

Our research has four main goals. The first is to show that psychological costs of retirement planning can be an important factor that may indeed affect the planning of retirement and savings, and also to investigate the relationship between these costs and variables with an important role in retirement planning activity such as retirement motivation, retirement planning knowledge, financial literacy, FTP and retirement affective valence, according to Friedman and Scholnick's (1997) planning model, and to Hershey's (2004) version of that model.

The second, in view of reported intercultural differences (Hershey et al., 2006, 2010a, 2010b; van Dalen et al., 2010), is to research, concerning retirement planning and savings, important variables in the domain of retirements saving like retirement planning knowledge, financial literacy, FTP, retirement motivation and affective valence, and demographic indicators such as age, gender, income, education, as well as work status.

Assuming savings behavior is guided by a person's future discount rate (Finke, 2005), the third goal is to investigate the relationship between impatience and relevant variables in the domain of retirement planning such as financial literacy, savings and demographic indicators (age, gender and work status), as well as the effect of retirement context on impatience, and how this effect could be related to psychological costs of retirement planning perception.

Our fourth and last goal is to research if time preference is sensitive to the degree of FTR in the language utilized (Chen, 2011, 2013), both in a neutral and in a retirement context in both a neutral and in a retirement context, and also to explore possible relations between delay, magnitude and sign, as well as age, and our predicted effect of language's FTR on impatience.

In view of the ageing and increased longevity of the European population (Hershey et al., 2006) in general, and Portuguese population in particular, and of what this means in terms of social security retirement pensions amounts, our final objective is to acquire knowledge about aspects that could contribute to improve any attempts of enhancing the savings for retirement, be it in form of information campaigns, intervention programs or financial education. All of these could be facilitators of retirement planning and savings, but in order to

be effective, they must address the actual difficulties and costs perceived by people and be conceived to adjust to the individual differences (Hershey et al., 2007; Lusardi & Mitchell, 2007b).

In the first study, one experiment was conducted for the purpose of:

a) Research our predicted relationships between psychological costs of retirement planning, retirement motivation and saving, knowledge of financial planning for retirement, retirement planning, and subjective savings;

b) Show the effect of financial literacy on psychological costs of retirement preparation, on retirement planning and subjective savings;

c) Research our predicted relationships between impatience and financial literacy, subjective savings, and several demographic indicators;

d) Research the relationships between retirement motivation, retirement planning knowledge and subjective savings, and replicate some of the results obtained in the domain of retirements saving concerning important variables such as motivation, age and retirement planning;

e) Explore the relationships between demographic indicators, cognition and psychological variables and behavioral variables, in view of empirical findings from literature;

f) Finally, demonstrate that psychological costs of retirement planning are a significant factor that may indeed affect the planning of retirement and retirement savings.

In the second Study we aimed to provide support for the effect of retirement context on impatience and investigate the relation of this context effect with psychological costs of retirement preparation. We compared the participant's measures of impatience in neutral and retirement contexts, in order to assess the existence of a context effect in terms of impatience degree variation, and investigated if this impatience variation between contexts presented a relationship with retirement affective valence and with psychological costs of retirement preparation. We also meant to demonstrate that psychological costs and retirement affective valence were inversely related, that retirement affective valence would be affected by income, and to search for differences between genders in relation to these two variables, as well as

impatience. Finally, we proposed to research the effect of work status concerning retirement affective valence, psychological costs, and impatience.

Our main objective in the third Study was to demonstrate that variables such as FTP and psychological costs of retirement planning play an important role in the retirement preparation process. For that end, we conducted one experiment with the purpose of researching if FTP and psychological costs of retirement planning were significant factors that could indeed affect the planning of retirement and retirement savings. We also searched for confirmation of some of our previous results from Study I, and proposed to replicate findings from literature in the domain of retirements saving.

Finally, in experiments I and II of the fourth Study, we address the effects of language in intertemporal choice, both in a neutral context and in a retirement context. In experiment I we compared Dutch and English, and in experiment II, Portuguese and English. The first objective of this study was to research the occurrence of an effect of language's FTR on impatience. The second objective was to research the occurrence of an effect of language's FTR degree on estimates of time periods, in order to access the possibility of languages with different FTR degrees produce alterations in the perception of time – a possible explanation for a differential discount on the value of delayed rewards, surfacing as different degrees of impatient, depending on the language. The third and last objective was to research if FTR effect on impatience depends on amount magnitude, delay size or signal, if it varies with age, and if it appears in a retirement context. Although presented last, for coherence with the information structure and literature findings, this study was chronologically the first to be implemented.

Chapter 2: Study I

Study I Theoretical Overview

As we stated before, an intertemporal choice is a decision involving tradeoffs between costs and benefits that occur in different moments in time (Frederick et al., 2002) and it is also often implicitly assumed that time preference is stable, in the sense that, although different people discount the future at different rates, each person is somewhat consistent in applying his or her discount rate to different decisions (Chapman, 2005). To some extent, research backs this up (Chapman, 2005; Chapman et al., 2001; Simpson & Vuchinich, 2000). However, research on context and framing effects also suggests that time preference is often dependent on the context and framing of the options, and on the amounts and delays presented (Frederick et al., 2002; Read, 2004). There is ample evidence that discounting rates can be affected by several task-related aspects, like the way choices are presented, different choice frames and contexts and the method by which discount rates are elicited (Read, 2004; Read et al., 2005; Tesch & Sanfey, 2008). The date/delay framing effect occurs when delays are framed as future dates versus regular time delays, and the discount rates are much lower in the former than in the latter case, probably because the intuitive impression people have of how long the time intervals are may change with different framings (Read et al., 2005).

A research paradigm most utilized in intertemporal studies consists in presenting people with choices that are usually between a smaller-sooner (SS) and a larger-later (LL) alternative. In real life, everyday people have to decide between an earlier and frequently smaller reward (or penalty) and a later and usually larger one. And while "the smaller-sooner reward might be the pleasure from a cigarette, [and] the larger-later reward might be good health" (Read, 2004, p. 428) most frequently in research the rewards are money quantities. For example, a choice between SS and LL amounts of money could be to choose between receiving €100 now or €150 in 3 months. Variation in impatience can be measured by the variation in the number of LL choices people make.

Remembering the OECD definition, people with high financial literacy have a high understanding of financial products and the skills to make informed choices, being aware of opportunities and associated risks. So, assuming that the prerequisite of numeracy - the individual's mathematical proficiency - will be present in people with high levels of financial

literacy, they will want to calculate interest rates, know variances and get other financial information, and will most probably be able to compare the choices presented to them with other options available in the market, known from memory. Based on this assumption, and concerning time preference, *H1.1* predicts a negative effect of financial literacy on impatience, namely that we expect to find lower impatience (higher number of LL choices) with high financial literacy.

As we mentioned before, psychological costs of retirement preparation may be high enough to inhibit planning altogether (Lusardi, 2003), when there is lack of financial information and knowledge. When there is low level of information, the need to acquire more may require too much time or too high an effort, constituting one dissuasive cost. Also, a positive link has been found between financial literacy and savings behavior (Hilgert et al., 2003), and also with financial retirement planning (Lusardi & Mitchell, 2007a). So, *H1.2* predicts a negative effect of financial literacy on psychological costs of retirement preparation (time consumption, search for knowledge, errors and inherent feelings of fear, anxiety and anticipatory regret): With high financial literacy, costs associated with planning should be perceived as lower. Hypothesis *H1.3* predicts a positive effect of financial literacy on retirement planning: Retirement planning should be higher with high financial literacy. Finally, *H1.4* predicts a positive effect of financial literacy on subjective savings.

The existence and clarity of goals is considered an important part of the motivational component of planning (Friedman & Scholnick, 1997) and therefore, their number and importance may be considered a measure of motivation for retirement. They appear consistently and positively related with retirement planning (Hershey et al., 2007; Petkoska & Earl, 2009). Financial goal strength and retirement savings contributions are also positively related (Neukam & Hershey, 2003), and goal clarity predicts planning degree (Stawski et al., 2007). Based on these previous findings, we expect retirement motivation to be a positive predictor of retirement planning knowledge, and of the two behavioral constructs considered. So, *H2.1* predicts a positive effect of retirement motivation on retirement planning, *H2.2* predicts a positive effect of retirement motivation on subjective savings, and *H2.3* predicts a positive effect of retirement motivation on retirement planning knowledge: High motivation should be related to higher retirement planning knowledge.

Moreover, the existence of goals is an important part of retirement motivation, and goal-setting exercises in retirement planning seminars seem to significantly elevate

expectations of planning and saving activities in the subsequent year (Hershey et al., 2003). Therefore, motivation may help diminish the perception of psychological costs. So, *H2.4* predicts a negative effect of retirement motivation on psychological costs of retirement preparation.

Lack of specific skills such as numeracy and planning experience, and low levels of both general and distinct financial knowledge and information may contribute to a heightened perception of planning costs, since the need to learn more may require too much time or too high an effort, constituting one dissuasive cost (Sundén, 2008, p. 325). Decisional anxiety experienced at the time decision tends to be more intense when individuals don't have enough knowledge, as well as anticipatory regret, which results from the fear of having made a bad decision (Loewenstein, 1999) and could also be related to a low level of knowledge. But anxiety could also result from the lack of knowledge to choose from an overpowering and complex offer of financial investment products (Loewenstein, 1999). Therefore, *H3.1* predicts a negative effect of retirement planning knowledge on psychological costs of retirement preparation.

A possible explanation for the low levels of retirement planning is that planning has costs in which the planner may be unwilling to incur (Ellis & Siegler, 1997) and these costs may have enough weight to inhibit planning altogether (Lusardi, 2003). So a high perception of these costs may ultimate lead to reduced retirement savings. Therefore, *H3.2* predicts a negative effect of psychological costs on retirement planning, and *H3.3* predicts a negative effect of these costs on subjective savings: People perceiving lower psychological costs should be more likely to plan and save.

In the intertemporal choice domain, time preference seems to vary with education and gender: People with a lower education degree, and men, tend to be more impatient (Warner & Pleeter, 2001). So, *H4.1* proposes there will be significant differences in impatience between genders, with higher impatience for men, and also *H4.2* predicts significant differences in impatience between education groups. Time preference seems also to depend on the participant's age: Even though in some studies older people discount less than anyone else (Warner & Pleeter, 2001), in others middle aged people seem to discount less than either older and younger people (Read & Read, 2004). Therefore, *H4.3* predicts differences in impatience between middle age group and the other two major age groups.

Earning a higher income (Bassett et al., 1998), being older (Bassett et al., 1998), being male (Quick & Moen, 1998), and having a higher education (DeVaney & Su, 1997) have all been related to a higher degree of retirement financial planning. However, in other studies, age predicted financial planning but income, gender, and education degree did not (Petkoska & Earl, 2009) and goal clarity was accounted for by age (Stawski et al., 2007). Certain tasks are socially encouraged in certain moments of life and, therefore, individuals are expected to pursue particular goals and perform certain tasks at or beyond some ages (Cantor, 2003). Since older people are expected to have a more developed idea of their retirement than younger ones, it is no surprise that age presents itself as the demographic indicator more consistently related to retirement financial planning. This also relates to societal, family and peer group rules pertaining to the cultural forces that both Hershey (2004) and Friedman and Scholnick (1997) consider to be one of the main contributing factors that may determine the degree of planning, saving and investing for retirement. Therefore, *H5.1* predicts a positive effect of age on retirement planning.

A relationship between impatience and savings degree is assumed to exist and, since it is usually difficult for individuals to objectively and accurately evaluate their savings, but easier to have a perception of their savings considering their effort, their objectives and in comparison with their peers, we will measure self-reported, subjective, perceived savings that evaluate the person's perception of her savings, and not objective or absolute savings. The self-assessment of variables like financial knowledge, as well as a wide range of other knowledge and skills, is usually somewhat overstated, but the actual and the self-assessed knowledge are generally strongly correlated (Hung et al., 2009), and we expect the same to occur with the self-reported savings. Therefore, *H6.1* predicts the existence of a positive relation between impatience (number of LL choices) and subjective savings.

Being older and being male is associated with higher retirement savings (Glass & Kilpatrick, 1998; Hurd & Wise, 1989) and men are usually more involved in investing than women (Hershey et al., 2007; Lusardi & Mitchell, 2008; Seguino & Floro, 2003). However, it is probable that, although demographic variables seem to be related to investing behavior, they function as proxies for the psychological basis of investor behavior (Hershey, 2004). According to Friedman and Scholnick's (1997) planning model and especially in accordance with Hershey's (2004; Hershey et al., 2007) view of their model, demographic variables may be predictors of psychological variables, and both demographic and psychological variable

can be predictors of behavioral variables. Reinforcing this idea, income was also found to be a predictor of retirement goal clarity (Hershey et al., 2007) and other research found that goal clarity is accounted for by age (Stawski et al., 2007). An explanation for the link between age and retirement goal clarity is provided by the work of Cantor (2003), who argues that different tasks are socially encouraged in different moments of life and, therefore, individuals are expected to pursue particular goals at certain ages. Income, gender, financial planning knowledge and financial planning activity have all been found as predictors of reported savings (Hershey et al., 2007). Other empirical findings are in agreement with these results: Income and planning activities predict savings contributions, and goal clarity is accounted for by age (Stawski et al., 2007).

In view of these findings, and according to Friedman and Scholnick's (1997) planning model and especially in accordance with Hershey's (2004; Hershey et al., 2007) view of their model, we raised the following research questions:

1. *Q1*. What demographic indicators (income, age, gender and education) have significant effect on cognition and psychological variables (financial literacy, retirement planning knowledge, psychological costs of retirement preparation and motivation)?
2. *Q2*. What demographic indicators (income, age, gender and education), and which cognition and psychological variables (financial literacy, retirement planning knowledge, psychological costs of retirement preparation and motivation) have significant effect on behavioral variables (retirement planning and subjective savings)?
3. *Q3*. Which of the studied non-behavioral variables (income, age, gender, education, financial literacy, retirement planning knowledge and motivation) have significant effect on psychological costs of retirement preparation?

Study I Method

Design

The design was between participants, and included two manipulated variables consisting of the delay size of the choice options (short - S_I, or long - L_I) and the size of the amounts involved (small - S_A, or large - L_A), with two variants for each amount size. These variables were manipulated according to a design 2 x (delay size) x 2 (amount size) x 2 (amount variant), resulting in eight pairs of choices for each participant (see Appendix B, Table B1). The dependent variable was impatience, measured by the number of LL option choices. The following variables were measured:

- Financial literacy, evaluated by accuracy of answers in the five literacy questions employed, four utilized by Lusardi and Mitchel (2007a), evaluating numeracy, probabilities interpretation, compound interests calculus, and inflation comprehension and one by the Portuguese central bank in a financial literacy inquiry to Portuguese population (BP, 2010a, 2010b), evaluating the diversification impact on investment risk.
- Psychological costs of retirement preparation, namely costs associated with lack of information, financial products complexity, difficulty and fear of error in investment decision, anxiety about decision, time spent and procrastination in decision;
- Retirement motivation;
- Retirement planning degree;
- Retirement planning knowledge;
- Subjective savings;
- Demographic variables: Age, gender, occupational status, education and income.

The intertemporal questions had the typical neutral context of the intertemporal choice domain. The order of presentation of items in each question, and the display order of the questions in each block was randomly determined.

Participants

In this study, participants were selected by convenience[4]. The sample was constituted by 140 participants, of which 57.9% were women. Participants average age was 35.3 (*SD*=10.9). In what regards the occupational status, 67.9% were employed, 17.9% were students, 10.7% were employed students, 2.1% were unemployed, and the remainder 1.4% were retired. The majority of the sample had, at least, a university degree (68.6%). Monthly household income indication was optional, but only 21.4% did not respond; 6.4% had less than €700 for month; 31.8% had a monthly income between €700 and €1399; 21.8% had a monthly income between €1400 and €2099; 15.5% had a monthly income between €2100 and €2799; and finally, 24.5% had a monthly income higher than €2800.

Instrument

The instrument developed was an online questionnaire, presented through Qualtrics Survey, and consists of five modules, as described next. Instructions appeared on the front page of the online questionnaire. Immediately after instructions and before the start of the first module, participants were asked their occupational status, in order to adapt some of the questions to their specific situation.

Module 1: Fixed choice in neutral context.

In the first module, participants were presented with nine questions (one for training) with two options. Each question proposed a choice between a smaller-sooner (SS) option (to receive or pay immediately) and a larger-later (LL) option (to receive or to pay with an S_I or L_I interval), both for S_A and L_A amounts. Impatience operationalization was made by the number of LL choices within-participant made, in each of the languages. The SS and LL

[4] Invitations were sent by email and through internet forums and via Facebook, and receivers were asked to re-send it to their friends and colleagues.

options utilized in this choice task were adapted from Scholten and Read's (2011) *online* questionnaire. The order of the questions (except the training one) and of the option within each question was completely random. The stimuli are presented in Table B1 (Appendix B; see also Appendix B for a question example).

Module 2: Financial literacy.

Financial literacy was assessed through five questions evaluating numeracy, probabilities interpretation, compound interests calculus, inflation comprehension and the diversification impact on investment risk (see Appendix B for an example).

Module 3: Retirement motivation.

Our purpose in this module was to evaluate the participant's degree of motivation for retirement, considering three aspects: How much participant had thought about retirement, how many retirement goals they had, and how important these goals were considered. This module was not presented if the occupational status of the participants was "Student".

Since it can be very difficult for people to tell directly how many goals they have, we asked them to tell us:

1. How much they had thought about retirement, in a scale of 1 (Never) to 5 (Frequently);
2. To avoid redundancie, only if response to the previous question was higher than 1 were they asked if they had retirement goals;
3. Again, only if the previous answer was yes, they were then asked to enumerate their goal in at least one of the five broad categories presented: Financial goals, health goals, leisure goals, work goals and other type of goals. These categories were the ones found by Petroska and Earl (2009);
4. Finally, they were asked how important these goals were, in a scale of 1 (Not important) to 3 (Very important).

Motivation was measured by a composite indicator constructed based on the amount of thought about retirement, number and importance given to retirement goals, a strategy similar to one utilized in other studies (Petkoska & Earl, 2009).

Module 4: Questionnaires.

The knowledge of financial planning for retirement was assessed with a scale consisting in a Portuguese adaptation of the six-item scale designed by Jacobs-Lawson and Hershey (2005) to evaluate individuals' general knowledge of financial planning for retirement (KFPR). This scale was a slight modification of a previous version developed by Hershey and Mowen (2000). All six items use a seven-point response format (1 - strongly disagree, 7 - strongly agree).

The subjective savings were measured using a Portuguese adaptation of the five-item scale designed by Jacobs-Lawson and Hershey's (2005), to evaluate individuals' perception of their savings, designated by subjective global savings (SGS) scale. Again, all items use a seven-point response format (1 - disagree, 7 - strongly agree). We should stress that this scale evaluates the person's perception of her global savings, and not objective savings.

Finally, the degree of retirement financial planning was evaluated with a Portuguese adaptation of the financial planning degree scale (FPD) from Petkoska and Earl (2009).

Psychological costs of retirement preparation were measured by a scale of seven items developed for this purpose, using a seven-point response format (1 - strongly disagree, 7 - strongly agree). This seven items resulted from a small qualitative pretest, where the proposed items were presented and discussed. The scale items are based on the types of costs already enumerated in the theoretical overview (search for information; errors and anxiety; time and postponing), and consists of seven very simple statements, as follows:

- I'm always postponing my retirement planning.
- It's easy to choose a financial product to invest my retirement savings. (R)
- I have already started to plan my retirement. (R)
- I'm afraid to make a poor financial choice and make a bad investment.
- When I try to invest my savings, I get too anxious and give up.

- I spend a lot of time analyzing financial investment products.
- The information about financial products is very complex.

This module was not presented if the occupational status of the participants was "Student".

Module 5: Personal data.

The questionnaire had a final part where participants were asked their gender, age, education degree and income (optional).

Procedure

Data collection was done between the months April and June of 2012, and 143 Portuguese individuals participated. Of these, three of the participants did not complete the demographic part of the questionnaire, and their results were not considered. Responses from students and retirees were only considered in financial literacy and impatience analyses.

Indicators. In the fixed choice task, the LL choice score was 1 and SS choice score was 0. Impatience degree operationalization is achieved through the sum score of the eight choices made by participants, with a minimum of 0 and a maximum of 8. Financial literacy is operationalized by the total score obtained in the five literacy questions, with a score of 1 for each correct answer. Psychological costs of retirement preparation, retirement planning knowledge, subjective savings and retirement financial planning were all measured by the total score obtained in the questionnaire. Motivation is a composite measure consisting of the value obtained on the only factor extracted in a principal-components factor analysis (by the Bartllet method - no distribution presupposed) performed with three variables: Number of retirement objectives, retirement objectives average importance, and amount of thought about retirement (see Appendix C).

Data Analysis

The construction of the database and all statistical analyzes referred to below were performed in SPSS Statistics (v.17 and v.19; IBM SPSS Inc, Chicago, IL).

According to Kline's (2005) criterion – proposing the distribution to be exceedingly different from the normal distribution when skewness (Sk) is larger than 3 and kurtosis (Ku) is larger than 7, in absolute values – there were no large deviations from the normal distribution for all the considered variables. The search for extreme values showed only one extreme outlier in the income variable, and analyses were performed with and without the outlier, reported where differences were found.

Exploratory factor analysis, by principal components, was performed on all the scales, either without rotation or with varimax rotation. To verify the adequacy of this statistical technique, we used the Keiser-Meyer-Olin measure (above 0.5) and the Bartlett's test (p<0.5). To decide about the number of factors to retain, the Kaiser's rule (eigenvalue above 1), the scree plot rule and the explained variance percentage (at least 50% of total, and more than 5% for a factor) were considered, since using any of these rules in isolation can lead to an incorrect number of extracted factors.

In the analysis of the psychological costs of retirement preparation (PCRP) scale, having verified the existence of adequate conditions to perform the analysis, two factors were extracted, explaining 54.0 % of the total variance. These factors were a complexity component and a time component.

Table 1

Rotated component matrix for PCRP scale

	Components	
	Complexity	Time
- I'm afraid to make a poor financial choice and make a bad investment choice.	,828	
- When I try to invest my savings, I get too anxious and I give up.	,724	
- The information about financial products is very complex.	,685	
- It's easy to choose a financial product to invest my retirement savings. (R)	,591	
- I already started to plan my retirement. (R)		,845
- I'm always postponing my retirement planning.		,699
- I spend a lot f time analyzing financial investment products. (R)		,629

Note: (R) Indicates item is reverse scored. Extraction method was by principal component analysis, and rotation method was varimax with kaiser normalization.

All of the seven items loaded positively above 0.59 in one of the factors. According to the construction of the scale, we expected to find three factors but affect and difficulty seem to appear combined, and so we found a complexity component and a time component. The items and factor loadings are reported in Table 1.

We ran an internal consistency analysis on the scale items, which revealed a standardized Cronbach alpha of .67. The analysis of the results showed an increase in the value of alpha if item 6 was deleted. The exclusion of this item led to an alpha of .68, very near to .70, value usually considered acceptable for this kind of instrument (Maroco, 2010; Nunnally, 1978). Therefore, the item 6 was discarded in calculating the scale score.

In what concerns the KFPR scale, only one factor had originally been found (in the first version; Hershey & Mowen, 2000), and Cronbach alpha was 0.94. There were very good conditions to perform an exploratory factor analysis of the Portuguese version of the KFRP scale, and only one factor was extracted, explaining 56.9 % of the total variance. All the items of the scale loaded above 0.62 in the knowledge component (see Table 2).

Table 2

Unrotated Component Matrix for KFRP scale

	Knowledge
- I am very knowledgeable about financial planning for retirement.	,856
- I know more than most people about retirement planning.	,773
- I am very confident in my ability to do retirement planning.	,720
- When I have a need for financial services, I know exactly where to obtain information on what to do.	,759
- I am knowledgeable about how Social Security works.	,621
- I am knowledgeable about how private investment plans work	,778

Note: Extraction method was by principal component analysis.

Regarding the SGS scale, its original alpha coefficient was 0.93. There were also very good conditions to perform an exploratory factor analysis of the Portuguese version of the SGS scale and again only one factor was extracted, explaining 61.0 % of the total variance. All the items of the scale loaded above 0.7 in the savings component (see Table 3).

Regarding the FPD scale, only one factor had originally been found but the scale's original Cronbach alpha is unknown.

Table 3

Unrotated component matrix for SGS scale

	Savings
- Made meaningful contributions to a voluntary savings plan.	,751
- Relative to my peers, I have saved a great deal.	,826
- Accumulated substantial savings.	,842
- Made a conscious effort to save.	,703
- Based on how I plan to live my life, I have saved accordingly.	,774

Note: Extraction method was by principal component analysis.

The Portuguese version of the FPD scale also presented good conditions to perform an exploratory factor analysis but this time two factors were extracted, explaining 53.0 % of the total variance, an activities component and an investment component. All the items of the scale loaded above 0.54 in one of the components (see Table 4).

Table 4

Rotated component matrix for FPD scale

	Component	
	Activities	Investment
- Participated in workshop, seminar, or course on retirement planning.	,639	
- Read books/articles/brochures about retirement planning.	,763	
- Visited retirement planning web sites on the Internet.	,586	
- Assessed/reassessed my net worth.	,625	
- Calculated the cost of living during retirement.	,651	
- Made long-term investments.		,794
- Made contributions to retirement savings plans.		,796
- Discussed retirement financial planning with a professional in the field.		,539

Note: Extraction method was by principal component analysis, and rotation method was varimax with kaiser normalization.

As for the reliability analysis, we found a standardized Cronbach alpha of .85 for the KFRP scale, of .84 for the SP scale and of .77 for the FPD scale, suggesting a good internal consistency of the data.

In order to test the hypotheses and the research questions formulated, simple and multiple linear regressions were conducted, by enter and stepwise methods. The existence of good conditions to perform this statistical technique was verified recurring to the Durbin-Watson, residuals analysis, and collinearity statistics in the case of multiple regressions. When

conditions for linear regressions were not good, Spearman nonparametric correlations were presented. We also conducted *t-student* tests, variance analysis, Pearson correlations, Spearman nonparametric correlations, as well as Phi nominal measures of correlation.

Because income was of optional answer and not all participants answered it, all analyses considering demographic variables were made without and with income (and also with and without the detected income outlier), and results were reported where differences in significance exist. All stated significance values are two-sided, except when otherwise stated by the notation "p_u".

Study I Results

Linear regression 1 was conducted to test *H1.1,* predicting a negative effect of financial literacy on impatience. Conditions to perform a linear regression were good, according to the Durbin-Watson statistic (d=2.0) and residuals analysis. The results showed a significant effect of financial literacy (r=.395; t(138)=5.06; $p < .001$), explaining 15.0% of variance: Impatience was greater when literacy was higher, consistent with *H1.1*.

Linear regression 2 was conducted to test *H1.2,* predicting a negative effect of financial literacy on psychological costs of retirement preparation. Conditions to perform a linear regression were acceptable, according to the Durbin-Watson statistic (d=1.6) and residuals analysis. The results showed a significant effect of financial literacy (r=-.193; t(113)=-2.09; p=.039), but explaining only 2.9% of variance: costs were smaller when financial literacy was higher, consistent with *H1.2*.

Linear regression 3 was conducted to test *H1.3,* predicting a positive effect of financial literacy on retirement planning. The results showed a significant effect of financial literacy (r=.220; t(113)=2.40; p=.018), but explaining only 4.0% of variance: Costs were smaller when financial literacy was higher, consistent with *H1.3*. However, according to Durbin-Watson statistic (d=1.3), conditions to perform this statistical technique were not adequate (auto-correlation of residuals) and, therefore, a Spearman nonparametric correlation was also performed: A significant correlation of .238 (p=.010) was found, also consistent with *H1.3*.

Linear regression 4 was conducted to test *H1.4*, predicting a positive effect of financial literacy on subjective savings. Conditions to perform a linear regression were adequate, according to the Durbin-Watson statistic (d=2.2) and residuals analysis. The results showed no significant effect (p=.864), inconsistent with *H1.4*.

Linear regression 5 was conducted to test *H2.1,* which predicted a positive effect of retirement motivation on retirement planning. The results showed a significant effect of motivation (r=.513; t(113)=6.35; $p< .001$), explaining as much as 25.6% of variance: Retirement planning was higher when motivation was higher, consistent with *H2.1* Since the conditions to perform this statistical technique were not ideal (possible auto-correlation of residuals), according to Durbin-Watson statistic (d=1.4), a Spearman nonparametric

correlation was also performed, and a significant correlation of .544 ($p < .001$) was found, also consistent with *H2.1*.

Linear regression 6 was conducted to test *H2.2,* predicting a positive effect of retirement motivation on subjective savings. Conditions to perform a linear regression were adequate, according to the Durbin-Watson statistic (d=1.8) and residuals analysis. The results showed a significant effect of motivation (r=.358; t(113)=4.08; p<.001), explaining 12.0% of variance: Subjective savings were higher when motivation was higher, consistent with *H2.2*.

Linear regression 7 was conducted to test *H2.3,* predicting a positive effect of retirement motivation on retirement planning knowledge. Conditions to perform a linear regression were acceptable, according to the Durbin-Watson statistic (d=1.6) and residuals analysis. The results showed a significant effect of motivation (r =.407; t(113)=4.74; p<.001), explaining 15.9% of variance: Retirement planning knowledge was higher when motivation was higher, consistent with *H2.3*.

Linear regression 8 was conducted to test *H2.4,* predicting a negative effect of retirement motivation on psychological costs of retirement preparation. Conditions to perform a linear regression were good, according to the Durbin-Watson statistic (d=2.0) and residuals analysis. The results showed a significant inverse effect of motivation (r=-.347; t(113)=-3.93; p<.001), explaining 11.2% of variance: Psychological costs of retirement preparation were higher when motivation was lower, consistent with *H2.4*.

Linear regression 9 was conducted to test *H3.1,* predicting a negative effect of retirement planning knowledge on psychological costs of retirement preparation. Conditions to perform a linear regression were good, according to the Durbin-Watson statistic (d=2.1) and residuals analysis. The results showed a significant a negative effect of retirement planning knowledge on planning costs (r=-.569; t(113)=-7.36; p<.001), explaining as much as 31.8% of variance: Psychological costs were lower when retirement planning knowledge was higher, consistent with *H3.1*.

Linear regression 10 was conducted to test *H3.2,* which predicted a negative effect of psychological costs of retirement preparation on retirement planning. The results showed a significant effect of perceived planning costs (r=-.389; t(113)=-4.50; p<.001), explaining 14.4% of variance. Since the conditions to perform this statistical technique were not ideal (possible auto-correlation of residuals), according to Durbin-Watson statistic (d=1.4) a

Spearman nonparametric correlation was also performed, and a significant correlation of -.383 (p<.001) was also found. Retirement planning was higher when psychological costs of retirement preparation were lower, consistent with *H3.2*.

Linear regression 11 was conducted to test *H3.3,* which predicted a negative effect of psychological costs of retirement preparation on subjective savings. Conditions to perform a linear regression were good, according to the Durbin-Watson statistic (d=1.9) and residuals analysis. The results showed a significant effect of psychological costs of retirement preparation (r=-.423; t(113)=-4.96; p<.001), explaining 17.2% of variance: Subjective savings were higher when psychological costs were lower, consistent with *H3.3*.

A *t-student* test was performed to test *H4.1,* proposing higher impatience for men than for women. We compared impatience between gender and found that impatience score for men (M=5.20; SD=2.64; n=59) was significantly higher (t(138)=1.86; p_u=.033) than for women (M=4.31; SD=2.94; n=81). Therefore impatience is higher for women, inconsistent with *H4.1*, stating the opposite.

To test *H4.2,* predicting significant differences in impatience between education groups, we grouped participants in three education groups: One pertained to a low level of education and included participants with less than a university degree, the other concerned medium education level and included participants with a university degree, and the third regarded a high level of education, and included participants with more than a university degree (post-graduation, master degree or PhD). An ANOVA was conducted, but no significant differences were found (p=.141), contrary to our predictions in *H4.2*.

To test *H4.3,* predicting significant differences in impatience between middle age and the other age groups, participants were divided in only two age groups: One group concerned young adulthood and included participants between 19 and 39 years, and the other concerned middle age and included participants between 40 and 59 years. Older people could not be compared with the young and middle age people, and an older participant with 69 years was not considered in this analysis. A *t-student* test was performed to compared impatience between the two age groups and no significant differences were found (p=.269), inconsistent with *H4.3*.

Linear regression 12 was conducted to test *H5.1,* predicting a positive effect of age on retirement planning. The results showed a significant positive effect of age (r=0.199; t(113)=

2.14; p=.035), but explaining only 3.1% of variance. However, retirement planning does increase with age, which is consistent with *H5.1*.

In what concerns *H6.1*, predicting the existence of a positive relation between impatience and subjective savings, we found no significant correlation (p=.240), between the variables, which is not consistent with *H6.1*

Table 5

Correlations

		Income	Impatience	F. literacy	R. motivation	Psy. costs	R. planning knowledge	R. planning	Subjective savings
Age	Pearson Correlation	,367**		,425**	,309**			,188*	-,157''
	Sig. (2-tailed)	,000		,000	,001			,045	,093
	N	110		140	115			115	115
Education	Pearson Correlation	,213*		,295**		-,194*	,255**		
	Sig. (2-tailed)	,026		,000		,038	,006		
	N	110		140		115	115		
Income	Pearson Correlation		,272**	,369**			,193		
	Sig. (2-tailed)		,004	,000			,068		
	N		110	110			90		
Impatience	Pearson Correlation			,395**					
	Sig. (2-tailed)			,000					
	N			140					
F. literacy	Pearson Correlation					-,193*	,168''	,220*	
	Sig. (2-tailed)					,039	,072	,018	
	N					115	115	115	
R. motivation	Pearson Correlation					-,347**	,407**	,513**	,358**
	Sig. (2-tailed)					,000	,000	,000	,000
	N					115	115	115	115
Psy. costs	Pearson Correlation						-,569**	-,389**	-,423**
	Sig. (2-tailed)						,000	,000	,000
	N						115	115	115
R. planning knowledge	Pearson Correlation							,515**	,428**
	Sig. (2-tailed)							,000	,000
	N							115	115
R. planning	Pearson Correlation								,437**
	Sig. (2-tailed)								,000
	N								115

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
''. Correlation is marginally significant (2-tailed).

Concerning the research questions, we first searched for Pearson correlations between all of the variables, except gender and occupational status, and found several significant correlations (see Table 5). We also found a marginally significant nominal correlation between gender and income (phi=0.38; p=.052), in that women tend to have a lower income (M=3.20; SD=1.97; n=64) than men (M=4.07; SD=1.99; n=46).

We then searched for differences between genders through *t-student* tests, and found that financial literacy was significantly higher ($t(137.6)=4.98$; $p_u<.001$) for men ($M=4.17$; $SD=0.89$; $n=59$) than for women ($M=3.25$; $SD=1.30$; $n=81$), and retirement planning knowledge was also significantly higher ($t(113)=1.84$; $p_u=.034$) for men ($M=23.83$; $SD=7.30$; $n=53$) than for women ($M=21.42$; $SD=6.72$; $n=62$).

All these significant results led us to further investigate research question *Q1*, through multiple linear regressions 13, 14, 15 and 16 were conducted[5]:

- Age (β=0.482; $t(86)=4.07$; $p < .001$), income (β=-0.334; $t(86)=-2.70$; $p=.008$) and education (β=0.240; $t(86)=2.33$; $p=.022$) emerged as significant predictors of retirement motivation, explaining 15.7% of variance;
- The significant predictors of financial literacy were:
    - Considering income without the income outlier, age (β=0.226; $t(104)=2.53$; $p=.013$), gender (β=-0.311; $t(104)=-3.81$; $p < .001$), income (β=0.204; $t(104)=2.26$; $p=.026$) and education (β=0.188; $t(104)=2.30$; $p= .024$), explaining as much as 33.1% of variance (without income as a predictive variable, age, gender and education are still significant predictors of financial literacy);
    - When income outlier was included in the analysis, income is no longer significant, but only age (β=0.312; $t(106)=3.77$; $p<.001$), gender (β=-0.328; $t(106)=-4.00$; $p<.001$) and education (β=0.233; $t(106)=2.88$; $p=.005$), explaining 30.6% of variance.
- Gender (β=-0.201; $t(87)=-2.01$; $p=.047$) and education (β=0.311; $t(87)=3.12$; $p=.002$) emerged as significant predictors of retirement planning knowledge, explaining 11.5% of variance;
- And, finally, none of the demographic variables were significant predictors of the psychological costs of retirement preparation.

[5] Since answering to the income question was optional and many participants did not, available sample is much smaller when income variable is taken into account. For that reason, statistical test were performed without and with income and, in this last case, with and without the detected outlier, but only significant differences are reported.

Multiple linear regressions 17 and 18 were conducted to address research question *Q2*. When income was included, only retirement planning knowledge (β=0.365; $t(87)=3.92$; $p<.001$) and retirement motivation (β=0.359; $t(87)=3.85$; $p<.001$) emerged as significant predictors of retirement planning, explaining as much as 35.3% of variance. Without income as a predictive variable, financial literacy also becomes a significant predictor of retirement planning (β=0.159; $t(111)=2.13$; $p=.036$), as well as retirement planning knowledge (β=0.336; $t(111)=4.12$; $p<.001$) and retirement motivation (β=0.374; $t(111)=4.63$; $p<.001$), and thus explaining 38.4% of variance.

The significant predictors of subjective savings, when income is considered, are retirement motivation (β=0.306; $t(86)=3.01$; $p=.003$), psychological costs of retirement preparation (β=-0.343; $t(86)=-3.52$; $p=.001$) and age (β=-0.237; $t(86)=-2.46$; $p=.016$), explaining 25.1% of variance. When income is not considered, knowledge for retirement planning also becomes a significant predictor (β=0.205; $t(110)=2.07$; $p=.041$) of subjective savings, along with retirement motivation (β=0.281; $t(110)=3.09$; $p=.003$), psychological costs of retirement preparation (β=-0.229; $t(110)=-2.38$; $p=.019$) and age (β=-0.276; $t(110)=-3.35$; $p=.001$), explaining 30.4% of variance. Pearson's correlation between behavioral constructs subjective savings and retirement planning for total participants ($r=.437$; $p<.001$; $n=115$) is significant but smaller than correlation obtained for participants reporting income ($r=.473$; $p<.001$; $n=90$).

Multiple linear regression 19 was conducted to research question *Q3*. The only significant predictor of psychological costs of retirement preparation found was retirement planning knowledge (β=-0.568; $t(88)=-6.48$; $p<.001$) explaining, by its own, as much as 31.5% of variance.

Study I Discussion

There were several objectives to this study. Firstly and foremost, we aimed at providing support for the importance of psychological costs of retirement preparation on retirement planning, and on subjective savings. The remaining objectives were:

- To research the predicted relationships between psychological costs of retirement planning and retirement motivation, retirement planning knowledge, retirement planning and subjective savings, as well as the predicted relationships between impatience and financial literacy, perceived savings, and several demographic indicators;
- To verify the effects of financial literacy on psychological costs of retirement preparation, on retirement planning and on subjective savings;
- To research the relationships between retirement motivation, retirement planning knowledge and subjective savings, and replicate some of the results obtained in the domain of retirements saving regarding important variables such as retirement motivation, age and retirement planning;
- And finally, in view of empirical findings from literature, to explore the relationships between demographic indicators, cognition and psychological variables and behavioral variables.

The two hypotheses addressing the effects of psychological costs of retirement preparation were confirmed: When psychological costs of retirement preparation were lower there were higher retirement planning and higher subjective savings. However, regarding subjective savings, psychological costs of retirement preparation explained 17.2% of variance, which is, in our view a very relevant result. Hence, results clearly support our claim that costs have an important relationship with retirement planning and more importantly with savings, which are the ultimate retirement goal.

The hypothesis addressing the effect of retirement planning knowledge on psychological costs of retirement preparation was also confirmed. The higher percentage of variance concerning psychological costs of retirement preparation was explained by retirement planning knowledge (31.8%), and this is not surprising since lack of knowledge contributes to a great extent, by definition, to the degree of costs one experiences. As we

argued in the introduction, the need to learn more about how to prepare for retirement or about investments in general may require too much time or too high an effort, and may constitute a highly dissuasive cost, moreover when people are confronted with an overpowering offer (and complexity) of financial investment products. More specifically, low levels - or the lack - of specific abilities and skills such as numeracy and planning experience, and of both general and specific financial information and knowledge may contribute for a heightened perception of planning costs. Also, decisional anxiety experienced at the moment of decision, as well as anticipatory regret both clearly tend to be more intense when individuals find themselves in such a situation. Moreover, we may even have some knowledge and the necessary skills, but still we may not be able to prepare for retirement. What these results show us is that psychological costs of retirement preparation do seem to have an important role in the retirement savings process. It is therefore reasonable to assume that an institutional effort aimed at the reduction of these costs may prove instrumental in achieving a better quality of life in retirement.

Three of the hypotheses that addressed the effects of financial literacy were also confirmed: People with higher financial literacy presented lower impatience (higher number of LL choices), and also lower psychological costs of retirement preparation and a higher degree of retirement planning. So, there is no doubt financial literacy is a very important type of knowledge in what concerns retirement planning.

However, the fourth hypothesis predicting subjective savings would be higher among people with high financial literacy was not confirmed. A possible explanation could be derived from the operationalization of the savings variable: It is usually very difficult for individuals to evaluate their savings objectively and accurately, but easier to have a perception of their savings considering their effort, their objectives and in comparison with their peers. Accordingly, we did not measure objective savings, but self-reported, subjective, perceived savings that only translate the person's perception of her savings. As presented in the introduction section, research has showed that self-reported and measured variables are often highly correlated, but as with all types of perception, we must nevertheless consider the possibility that savings perception may have been slightly biased. For instances, if people with higher financial literacy are also more financially demanding with themselves they may perceive their savings as lower than they actually are and this could explain the absence of a significant result in our data.

The four hypotheses addressing the effects of retirement motivation were all confirmed: People with a high motivation also presented a higher retirement planning, a higher retirement planning knowledge, reported higher subjective savings and lower psychological costs of retirement preparation. The first result replicates empirical findings from relevant literature, the second and the third corroborate them. All considered, they suggest retirement motivation to be important variable in achieving a higher retirement planning and savings degree. Regarding the last hypothesis, in the theoretical overview we argued that, since the existence of goals presents itself as an important part of retirement motivation and goal-setting exercises in retirement planning seminars significantly elevated expectations of planning and saving activities in the subsequent year (Hershey et al., 2003), motivation could contribute to diminish the perception of psychological costs. As we predicted, our results suggest that motivation could be of major important aspect in achieving the reduction of these costs.

None of our hypotheses regarding demographic variables (gender, education degree and age) and impatience was verified. However, concerning age, we were only able to compare two age groups: Middle aged people and younger people. We did find a significant but puzzling result, opposite to our predictions: Impatience was higher for women than for men and this result was quite unexpected. Research about time perspective suggests that a lower income could lead to a shorter future horizon (Hershey et al., 2007), and women presented a lower income than men. Therefore, a possible explanation is that income could have affected the impatience. However, we should highlight that the difference concerning income found between genders was only marginally significant.

The hypothesis concerning age and retirement planning was verified, since we found a small positive but significant effect of age on retirement planning. This suggests that older people do indeed tend to plan more for retirement than younger people, however age does not seems a determinant variable.

The hypothesis concerning impatience and subjective savings was not verified, since no significant result was found. However, a relationship between impatience and savings degree is assumed to exist. So, the fact that no relationship was found between impatience and perceived savings could be, again, due to the characteristics of the savings measure we adopted. For several reasons, as we argued before, we did not measure effective savings but subjective, perceived ones, and we must consider the possibility that this perception may have been somewhat biased. We noted as much when we discussed the absence of a relationship

between financial literacy and subjective savings. People with higher financial literacy presented lower impatience. But if they are indeed more demanding with themselves and perceive their savings as lower than they actually are, as we proposed earlier, this same bias may have affected the relationship between impatience and subjective savings. There is another possibility: It may be related to the fact that impatience is sensitive to the context in which choice is made, as we highlighted in the introduction section. And while planning and saving for retirement are decisions obviously taken in a retirement context, we did measure the level of impatience in an abstract or neutral context.

In what concerns the exploratory part of the study, the result show that all demographic indicators are predictor of at least one of the cognitive and psychological variables: Age, income and education are predictors of retirement motivation and financial literacy. These results are in accordance with previous research showing that income is a predictor of retirement goal clarity (Hershey et al., 2007) and that goal clarity is accounted for by age (Stawski et al., 2007). Education is also a predictor of financial literacy and retirement planning knowledge, and gender is a negative predictor of both financial literacy and retirement planning knowledge: Women tend to be lower on either. Our preliminary results had already showed a significantly lower degree of both financial literacy and retirement planning knowledge for women, as well as a lower income, and this is in accordance with literature results showing lower scores on measures of financial knowledge and literacy for women (Gustman & Steinmeier, 2005; Lusardi & Mitchell, 2008), that men are usually more involved in investing than women (Hershey et al., 2007; Lusardi & Mitchell, 2008; Seguino & Floro, 2003), and that being male is associated with higher retirement savings (Glass & Kilpatrick, 1998; Hurd & Wise, 1989).

However, when cognitive and psychological constructs were considered, none of the demographic variables were significant predictors of any of the behavioral constructs, apart from age, nor emerged as predictors of the psychological costs of retirement preparation. This gives support to the claim that demographic indicators make much more sense in conjunction with psychological aspects, since these are the ones that may establish a bridge between the demographic indicators and behavioral constructs related to savings (Hershey et al., 2007). It makes sense that age arises as the most important variable in this category, since we are talking about retirement and savings. Older people had more time to save and are nearer to retirement than younger people. The positive correlation found between age and retirement motivation also reflects this.

One surprising result was that age appeared as a negative predictor of subjective savings. As we stated before, we measured self-reported, subjective, perceived savings and so, a possible explanation has to do with the fairly recent change in expectations about retirement pensions. Because they expected to have a retirement pension that would cover most of their needs, some of the older people probably were not much concerned with saving and investing for retirement. Now that things are changing, they may fear not having saved enough and, therefore, perceive their savings as low. At the same time, some of the younger people, who possibly no longer trust social security pension plans will be enough, may already have started their savings plans and, therefore, evaluate their savings as high. This could result in a negative effect of age. Another possible explanation for this unexpected result was that we evaluated global savings, and not specifically retirement savings.

The considered cognitive and psychological variables are, in turn, predictors of the behavioral constructs, explaining a considerable amount of variance. The two behavioral constructs are not highly related to each other, which was to be expected if we consider that planning degree is specific for retirement whereas subjective savings can be seen as a broader category of savings, although retirement savings are clearly included in it. We must also take into account the characteristics of the savings measure we adopted, already discussed above.

All of the cognitive and psychological variables considered are predictors of at least one of the behavioral constructs: Retirement motivation, financial literacy and retirement planning knowledge are predictors of retirement planning. Also, retirement motivation, retirement planning knowledge and psychological costs of retirement preparation are predictors of subjective savings.

Although psychological costs of retirement preparation presented, on their own, a significant effect on retirement planning, explaining 14.4% of the variance, when all of the cognitive and psychological variables were considered, psychological costs did not emerge as a significant predictor of retirement planning. However, and more importantly, psychological costs of retirement preparation remain a significant predictor of subjective savings, consistent with hypothesis *H3.3***.**

Overall, we believe results of this study demonstrated that psychological costs of retirement preparation are an important variable that can affect how people make their retirement decisions and must be addressed when trying to overcome the difficulties felt in planning for retirement. Although retirement motivation is an important variable on its own concerning the planning of retirement, results also suggest that it may be instrumental in

achieving the reduction of these costs. So, intervention programs and enhanced education could, in fact, become facilitators of retirement savings and planning and lead to improved quality of life during retirement by stimulating motivation and, at the same time, attempting to reduce the actual costs perceived by people.

Although our purpose was merely to research the relationship between variables, in view of the characteristics of the sample, a possible avenue to pursue in future research would be to further explore these relationships in a population/sample with lower education degree.

Chapter 3: Study II

Study II Theoretical Overview

An intertemporal choice is a decision involving tradeoffs between costs and benefits that occur in different moments in time (Frederick et al., 2002) and it is also often implicitly assumed that time preference is stable, in the sense that, although different people discount the future at different rates, each person is somewhat consistent in applying his or her discount rate to different decisions (Chapman, 2005). To some extent, research backs this up (Chapman, 2005; Chapman et al., 2001; Simpson & Vuchinich, 2000). However, research on context and framing effects also suggests that time preference is often dependent on the context and framing of the options and on the delays presented. There is also ample evidence that discounting rates can be affected by several task-related aspects, like the way choices are presented, different choice frames and contexts, and the method by which discount rates are elicited (Read, 2004; Read et al., 2005; Tesch & Sanfey, 2008). According to Read et al. (2005), the date/delay framing effect occurs when delays are framed as future dates versus regular time delays, and the discount rates are much lower in the former than in the latter case. For these authors, it seems probable that people have an intuitive impression of how long the time intervals in question are, but believe that those impressions may change with different framings.

The savings behavior is considered to be guided by an individual's personal future discount rate, since it involves the reduction of present consumption to increase expected future consumption, and people who discount less the future have a lower rate of time preference, and will be more likely to reflect a more patient time orientation (Finke, 2005). Since greater discounting rates were found for smaller rewards and shorter delays, and saving behavior in general – and savings for retirement in particular – typically involves relatively large amounts of money and large delay lengths, retirement context may naturally create conditions conductive to lower impatience. Also, at the time retirement planning usually needs to be started, retirement is a stage of life that is still many years away. So, as proposed by Read et al. (2005), the intuitive impression of how long are the delays involved in the investment choices may change within a retirement savings framing. When thinking about saving for retirement, with longer delays and larger amounts at stake, people will probably

tend to be less impatient. One of the research paradigm more utilized in intertemporal studies consists in presenting people with choices that are usually between a smaller-sooner (SS) and a larger-later (LL) alternative, and variation in impatience can be measured very simply by the variation in the number of LL choices people make. Therefore, *H1* predicts that, in retirement context, there will be lower impatience than in neutral context – meaning people will make more LL choices in retirement context.

As stated before, psychological costs of retirement preparation may be important and perceived as high enough to inhibit retirement planning (Lusardi, 2003), and thus lead to reduced retirement savings. Namely, based on planning models and their characteristics (Ellis & Siegler, 1997; Friedman & Scholnick, 1997; Hershey, 2004; Scholnick & Friedman, 1987) and several assessments of the costs planning may present (Loewenstein, 1999; Lusardi, 2002, 2003; McCarthy & Tchernis, 2009; Sundén, 2008), we believe the high perception of these costs may be related to specific skills (numeracy and planning experience), levels of knowledge and information (financial literacy and retirement planning knowledge), overwhelming offer and complexity of financial investment products, level of postponement of financial investment decisions, and feelings of anxiety and anticipatory regret associated with financial investment decisions. High levels of anxiety and stress can lead to a selective allocation of attention to the information perceived as threatening in some way (Lonigan et al., 2004; Mogg et al., 1990). So, it is plausible to assume that someone who perceives high retirement preparation psychological costs could become very sensitive to the retirement theme altogether. Consequently, if psychological costs of retirement preparation influence sensitivity to retirement context, there may be an effect on impatience when decisions are made in a retirement context. Therefore, *H2* predicts that psychological costs of retirement preparation will affect the variation of impatience between contexts and *H2.1* predicts that the impatience variation will be larger for higher than for smaller costs.

People don't all feel the same way about retirement. If for some, retirement represents a desirable and expected outcome for a lifetime of work, for others it may not be desirable at all. For a variety of motives (e.g. aging, lack of productivity, too much free time, etc.), the prospect of retirement can be anticipated as a very unpleasant situation that, in turn, can be assigned a negative affective valence. To some people, retirement may be considered an undesirable situation by itself. But since old age is frequently viewed as unpleasant and worrisome, there may also be an association between retirement and old age. But, for others, it may be viewed as a deserved rest from a lifetime of work, the moment to fulfill a number of

postponed plans (like doing voluntary work, traveling, spend time with grandsons, etc.). Many of this plans emerged in Study I as goals for retirement and they are all related, in some measure, with financial security in retirement. Thus, the prospect of retirement may be associated with a more positive or a more negative affective valence.

Considering the psychological costs of retirement preparation, as described above, we believe that these costs may also contribute to this affective valence and so, *H3* predicts that these costs are inversely related to retirement affective valence. More specifically, *H3.1* proposes that lower costs will be related with a more positive retirement affective valence than medium or higher costs. The reasoning behind this proposal is that if retirement planning is not perceived as effortful, there may be a more positive retirement affective valence than if it is perceived as costly. However, the reverse might not be entirely true.

As we have mentioned before, demographic indicators such as income have been considered important variables in predicting differences concerning retirement savings: Income presents a large influence over the probability of resource allocation for retirement savings purposes, and has been found a predictor of reported savings (Hershey et al., 2007). Higher income is related with a higher degree of retirement financial planning (Bassett et al., 1998). Income, beyond constraining the retirement savings ability, also establishes social security retirement pension. So, we believe that income will also have an important effect on retirement affective valence, whatever people's retirement affective valence baseline may have been. For example, even if the fear of sickness exists, expected financial security in retirement may help diminish the fearfulness of not being able to afford doctor and prescription bills. So, *H3.2* proposes that both psychological costs of retirement preparation and income will affect retirement affective valence. But while cost will have a negative effect, income will have a positive effect.

Regarding gender, literature results show women have lower financial knowledge and literacy (Gustman & Steinmeier, 2005; Lusardi & Mitchell, 2008) and that men are usually more involved in investing than women (Hershey et al., 2007; Lusardi & Mitchell, 2008; Seguino & Floro, 2003). Our previous result also showed that women tend to have lower financial literacy, lower retirement planning knowledge and lower income. Therefore, *H4.1* predicts that women will also present a more negative retirement affective valence than men, *H4.2* predicts that women will present higher psychological costs of retirement preparation than men, and *H4.3* predicts that women will have a lower income than men. In what concerns impatience, in Study I we expected to find higher impatience for men, according to

literature (Warner & Pleeter, 2001), although we did not. So, again *H4.4* proposes there will be significant differences in impatience between genders, with a higher impatience for men, in both retirement and neutral contexts.

Regarding work status, in economics, labor force is usually classified in three categories - employed (workers and working-students, whether self-employed or otherwise), unemployed, and economically no-work (students, retired and unemployed not searching for work) (Eurostat, 2013). Simplifying this division, we have on one side the work group, and on the other side, the no-work group. We were unable to find enough information in literature about work status that would permit us to formulate hypotheses but, assuming people on the first group have a regular income (receive a salary, or generate income, for the self-employed) and people in the second group do not, we believe there may be differences in impatience between them. This is based, on one hand, in the explanation forwarded for the relation between income and time perspective: A lower income could lead to a shorter future horizon due to a day-to-day money management (Hershey et al., 2007). On the other hand, impatient individuals seem to be more present oriented than more patient ones (Wittmann & Paulus, 2008, 2009a; Zimbardo & Boyd, 1999) and also on a significant inverse correlation that was found between discount parameter and degree of future orientation (Adams & Nettle, 2009). We also expect that having, or not, work and, therefore, a regular income will give rise to differences in psychological costs of retirement preparation and retirement affective valence. Therefore, the following research questions were formulated:

Q.1 - Are there differences in impatience between work and no-work group?

Q.2 - Are there differences in psychological costs of retirement preparation between work and no-work group?

Q.3 - Are there differences in retirement affective valence between work and no-work group?

Study II Method

Design

The independent variables considered in this study were choice context (neutral and retirement savings), interest rate, time delay and magnitude of the amounts. The dependent variable was impatience, measured by the number of LL choices, as described for Study I. The design was within-participants.

Also measured were the psychological costs of retirement preparation, as described for Study I, as well as the retirement affective valence, and the demographic variables age, gender, professional status, income and education degree were collected.

The four manipulated variables consisted of the magnitude of the amounts involved (larger, L_A - €10100/€10150, or smaller, S_A - €5100/€5150), the time delay of the delayed options (longer, L_I - 6 years, or shorter, S_I - 3 years), the annual interest rate of the delayed options (larger - 6.0 %, or smaller - 4.0 %), and the context where the choice between the two options was presented (neutral context or retirement context). For each of these two contexts, variables were manipulated according to a design 2 (magnitude of the amounts) x 2 (time delay) x 2 (interest rate), resulting in 16 pairs of choices for each participant, eight for each context. The first eight intertemporal questions presented had the typical neutral context of the intertemporal choice domain, in gains. The order of presentation of items in each question, and the display order of the questions in each block were randomly determined.

Participants

In this study, participants were selected by convenience[6]. The sample was constituted by 194 participants, of which 61.9 % were women. Participants average age was 38.9 (*SD*=10.5). In the case of professional status, 6.7 % were students, 8.8 % were employed students, 10.8 % were unemployed, 2.1 % were retired, and the remainder 71.6 % were employed. The great majority of the sample had, at least, a university degree (84.0 %).

[6] Invitations were sent by email, through internet forums, via LinkdIn and posted in Facebook, and receivers were asked to re-send it to their friends and colleagues.

Monthly household income was optional, but only 22.2 % did not respond; 6.0 % has less than €700 for month; 24.5 % has a monthly income between €700 and €1399; 19.9 % has a monthly income between €1400 and €2099; 11.9 % has a monthly income between €2100 and €2799; and finally, 37.7 % has a monthly income higher than €2800.

Instrument

The instrument developed was an online questionnaire, presented through Qualtrics Survey. Instructions appeared on the front page of the online questionnaire, which was composes of five modules, described ahead.

Module 1: Fixed choice in neutral context.

In the first module, participants were presented with eight intertemporal questions with two options. Each question proposed a choice between a smaller-sooner (SS) option (to receive immediately) and a larger-later (LL) option (to receive with an S_I or L_I interval), both for S_A and L_A amounts and larger (6.0 %) or smaller (4.0 %) annual interest rates. Impatience was operationalized by the number of LL choices made by participants.

As in Study I, the SS and LL options utilized in this choice task were based on Scholten and Read's (2011) online questionnaire (see Appendix D for an example). The order of the questions (except the training one) and of the option within each question was completely random. The stimuli are presented in Table D1, under Group 1 (Appendix D).

Module 2: Retirement choice context activation questions.

The items of the psychological costs of retirement preparation (PCRP) scale are presented as activators of retirement context. The costs are measured as described for Study I, by the six items developed for this purpose, using a seven-point response format (1 - strongly disagree, 7 - strongly agree). The scale consists of six statements, as follows:

- I'm always postponing my retirement planning.
- It's easy to choose in which financial product to invest my retirement savings. (R)
- I have already started to plan my retirement. (R)
- I'm afraid of making a poor financial choice and make a bad investment.

- When I try to invest my money, I get too anxious and give up.
- The information about financial products is very complex.

Module 3: Retirement affective valence.

After retirement context activation, this module evaluates how positive or negative is the valence of the participant's affect associated with retirement expectations. Given its simplicity, we choose a five Likert type item (5 - strongly agree; 4 – agree; 3 – undecided; 2 – disagree; and 1 - strongly disagree) from Glamser's (1976) Attitude Toward Retirement Scale (ATRS) that was adapted to Portuguese: "I think that things will go well for me in retirement". Affective valence of retirement expectations is measured by the degree of agreement / disagreement with the statement, with higher scores representing a more positive valence. The remaining items from the ATRS scale were also presented, as fill-in items: "Retirement is mostly good for a person," "It is not fair to make a person retire because of his age," "I am looking forward to the time off that retirement will bring," and "If it were up to me alone, I would keep on working as long as possible."

Module 4: Fixed choice in retirement context.

In this module, participants were again presented with eight questions with two options each. As in module 1, every question proposed a choice between a smaller-sooner (SS) option (to receive immediately) and a larger-later (LL) option (to receive with an S_I or L_I interval), both for S_A and L_A amounts, and larger (6.0 %) or smaller (4.0 %) annual interest rate. Impatience operationalization was made through the number of LL choices participants made. The delays and rates are exactly the same as in module 1 but amounts, although very similar, are not equal to avoid remembered answers (see Appendix D; Table D1, under Group 2). Both the introductory text to this module and the formulation of the option explicitly activated the retirement savings context (See Appendix D for an example). Again, the SS and LL options utilized in this choice task were based on Scholten and Read's (2011) online questionnaire, and the order of the questions, as well as the options within each question, was completely random.

Module 5: Personal data.

The questionnaire had a last part in which participants were asked their gender, age, occupational status, education degree and income (optional).

Procedure

Data collection was done between October, 2012 and March, 2013, and 215 Portuguese individuals participated. Of these, 194 participants completed the questionnaire, and only their results were considered in the subsequent analyses. The instructions appeared on the front page of the online questionnaire.

Indicators. In both choice tasks, the LL choice score is 1 and SS choice score is 0. Impatience is operationalized by the sum score of the eight choices made by participants, with a minimum of 0 and a maximum of 8. An indicator of variation between contexts was constructed, consisting of the score of the retirement context subtracted of the score obtained on the neutral context. If the value of this indicator was positive, score in retirement context was higher, and therefore the impatience degree was lower. Psychological costs of retirement preparation were evaluated by the total score obtained in the questionnaire, and retirement affective valence by the score obtained in the item "I believe in retirement, things will go well for me".

Data Analysis

The construction of the database and all statistical analyzes referred below were performed in SPSS Statistics (v.17 and v.19; IBM SPSS Inc, Chicago, IL).

The distributions of the considered indicators were verified, either globally, either by each of the analysis groups created. There were no large deviations from the normal distribution for all the considered variables, according to Kline's (2005) criterion: The distributions were not exceedingly different from the normal distribution since skewness (Sk) is smaller than 3 and kurtosis (Ku) is smaller than 7, in absolute values, in all cases.

Exploratory factor analysis, by principal components, on the PCRP scale was performed with varimax rotation. To verify the adequacy of this statistical technique, we used

the Keiser-Meyer-Olin measure (above 0.5) and the Bartlett's test (p<0.5), and to decide about the number of factors to retain, the Kaiser's rule (eigenvalue above 1), the scree plot rule and the explained variance percentage (at least 50% of total, and more than 5% for a factor) were considered, since using these rules in isolation can lead to an incorrect number of extracted factors.

In the analysis of the PCRP scale, after verifying the existence of adequate conditions to perform the analysis, two factors were extracted, by principal component analysis, explaining 63.5 % of the total variance. These factors coincide with the ones found in Study I, and were a complexity component and a time component.

All of the six items loaded positively equal or above 0.62 in one of the two factors. The items and the factor loadings are reported in Table 6.The structure found is similar to the one reported in Study I. Again, affect and difficulty appear combined in the complexity factor.

Table 6

Rotated Component Matrix for PCRP scale

	Component	
	Complexity	Time
- The information about financial products is very complex.	,798	
- I'm afraid to make a poor financial choice and make a bad investment choice.	,795	
- When I try to invest my savings, I get too anxious and I give up.	,750	
- It's easy to choose a financial product to invest my retirement savings (R).	,620	
- I already started to plan my retirement (R).		,856
- I'm always postponing my retirement planning.		,817

Note: (R) Indicates item is reverse scored. Extraction method was by principal component analysis, and rotation method was varimax with kaiser normalization.

We ran an internal consistency analysis on the scale items, which revealed a standardized Cronbach alpha of .70, the value usually considered acceptable for this kind of instrument (Maroco, 2010; Nunnally, 1978), and an inter-item correlation of .278. In Study I we had found an alpha of .68.

Work status was condensed in two categories: Workers and working-students, whether self-employed or otherwise, belong to the work group and students, unemployed and retired belong to the no-work group – except in the costs analysis, where retiree were not included. Since retirement in an ongoing process, we do not consider inappropriate to measure of retirement affective valence in retirees. However, some of the items in the psychological costs of retirement preparation questionnaire are not adequate for people already retired. Therefore,

all analyses concerning psychological costs of retirement preparation were made without the retired participants (n=4). Analyses that include income have a smaller sample (n=151) because not all participants answered.

To perform several variance analyses, participants were classified in groups by their psychological costs of retirement preparation degree (low, medium and high), and by their retirement affective valence (positive, neutral and negative). The criteria used to classify participants were:

- Psychological costs of retirement preparation :
  - Low [6 , 17]
  - Medium [18, 30]
  - High [31 , 42]
- Retirement affective valence
  - Negative [1, 3]
  - Neutral = 4
  - Positive [5, 7].

In order to test the hypotheses formulated, we conducted McNemar crosstabs exact tests, *t-student* tests, simple and multiple univariate linear regressions, and variance analysis with Dunnett's parwise post-hoc comparisons. Pearson correlations, as well as Phi nominal measures of correlation were also conducted. Existence of good conditions to perform linear regressions was verified recurring to the Durbin-Watson statistics and residuals analysis, and also collinearity, in the case of multiple regressions. Conditions to perform ANOVA were verified through normality assessment and tests of homogeneity of variances. Stated significance values are two-sided, unless otherwise indicated by the notation "p_u".

Study II Results

As stated in *H1*., we expected impatience in retirement context to be lower than impatience degree in neutral context. Through a *t-student* test, we compared the total scores in impatience obtained in both contexts, and verified that the score in the retirement context (M=4.22; SD=2.99; n=194) was significantly higher ($t(193)$=10.20; p_u<.001) than in the neutral context (M=2.04; SD=2.60; n=194). This result is in accordance with our hypothesis, since a higher score means lower impatience (a larger number of LL choices). We also compared the pairs of items to see if some combinations made people more susceptible to context than other: Large or small amount, delay of 3 or 6 years and annual return rate of 4% or 6%. Result from McNemar crosstabs exact tests (continuity corrected) show that choices in different contexts were significantly different for the eight pairs, namely for:

- Small amounts, 3 years and 4% (X^2=33.97; p<.001; n=194);
- Small amounts, 3 years and 6% (X^2=40.88; p<.001; n=194);
- Large amounts, 3 years and 4% (X^2=29.80; p<.001; n=194);
- Large amounts, 3 years and 6% (X^2=39.19; p<.001; n=194);
- Small amounts, 6 years and 4% (X^2=31.74; p<.001; n=194);
- Small amounts, 6 years and 6% (X^2=46.41; p<.001; n=194);
- Large amounts, 6 years and 4% (X^2=43,91; p<.001; n=194);
- Large amounts, 6 years and 6% (X^2=46.51; p<.001; n=194).

All differences were in the direction of smaller impatience (more LL choices) in the retirement context**.**

Hypothesis *H2.* proposed that psychological costs of retirement preparation would affect the impatience variation between contexts: Variation would be larger for higher than for lower costs. Conditions to perform a linear regression were adequate, according to the Durbin-Watson statistic (d=2.2) and residuals were homogeneous and presented a distribution near normal. We found a significant effect of psychological costs on impatience variation (r=.143; $t(188)$=1.98; p=.049), which is in accordance with our hypothesis.

To test hypothesis *H2.1* we then classified participants in three groups according to their psychological costs of retirement preparation degree (low, medium and high) in order to

perform an ANOVA and compared the variation in impatience between the groups, finding a significant difference ($F(2,187)=3.35$; $p=.037$; $\eta^2_P=0.035$; $\pi=0.63$). The post-hoc comparison of the groups by a Dunnett one-tailed *t*-test, using the high cost group as the control group, showed that impatience variation was significantly higher ($p_u=.023$) in the group of high costs ($M=3.00$, $SD=3.24$, $n=56$) when compared with the groups of low costs ($M=1.25$, $SD=2.69$, $n=20$), and also significantly higher ($p_u=.036$) when compared with the group of medium costs ($M=1.99$, $SD=2.86$, $n=114$). Since impatience variation is significantly higher for the high costs group, results are in accordance with hypothesis *H2.1* stating that variation would be larger for higher than for smaller costs. We also compared impatience between the groups of high and low costs, both in neutral and retirement context. We found no differences in neutral context ($p=.864$), but significant differences in retirement context ($t(74)=-2.12$; $p=.038$).

Hypothesis *H3.* proposed that psychological costs of retirement preparation would be inversely related to retirement affective valence. Conditions to perform linear regression were acceptable according to the Durbin-Watson statistic ($d=2.2$), and residuals were homogeneous and presented a distribution near normal. We found a significant inverse effect of psychological costs on retirement affective valence ($r=-.283$; $t(188)=-4.05$; $p<.001$), which is in accordance with our hypothesis.

Hypothesis *H3.1* proposed that low costs would be related with a more positive retirement affective valence than medium or high costs. To test this, we then classified participants in three groups according to degree of psychological costs of retirement preparation and, through an ANOVA, compared the retirement affective valence between the three groups. Psychological costs of retirement preparation have a statistically significant effect on retirement affective valence ($F(2,187)=7.91$; $p=.001$; $\eta^2_P=0.08$; $\pi=0.95$). We compared the groups post-hoc by a Dunnett one-tailed *t*-test using the low costs group as the control group, and verified that the retirement affective valence of the low costs group ($M=4.75$, $SD=1.74$, $n=20$), is significantly higher ($p=.001$) than that of the high costs group ($M=3.34$, $SD=1.56$, $n=56$) and is also (marginally) significantly higher ($p=.079$) than that of the medium costs group ($M=4.14$, $SD=1.50$, $n=114$). We also verified that average retirement affective valence in low cost group was significantly higher that 4 (neutral affective valence value; $t(19)=1.92$; $p_{u=}.035$), and so positive, average retirement affective valence was significantly lower than 4 in high cost group ($t(55)=-3.16$; $p_{u=}.002$) and therefore negative,

and was not significantly different from 4 in medium cost group (t(113)=1.00; p=.319), and so neutral. Therefore, the hypothesis is verified.

Hypothesis *H3.2* proposed that both psychological costs of retirement preparation and income would affect retirement affective valence, but cost would have a negative effect, while income would have a positive effect. Conditions to perform a linear regression were again acceptable, according to the Durbin-Watson statistic (d=1.9), and residuals homogeneous with a distribution near normal. Using both stepwise and backward methods, we found a significant inverse effect of psychological costs on retirement affective valence (β=-0.313; t(144)=-4.10; p<.001), and a significant positive effect of income on affective valence (β=0.270; t(144)=3.53; p=.001), which is in accordance with our hypothesis. These two variables account for 20.2% of variance (adjusted) in retirement affective valence. Although there is a significant inverse correlation between costs and income (r=-.251; p=.002; n=147), no high collinearity between the variables was detected.

Hypotheses *H4.1*, *H4.2* and *H4.3* proposed significant differences between genders regarding retirement affective valence, psychological costs of retirement preparation and income. More clearly, we predicted women would present a more negative retirement affective valence, higher psychological costs of retirement preparation and have a lower income than man. Differences between genders were studied by variance analysis.

Hypothesis *H4.1* proposed significant differences between genders regarding retirement affective valence and significant differences were found F(1,192)=6.99; p=.009; η^2_P=0.035; π=0.75), with women presenting a much more negative retirement affective valence (M=3.73, SD=1.61, n=120) than men (M=4.35, SD=1.54, n=74). We also verified that average retirement affective valence for men was significantly higher than 4 (t(73)=1.96; $p_{u=}$.027), and so positive, but significantly lower that 4 for women (t(119)=-1.82; $p_{u=}$.036), and therefore negative. Hypothesis *H4.2* proposed significant differences between genders regarding psychological costs of retirement preparation. We found significant differences (F(1,188)=7.70; p=.006; η^2_P=0.039; π=0.79), with women presenting a much higher costs (M=4.53, SD=1.04, n=118) than men (M=4.09, SD=1.10, n=72). Hypothesis *H4.3* proposed significant differences between genders regarding income, and as in Study I, we found a significant nominal correlation between gender and income (phi=0.369; p=.016), with women presenting a lower income (M=3.83, SD=2.56, n=96) than men (M=4.56, SD=1.95, n=55). Therefore, all three hypotheses were verified.

Hypothesis *H4.4* proposed significant differences between genders regarding impatience in both retirement and neutral contexts, with higher impatience for men. However, no significant difference were found in neither of the contexts, neutral (p=.449) or retirement (p=.636). Therefore, the hypothesis was not verified.

To investigate research questions *Q.1*, *Q.2* and *Q.3*, we grouped participants in two groups: Work and no-work group, and analyzed differences between them. In investigating research question *Q.1*, asking if there would be differences in impatience between work and no-work group, we found a marginally significant difference in impatience in retirement context (F(1,192)=3.67; p=.057; η^2_P=0.019; π=0.48). We also found a marginally significant difference in impatience in neutral context F(1,192)=2.91; p=.090; η^2_P=0.015; π=0.40). On both contexts, the no-work group consistently presents higher impatience. Reinforcing this result, a positive significant correlation was found between income and impatience in neutral context (r=.185; p=.023; n=151): The higher the income, the lower the impatience (higher score).

Regarding *Q.2*, asking if there would be differences in psychological costs of retirement preparation between work and no-work group, we found significant differences in psychological costs of retirement preparation F(1,188)=6.84; p=.010; η^2_P=0.035; π=0.74).

And last, concerning *Q.3*, asking if there would be differences in retirement affective valence between work and no-work group, we found a significant difference in affective valence (F(1,192)=8.11; p=.005; η^2_P=0.041; π=0.81). The average retirement affective valence was significantly lower than 4 in no-work group (t(37)=-2.80; $p_{u=}$.004) and therefore negative, but was not significantly different from 4 in the work group (t(155)=1.01; p=.316), and therefore neutral.

Study II Discussion

In this second study we intended to compare, through one experiment, the participant's measures of impatience in neutral and retirement contexts, in order to assess if retirement context does affect their impatience degree and if this effect of context could be related with psychological costs of retirement preparation. We also expected to demonstrate the existence of an inverse relationship between these costs and retirement affective valence, that affective valence would also be affected by income, and research differences between genders concerning these two variables, in addition to impatience degree. Finally, we intended to research the work status concerning retirement affective valence, psychological costs and impatience.

Our first hypothesis proposed that, in retirement context, there would be a lower degree of impatience than in neutral context and therefore. The results were in accordance with this hypothesis. We proposed that the retirement context, by itself, would predispose people to be less impatient and indeed, when comparing choices between contexts, we found significant differences in each of the eight pairs of choice: In every case, people were less impatience in the retirement context. So, it is possible that contextualizing people in a future moment in time when they will most certainly need their savings, as far away as it may be, will lead them to be less impatient. Read et al. (2005) proposed that, within certain framings, the intuitive impression of how long the delays involved are may change. Retirement is, for most, a still far way event (participants age: M=38.9; SD=10.5), but in this context the longer delays may not seem so long after all, and people are more predisposed to wait for a larger amount of money.

We proposed that psychological costs of retirement preparation would affect impatience variation between contexts, and also that impatience variation would be larger for higher than for smaller costs. Both hypotheses were verified. The results demonstrated that psychological costs do have an effect on impatience variation and people with higher costs presented a significantly higher variation of impatience between contexts than the others. As we argued, this may be due to a heighten sensitivity to retirement context by people with high perceived costs. High costs signify great difficulty in planning for retirement, possibly associated with anxiety and fear of choosing badly and lose the investments. Compared with most retirement investment financial products, the choice we proposed was a very easy one: Either you receive money now, or you invest it and receive more money guaranteed in x

years. However, even when confronted with an easy choice in retirement context, people with high perceived costs might have experienced increased levels of anxiety and stress that, in turn, could lead to a selective allocation of attention to aspects related to retirement.

We expected to find an inverse relation between psychological costs of retirement preparation and retirement affective valence, and also expected that people with lower cost would present a more positive retirement affective valence than other people. Both hypotheses were verified. Results demonstrated not only that people with low costs had a more positive affective valence than others but also that these people's average retirement affective valence was not only higher but within the positive values range. This means that for people experiencing low degree of psychological costs of retirement preparation, retirement affective valence is not just more positive but truly positive.

We also predicted that psychological costs of retirement preparation and income would affect the retirement affective valence, but while cost would have a negative effect, income would have a positive effect. This was also verified, since both variables were, as expected, significant predictors of affective valence explaining, together, more than 20% of variance. This result demonstrates that both lower perceived psychological costs and higher income are related with a more positive retirement affective valence. Whatever their baseline retirement affective valence may be (related to their cultural background, education, life experience, etc.), showing people they are able to save part of their income (e.g. rationalizing their expenses) and don't perceive major difficulties in investing for retirement, it will most likely be possible to improve their expectations for retirement. Even though the work force is ageing, in western societies there is transversal negative view regarding older workers, which may affect perception of retirement (Tougas et al., 2004), and convey fear of not being productive anymore (Haro & López, 2012) and becoming a burden to others (Feijóo, 2006). Getting old is also often viewed as unpleasant, worrisome, and associated with sickness (Sundén, 2008). A negative vision of old age is not new, but it never before played such a role like the one it does in nowadays western societies (Gilleard & Higgs, 2000). So, depending on how negative the baseline retirement affective valence is, reducing psychological costs of retirement preparation may or may not be enough for a truly positive valence to take place. However, we believe intervention and financial education programs could be more successful if dealing first with the possible causes of such negative and persistently biased conceptualizations of retirement. Afterwards, when addressing issues related with retirement planning and focusing on reducing the actual costs perceived, individuals could be more

receptive and aware of the benefits of this kind of information, and a more positive retirement affective valence might be attained.

In what regards gender, we found significant differences in the retirement affective valence, as well as in psychological costs of retirement preparation and income. Women have a more negative retirement affective valence, and these results could be related to the fact that women also tend to have lower income than men, and perceive higher psychological costs of retirement preparation. Altogether, they seem to feel a greater difficulty in planning retirement than men that, when combined with a lower income, probably leads them to expect a low retirement pension and very few retirement savings. However, contrary to literature findings, and contrary to our own findings from Study I, we found no significant difference in impatience, in either context, between genders.

We found very little information about work status in literature and none that would allow us to establish hypotheses relating it with impatience, psychological costs of retirement preparation or retirement affective valence. So, in this study we also aimed at contributing to extend empirical information about this variable. Regarding the research questions formulated, we found very clear differences in retirement affective valence and psychological costs between the two groups of professional status: The no-work group presented a more negative retirement affective valence, and also higher psychological costs of retirement preparation. People belonging to this group do not have a job (even though it may be a temporary situation), and therefore do not receive a salary, although some may be receiving an unemployment subsidy. Although we do not know anything about their possible incomes sources, we can speculate that some of them, if not most, could experience difficulty in accumulating savings and some may even be consuming the savings they had. This could create uncertainty concerning their future and their retirement. And, remaining in this thread of thought, one of our most interesting results pertains to impatience, both in neutral and retirement context, with the no-work group consistently presenting higher impatience. Research about time perspective suggests that a lower income could lead to a shorter future horizon (Hershey et al., 2007) and our result is consistent with this: Again assuming people belonging to this group do not receive a salary, being “short of money” probably makes them less interested in waiting to receive more money. Unfortunately, with the limited information we possess, we cannot discard the possibility of their individual characteristics (e.g. personality traits) making them more impatient as well as more likely candidates for unemployment.

In sum, Study II results point to a considerable weight of retirement and unemployment context in impatience and to the possibility of a heighten sensitivity to retirement context by people with high perceived costs. Also, retirement affective valence represents a characteristic of individuals that emerges as positively affected by income and negatively affected by costs. Moreover, in people experiencing low degree of psychological costs, retirement affective valence seems not only to be more positive but truly within positive range. Overall, retirement affective valence represents a characteristic of individuals that, although related to psychological costs, could also have a component derived from a negative vision of old age, frequently regarded as unpleasant and worrisome, or from fear of not being productive anymore and becoming a burden to others. In our view, this should be taken into account when conceiving intervention and enhanced financial education programs aiming at the reduction of the psychological costs of retirement preparation. No doubt these programs could be facilitators of retirement savings and planning but in order to be truly effective they must be adjustable to people's individual differences, like their retirement affective valence, in at least some measure. Ideally, these programs should not address the issues related with retirement in a direct approach when targeting people with negative retirement affective valence, but ought to start by dealing with the possible causes of such a negative and probably biased conceptualization of retirement. Subsequently, people could be more receptive to issues related with retirement, and attempting to reduce cost perception could prove to be easier to achieve. The desired outcome would be lower perceived costs in addition to a more positive retirement affective valence.

As in Study I, our purpose was to research the relationship between variables. However, in view of the characteristics of the sample, a possible direction for future research would be to replicate these relationships in a sample with both lower income and education degree.

Chapter 4: Study III

Study III Theoretical Overview

Time perspective is one of the psychological influences in the retirement planning model to which highlight has been given as a proximal determinant of investing behavior, and considered a powerful influence in the degree of financial planning (Hershey, 2004). From a personality perspective, predisposition for planning may arise from the degree of FTP (Padawer et al., 2007). It is considered a personality trait that antecedes cognitive constructs (Gupta et al., 2012), and fundamental to the expression of cognitive states (Hershey et al., 2007). However, from a cognitive point of view, it is regarded as a perceptual dimension that influences individual's view of the world, their goals, decisions, and plans (Nuttin, 1984, as cited in Gupta et al., 2012). Considered as a personality trait, time perspective is inherently stable. However, as a perceptual dimension it may be susceptible to a great number of influences, both internal and external. For instances, people in a positive mood tend to be more future oriented (Hornik, 1992). Demographic indicators such as age, sex, income, marital status, and education may be conceptualized, from a theoretical perspective, as proxies for the forces that influence the expression of time perspective (Padawer et al., 2007). And, indeed, time perspective seems to be related with income (Hershey et al., 2007; Padawer et al., 2007), and the explanation forwarded by the authors is that a lower income could lead to a shorter future horizon due to a day-to-day money management (Hershey et al., 2007).Therefore, *H1.1* proposes that income is a significant predictor of FTP.

Whichever the perspective (personality or cognitive), FTP reflects a general future orientation, dominated by an effort in reaching future objectives, goals and rewards, and is characterized by planning (Zimbardo & Boyd, 1999). Is considered to be related to work motivation in general (Seijts, 1998), and to retirement goal clarity (Hershey et al., 2007). Therefore, *H1.2* predicts a positive effect FTP on retirement motivation: Higher future perspective should also be related to higher retirement motivation.

Since FTP is characterized by planning (Zimbardo & Boyd, 1999), and individuals with a high degree of FTP seem to engage more easily in activities requiring planning such as preventative health behaviors (Rothspan & Read, 1996), *H1.3* predicts a positive effect FTP

on retirement planning: Higher future perspective should be related to higher retirement planning.

FTP and self-reported financial preparedness for retirement have been positively associated (Hershey & Mowen, 2000), and individuals with a short planning horizon present a lower net worth, and expect a lower income from personal savings in retirement (Lusardi, 1999). FTP was found to be a predictor of retirement savings (Jacobs-Lawson & Hershey, 2005) and planning horizon affects participation in retirement plans and the size of contributions (Munnell et al., 2001/2002). So, *H1.4* predicts a positive effect FTP on retirement subjective savings: Higher FTP should also be related to higher retirement subjective savings.

Since FTP is dominated by an effort in reaching future objectives, goals and rewards, and is characterized by planning (Zimbardo & Boyd, 1999), individuals with a high degree of FTP seem to engage more easily in activities requiring planning (Rothspan & Read, 1996), and FTP is related to work motivation (Seijts, 1998), and of retirement goal clarity (Hershey et al., 2007), we also expect FTP to help reduce the perception of psychological costs. Thus, *H1.5* predicts an inverse effect of FTP on psychological costs of retirement preparation.

As mentioned before, the existence and clarity of goals is considered important for the motivational aspect of planning (Friedman & Scholnick, 1997). Number and importance of retirement goals may, therefore, be considered a measure of retirement motivation. Goals appear consistently and positively related with retirement planning (Hershey et al., 2007; Petkoska & Earl, 2009), financial goal strength and retirement savings contributions are also positively related (Neukam & Hershey, 2003), and goal clarity predicts planning degree (Stawski et al., 2007). Also, goal-setting exercises in retirement planning seminars seem to significantly elevate expectations of planning and saving activities in the subsequent year (Hershey et al., 2003). Consequently, motivation may help diminish the perception of psychological costs and, indeed, the results from Study I showed motivation to be a negative predictor of costs. Based on literature findings and also in our own findings from Study I, we expect motivation to positively predict the two behavioral constructs considered and to be inversely related to psychological costs of retirement preparation. More clearly, *H2.1* predicts a positive effect of retirement motivation on retirement planning: Higher retirement motivation should be related to higher retirement planning, and *H2.2* predicts positive effect of retirement motivation on retirement subjective savings: Higher retirement motivation

should also be related to higher subjective savings, whereas *H2.3* predicts a negative effect of retirement motivation on psychological costs of retirement preparation.

As stated before, low levels of retirement planning may be explained by the unwillingness of the planner in incurring in planning costs (Ellis & Siegler, 1997), costs that may have enough weight to completely inhibit planning (Lusardi, 2003). Therefore, a high perception of these costs may lead to reduced retirement savings, and the results from Study I showed an inverse effect of psychological costs of retirement preparation on retirement planning, and on subjective savings. Therefore, *H3.1* predicts a negative effect of psychological costs of retirement preparation on retirement planning, and *H3.2* predicts an also negative effect of psychological costs on retirement subjective savings: People perceiving lower psychological costs should be more likely to plan and save.

Age consistently predicts retirement financial planning (Bassett et al., 1998; Petkoska & Earl, 2009) and goal clarity, usually related with planning degree, was also accounted for by age (Stawski et al., 2007). Some tasks are socially expected in certain moments of life and, therefore, individuals are more encouraged to pursue those particular goals and tasks at certain ages (Cantor, 2003). Since older people are nearer to retirement, and are expected to think more about that subject than younger people, it is no surprise that age emerges as the demographic indicator most reliably related to retirement financial planning. In Study I age also significantly predicted retirement planning, even though explaining a small amount of variance. Therefore, *H4.1* predicts a significant effect of age on retirement planning.

In Study I, when both demographic and psychological constructs were considered, psychological costs of retirement preparation, retirement motivation, retirement planning knowledge, and age predicted global subjective savings. However, age unexpectedly emerged as a negative predictor. Our proposal of explanation for this result considered two aspects. One was that we were not measuring absolute or objective savings, but self-reported, subjective, perceived savings that only evaluate the person's perception of her savings. The other aspect was that, in some cases, these perceptions may have been influenced in some degree by fairly recent changes in expectations about social security retirement pensions. Some of the older people may have been less concerned with saving and investing for retirement than they now believe they should, perhaps because they expected to receive a retirement pension that would cover most of their needs. But now things are changing, and they may fear not having saved enough and so, they may now perceive their savings as low. By comparison, younger people, no longer believing in social security retirement pensions,

may have already started saving and will, as a result, evaluate their savings as high. Another possible explanation for the unexpected result was that in Study I we evaluated global savings, and not retirement savings. However, in literature being older is usually associated with higher retirement savings (Glass & Kilpatrick, 1998; Hurd & Wise, 1989) and so we expect age to predict subjective retirement savings. Therefore *H4.2* proposes that retirement motivation, age and psychological costs of retirement preparation are all significant predictors of retirement subjective savings, the first two being positive predictors, contrary to the last one.

Study III Method

Design

In this study, the following variables were measured:

- Future time perspective (FTP);
- Retirement motivation: Number of goals and their importance;
- Retirement planning degree;
- Psychological costs of retirement preparation;
- Self-reported retirement perceived savings;
- Demographic variables: Age, gender, work status, income and education degree.

The order of presentation of items in each question, and the display order of the questions in each block was randomly determined.

Participants

In this study, participants were selected by convenience[7]. The sample was constituted by 124 participants, but one of the participants did not complete the personal information part of the questionnaire. Participants average age was 40.3 (*SD*=11.2), and 58.9 % were women. In the case of professional status, 0.8 % were students, 5.6 % were employed students, 9.7 % were unemployed and 8.1 % were retired. The remainder 75.0 % were employed. The great majority of the sample (86.2 %) had, at least, a university degree.

Monthly household income answer was optional, but only 20.2 % did not respond. Regarding the remainder 79.8%, 1.0 % had less than €700 for month; 29.3 % had a monthly income between €700 and €1399; 39.4 % had a monthly income between €1400 and €2099; 12.1 % had a monthly income between €2100 and €2799; and 19.2 % had a monthly income higher than €2800.

[7] Invitations were sent by email, through internet forums, via LinkdIn and posted in Facebook, and receivers were asked to help gathering data by forwarding the invitation to friends and colleagues.

Instrument

The instrument developed was an online questionnaire, presented through Qualtrics Survey. It was composed of four modules, described ahead.

Module 1: Future time perspective.

In the first module, participants were presented with a Portuguese translation of the Jacob-Lawson and Hershey's (2005) Future time perspective (FTP) scale. This scale was selected instead of the Future Time scale from Zimbardo's Time Perspective Inventory (Zimbardo & Boyd, 1999), already translated to Portuguese, because it seems to deal better with the longer delays characteristic of retirement planning (Hershey et al., 2007; Jacobs-Lawson & Hershey, 2005). The FTP scale developed by Jacob-Lawson and Hershey (2005) consists of the following six statements:

1. I follow the advice to save for a rainy day.

2. I enjoy thinking about how I will live years from now in the future.

3. The distant future is too uncertain to plan for. (R)

4. The future seems very vague and uncertain to me. (R)

5. I pretty much live on a day-to-day basis. (R)

6. I enjoy living for the moment and not knowing what tomorrow will bring. (R)

For each of these statements, participants were required to state their degree of disagreement/agreement, using a seven-point response format (1 - strongly disagree, 7 - strongly agree).

Module 2: Retirement motivation.

Our purpose in this module was to evaluate the participant's degree of motivation for retirement, in a way that would permit us to understand if the participants had retirement goals, if these goals were general or specific, and how important these goals were considered. Since it has proven difficult for people to tell us directly how many goals they have, but our previous approach was very complex, we simplified the approach utilized in Study I and simply asked them to tell us:

1. If they had goals, and if they were only general or if they had one or two specific goals, three or four specific goals, or many specific goals;
2. How important these goals were, in a scale of 1 (not very important) to 3 (very important).

Module 3: Questionnaires.

This module was composed by three questionnaires in a randomized order. Also, the order of the question within each questionnaire was random.

The degree of retirement financial planning was evaluated with the Portuguese adaptation of the financial planning degree scale (FPD) from Petkoska and Earl (2009) utilized in Study I.

Psychological costs of retirement preparation were measured by the six items of the PCRP scale developed for this purpose, using a seven-point response format (1 - strongly disagree, 7 - strongly agree), as described for Study I and II. The scale consists of six very simple statements, as follows:

- I'm always postponing my retirement planning.
- It's easy to choose in which financial product to invest my retirement savings. (R)
- I have already started to plan my retirement. (R)
- I'm scared of making a poor financial choice and make a bad investment.
- When I try to invest my money, I get too anxious and give up.
- The information about financial products is very complex.

Finally, the subjective savings were measured using a Portuguese adaptation of the five-item scale designed by Jacobs-Lawson and Hershey's (2005), to evaluate individuals' perception of their subjective retirement savings. This scale is similar to the one used in Study I but specific for retirement savings and therefore will be refer to as subjective retirement savings (SRS) scale. It does not evaluate objective savings for retirement but the person's perception of her retirement savings. Again, all items use a seven-point response format (1 - strongly disagree, 7 - strongly agree).

Module 4: Personal data.

The questionnaire had a last part in which participants were asked their gender, age, occupational status, education degree and income (optional).

Procedure

Data collection was done between October, 2012 and April, 2013, and 124 Portuguese individuals participated. Of these, only one participant did not complete the questionnaire, by not answering the personal data module. Instructions appeared on the front page of the online questionnaire.

Indicators. To evaluate motivation, we applied the same procedure of Study I. Motivation was measured by a composite indicator constructed based on both the number and importance given to retirement goals (see Appendix E). Psychological costs of retirement preparation, as well as future time perspective, financial planning and subjective retirement savings, were all measured by the total score obtained in their respective questionnaires.

Data Analysis

The construction of the database and all statistical analyzes referred to next, were performed in SPSS Statistics (v. 17 and v.19; IBM SPSS Inc, Chicago, IL).

There were no large deviations from the normal distribution for all the considered variables, according to Kline's (2005) criterion, considering the distribution exceedingly different from the normal distribution when skewness（*Sk)* is larger than 3 and kurtosis（*Ku*）is larger than 7, in absolute values. The search for extreme values showed two extreme outliers concerning the income variable, and analyses were performed with and without the outliers, results being only reported where differences were found.

Exploratory factor analysis by principal components was performed on all the scales either without rotation or with varimax rotation. To verify the adequacy of this statistical technique, the Keiser-Meyer-Olin measure (at least 0.5) and the Bartlett's test (p<0.5) were used. To decide about the number of factors to retain, the Kaiser's rule (eigenvalue above 1), the scree plot rule and the explained variance percentage (at least 50% of total, and more than

5% for a factor to be included) were considered, since using these rules isolated can lead to an incorrect number of factor extraction.

Concerning the FTP scale, an alpha of 0.75 had previously been found. In our analysis of the translated scale, having verified the existence of adequate conditions to perform the analysis, two factors were extracted, by principal component analysis, explaining 57.0 % of the total variance: Planning and uncertainty (See Table 7).

Table 7

Rotated component matrix for FTP scale

	Component	
	Planning	Uncertainty
I enjoy living for the moment and not knowing what tomorrow will bring. (R)	,787	
I pretty much live on a day-to-day basis. (R)	,662	
I follow the advice to save for a rainy day.	,656	
I enjoy thinking about how I will live years from now in the future.	,620	
The future seems very vague and uncertain to me. (R)		,834
The distant future is too uncertain to plan for. (R)		,686

Note: (R) Indicates item is reverse scored. Extraction method was by principal component analysis, and rotation method was varimax with kaiser normalization.

All scale items loaded equal or above 0.62 in one of the components. We ran an internal consistency analysis on the scale items, which revealed a standardized Cronbach alpha of .60. The analysis of the results showed an increase in the value of alpha if item 4 was deleted. The exclusion of this item led to an alpha of .65, and an inter-item correlation of .271. Therefore, the item 4 was not considered in calculating the FTP scores.

Regarding the FPD scale, only one factor had originally been found and the scale's original Cronbach alpha was not known. Concerning the Portuguese version of the FPD scale utilized in Study I, two factors were extracted, explaining 53.0 % of the total variance: an activities component and an investment component. In the present analysis, two factors were again extracted, explaining 58.1 % of the total variance, and all the scale items loaded equal or above 0.56 in one of the components (see Table 8). A standardized Cronbach alpha of .77 was found.

As for the reliability analysis, we found a standardized Cronbach alpha of .82 for the FPD scale, suggesting a good internal consistency of the data, and an inter-item correlation of .363.

Table 8

Rotated component matrix for FPD scale

	Component	
	Investment	Activities
- Made long-term investments.	,852	
- Assessed/reassessed my net worth.	,763	
- Made contributions to retirement savings plans.	,680	
- Calculated the cost of living during retirement.	,568	
- Read books/articles/brochures about retirement planning.		,837
- Visited retirement planning web sites on the Internet.		,697
- Participated in workshop, seminar, or course on retirement planning.		,685
- Discussed retirement financial planning with a professional in the field.		,560

Note: Extraction method was by principal component analysis, and rotation method was varimax with kaiser normalization.

In the analysis of the psychological costs of retirement preparation (PCRP) scale, having verified the existence of adequate conditions to perform the analysis, two factors were extracted, by principal component analysis, explaining 61.9 % of the total variance. These factors coincide with the ones found in Studies I and II, and were a complexity component and a time component. Again, affect and difficulty appear combined in the complexity factor. Retirees' answers were not considered for this scale.

All of the six items loaded positively equal or above 0.56 in one of the two factors. The structure found is similar to the one reported in Studies I and II. The items and factor loadings are reported in Table 9.

Table 9

Rotated component matrix for PCRP scale

	Component	
	Complexity	Time
- I'm afraid to make a poor financial choice and make a bad investment choice.	,817	
- The information about financial products is very complex.	,771	
- When I try to invest my savings, I get too anxious and I give up.	,621	
- It's easy to choose a financial product to invest my retirement savings. (R)	,557	
- I already started to plan my retirement. (R)		,922
- I'm always postponing my retirement planning.		,816

Note: (R) Indicates item is reverse scored. Extraction method was by principal component analysis, and rotation method was varimax with kaiser normalization.

We ran an internal consistency analysis on the scale items, which revealed a standardized Cronbach alpha of .69 and an inter-item correlation of .268. In Studies I and II we had found an alpha of .68 and .70, respectively.

Regarding the SRS scale, in the present study there were good conditions to perform an exploratory factor analysis and only one factor was extracted, explaining 73.5 % of the total variance. All the items of the scale loaded above 0.83 (see Table 10).

Table 10

Unrotated component matrix for SRS scale

	Savings
- Made a conscious effort to save for retirement.	,897
- Based on how I plan to live my life in retirement, I have saved accordingly.	,871
- Accumulated substantial savings for retirement.	,848
- Relative to my peers, I have saved a great deal for retirement.	,839
- Made meaningful contributions to a voluntary retirement savings plan.	,828

Note: Extraction method was by principal component analysis.

As for the reliability analysis, we found a standardized Cronbach alpha of .91 for the SRS scale, suggesting very good internal consistency of the data, with an inter-item correlation of .667. Its original alpha coefficient was 0.93.

To perform several variance analyses, participants were classified in groups by their retirement motivation degree (low and high motivation) and by their psychological costs of retirement preparation (low, medium and high). The criteria used to classify participants were:

- Retirement motivation degree:
  - Low [-1.88 , -.03]
  - High [0.17 , 1.80]
- Psychological costs of retirement preparation degree:
  - Low [6 , 17]
  - Medium [18, 30]
  - High [31 , 42]

The retirees were not included in psychological costs analysis, because some of the items in the psychological costs of retirement preparation questionnaire are not adequate for

people already in retirement. All analyses concerning psychological costs of retirement preparation were made without the retired participants (n=10).

Because not all participants answered, analyses that include income have a smaller sample (n=99). Furthermore, two extreme outliers in income variable were detected, so analyses were conducted with and without these two observations, and results are reported when differences were found.

In order to test the hypotheses formulated, we conducted simple and multiple univariate linear regressions and variance analysis with Dunnett's parwise post-hoc comparisons. The existence of good conditions to perform linear regressions was verified recurring to the Durbin-Watson statistics, residuals analysis and collinearity, in the case of multiple regressions. When conditions were not good, Spearman nonparametric correlations were presented. Conditions to perform ANOVA were verified through normality assessment and tests of homogeneity of variances. Stated significance values are two-sided, unless otherwise stated by the notation "p_u".

Study III Results

Linear regressions 1 and 2 were conducted to test *H1.1,* proposing income to be a predictor FTP. According to Durbin-Watson statistic (d=1.6) and residuals analysis, conditions to perform this statistical technique were good. The results showed a significant effect of income on FTP (r=.313; t(95)=3.22; p=.002), explaining 8.9% of variance: FTP was higher when income was larger, consistent with *H1.1*. When income outliers were considered in the analysis, conditions to perform this statistical technique were adequate according to Durbin-Watson statistic (d=1.7) and residuals analysis, but the effect was only marginally significant (p=.098).

Linear regression 3 was conducted to test *H1.2,* predicting a positive effect FTP on retirement motivation. According to Durbin-Watson statistic (d=1.8) and residuals analysis, conditions to perform this statistical technique were good. The results showed a significant effect of FTP (r=.429; t(121)=5.23; p<.001), explaining 17.8% of variance: Motivation was greater when FTP was higher, consistent with *H1.2*.

Linear regression 4 was conducted to test *H1.3,* predicting a positive effect of FTP on retirement planning. According to Durbin-Watson statistic (d=2.0) and residuals analysis, conditions to perform this statistical technique were good. The results showed a significant effect of FTP (r=.347; t(121)=4.07; p<.001), explaining 11.3% of variance. Results are in accordance with hypothesis *H1.3*, since retirement planning was higher when FTP was also higher.

Linear regression 5 was conducted to test *H1.4,* predicting a positive effect FTP on subjective retirement savings. According to Durbin-Watson statistic (d=1.6) and residuals analysis, conditions to perform this statistical technique were acceptable. The results showed a significant effect of FTP (r=.309; t(121)=3.57; p=.001), but explaining 8.8% of variance. Since retirement savings perception is significantly higher for higher FTP, results are in accordance with hypothesis *H1.4*.

Linear regression 6 was conducted to test *H1.5* proposing an inverse effect of FTP on psychological costs of retirement preparation. According to Durbin-Watson statistic (d=0.04), conditions to perform this statistical technique were unacceptable (severe auto-correlation of residuals). We then proceeded to test hypothesis *H1.5* through a Spearman correlation, and an

inverse correlation of -.163 was found between the variables that, although only marginally significant (p=.085), gives support to our prediction.

Linear regression 7 and 8 were conducted to test *H2.1* and *H2.2,* both predicting a positive effect of retirement motivation, the first on retirement planning and the second on subjective retirement savings. According to Durbin-Watson statistic (d=1.9 and d=2.0, respectively) and residuals analysis, conditions to perform this statistical technique were adequate and both results were significant: The results showed a significant effect of retirement motivation on retirement planning (r=.446; t(121)=5.48; p<.001), and also a significant effect of retirement motivation on subjective retirement savings (r=0.428; t(121)=5.20; p<.001). Both results are in accordance with hypotheses *H2.1* and *H2.2.*

Linear regression 9 was conducted to test *H2.3,* predicting a negative effect of retirement motivation on psychological costs of retirement preparation. According to Durbin-Watson statistic (d=0.08), conditions to perform this statistical technique were unacceptable (severe auto-correlation of residuals). We then proceeded to test the hypothesis through a Spearman nonparametric correlation, and found a significant inverse correlation between the variables (r_S=-.243; p=.010; n=112), which is in accordance with our prediction.

Linear regression 10 and 11 were conducted to test *H3.1* and *H3.2*, both predicting a negative effect of psychological costs of retirement preparation, but the first on retirement planning, and the second on subjective retirement savings. According to Durbin-Watson statistic (d=0.9 and d=1.5), again conditions to perform this statistical technique were inadequate (auto-correlation of residuals), though both results were significant. To test the hypotheses, we then classified participants in three groups according to degree of psychological costs of retirement preparation and, through an ANOVA, compared both retirement planning and subjective retirement savings between the three groups. Psychological costs of retirement preparation presented a statistically significant effect on retirement planning (F(2,110)=4.40; p=.014; η^2_P=0.07; π=0.75). We compared the groups post-hoc by a Dunnett one-tailed t-test using the high costs group as the control group, and verified that the retirement planning of the low costs group (M=20.00, SD=5.98, n=15) was significantly higher (p=.004) than that of the high costs group (M=14.24, SD=5.14, n=21), and was also significantly higher (p=.027) than that of the medium costs group (M=17.43, SD=6.06, n=77).

Psychological costs of retirement preparation presented a statistically significant effect on subjective retirement savings (F(2,110)=5.09; p=.008; η^2_P=0.09; π=0.81). We compared

the groups post-hoc by a Dunnett one-tailed *t*-test using the high costs group as the control group, and verified that the subjective retirement savings of the low costs group (*M*=20.60, *SD*=6.16, *n*=15) was significantly higher (*p*=.007) than that of the high costs group (*M*=13.76, *SD*=6.73, *n*=21), and was also significantly higher (*p*=.004) than that of the medium costs group (*M*=19.04, *SD*=7.73, *n*=77).

Linear regression 12 was conducted to test *H4.1,* predicting a significant effect of age on retirement planning. According to Durbin-Watson statistic (*d*=1.8) and residuals analysis, conditions to perform this statistical technique were acceptable. The results showed a significant effect of age (*r*=.194; *t*(121)=2.18; *p*=.031), but explaining only 3.0% of variance. Since retirement planning was significantly higher for older people, results are in accordance with hypothesis *H4.1*.

Linear regression 13 was conducted to test *H4.2,* proposing that retirement motivation and age are positive predictors of subjective retirement savings, while psychological costs of retirement preparation are a negative predictor. According to Durbin-Watson statistic (*d*=2.2), and residuals analysis, conditions to perform this statistical technique were acceptable. The results showed a significant effect of age (β=0.205; *t*(109)=2.45; *p*=.016), retirement motivation (β=0.332; *t*(109)=3.88; *p*<.001), and psychological costs of retirement preparation (β=-0.204; *t*(109)=-2.39; *p*=.018), explaining 24.1% of variance. Therefore, results are in accordance with hypothesis *H4.2.*

Study III Discussion

In the third Study, we conducted one experiment with the purpose of demonstrating that both FTP and psychological costs of retirement planning were significant factors that could affect the planning of retirement and subjective retirement savings, and research our predicted relationships of these costs with retirement motivation and future time perspective. We also intended to replicate some of the results obtained in the domain of retirements saving, and search for confirmation of results obtained in Study I.

All of the hypotheses proposed in this study were verified. Regarding FTP, we expected a positive effect of FTP on retirement motivation, on retirement planning and on subjective retirement savings, and an inverse effect of FTP on psychological costs. We also anticipated income to be a significant predictor of FTP. All of these hypotheses were verified and these results clearly support our belief in FTP's major importance in the retirement planning and savings domain.

By conceptualizing time perspective from a cognitive perspective, it may be regarded as a perceptual dimension, susceptible to several internal and external influences, with an impact on people's view of the world, their goals, decisions and plans (Gupta et al., 2012) cit Nuttin, 1984). Even a positive mood can make people more future oriented (Hornik, 1992). If it can be influenced and modified, FTP may constitute a relevant factor in trying to help people to better plan their retirement, due to the effects we have found on such important variables to the retirement planning process like retirement motivation, retirement planning, subjective retirement savings and psychological costs, as we described above: People more enthusiastic and optimistic about the future should be more interested in reaching future goals and rewards and better able to overcome obstacles crossing their way.

As in study I, and in accordance with findings from literature, we expected to find a significant age effect on retirement planning and, once more, age emerged as a positive predictor of retirement planning. Cantor (2003) argues that different tasks are socially encouraged in different moments of life and, therefore, individuals are expected to pursue particular goals at certain ages: Older people, closer to retirement, should be more concerned with retirement planning than younger people. However, although significant, age does not seem to be a determinant aspect since it consistently explains a very small amount of variance (3.1 % in Study I and 3% in the present study).

The three hypotheses concerning motivation addressed how this variable could have a positive effect on retirement planning, a positive effect on subjective retirement savings and a negative one on psychological costs of retirement preparation. Again, all of the hypotheses were verified.

Our results respecting retirement planning and subjective retirement savings replicate our own findings from Study I, even though in the present study the subjective savings variable concerns specifically to retirement savings and in Study I it concerned global savings. They also corroborate the empirical findings from literature: Goals appear as positively related to retirement financial planning (Hershey et al., 2007; Petkoska & Earl, 2009), financial goal strength and retirement savings contributions are positively related (Neukam & Hershey, 2003), goal clarity predicts planning degree (Stawski et al., 2007), and goal-setting exercises increase expectations of planning and saving activities (Hershey et al., 2003).

As we stated, our third hypothesis about motivation predicted this variable would have a negative relation with psychological costs and, indeed, results from the exploratory part of Study I had already showed motivation to be a negative predictor of costs. Results from the present study replicate our previous results, and confirm the importance of motivation on reducing psychological costs of retirement preparation. In pragmatic terms, these results imply that finding a way to motivate people towards retirement could be, as usually said, "half way through" in achieving a considerable reduction of their perception of costs.

This is especially relevant given that we predicted and again found an inverse relation among psychological costs of retirement preparation and retirement planning, and also with subjective retirement savings, replicating findings from Study I. Related to these results concerning motivation, are our findings that both retirement motivation and age are significant positive predictors of subjective retirement savings, together with psychological costs of retirement preparation, which is a negative predictor.

In conclusion, and in view of these results, we consider reasonable to assume that both FTP and psychological costs, along with more well-studied variables like motivation and knowledge, are variables that should always be taken into consideration when attempting to understand and diminish the real difficulties people feel when trying to plan and save for their retirement.

As in Study I and II, our purpose was to research the relationship between variables. However, in view of the characteristics of the sample (a very high education degree and a very high inverse correlation between age and education), a possible direction for future research would be to replicate these relationships in a sample with different education characterization.

Chapter 5: Study IV

Study IV Theoretical overview

It has been shown that time preference is often dependent on the context and framing of the options and the delays, and there is even evidence that it can be affected by several task-related aspects like the method by which discounting choices are presented and elicited (Read, 2004; Read et al., 2005; Tesch & Sanfey, 2008). Therefore, our premise is that time preference is labile to some degree and, therefore, may be affected by the characteristics of language.

As mentioned in Study I, a research paradigm most frequent in intertemporal studies consists in presenting people with choices that are usually between a smaller-sooner (SS) and a larger-later (LL) alternative, and variation in impatience can be measured very simply by the variation in the number of LL choices people make. However, there are two other discount measures that are commonly used to assess time preference: Discount parameter *k* and discount factor δ. The first measure assumes hyperbolic discounting of future outcomes. The person is indifferent between SS and LL when:

$$\frac{xS}{1+ktS} = \frac{xL}{1+ktL}.$$

Solving this equation for the discount parameter *k* (see Mazur, 2001; Mazur & Biondi, 2009):

$$k = \frac{xL - xS}{tLxS - tSxL}.$$

The second measure assumes exponential discounting of future outcomes. The person is indifferent between SS and LL when:

$$\delta^{tS} xS = \delta^{tL} xL.$$

Solving this equation for the discount factor δ (see Scholten & Read, 2010):

$$\delta = \left(\frac{xS}{xL}\right)^{\frac{1}{tL-tS}}.$$

Therefore, variation in impatience can also be measured by changes in the discount parameter *k*, or in the discount factor δ, and this kind of measures gives more flexibility of choice because it implies asking participants to tell us the amount they would prefer to receive. For example, we would ask participants to fill in the value in following statement: For me, receiving € 300 today is as good as receiving € _____ in 12 months.

Concerning the effects of language, we propose that time preference may be sensitive to the characteristics of language, specifically to its degree of future time reference. In this manner, languages may have an impact on people's intertemporal choices, by affecting their time preference. Although native languages can have long-term effects in their speakers (Boroditsky, 2001; Boroditsky et al., 2011; Casasanto et al., 2004), the non-native language can also have an effect on thought (Danziger & Ward, 2010; Ogunnaike, Dunham, & Banaji, 2010), and different languages seem to be able to make us to pay different degrees of attention to different aspects, biasing speakers in their experiences while reading and speaking (Boroditsky, 2001), or even just "thinking for speaking" (Slobin, 2003).

It has also been established, in the section about future time reference in European languages, that Portuguese, English and Dutch languages vary in their degree of reference to future time. So, we consider that speaking or reading in each one of these languages may produce variations in the inherent perception of the time interval in consideration. Although subjective time perception seems to be always more contracted than objective time, and does not adequately accompany changes in objective time (Zauberman et al., 2008), subjective time perceptions could vary with the degree of future reference of the language. Impulsive individuals, in comparison with more self-controlled ones, tend to make larger estimations of time duration and, as a consequence, discount the value of delayed rewards more strongly because they experience time at a higher cost (Wittmann & Paulus, 2008). If subjective time perceptions may vary with the degree of future reference of the language, a greater degree of reference to the future may expand the perception of time. This may lead people to make larger time estimations and, if experiencing time at a higher cost, they will tend to discount the value of delayed rewards more strongly, which will appear as higher impatient. Therefore, when speaking in Portuguese, a greater degree of reference to the future than in English may drive people to make larger time estimations and, experiencing time at a higher cost, lead them to be more impatient. Meanwhile, when speaking Dutch, a smaller degree of reference to future time than in English may lead to a contraction of the perception of time and to less impatience. Therefore, *H1.1* predicts that in Dutch, a lower degree of FTR will lead to lower

impatience than in English (moderate FTR) and *H1.1a* predicts that in Portuguese, a higher degree of FTR will lead to greater impatience than in English. The change in impatience that a different language brings about can be measured by the variation in the number of LL choices people make, and changes in k parameter, or discount factor δ.

Nevertheless, since effects caused by magnitude, delay and sign are ever-present and transversal effects in the intertemporal choice area, we also intend to explore the possible relations between delay, magnitude and sign, and our predicted effect of language's FTR on impatience. Therefore, we advance the following research question: *Q.1* – Is the language's FTR effect on impatience related to amount magnitude, delay size or signal?

The discount rates are much lower when delays are framed as future dates than when they are framed as regular time delays: This is known as the date/delay effect. A possible explanation for this effect is the differential time estimation hypothesis, proposing that the mere framing of the options could lead to different estimations of the temporal interval (Read et al., 2005). Another is the attention-focusing, where the framing of the time interval itself is proposed to influence the degree of attention allocated to the timing of a future outcome, in comparison to the value, with the former receiving relatively less attention under one framing than another (Read et al., 2005). In a similar way, Ebert and Prelec (2007) speak of insensitivity to the temporal dimension stating that when people make intertemporal choices they are not sufficiently sensitive to the temporal dimension to begin with, and what small sensitivity they have is highly malleable. Therefore, when time horizon is made more accessible by enhancing attention to it, people become more sensitive to time dimension (Zauberman et al., 2008).

Since it is possible that changes in the degree of attention given to time may influence the discounting pattern and also the subjective time estimations, a possible explanation for the effect of language on time preference could be that the degree of reference to the future influences the attention given to the time attribute, altering time perception by making the time horizon more or less accessible (Zauberman et al., 2008). So, we further propose that, in what concerns subjective time perception, when reading/speaking in Portuguese, the greater degree of reference to the future may expand the subjective time perception, driving people to make larger subjective time estimations than in English. Meanwhile, when reading/speaking in Dutch, the smaller degree of reference to future time may lead to a contraction of the perception of time and to smaller time estimations than in English. If greater reference to future time leads to greater attention to the time interval (delay), it could result in greater

impatience: People should be more impatient and pay more attention to time in Portuguese than in English, and more in English than in Dutch. So, in conclusion, less impatience in Dutch than in English (and less in English than in Portuguese), may be due to a contraction of the perception of time that, in turn, may be a consequence of a lessened attention to time attribute, emphasizing value and enhancing the preference for a larger-later option (LL). Therefore, *H1.2* predicts that in Dutch, a lower degree of FTR will lead to smaller estimates of time periods than in English (moderate FTR) and *H1.2a* predicts that in Portuguese, a higher degree of FTR will lead to larger estimates of time periods than in English.

Time preference may depend on age but there seems to be some lack of consensus in what regards the direction of that change. Several authors (Green, Fry, & Myerson, 1994; Read & Read, 2004; Warner & Pleeter, 2001) agree that elderly people's time preference is distinct from middle-aged ones. So, it is possible that different FTR degrees affect their intertemporal choice in different ways. So a research question is also raised about the relation between age and FTR degree effect. Therefore, we pose another research question: *Q.2.* – Is the language's FTR degree effect on impatience identical in different age stages (young, middle-age and elderly)?

However, all that was said above relates to a neutral or abstract context. But what if the context is one that predisposes to lower impatience? Let's consider the context of retirement savings, in light of its characteristics. This context is characterized by long periods of time and large amounts of money, and we believe it can predispose people to be less impatient[8]. Therefore, a final research question is raised: *Q3.* – Do language's FTR degree effects on impatience also appear in a retirement context?

[8] Results from Study III suggest that a retirement context may generate a lower degree of impatience than a neutral context, but at the time Study IV was executed, we didn't have this information. As already stated, this study is presented last but it was chronologically the first to be implemented.

Study IV Method

In this study regarding the language effect, two experiments were conducted. One was conducted with Dutch/English bilingual participants and the other with Portuguese/English ones, each of the samples residing in the same country to minimize issues related to different country economies.

Design

Two experiments were designed and implemented in parallel, to verify if the language in which people speak/think affects their intertemporal choice, both in neutral context and in saving for retirement/investment context. In these experiments, the design was intra-participants, and included six independent variables, consisting of the language in which the questionnaire was presented to participants (Dutch and English for the experiment I, and Portuguese and English for the experiment II), in the time delay of the options, the time interval size, the size of the amounts involved and the signal of these amounts (losses or gains), and the choice type. Dependent variable was impatience, measured by number of LL choices, by the *k* parameter and discount factor δ, by number of LL choices and subjective time interval length. There were no methodological differences between experiments.

In the first part of the questionnaire, the independent variables were language, the time delay of the choice options (short - S_I, or long - L_I), the size of the amounts involved (small - S_A, or large - L_A) and the sign (gains - to receive, or losses - to pay) manipulated according to a design 2 (languages) x 2 (delay size) x 2 (amount size) x 2 (amount signal), resulting in sixteen pairs of choices for each participant, eight in each language. In both experiments, dependent variable was impatience, measured by the variation of the number of LL option choices. The first part had the typical neutral context of the intertemporal choice domain.

In the second part of the questionnaire, the independent variables were language, time delay of the options (small - S_I, or large - L_I), the size of the amounts involved (small - S_A, or large - L_A), and the choice type (SS or LL fill-in). These variables were manipulated according to a design 2 (languages) x 2 (delay size) x 2 (amount size) x 2 (choice type), resulting in sixteen pairs of choices for each participant, eight in each language. The dependent variable was impatience, measured by the *k* parameter and discount factor δ.

In the third part of the questionnaire, the independent variables were language, time delay of the options (short - S_I, or long - L_I), and the size of the amounts involved (small - S_A, medium - M_A, and large - L_A). These variables were manipulated according to a design 2 (languages) 2 x (delay size) x 3 (amounts in accordance to return rates: 2, 4 and 6%), resulting in twelve questions for each participant, six in each language. The language to be submitted first to the participants, the order of presentation of items in each question, and the display order of the questions in each block was randomly determined. Dependent variable was impatience, measured by the variation of the number of LL option choices. When the participant's age was 60 years or more, an *if-then* logical condition was implemented in order to replace the option with reference to retirement savings for another option that only made reference to general investment. Thus, for participants under 60 years (G1), the framework was retirement savings, and for participants with 60 years of age or more (G2), the framework was investment.

In the fourth part of the questionnaire, the independent variables were language and interval size. These variables were manipulated according to a design 2 (languages) x 4 (interval size), resulting in eight questions for each participant, four in each language. The display order of the questions was randomly determined. Dependent variable is subjective time interval length.

Participants

The sample strategy was dictated by the predicted difficulty in accessing bilinguals, having been selected by convenience. Almost a thousand invitations were sent to translators and interpreters known to work in the intended pairs of languages, and 176 Dutch/English and Portuguese/English bilinguals participated. However, only 155 answers were kept because of demands regarding country of residence, which had to be the same for each sample. A very large percentage of the answers discarded belonged to Dutch/English bilinguals resident in the USA. All of the participants gained access to a lottery where ten were randomly selected to receive an Amazon.com voucher of $10.

In experiment 1, the sample was constituted by 77 Dutch/English bilinguals all living in the Nederland, of which 68.8% were women. Age average was 53.3 (*SD*=10,5) in the second measurement (three to four weeks later than the first measurement). Country of origin was UK for 36.4%, USA for 16.9%, Nederland for 28.6% and various other countries for

18.2% of the participants. In what regards the professional status, 2.6% were unemployed, 10.4% were retired, and the remainder 87.0% were employed. The vast majority of the sample had, at least, a university degree (81.9%). Annual household income question was optional, and only 55.8% responded. Self-evaluated fluency in English was fair, with 100% of the sample above an average of 5.3 for speaking, reading and writing. In what concerns fluency in Dutch, 6.5% participants self-evaluated their average fluency for speaking, reading and writing below 5 (fair).

In experiment II, the sample was constituted by 78 Portuguese/English bilinguals all living in the USA, of which 78.2% were women. Age average was 49.6 (*SD*=11,9) in the second measurement (3 to 4 weeks later than the first measurement). Country of origin was USA for 43.6%, Brazil for 42.3%, Portugal for 3.8%, UK for 1.3% and various other countries for 9.0% of the participants. In what regards the professional status, 1.3% were unemployed, 5.1% were students, 7.7% were retired, and the remainder 85.9% were employed. The vast majority of the sample had, at least, a university degree (87.2%). Annual household income was optional, and only 66.7% responded. Self-evaluated fluency in English was good, with 100% of the sample above an average of 6.3 for speaking, reading and writing. In what concerns fluency in Portuguese, 20.5% participants self-evaluated their average fluency for speaking, reading and writing below 5 (fair).

Instrument

The instrument developed was an online questionnaire, presented through Qualtrics Survey. Instructions appeared on the front page of the online questionnaire. It was composes of five modules, described ahead, and a small pretest was conducted to verify readability and layout ergonomics. The translations were made by a Portuguese and a Dutch. In each of the three languages, it was explained to the participants, at the introduction, what was the main purpose of the study and that it implied to be contacted a second time.

Just before the presentation of the first module of the questionnaire, participant were invited to fill in their age, country of residence and an email address to send, two weeks, later the link for the second language questionnaire.

Module 1: Fixed choice in neutral context.

In the first module, participants were presented with nine questions (one for training) with two options. Each question proposed a choice between a smaller-sooner (SS) option (to receive or pay immediately) and a larger-later (LL) option (to receive or to pay with an S_I or L_I interval), both for S_A and L_A amounts. Impatience operationalization was made by the number of LL choices within-participant made, in each of the languages. The SS and LL options utilized in this choice task were adapted from Scholten and Read's (2011) online questionnaire. The order of the questions (except the training one) and of the options within each question was completely random. The stimuli and their construction are presented in Appendix G, Table G1, as well as an example.

Module 2a and 2b: Open end delayed and immediate choice in neutral context.

To allow more flexibility in choice, eight more questions followed. In module 2a, an amount and time delay was presented and participants had to state the delayed amount they would prefer. In module 2b, the delayed amount and time delay were given and participants were invited to state the present amount they preferred. The four SS fill-in options were randomly presented, as were the four LL fill-in ones. Based on the values stated for each of the choices, we calculated the parameter k and discount factor δ. The stimuli are presented in Appendix G, Table G2 (see also an example in Appendix G).

Module 3: Retirement savings/investment context.

Our purpose in this module was to create a retirement savings or investment context, using a choice instrument that would permit us to compare impatience between languages.

When the instrument was developed, our expectation was to gather a sample of Portuguese/English bilinguals from Portuguese origin residing in the USA, and a sample of Dutch/English bilinguals composed by Dutch people residing in Portugal. Therefore, the instrument characteristics were developed to that end.

In order to avoid the specificities of any given country, and in the existence of a present-day financial system, we assumed that the majority of retirement saving investment would be made in one of the following major categories:

1. Current or demand deposit accounts;

2. Fixed-term deposits or time deposits - with terms of one, two, three, four or five years, but mostly two year terms;

3. Savings accounts - these depend on the bank specific options and, if they are associated with tax benefits, on the country jurisdiction;

4. Bonds - with maturity terms below or above ten years;

5. Shares - listed or quoted on the stock exchange or not;

6. Open-end investment funds;

7. Other financial instruments with terms over ten years, such as closed-end investment funds, retirement savings schemes (PPR), life insurance with capitalization, etc…;

8. Other real investment goods like real estate, art and gold.

In Portugal, according to an inquiry made by DECO (2010), 44% of respondents consider fixed-term deposits (or time deposits) to be the preferred choice of savings investment, with retirement savings schemes obtaining 10% of preference, and savings accounts reaching only 6% of preference. The lowest in preference were the treasury certificates (Certificados do Tesouro), with preferences of only 3%. Actually, regarding retirement savings, DECO (2011a, 2011b) does not recommend investment in retirement savings schemes (PPR), since tax benefits have been reduced and are only available to a few tax payers. They do, however, recommend investment in other long term financial instruments, with higher return or yielding, like treasury certificates with a term of ten years, but also in time deposits for time periods under five years. These time deposits are usually renewable under new conditions (interest rates that change with market rates). Depending on the juridical contract signed, there may or may not be interest penalties by early withdrawal, but some time deposits do not allow early withdrawal at all. At the time of instrument conception, the treasury certificates had a term of ten years; however, there is no capitalization. In what concerns the retirement savings scheme, term date depends on the investor's age, and it could be a very long time, as long as 30 years or more, since at the time they could only be redeemed at age 60, provided five year have gone since the last delivery. Since the greatest percentage of retirement saving seem to be invested in "fixed-term deposits" with terms of one, two, three, four or five years, but mostly two years, we chose time delays of two, three, and five years, in order to render the task as realistic as possible.

In building the instrument, the fixed amount, delays and interest rates were selected both for pragmatic reasons and to render the task as realistic as possible according to the economic conditions at the time, in order to guarantee the retirement savings context we needed. The delays chosen are among the ones more frequently considered in the financial instruments available in the financial market, and delayed rewards were calculated through compound return formula, considering return rates with a minimum of 2% and a maximum of 6%. This part of the questionnaire comprised a total of six questions, and each question offered three response options, all with the same return rate, but with different time periods. The higher complexity of these questions in comparison with neutral context is related to the multiplicity of retirement investment options.

The retirement savings context was only created if participant's age was bellow 60 years. That being the case, one of the options (option 3a) would refer specifically to retirement savings. When age was of 60 years or more, another option (option 3b) was presented, inducing an investment context. The amounts presented were calculated in the following manner:

- For option 3a, age (a) was asked in the beginning of the questionnaire and the amount was calculated through compound return formula, $10000\ (1 + t)^{(65 - a)}$, where t is the interest rate considered (0.02, 0.04 or 0.06). Since the youngest participant had 29 years and maximum allowed age being 59, these amounts varied between 14185 and 20399. Also, minimum delay was of six years and the maximum of 36 years. For example, if the person's age was 35 year old, delay was 30 years and the amount would be €18,114 for an immediate reward of €10,000 and an interest rate of 2%.
- For option 2 and for option 3b, $10000\ (1 + t)^{(y)}$, where t is again the interest rate considered (0.02, 0.04 or 0.06) and where y is the number of years of investment (three or five; two years in option 3b, were participants are of 60 or more years old). Amounts are presented in Appendix H, Table H1.

Thus, participants with 59 or less years (from now on designated as Group 1, G1) were presented, for each of the three rates considered:

a) An SS choice option, with immediate reward of 10,000 (Euros in the Netherlands; Dollars in the U.S.);

b) An LL_a option with an intermediate delay of three or five years, and a reward greater (return rates of 2%, 4% or 6% a year) than the present value;

c) A third option, called XLL_a option, specifically related to retirement savings and with a delay period that depended on the participant's age (number of years until they were 65 years old, but never less than six years), and a larger reward than the LL_a option (again, rates of 2%, 4% or 6% a year).

Participants aged 60 years or more (from now on designated Group 2, G2) were presented, again for each of the three rates:

a) An SS choice option, with a fixed immediate reward of 10,000 (Euros in the Netherlands; Dollars in the U.S.);

b) An LL_b option with an intermediate delay of two years and a reward larger (rates of 2%, 4% or 6% a year) than SS;

c) A third option, called option XLL_b with an interval of three or five years, and a reward inherently greater than the two years option.

The order in which questions were presented to each participant was randomly selected, as was the order of options within each question. The generic format of the questions in this section is presented in Appendix H.

As in the first module, impatience was compared within subjects. But, contrary to the instrument in module 1, this one has three possible choices: An SS option with an immediate fixed reward, an LL choice with a given delay, and a third option, named XLL choice, related specifically with retirement savings, with a delay period and delayed reward that are related to the participant's age because delay is until they are 65 years old. Based on responses, we calculated several indicators (described ahead, in the indicators section) for this task, and compared the variation of scores obtained between pairs of languages and for each age group and context.

Module 4: Time perception.

Subjective time perception or more exactly, the subjective perception of temporal distance to the outcome (e.g., perception of duration until the receipt of delayed outcomes) is to be measured by a visual "cue". A very simple technique that has been frequently used is to

ask participants to indicate the magnitude of the perceived duration by marking the perceived length on a line (Kim & Zauberman, 2009; Zauberman & Kim, 2010).

Delays are referred in months in order to reduce the special influence the "year" unit can present, as we will argue next. Some important aspects of time are related to the cyclic properties of days and seasons and, from a cultural point of view but also from a biological one, the day and the year are two time units that have important meaning and implications to human beings (Wittmann & Paulus, 2009b). In today's human life, undoubtedly "social, political, and economic planning is packed into 1-year time frames" (Wittmann & Paulus, 2009b, p. 5), and in one day frames. Biologically, almost all life forms, from bacteria to humans, exhibit circadian rhythms: The circadian rhythm is of about one day and the circannual rhythm is of about one year (Vitaterna, Takahashi, & Turek, 2001). Although the presence of endogenous circannual rhythms is well established in many mammals, their presence in humans has not yet been clearly determined (Goldman et al., 2004) since human seasonality is, in general, understudied as a result of the obvious difficulty in maintaining human beings in constant conditions for the long periods of time needed to investigate these aspects (Arendt, 2006). However, some seasonal cycles, such as Seasonal Affective Disorder, have been clearly demonstrated (Nelson, Badura, & Goldman, 1990). It is therefore conceivable that these two time units may have a special impact on subjective time perception, causing events that correspond to those periods to be treated differently than those that don't reach or go beyond them (Wittmann & Paulus, 2009b).

Participants would be informed at the beginning that they would be estimating four time intervals from 3 to 24 months, in a total of four line markings, namely 3, 6, 12 and 24 months. For instance, they would be asked to consider the duration of the time period starting today and ending 12 months from now. Then, on screen, participants would view a line with endpoints labeled "short" on the left end and "long" on the right end. They would then be asked to move a slider mark along the line indicating how long they would consider the duration of the time period (see Appendix I).

The distance from the left end of the scale to the mark will be used as an indicator of subjective time interval estimation (Zauberman, Kim, Malkoc, & Bettman, 2009), to be compared between languages. When reading/speaking in Portuguese, the greater degree of reference to the future may expand the subjective time perception, driving people to make larger subjective time estimations than in English. Meanwhile, when reading/speaking in

Dutch, the smaller degree of reference to future time may lead to a contraction of the perception of time and to smaller time estimations than in English.

In the second questionnaire, presented three to four weeks later, everything was equal, except for the language and the final part, were we asked participants about their proficiency in the language pair, gender, country of origin, professional status, education degree, and household income (this answer was optional).

Module 5: Personal data.

The questionnaire presented in the second moment of measurement, whichever the language it was in, had a fifth part in which participants were asked to self-evaluate their knowledge in the researched languages (reading, writing and speaking), and what was their country of origin, gender, occupational status, education degree and income (optional).

Procedure

Data collection was done in three phases, between July and October of 2011, with an interval of no less than two and no more than four weeks between presentation of the two versions of the questionnaire, one in each language, to each participant.

The instructions were identical in all three languages and appeared on the front page of the online questionnaire. Responses were collected in two waves, where language of the first wave was randomly attributed, with 45.5% of the participants answering in Dutch in the first wave of experiment I and 47.4% of the participants answering in Portuguese in the first wave of experiment II. Average age was calculated based on age reported in the second measurement moment, since some of the participants had their birthday between the two moments.

The language fluency was measured by the average score in speak, read and write categories, with a scale between 1 and 7 (1- Very bad, 2-Bad, 3-Poor, 4-Neither good nor bad, 5-Fair, 6-Good, 7-Very good). In experiment I, five participants self-evaluated their fluency in Dutch below 5 (Fair). It was considered they did not possess enough knowledge in both languages for contextual effect to appear, and therefore were not considered in the subsequent analysis, reducing the sample to 72 participants. In experiment II, 16 participants who self-

evaluated their fluency in Portuguese below 5 were also not considered in further analysis, reducing the sample to 62 participants.

Indicators. Regarding the data from fixed choice in neutral context, choice scores were calculated for each participant, attributing one point for each SS choice and two points for each LL choice. A less impatience person will have a higher score (more LL choices) than a more impatient one. For comparison between languages, fifteen indicators (see Appendix J, Table J1) were constructed considering scores from:

a) All the task choices (score range between 8 and 16);

b) Task choices by amounts size (small - S_A or large - L_A; score range between 4 and 8);

c) Task choices by signal (gain or loss; score range between 4 and 8);

d) Task choices by delay size (short: 6 months - S_I; long: 24 months - L_I; score range between 4 and 8);

e) Task choices by sign and amounts size (score range between 2 and 4);

f) Task choices by sign and delay size (score range between 2 and 4).

Regarding the data from the open end delayed and immediate choice task in neutral context, a total average for k parameter and discount factor δ were calculated, as well as averages for 6 and 24 months delays.

As for the data from the retirement savings/investment context, six indicators were constructed:

- In the retirement context (see Appendix L; Table L1) for G1, comparison between language was made by total score of choice task, and scores by investment rate (2, 4 or 6%) and by delay of the LL_a intermediate choice (3 and 5 years). Scores were calculated for each participant, attributing 1 point for each SS choice, 2 for each LL choice and 3 points for each XLL_a choice. A less impatience person will have a higher score than a more impatient one;
- In the investment context (see Appendix L; Table L2) for G2, the comparison of total score of choice task, and scores by investment rate (2, 4 or 6%) and by

option XLL_b delay (3 and 5 years) was made. Scores were calculated for each participant, attributing 1 point for each SS choice, 2 points for each LL_b choice and 3 for each XLL_b choice.

In the fourth module, more manageable indicators of time perception were created by dividing by 100.000 the original values of the line length for each of the four time periods (3, 6, 12 and 24 months).

Data Analysis

The construction of the database and all statistical analyzes referred to below, were performed in SPSS Statistics (v.17 and v.19; IBM SPSS Inc, Chicago, IL).

Regarding experiment I, in module 2, the distribution for *k* parameter values was exceedingly different from the normal distribution, according to Kline's (2005) criterion. Search for extreme values showed the existence of 14 extreme outliers. With their removal, the distributions were proximate to normal - except in the case of the average *k* parameter for 6 months - so they were not considered in the parametric analysis. Therefore, to achieve the normality of the distribution of the average *k* parameter for 6 months, we performed a Log_{10} transformation (*Log10k)*. In the third part, when considering retirement context, since G1 age varies between 29 and 59 year, it was partitioned in two groups according to delay until 65 years of age: $G1_a$ for longer delays, between 15 and 36 years (n=27), and $G1_b$ for shorter delays, between 6 and 14 years (n=22). In the fourth part (subjective time perception task) answer was optional and not all respondents answered, so the sample is smaller.

According to Kline (2005), the distribution is exceedingly different from the normal distribution when skewness (*Sk*) is larger than 3 and kurtosis (*Ku*) is larger than 7, in absolute values. Since this was the case, a search for extreme values was conducted and 2 participants presenting outliers values were not considered in the analysis, reducing the sample size to 66.

Regarding experiment II, the distribution of *k* parameter values was exceedingly different from the normal distribution, according to Kline's (2005) criterion. Search for extreme values showed the existence of 12 extreme outliers. With their removal, the distributions were proximate to normal, so the outliers were not considered in the parametric analysis. Regarding retirement context, since G1 age varies between 30 and 59 year, it was partitioned in two groups according to delay until 65 years of age: $G1_a$ for longer delays, between 15 and 36 years (n=31), and $G1_b$ for shorter delays, between 6 and 14 years (n=19).

The remaining sample for the investment context (G2) was small (n=11). One of the participants turned 60 between questionnaire presentations, changing from G1 to G2 and could not be considered in the analyses. The subjective perception of temporal distance to the outcomes task was optional and not all respondents answered, so the sample is smaller.

In order to test the hypotheses, the data obtained for English-Dutch, and Portuguese-English pairs was compared through one-sided *t-student* tests for paired samples and through Wilcoxon signed rank tests. Part of the data was also analyzed using one-sided *t-student* tests for independent samples with Welch correction, and repeated measures ANOVA. All stated significance values for *t-student* tests are one-sided (p_u). The multiple means comparison was performed post-hoc considering the Bonferroni correction.

Study IV - Experiment I Results

Regarding *H1.1,* a *t-student* test for paired samples was performed considering the total score in the neutral choice task but no difference in impatience between Dutch and English was detected (p_u=.119), which is contrary to our hypothesis. However, when considering choices with larger amounts, impatience in Dutch (*M*=5.94; *SD*=0.71; *n*=72) is significantly higher (*t*(71)=1.94; p_u=.028) than impatience in English (*M*=5.75; *SD*=0.69; *n*=72), and when considering just losses with larger amounts, impatience in Dutch (*M*=2.22; *SD*=0.48; *n*=72) is also significantly higher (*t*(71)=1.84; p_u=.035) than impatience in English (*M*=2.12; *SD*=0.37; *n*=72). For longer delays in general and for gains with longer delays differences were also detected pointing in the same direction, but these results are only marginally significant (*t*(71)=1.49; p_u=.071; and *t*(71)=1.41; p_u=.082, respectively). So, when analyzing choices by amount, delay size and signal**,** results do give some support to the *H1.1* hypothesis that, in Dutch, a lower degree of RTF leads to less impatience than in English (average RTF).

In what concerns *Q.1*, this result suggests that when choice conditions are such that they contribute to lower impatience (which occurs with losses, larger amounts and longer delays, according to the effects of magnitude, delay and signal mentioned in this study's theoretical overview), the effects of language FTR may appear more clearly. In Dutch, both these effects – effect from FTR and choice characteristics – go in the same direction.

Again addressing *H1.1*, the *k* parameter and discount factor δ were calculated from the values stated in the open end task, and compared between languages. Comparison between languages with *t-student* tests for paired samples for total *k* and total δ, Log_{10} transformation of *k* for 6 months delays, δ for 6 months, *k* for 24 months and δ for 24 months showed no significant differences. Wilcoxon signed rank tests were performed considering the outliers *(n*=72) and with the non-transformed value of *k* for 6 months delays, but again no differences were found. The results obtained using these impatience indicators contradict our hypothesis that a lower degree of RTF in Dutch leads to less impatience than in English (average RTF). We should point out, however, that data analysis showed that, in many cases, the values entered by the participants indicate the use of a calculating device and some calculus algorithm (e.g., a percentage or a known return rate), that may have completely shielded the choices from the effect of FTR.

Concerning *H1.2,* between languages comparison of the indicators for the time period length estimations was achieve through one-sided *t-student* tests for paired samples. The only significant difference found regards the 12 month period, which is lower ($t(65)=-1.84$; $p_u=.036$) in Dutch ($M=2.44$; $SD=1.69$; $n=66$) than in English ($M=2.96$; $SD=2.00$; $n=66$). This result is in accordance with our hypothesis *H1.2,* stating that in Dutch, a lower degree of RTF could lead to smaller time estimations than in English (moderate FTR), for the same time periods.

To investigate *Q.2,* as well as *Q.1*, participants were aggregated by age in two groups (G1 – participants from 29 to 59 years old; and G2 – participants from 60 to 75 years old) and the scores from the neutral choice task were compared between languages. We analyzed the data from G1 and G2 separately and compared total impatience, as well as scores by amount size, by signal, by delay size, by sign and amounts size, and by sign and delay size.

In G1, we found no differences in impatience between languages. However, in G2, the older group, several significant differences were found, presented in Table 11. Most importantly, we found significant differences between languages for the overall score in intertemporal choice task. Also, we found differences between languages for larger amounts (both losses and gains) and longer delays, and all differences found entail less impatience in Dutch than in English.

Table 11

One-sided t-student tests for paired samples

				Paired Differences					
	Language	*M*	*SD*	*M*	*SD*	*SEM*	*t*	df	Sig. (1-tailed)
Total	D	11,39	1,08	0,57	1,41	0,29	1,92	22	,034
	En	10,83	1,59						
Larger amounts	D	5,87	0,69	0,48	0,9	0,19	2,55	22	,009
	En	5,39	0,84						
Longer delays	D	5,91	0,51	0,35	0,83	0,17	2,01	22	,029
	En	5,57	0,73						
Gains larger amounts	D	3,74	0,62	0,35	0,71	0,15	2,34	22	,015
	En	3,39	0,84						
Losses larger amounts	D	2,13	0,34	0,13	0,34	0,07	1,82	22	,041
	En	2,00	0,00						

It seems that differences between the languages tend to be stronger for older people and especially when option characteristics in terms of amount size, time delay and signal, are known to lead to lower impatience (e.g. larger rewards, longer delays or losses).

We then conducted two repeated measures ANOVA, the first considering language, signal and amount size as within-subjects factors and age group as a between-subjects factor, and the second considering language, signal and delay size as within-subjects factors and age group as a between-subjects factor.

In the first ANOVA, as was to be expected, signal and amount size main effects were detected, as well as an interaction effect between signal and amount size. Also, three interaction effects were detected, all marginally significant: Between amount size and language ($F(1,70)=3.65$; $p=.060$; $\eta^2_P=0.050$; $\pi=0.5$), between amount size and age group ($F(1,70)=3.26$; $p=.075$; $\eta^2_P=0.044$; $\pi=0.4$), and between language, amount size, signal and age group ($F(1,70)=3.05$; $p=.085$; $\eta^2_P=0.042$; $\pi=0.4$). So, this means that there are differences between languages for larger amounts but not for smaller amounts, and between age groups for larger amounts, but not for smaller amounts. It also means there are no differences between age groups for smaller amounts, whatever the language or signal, but there are differences between age groups, only in English, and only for larger amounts and gains (see Fig.1).

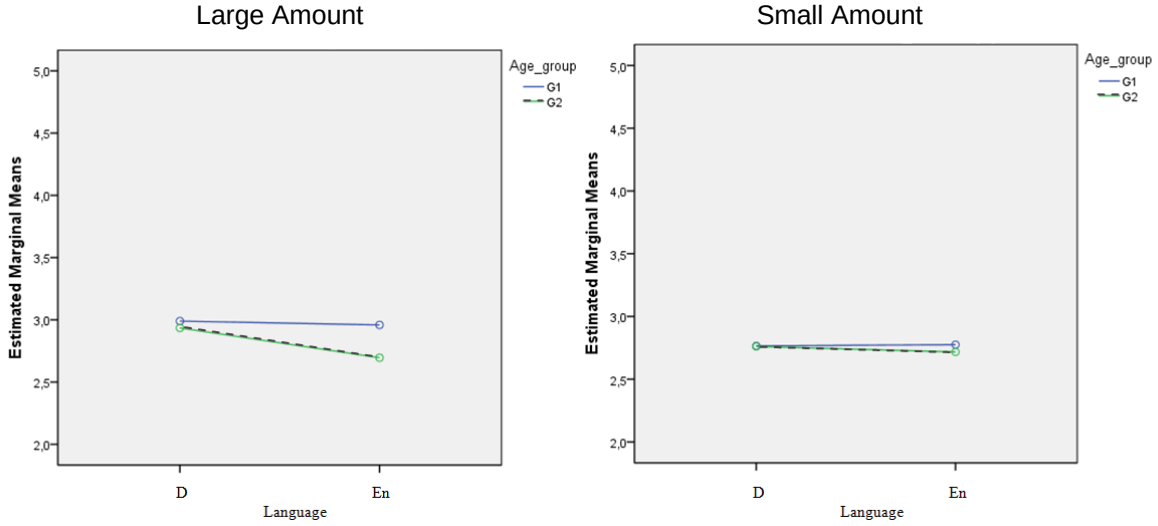

*Figure 1.*Differences in impatience by language and age group, for each amount size.
(29 to 59 years), and G2 refers to older people (60 to75 years).

In the second ANOVA, also as expected, the usual signal and delay size main effects were detected, as well as an interaction effect between signal and delay size. We also found an interaction effect, marginally significant, between delay size and age group ($F(1,70)=3.94$;

p=.051; η^2_P=0.053; π=0.5), meaning that taking into account the two languages results, G2 (older people, from 60 to 75 years old) is more impatient than G1 (younger people, from 29 to 59 years old) for shorter delays but not for longer delays.

Regarding *Q.2,* we compared, between G1 and G2, scores from neutral choice task for total impatience by language, as well as scores, for each language, by amount size, by signal, by delay size, by sign and amounts size, and by sign and delay size, in each case using one-sided *t-student* tests with Welch correction (equal variances not assumed).

Table 12

One-sided t-student tests for independent samples with Welch correction

	Language		Levene's Test for Equality of Variances				*t*-test for Equality of Means				
			M	*SD*	*F*	Sig.	*t*	df	*M* Difference	*SD* Difference	Sig. (1-tailed)
Losses short delays	D	G1	2,27	0,08	9,44	,00	1,76	69,51	0,18	0,10	,041
		G2	2,09	0,06							
Total	En	G1	11,47	0,17	9,40	,00	1,74	33,41	0,64	0,37	,045
		G2	10,83	0,33							
Total large amounts	En	G1	5,92	0,08	17,48	,00	2,76	30,65	0,53	0,19	,005
		G2	5,39	0,18							
Total losses	En	G1	4,35	0,12	12,72	,00	2,40	59,42	0,30	0,13	,010
		G2	4,04	0,04							
Total short delays	En	G1	5,71	0,11	8,55	,01	1,98	35,47	0,45	0,23	,028
		G2	5,26	0,20							
Losses longer delays	En	G1	2,10	0,05	8,07	,01	1,94	48,00	0,10	0,05	,029
		G2	2,00	0,00							
Losses short delays	En	G1	2,24	0,08	13,69	,00	2,21	67,66	0,20	0,09	,015
		G2	2,04	0,04							
Gains large amounts	En	G1	3,73	0,08	11,52	,00	1,78	31,86	0,34	0,19	,042
		G2	3,39	0,18							
Losses large amounts	En	G1	2,18	0,06	21,94	,00	2,91	48,00	0,18	0,06	,003
		G2	2,00	0,00							
Losses small amounts	En	G1	2,16	0,07	6,07	,02	1,49	69,86	0,12	0,08	,070
		G2	2,04	0,04							

Note. G1 refers to younger people, from 29 to 59 years old, and G2 refers to older people, from 60 to75 years old.

As showed in Table 12, most of the differences, including differences for total score in impatience, emerged in English, - in this case, the higher FTR language) - and just one in Dutch, concerning losses with shorter delays. Every difference found points to a higher degree

of impatience by the older group. In sum, the older people were more impatient than the younger, but mostly when answering in English, the higher FTR language.

Still addressing *Q.2*, we then compared the scores obtained in the investment context choice task since, by design, these are older people. Again, through one-sided *t-student* tests for paired samples, almost no differences exist between the languages. Only a marginally significant result was obtained, pertaining to the 4% return rate: score in Dutch (M=3.83; SD=1.37; n=23) was higher (t(22)=1.56; p_u=.067) than in English (M=3.35; SD=1.67; n=23), indicating lower impatience in Dutch than in English.

Through a repeated measures ANOVA, considering language and return rate size as within-subjects factors, a main effect of return rate size was again found (F(2,44)=15.99; p<.001; η^2_P=0.421; π=1.0). Post-hoc pairwise comparison showed differences between all the return rates, although one only marginally significant (2% and 4%, p=.002; 2% and 6%, p<.001; 4% and 6%, p=.089). An interaction effect was found between language and return rate size (F(2,44)=5.53; p=.007; η^2_P=0.201; π=0.8). Impatience was lower in Dutch than in English for 4% return rates, but not for 2% or 6% rates. No effects regarding delay were found when considering language and larger delay size option (3 or 5 years) as within-subjects factors.

In what concerns *Q.3* and the FTR effect in a retirement savings context, we used one-sided *t-student* tests for paired samples, but no differences for total impatience score between the considered languages were found. Only a marginally significant result emerged, pertaining to the total score for the 2% return rate: Impatience in Dutch (M=3.16; SD=1.49; n=49) was lower (t(48)=-1.35; p_u=.093) than in English (M=3.43; SD=1.62; n=49). So, regarding *Q3.,* language's FTR degree effects on impatience did appear in a retirement context, but indicating higher impatience in Dutch than in English.

Since in the case of retirement context participant's age varies between 29 and 59 year, two groups were considered according to the delay until 65 years of age (more or less than 15 years): $G1_a$ concerns people further away from retirement, between 15 to 36 years (n=27), and $G1_b$ concerns people closer to retirement, between 6 and 14 years (n=22). When analyzing results from the group further away from retirement, only one marginally significant result was obtained, pertaining to total score for 6% return rate: Impatience in Dutch (M=4.89; SD=1.45; n=27) was higher (t(26)=1.36; p_u=.093) than in English (M=4.52; SD=1.65; n=27). So, regarding *Q.3,* in retirement context results indicate lower impatience in Dutch than in English.

However, when analyzing results from the group closer to retirement, several differences were found (although some are only marginally significant), which are presented in Table 13:

Table 13

One-sided t-student tests for paired samples

				Paired Differences					
	Language	*M*	*SD*	*M*	*SD*	*SEM*	*t*	df	Sig. (1-tailed)
Total	D	13,00	3,34	-1,27	2,96	,63	-2,02	21	,028
	En	14,27	3,43						
3 years delay	D	6,55	1,84	-,59	1,62	,35	-1,71	21	,051
	En	7,14	1,64						
5 years delay	D	6,45	1,77	-,68	1,84	,39	-1,74	21	,048
	En	7,14	1,88						
2% rate	D	3,27	1,61	-,55	1,79	,38	-1,43	21	,084
	En	3,82	1,71						
6% rate	D	5,14	1,32	-,68	1,36	,29	-2,35	21	,014
	En	5,82	1,32						

All of the above results point to a higher degree of impatience in Dutch than in English. In attempting to answer *Q.2* and *Q3,* they do suggest that retirement context might have affected mainly the larger FTR language – in this case, English – reversing the relationship found in a neutral context, in particular for older people.

To further explore this, we performed a repeated measures ANOVA, considering language and return rate size as within-subjects factors, and the age group ($G1_a$ and $G1_b$) as a between-subjects factor, and found a main effect of return rate size ($F(2,94)=59.42$; $p<.001$; $\eta^2_P=0.558$; $\pi=1.0$). Post-hoc pairwise comparison showed significant differences between the three return rates ($p<.001$). Since larger return rates imply larger amounts, we find, once again, the well-known main effect of amount size. We also found an interaction effect between language and age group ($F(2,94)=4.74$; $p=.035$; $\eta^2_P=0.092$; $\pi=0.6$). This interaction means that there are differences between age groups in English, with a larger score and therefore less impatience in the older group closer to retirement than in the younger group, but no differences in Dutch. No effects regarding delay were found when considering language and intermediate delay size (3 or 5 years) as within-subjects factors.

Study IV - Experiment I Discussion

The first purpose of experiment I was to verify the occurrence of an effect of language's FTR on impatience. The first hypothesis proposed that in Dutch, the lower degree of FTR would lead to lower impatience than in English (presenting an average FTR). We found no differences when comparing the total score obtained in the task choice, composed of several choices with losses and gains, large and small amounts, and large and small delays, but found significant results for large amounts and for high amount losses, and marginally significant ones for longer delays. So, *H1.1* hypothesis is only partially supported by our results. It appears that the effect of language's FTR is most strong when remaining conditions contribute to lower impatience, known to occur with losses, larger amounts and longer delays. We will discuss this further when addressing research question *Q.1*.

Concerning the other impatience indicators k and δ, no significant results were found, and this goes against our *H1.1* hypothesis. But, as we already mentioned in results section, we suspect these results may not be entirely reliable, since a (potential) problem was detected. Data analysis showed that, in several cases, the type of values entered by the participants - very precise values, sometimes with one or two decimals - implied they were calculated using some sort of aid, such as a calculator. This, in turn, suggests the utilization of some calculus algorithm (e.g., a percentage or return rate) that may have shielded the choices from the influenced of FTR. Such behavior was not foreseen and there were no instructions against it.

The second objective of experiment I was to verify the occurrence of an effect of language's FTR degree on estimates of time periods, since our presupposition was that an expansion or contraction of the perception of time could be responsible for the effect of FTR. Our second hypothesis stated that a lower degree of FTR in Dutch would lead to smaller estimates of time periods than in English (moderate FTR). Results support our hypothesis but only regarding the 12 month period. However, this may be related to the special status given to the year unit we referred before. So, it is conceivable that the 12 month period may have a special impact on subjective time perception and although the questions directed people's attention to the evaluation of several time length periods stated in months, this may not have been enough to dilute the impact of the one year unit, frequently treated in a different way than periods that are within or go beyond it (Wittmann & Paulus, 2009b). Therefore, globally results do not seem to support our presupposition that an expansion or contraction of the perception of time could be responsible for the effect of FTR in impatience.

The third objective of experiment I was to find an answer to the three research questions formulated, questioning if FTR effect on impatience depended on amount magnitude, delay size and signal (*Q.1*), if FTR degree effect on impatience varies with age (*Q.2*), and if FTR degree effects on impatience also appear in a retirement context (*Q.3)*.

In what concerns *Q.1*, the fact that *H1.1* hypothesis is only supported by results for large amounts, longer delays, and marginally for high amount losses and large delay gains is, from our point of view, revealing. As mentioned in this study's theoretical overview, according to the magnitude effect and to the sign effect, greater discounting rates are found for smaller rewards, and gains are usually discounted more than losses (Frederick et al., 2002; Read, 2004; Tesch & Sanfey, 2008). This means people usually exhibit less impatience regarding larger amounts, and losses. Also, according to the delay effect the value of outcomes is discounted less for longer delays than for shorter ones, meaning people are usually less impatience regarding longer delays (Frederick et al., 2002; Read, 2004) and it is well known that magnitude, delay and sign effect are very strong. So, it appears that the effect of Dutch's lower RTF on impatience is most strong when choice conditions contribute to lower impatience (or do not contribute to increase impatience). As we said earlier, this is known to occur with losses, larger amounts and longer delays. It seems that in these conditions, the effects of FTR may be more clearly revealed possibly because in the lower RTF language of the pair (Dutch) both these effects – effect from FTR and choice characteristics – go in the same direction, probably adding up. There is less impatience in Dutch, and also less impatience when dealing with losses, larger amounts and longer delays. In sum, the effect Dutch's FTR is congruent with losses, larger amounts and longer delays, but incongruent with gains, lower amounts and shorter delays.

As we said, time preference may depend on age and several authors agree that elderly people's time preference is distinct from middle-aged ones (Green, Fry, & Myerson, 1994; Read & Read, 2004; Warner & Pleeter, 2001), but there seems to be some lack of consensus in what regards the direction of that change. So, in *Q.2* we investigated how FTR degree could affect impatience in different age stages. Significant differences between languages were found but only for the older people and all of them showed less impatience in Dutch than in English. We found differences between languages for the overall score in intertemporal choice task and for larger amounts (both losses and gains) and longer delays. This suggests that older people could be more sensitive to the language's FTR degree effect on impatience than younger people.

By design, people answering in the investment context are the oldest. In our view, investment context could be more encouraging to low impatience than a neutral or abstract context, but never as favorable as retirement savings context. In this context, only a marginally significant result was obtained but impatience degree in Dutch (the lower FTR language) was lower than in English. This was confirmed by the discovery of a marginally significant interaction effect between language and return rate size, meaning impatience was lower in Dutch than in English for intermediate return rates, but not for lower or higher rates. Although not strongly, this corroborates the proposal of a higher sensitivity from older people to the language's FTR degree effect on impatience.

Time preference seems to depend on the participant's age but in some studies older people seem to discount more than middle aged people (Read & Read, 2004), while in others older people discount less than anyone else (Warner & Pleeter, 2001). So, concerning impatience, most of the differences found between age groups emerged in English, the higher FTR language, including differences for total impatience score, which is in accordance with the effect we proposed for a higher FTR degree. All of these results point to a higher degree of impatience by the older people. The subjective perception of temporal distance by older people could be also affected by the influenced of the awareness of being nearer to the end of their life. This may drive older people to experience time at a much higher cost, leading them to discount the value of delayed rewards more strongly, which translates in more impatient, especially when confronted with small delays, since they contribute to higher impatience.

Consistent with this, when age groups were analyzed through analysis of variance, three interesting marginally significant interaction effects were detected: Between delay size and age group, between amount size and age group, and between language, amount size, signal and age group. This means that there are differences in impatience between older and younger people for shorter delays but not for longer delays, and for larger amounts, but not for smaller amounts. It also means there are differences in impatience between older and younger people, in English and for larger amounts and gains, but there are no differences for smaller amounts, whatever the language or signal. In sum, older people were clearly more impatient than younger people, but mostly when answering in English, the higher FTR language in this language pair and, therefore, the one that promotes more impatience.

Research question *Q.3* questioned if language's FTR degree effects on impatience also appeared in a retirement context, highly conducive to less impatience. In our view, the characteristics of the retirement savings context should have reinforced the predisposition for

less impatience in general. In this context, when considering the totality of the participants, the only significant result found showed that in Dutch (the lower FTR language) impatience was higher than in English. When participants were aggregated by closeness to retirement, for the people further away from retirement and thus younger, only one marginally significant result appeared showing lower impatience in Dutch than in English. We recall that in neutral or abstract context no significant differences between languages were found for younger people. So, it is possible this context being more favorable to less impatience could facilitate sensitivity of this age group to the FTR effect.

However, for the older ones and thus closer to retirement, all of the significant results showed again that in Dutch impatience was higher than in English. This result suggests that retirement context might have affected mainly the larger FTR language – in this case, English – and in particular for older people.

The expected effect of retirement context (lower impatience) are congruent with the expected effect of the lower FTR and incongruent with the expected effect of the higher FTR, so such a framing should have enhanced the difference between the languages. However, what seems to have happened was not and emphasis of the lower FTR effect but a reduction of the higher FTR effect. We can conjecture that because of the predisposition for less impatience created by the context, and especially so for people closer to retirement, a ceiling effect might have occurred concerning the lower FTR language – low RTF effect led to a very small change because impatience was already very near to it's possible lowest – making it difficult for impatience to be reduced in this case and therefore affecting mainly the higher FTR language.

We should also take into account that although all of these people were living in the Nederland, more than half of them (at least 53.3%) were born in English speaking countries (UK and USA) and even though we asked for a self-assessment of their fluency in speaking, reading and writing in both languages, there is always the possibility of other effects of languages on thought that go beyond the FTR effect.

There may be effects of native languages on thought since aspects of time usually specified in a native language, through spatial metaphors, may lead to the importing of relational structure from space to time (Boroditsky, 2000). Just as an example, while English talk about time much more as if it were horizontal than vertical (Boroditsky, 2001; Boroditsky et al., 2011), in Mandarin time is describes as vertical almost as frequently as horizontal - nearly 40% of the times (Chen, 2007). Furthermore, according to Casasanto et al. (2004),

space may influence our temporal thinking even when we are not "thinking for speaking". Native languages can influence both linguistic and non-linguistic representations, since people speak about time using spatiotemporal metaphors, but they also seem to think about time using spatial representations (Casasanto et al., 2004). Concerning to the effects of non-native languages on thought, some fluent bilinguals have claimed to think differently in different languages (Hunt & Agnoli, 1991). Being Polish and living in Australia, the linguist Anna Wierzbicka (1997) stated that she actually felt like a different person when speaking English. Recently, several researchers showed interest in languages influence on non-linguistic cognitive processes beyond the effect of syntactic or lexical distinctions explicitly encoded in them (Danziger & Ward, 2010; Ogunnaike et al., 2010). They found out that the language one uses to express oneself can also have an effect on thought. Both tested bilingual participants to see if attitudes, measured with IAT, were affected by the language in which people expressed themselves and the results provided ample and strong evidence that preferences are not solely expressed through language but truly carved by it. The explanation proposed is that these effects are being promoted by associations that may reside within the languages themselves (Ogunnaike et al., 2010). Any of these effects of languages could have affected choice, beyond the FTR effect, and some of them may be associated with retirement or investment contexts.

Study IV - Experiment II Results

Regarding *H1.1a,* a *t-student* test for paired samples was performed considering the total score in the neutral choice task but no difference in impatience between Portuguese and English was detected (p_u=.467), which goes against our hypothesis. However, when considering only the choices with gains and longer delays, impatience in Portuguese (M=3.21; SD=0.85; n=62) was higher (t(61)=1.70; p_u=.047) than the score in English (M=3.06; SD=0.79; n=62). This means that people were less impatience in Portuguese than in English and so both results contradict our prediction stated in *H1.1a* that, in Portuguese, a higher degree of RTF would lead to more impatience than in English (average RTF).

Again addressing *H1.1a*, the k parameter and discount factor δ were calculated from the values stated in the open end task, and compared between languages. Comparison between languages with *t-student* tests for paired samples for total *k, k* for 6 months, *k* for 24 months, total δ, δ for 6 months and δ for 24 months showed no significant differences. This result contradicts our hypothesis that a higher degree of RTF in Portuguese leads to more impatience than in English (average RTF). We must again mention that data analysis showed that, in several cases, the values entered suggested the use of a calculator, thus possibly shielding the choices from the influenced of FTR.

Concerning *H1.2a,* between languages comparison of the indicators for the time period length estimations was achieve through one-sided *t-student* tests for paired samples, but no significant differences were found. This result is not in accordance with *H1.2a* hypothesis stating that in Portuguese, a higher degree of RTF could lead to a lower contraction of the perception of time.

Regarding *Q.1*, as mentioned when addressing *H1.1a*, the only difference found through *t-student* tests for paired samples, considering scores from the neutral choice task, pertains to gains and longer delays. However, impatience in Portuguese was higher than the score in English, meaning less impatience in Portuguese than in English.

To investigate *Q.2,* as well as *Q.1*, participants were aggregated by age in two groups (G1 – from 30 to 59 years old; and G2 – from 60 to 73 years old) and the scores from the neutral choice task were compared between languages. We analyzed the data from G1 and G2 in separate and compared total impatience score, as well as scores by amount size, by signal, by delay size, by sign and amounts size, and by sign and delay size. For the younger

participants (G1), we found only one marginally significant difference between languages, regarding gains and longer delays: In Portuguese (M=3.20; SD=0.86; n=50) score was higher (t(49)=1.66; p_u=.052) than in English (M=3.04; SD=0.81; n=50). This result implies less impatience in Portuguese than in English.

In G2, the older group, again only one marginally significant difference between languages was found, regarding total score for losses. The score in Portuguese (M=4.27; SD=0.47; n=11) was lower (t(10)=-1.49; p_u=.083) than the score in English (M=4.64; SD=0.92; n=11). So, as in Experiment I, this difference was in the direction of more impatience in higher FTR language (Portuguese) than in the lower FTR language (English).

We also conducted two repeated measures ANOVA, the first considering language and amount size as within-subjects factors and age group (G1 and G2) as a between-subjects factor, and the second considering language and delay size as within-subjects factors and age group as a between-subjects factor. Signal could not be considered, because it failed the normal distribution condition.

In the first ANOVA, as expected, amount size main effect was detected (F(1,59)=18.43; p<.001; η^2_P=0.238; π=1.0), but no other main or interaction effect. In the second ANOVA, also as expected, the usual delay size main effect was detected (F(1,59)=4.22; p=.044; η^2_P=0.067; π=0.5), but also no other main or interaction effect.

Table 14

One-sided t-student tests for independent samples with Welch correction

				Levene's Test for Equality of Variances		*t*-test for Equality of Means				
Language: Portuguese		*M*	*SD*	*F*	Sig.	*t*	df	*M* Difference	*SD* Difference	Sig. (1-tailed)
Total losses	G1	4,62	,92	5,81	,019	1,81	30,05	,35	,19	,040
	G2	4,27	,47							
Large losses	G1	2,42	,64	6,41	,014	1,57	22,72	,24	,15	,066
	G2	2,18	,41							

Note. G1 refers to younger people, from 30 to 59 years old, and G2 refers to older people, from 60 to73 years old.

To additionally investigate *Q.2*, and again considering the two age groups (G1 – ages from 30 to 59 years old; and G2 – ages from 60 to 73 years old), we compared between them scores from neutral choice task for total impatience score by language, as well as scores, for

each language, by amount size, by signal, by delay size, by sign and amounts size, and by sign and delay size, in each case using one-sided *t-student* tests with Welch correction (equal variances not assumed). The results are presented in Table 14. Only two significant results were found, concerning total losses and large losses (the latter only marginally significant) but only in Portuguese, which is the higher FTR language of the considered pair and both results point to higher impatience by the older group. No differences were found in English. In sum, older people were more impatient than the younger, but mostly when answering in Portuguese, the higher FTR language. Still addressing *Q.2*, we then compared the scores obtained in the investment context choice task, since by design these are older people. Through one-sided *t-student* tests for paired samples, we found only two marginally significant differences between languages: One for the 2% return rate: Score in Portuguese (M=4.00; SD=1.48; n=11) was higher ($t(10)$=1.55; p_u=.076) than in English (M=3.27; SD=1.01; n=11), and the other for the 3 years delay: Score in Portuguese (M=6.64; SD=1.96; n=11) was also higher ($t(10)$=1.51; p_u=.081) than in English (M=5.63; SD=1.43; n=11). Therefore, in investment context, impatience was lower in Portuguese (the higher FTR language) than in English.

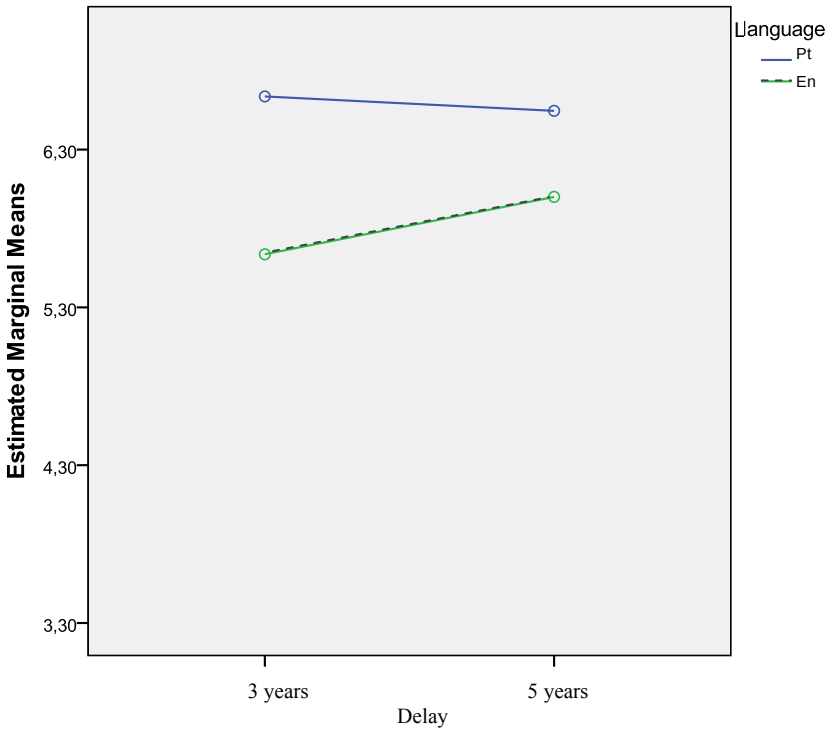

Figure 2. Differences in impatience by language and by delay size.

Concerning results from the investment context choice task, we then performed a repeated measures ANOVA considering language and delay size as within-subjects factors and a marginally significant interaction effect between language and delay size was detected ($F(1,10)=3.38$; $p=.096$; $\eta^2_P=0.025$; $\pi=0.4$). Differences between languages only occur for the 3 years delay, and not for the 5 years delay, but with less impatience in Portuguese than in English (see Fig.2). In a repeated measures ANOVA considering language and return rate size as within-subjects factors, we found a significant effect of rate ($F(1.31,13.05)=4.68$; $p=.042$; $\eta^2_P=0.319$; $\pi=0.6$), but no interaction effects.

In what concerns *Q.3* and the FTR effect on a retirement savings context, we utilized one-sided *t-student* tests for paired samples to compare total impatience score but the difference obtained was only marginally significant. Nonetheless, impatience in Portuguese ($M=11.68$; $SD=4.49$; $n=50$) was lower ($t(49)=-1.37$; $p_u=.088$) than in English ($M=12.40$; $SD=4.29$; $n=50$). We also found two significant results: One pertaining score for the 4% return rate: Score in Portuguese ($M=3.86$; $SD=1.62$; $n=50$) was lower ($t(49)=-1.85$; $p_u=.035$) than in English ($M=4.28$; $SD=1.64$; $n=50$), and the other pertaining to impatience for intermediate delay (5 years): Score in Portuguese ($M=5.72$; $SD=2.37$; $n=50$) was also lower ($t(49)=-1.83$; $p_u=.037$) than in English ($M=6.24$; $SD=2.11$; $n=50$). So, regarding *Q3.,* in this case language's FTR degree effects on impatience did appear in retirement context, indicating higher impatience in the higher FTR language (Portuguese).

Table 15

One-sided t-student tests for paired samples

				Paired Differences					
Impatience	Language	*M*	*SD*	*M*	*SD*	*SEM*	t	df	Sig. (1-tailed)
Total	Pt	11,053	4,378						
	En	13,158	3,236	-2,1053	3,9285	0,9013	-2,34	18	0,016
3 years	Pt	5,632	2,166						
	En	6,579	1,865	-0,9474	1,8995	0,4358	-2,17	18	0,022
5 years	Pt	5,421	2,293						
	En	6,579	1,539	-1,1579	2,1925	0,503	-2,30	18	0,017
4% rate	Pt	3,579	1,539						
	En	4,579	1,465	-1	1,6997	0,3899	-2,57	18	0,01
6% rate	Pt	4,263	1,727						
	En	5,211	1,228	-0,9474	1,8401	0,4222	-2,24	18	0,019

Since in the retirement context participant's age varies between 30 and 59 year, two groups were considered according to the delay until 65 years: $G1_a$ concerns people further

away from retirement, between 15 to 35 years (n=31), and $G1_b$ concerns people closer to retirement, between 6 and 14 years (n=19). When analyzing results from the younger group, further away from retirement, no significant results were obtained.

However, when considering the group closer to retirement, several significant differences were found, presented in Table 15 and, in all cases, average score in Portuguese is lower than in English, so all results imply higher impatience in the higher FTR language (Portuguese). This is the opposite of what happened in experiment I. Therefore, in trying to answer *Q3.,* language's FTR degree effects on impatience did appear in a retirement context, and go in the direction of higher impatience in the higher FTR language (Portuguese).

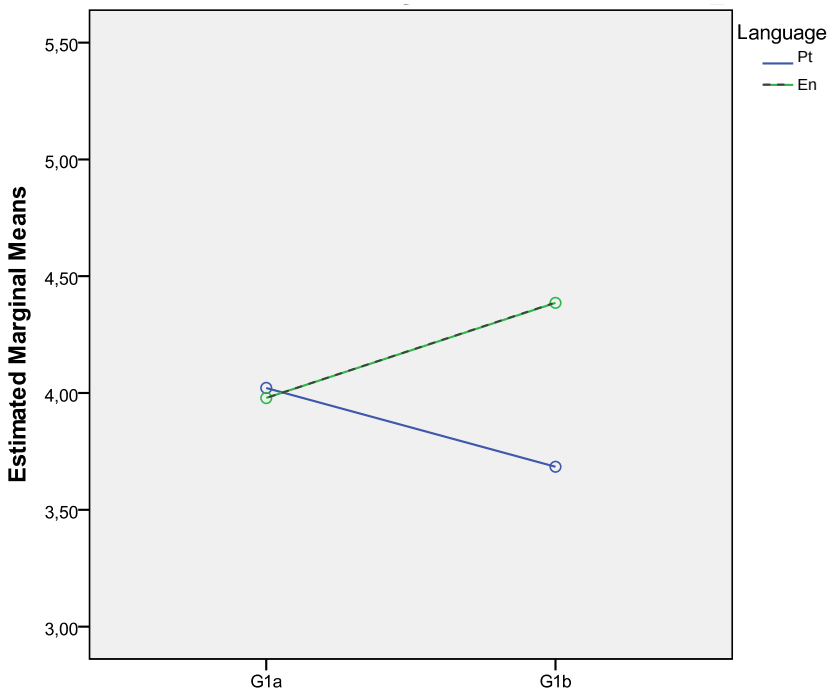

Figure 3. Differences in impatience, in retirement context, by language and delay until 65 years of age. G1a - Less than 15 years; G1b, 15 years or more.

Through a repeated measures ANOVA, considering language and return rate size as within-subjects factors, and the two age groups referred above as a between-subjects factor, we found a significant main effect of return rate size (F(1.667,80.03)=33.63; p<.001; η^2_P=0.412; π=1.0). Post-hoc pairwise comparison showed significant differences between the three return rates (p<.001). Since increasing return rates imply increasing amounts, we find, once again, the well-known main effect of amount size. Also, we found a marginally significant main effect of language (F(1,48)=3.59; p=.064; η^2_P=0.070; π=0.5) and a

significant interaction effect between language and age group ($F(1,48)=4.58$; $p=.037$; $\eta^2_P=0.087$; $\pi=0.6$). This interaction means there are differences between languages for people closer to retirement, with more impatience in Portuguese than in English, but no differences for the younger group (see Fig. 3).

We recall that in the retirement context participant's age varies between 30 and 59 year, and so two groups were considered according to the delay until 65 years of age (more or less than 15 years): $G1_a$ concerns people further away from retirement, between 15 to 35 years ($n=31$), and $G1_b$ concerns people closer to retirement, between 6 and 14 years ($n=19$). It is to these two groups we refer when, in the retirement context, we mention age groups.

Another marginally significant interaction effect between language, age group (delay until 65 years old) and return rate was detected ($F(1.93,92.68)=2.64$; $p=.079$; $\eta^2_P=0.052$; $\pi=0.5$). This interaction signifies that for the lower return rate (2%), impatience degree in both languages and both groups is very similar; for the intermediate return rate (4%), impatience degree for $G1_a$ is very similar for both languages, but is much higher in Portuguese than in English for group $G1_b$ (see Fig.4) and the same applies for the higher return rate (6%).

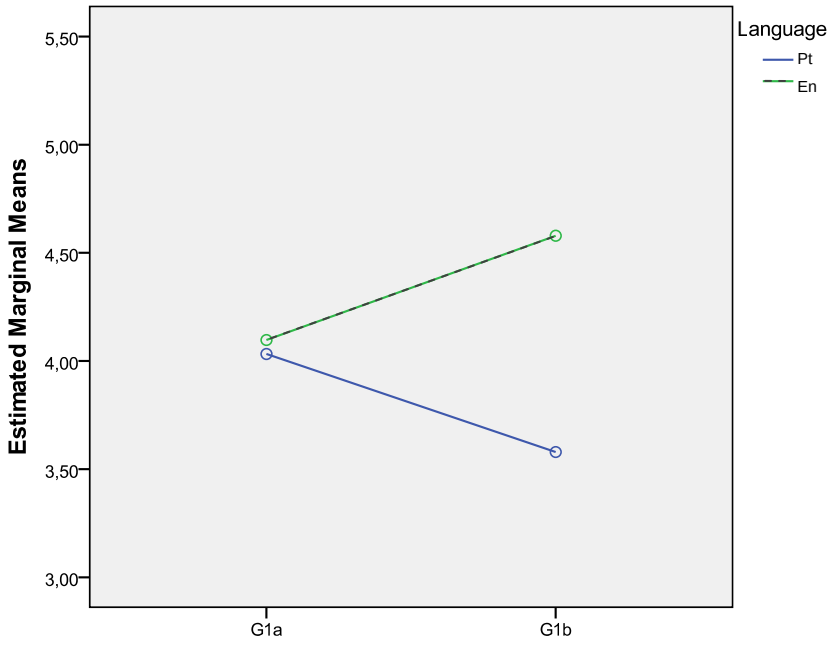

Figure 4. Differences in impatience for rate 4% by language and delay until 65 years of age. G1a - Less than 15 years, and G1b - 15 years or more.

When considering language and intermediate delay size (3 or 5 years) as within-subjects factors, no effects other than the ones already reported were found (language, and interaction between language and age group).

Study IV - Experiment II Discussion

The first purpose of experiment II was to verify the occurrence of an effect of language's FTR in people's impatience. The first hypothesis proposed that in Portuguese the language's higher degree of FTR would lead to higher impatience than in English (presenting an average FTR). We found no difference when comparing the total score obtained in the task choice, composed of several choices with losses and gains, large and small amounts, and large and small delays. The only difference found concerned gains and longer delays but suggests less impatience in Portuguese than in English. So, *H1.1a* hypothesis is not confirmed by our results. It is possible that the difference between FTR degrees, in this pair of languages, is not as pronounced as we anticipated, but nearer. If so, differences where they exist may not be totally coherent with RTF degrees since they may be under the influence of other language effects. For example, aspects like native and non-native languages effects on though cannot be dismissed. This issue was already mentioned in Experiment I, and we will further discuss it in the joint discussion that follows.

Concerning the other impatience indicators k and δ, no significant results were found, and this also goes against our *H1.1a* hypothesis. But, as we already mentioned in the results section, we suspect these results may not be entirely reliable, since a (potential) problem was detected. Data analysis showed that, in several cases, the type of values entered by the participants - very precise values, sometimes with one or two decimals - implied they were calculated using some sort of aid, such as a calculator. This, in turn, suggests the utilization of some calculus algorithm (e.g., a percentage or return rate) that may have shielded the choices from the influenced of FTR. Such behavior was not foreseen and there were no instructions against it.

The second objective of experiment II was to verify the occurrence of an effect of language's FTR degree in people's estimates of time periods, in consequence of our presupposition that an expansion or contraction of the perception of time was responsible for the effect of FTR. Our second hypothesis stated that that in Portuguese, a higher degree of FTR will lead to larger estimates of time periods than in English. No significant differences were found; therefore results do not support our hypothesis. We had proposed that a higher degree of RTF could lead to a lower contraction of the perception of time and to larger time estimations than in English, for the same time periods, but this did not happen, not even for the 12 month period, as in Experiment I. These results do not support our presupposition that

an expansion or contraction of the perception of time could be responsible for the effect of language FTR in impatience, and strengthen our notion of a more nearer FTR degree between these two languages than we anticipated.

The third objective of experiment II was to search for answers to the three investigation questions formulated, questioning if FTR effect on impatience depends on amount magnitude, delay size and signal (*Q.1*), if FTR degree effect on impatience varies with age (*Q.2*), and if FTR degree effects on impatience also appear in a retirement context (*Q.3)*.

In what concerns *Q.1*, in neutral choice we found a difference between languages regarding gains and longer delays but the result shows that impatience in Portuguese was lower than in English. As we said earlier, difference between FTR degrees, in this pair of languages, could be lower than anticipated and so differences where they exist may not be totally coherent with RTF degrees, since they may be under the influence of other language effects.

As mentioned before, time preference seems to depend on the participant's age although the direction of this effect has discrepancies (Read & Read, 2004; Warner & Pleeter, 2001). So, in *Q.2* we investigated how language's FTR degree would affect impatience concerning people in different age stages. In neutral choice, differences between languages for the younger group, as happened in global results, concerned gains and longer delays with less impatience in higher FTR language (Portuguese) than in the lower FTR language (English). Results for the older group in neutral choice showed more impatience in Portuguese than in English, but only regarding losses. However, all the differences found between age groups concerning impatience point to a higher degree of impatience by the older people and emerged exclusively in Portuguese, the higher FTR language of the pair.

This is in accordance with the effect we proposed for a higher FTR degree and is one of few similarities between Experiment I and II. The subjective perception of temporal distance by older people can also be related to the fact that older people are aware of their time alive as shorter, being nearer to the end of their lives. This may drive older people in particular to make larger time estimations and, experiencing time at a higher cost, they tend to discount the value of delayed rewards more strongly, emerging as more impatient.

By design, people answering in the investment context are the oldest, and only two marginally significant results were obtained. In both cases, impatience was lower in the higher

FTR language (Portuguese), but these results concern only the smaller amount and the intermediate delay. In our view, investment context should be more conducive to low impatience than a neutral or abstract context, but never as favorable as retirement savings context. A possible explanation is that, particularly in the USA, investment context could have a different effect than we expected, maybe a cultural one.

Research question *Q.3* asked if language's FTR degree effects on impatience also appeared in a retirement context. The characteristics of the retirement savings context should have reinforced the predisposition for less impatience in general. In this context, when considering the totality of answers, all the result found showed higher impatience in higher FTR language (Portuguese) and this is in accordance with the effect we proposed for a higher FTR degree.

When participants were aggregated in two groups by closeness to retirement, for the group further away from retirement and thus younger, no significant result appeared. However, for the older one and thus closer to retirement all of the significant results imply higher impatience in the higher FTR language (Portuguese). Consistent with this, we found an interaction effect signifying that for the lower amounts, impatience in both languages and both age groups is very similar; but for intermediate and larger amounts, impatience for younger people is still very similar in both languages, but is much higher in Portuguese than in English for older people.

Limitations.

While this study was in course, in between the two applications of the questionnaire, a natural catastrophe occurred in some states of the USA, which is known to have directly affected some of the participants and could have indirectly affected some of the other participants. Such an event could easily have modified – even if temporarily – the participants' answers in ways difficult to predict.

Another important issue is that the Portuguese version of the questionnaire was not written in Brazilian Portuguese but in Portugal Portuguese, and 42.3% of participants lived in USA but their country of origin was Brazil. We address this matter further in the joint discussion that follows.

We would also like to point out that although all of these people were living in the USA, country of origin was USA for 43.6%, Brazil for 42.3%, Portugal for 3.8%, UK for

1.3% and various other countries for 9.0% of the participants. So, almost half of these people are living in the country were they were born. Participant from experiment I had a very different situation since they were all living in the Nederland, but more than half of them (at least 53.3%) were born in English speaking countries (UK and USA).

Study IV Discussion

In the fourth Study, we intended to address the effects of language in intertemporal choice, both in a neutral context and in a retirement context. In experiment I we compared Dutch and English, and in experiment II, Portuguese and English. The first objective of this study was to research the occurrence of an effect of language's FTR on impatience. The second objective was to research the occurrence of an effect of language's FTR degree on estimates of time periods, in order to access the possibility of languages with different FTR degrees produce alterations in the perception of time – a possible explanation for a differential discount on the value of delayed rewards, surfacing as different degrees of impatient, depending on the language. The third and last objective was to research if FTR effect on impatience depends on amount magnitude, delay size or signal, if it varies with age, and if it appears in a retirement context. Although presented last, for coherence with the literature findings and information structure, this study was chronologically the first of the four studies presented to be implemented.

In the neutral choice task, concerning the older people, we found differences in impatience between languages in the same direction, implicating less impatience in the lower FTR language than in higher FTR language, both in Experiment I and II. Also, all the differences found between age groups point to higher impatience by the older people and emerged mostly in the higher FTR language of the pair. This is in accordance with the effect we proposed for a higher FTR degree, and these are similarities between Experiment I and II worthy of highlight.

Our proposal of subjective time perceptions varying with the degree of future reference of the language, and therefore the effect of FTR on the contraction or expansion of the perception of time being responsible for the differences in impatience did not receive much support. The only difference found was between Dutch and English, and only for the 12 month period. As mentioned, this could be related with the special status of the one year time period, but no such result was found in Experiment II. We thus must consider the possibility that the FTR effect on impatience may not be due to a variation on time perception, but that FTR may affect impatience differently, for instances by changing the intuitive impression of the length of the delay (Read et al., 2005).

In fact, many of the results from experiment I and II are not congruent with each other. However, the occurrence of a natural catastrophe in some of the USA states in between questionnaire applications could easily have affected the Portuguese-English participants' impatience degree in ways difficult to predict. It is also possible that the difference in FTR degree between Portuguese and English may not be as prominent as the difference between Dutch and English, and so aspects related to language other than FTR may have influenced the choices regarding Portuguese and English.

Considering the grammatical characteristics of the studied languages, in most Germanic languages there is widespread use of present tenses as the normal way to indicate future time reference but English is somewhat isolated because it normally has obligatory marking of FTR (Comrie, 1985; Dahl, 2000) and is sometimes presented by traditional grammar as having a future tense, namely the form using the modal auxiliaries *will* or *shall* (Comrie, 1985). In Dutch there is a total absence of inflectional futures and the present tense seems to be the most common means of referencing the future, although grammatical means similar to English to define post-present time can also be used (Beheydt, 2005). In English one would say *John will leave tomorrow,* while the most frequent equivalent in Dutch would translate to *John leaves tomorrow.* In Portuguese, inflectional future is in fact used (Dahl, 2000), but not always and both present tenses and modal auxiliaries can be utilized to indicate future time. Although these grammatical differences between Portuguese and English are true in written and more formal spoken language, they may tend to diminish in informal every day speech. In Portuguese from our own experience, many references to future events in informal speech are very similar to English ones, namely the employ of the form using the modal auxiliaries *will* or *shall*. Portuguese people may formally write *O João partirá amanhã*, but they will most probably say *O João vai partir amanhã*, very similar to *John will leave tomorrow*.

So, if FTR degree in Portuguese and English is indeed more near than anticipated, differences where they exist may not be totally coherent with RTF degree variation since decisions may be under the influence of other language related factors. Namely, like in Experiment I, aspects like native and non-native languages effects on though cannot be dismissed. As mentioned before, bilinguals have claimed to think differently in different languages (Hunt & Agnoli, 1991; Wierzbicka, 1997) and preferences can sometimes be shaped by language (Danziger & Ward, 2010; Ogunnaike et al., 2010), while native languages can influence linguistic and non-linguistic representations, since people frequently speak and

think about time using representations imported from their native language (Boroditsky, 2000; Casasanto et al., 2004).

Therefore, there could be native and non-native influences, and this might be a very important aspect affecting the results of both experiments, but particularly of Experiment II. In Experiment I we addressed differences between Dutch and English, and participants resided in Nederland where official language is Dutch; however, 53.3% of participants came from English speaking countries and only 28.6% were from Nederland. Experiment II examined differences between Portuguese and English, but participants resided in USA, where official language is English. And although in this case original language percentages are more or less even, since 44.9% came from English speaking countries and 46.1% came from Portuguese speaking countries, the first were mostly from USA, but the second were mostly (42.3%) from Brazil, and not Portugal – and this may have implications we will discuss further ahead.

We must also reflect upon the differences associated with retirement savings and investment in Nederland and USA at the time of data collection (2011). To supplement their public pensions, Dutch had earnings-related occupational plans, referred in USA as *employer pensions* and 91% of employees were covered. In USA, over the past two decades, pension funds have been under reform, mostly implemented through a massive shift from defined benefit plans to defined contribution ones. American employers are not required to provide pension benefits and those that do are also not required to cover all of their employees. Voluntary saving arrangements in the US pension system are made through private savings in several forms of personal investments, and this method of complementing retirement is much more significant in the USA than in Netherland. Until recent years, voluntary retirement savings played an insignificant part in retirement income for Dutch households, but even these private savings plans were subsidized by the state to overcome any income shortfalls in old age (van Dalen et al., 2010). So, it is probable that investment and retirement contexts could be perceived as more similar in the USA than in Nederland, since investment for retirement was rather usual in the USA at the time the data was collected, but not especially in Nederland, and this may have contributed to generate some of the incongruent results.

Results from Experiment I are mostly in accordance with our proposals, since both *H1.1* and *H1.2* were at least partially verified, and we consider data from Experiment I more trustworthy than data from Experiment II as, concerning the Portuguese-English pair, two aspect must be taken into account. One is the already referred occurrence of a natural

catastrophe in some states of the USA in between questionnaire applications, and the other is that the Portuguese version of the questionnaire was written in Portugal Portuguese, but answered mostly by Brazilian Portuguese speakers. This may not seem all that important, but there is a critical difference between the two: In Portugal, Retirement is designated "Reforma", but in Brazil is "Aposentadoria". In Brazilian Portuguese "Reforma" means reform or renovation, and this is a major difference. Other dissimilarities are not as important, but we consider this one as essential. We also suspect that, given the proximity between USA and Brazil, most Portuguese-English bilinguals born in USA also spoke Brazilian Portuguese.

Regarding k parameter and discount factor δ, many of the answers obtained in this part of the questionnaire, in both studies, presented decimals. Mistakenly, we gave no instructions against the use of calculators, and this make us suspect that calculating devices of some sort were utilized. If the same calculating rule was applied in both languages, this explains why we found no differences whatsoever.

In sum, although languages seem to have an effect on intertemporal choice, they probably cast their influence beyond the effect of FTR, such as effect related to the inherent structure of the languages and to cultural aspects deeply connected to them.

Chapter 6: General Discussion

As mentioned in Chapter I, our research had four main objectives. The first was to demonstrate that psychological costs of retirement planning can be an important factor that may affect the degree of retirement planning and savings, and to investigate the relationship between these costs and other variables that, according to the Friedman and Scholnick's (1997) planning model, and Hershey's (2004) revision of their model, play an important role in the planning activity, such as retirement motivation, retirement planning knowledge, financial literacy, FTP and retirement affective valence.

In this research, we consistently found retirement motivation to negatively affect psychological costs of retirement preparation. This means that people with a high motivation presented lower psychological costs of retirement preparation and this clearly suggests that motivation could be a very important aspect in achieving the reduction of these costs perception. Recalling the words of Loewenstein (1999, p. 1), when preparing for retirement, "we may not know enough to choose among the options presented to us, lack the time or motivation to attempt to make good choices, or fear that bad decisions will haunt us in the future, tingeing our decision making with feelings of anxiety and anticipatory regret". It could be that motivated people, attempting to make good choices, manage to be more perseverant in the pursuit of information and financial product choice, or are perhaps more resilient to the challenges that psychological costs of retirement preparation pose.

Concerning financial knowledge, retirement planning knowledge is a strong negative predictor of psychological costs of retirement preparation. This is not unexpected, since lack of knowledge contributes to a great extent, by definition, to the degree of costs one experiences. However, in the exploratory part of this research, we also found that both retirement planning knowledge and psychological costs of retirement preparation together with retirement motivation are significant predictors of subjective savings. So, although retirement planning knowledge greatly contributes to psychological costs of retirement preparation, the "whole is greater than the sum of its parts", and both constructs contribute to subjective savings perception. Financial literacy is also negative predictor of psychological costs of retirement preparation, although explaining a much smaller amount of variance than retirement planning knowledge. This suggests that, for both types of knowledge, to know more is related to perceiving less retirement preparing costs. Learning about pensions plan is not easy, and their complexity and number can be detrimental if there is insufficient

knowledge, not forgetting the possible psychological costs derived from the association between retirement and old age, frequently viewed as unpleasant and worrisome (Loewenstein, 1999; Sundén, 2008). So, as proposed, the lack of financial and retirement knowledge seems to weights heavily on psychological costs of retirement preparation.

We argued that empirical findings suggested that individuals with higher FTP would be more likely than others to set goals, better plan and save for their retirement (Hershey et al., 2007; Hershey & Mowen, 2000; Jacobs-Lawson & Hershey, 2005; Lusardi, 1999; Munnell et al., 2001/2002; Rothspan & Read, 1996; Seijts, 1998), and therefore, is was our expectation that FTP would help reduce the perception of psychological costs. In fact, the present research confirmed an inverse effect of FTP on psychological costs and, in our view, this result means those more enthusiastic and optimistic about future perceived lower retirement preparing costs, which strongly suggests an important role for FTP on retirement planning and saving behavior. This is all the more important if we consider FTP as a perceptual dimension, and as such susceptible to a great number of influences, both external and internal, including mood.

Finally, in respect to retirement affective valence, our results demonstrated not only that people with low psychological costs of retirement preparation had a more positive affective valence than the others but also that their average retirement affective valence was within the positive values range. We interpret this result as meaning that people experiencing low psychological costs of retirement preparation tend to present truly positive retirement affective valence. Also, psychological costs of retirement preparation together with income were predictors of affective valence explaining more than 20% of variance. This conveys the idea that both lower perceived psychological costs and higher income conduce to a more positive affective valence. Although attaining a higher income is not always easy or even possible, to reorganize and rationalize expenses is. It is not difficult to imagine that if people realize they can manage to save part of their income, and find they do not perceive major difficulties in saving and investing it for retirement, they will most likely improve their expectations for retirement, whatever their initial retirement affective valence was.

Not only all of the above variables have an important role in Hershey's (2004) adaptation and simplification of Friedman and Scholnick's (1997) planning model, but also our results demonstrated that, since psychological costs of retirement preparation were consistently and inversely related to retirement planning and both global and retirement subjective savings, these costs can be an important factor concerning the planning of

retirement and the perceived savings. We therefore consider we have achieved our first purpose, since our results showed significant relationships between psychological costs of retirement planning and all of the above mentioned variables. Also, in an applied perspective, given that in our viewpoint all of these variables (motivation, retirement planning knowledge, financial literacy, FTP and retirement affective valence) are in some measure liable of change – even though some may be more pliable than others – this provides a considerable room for maneuver in which to attempt a reduction in the perception of psychological costs and an increase of retirement planning, through specific education and training programs. In our point of view, these programs can be facilitators of retirement planning, contributing to an improvement of savings for retirement but, in order to be efficacious, they must directly and clearly address the psychological costs of retirement planning perceived by people.

In face of the reported intercultural differences (Hershey et al., 2006, 2010a, 2010b; van Dalen et al., 2010), our second goal was to research, concerning retirement planning and savings, important variables in the domain of retirements saving like retirement motivation, retirement planning knowledge, financial literacy, FTP and affective valence, as well as demographic indicators such as gender, age, income and education. We also intended to explore the relations between work status and psychological costs of retirement preparation, in addition to retirement affective valence.

Motivation presented a positive effect on retirement planning knowledge, retirement planning and both types of subjective savings. This corroborates the empirical findings from relevant literature, showing that motivated people tend to plan more for retirement and confirms motivation as an important variable in achieving a higher retirement planning and savings degree.

People with higher financial literacy also presented higher retirement planning. So, financial literacy is also a very important type of knowledge in what concerns retirement planning. However, the hypothesized relation between financial literacy and subjective global savings was not confirmed and a possible explanation could be derived from the operationalization of the savings variable. It is usually much easier for individuals to have a perception of their savings considering their effort, their objectives and in comparison with their peers than to evaluate their savings objectively and accurately. So, accordingly, we measured self-reported, subjective, perceived savings that only convey the person's perception of her savings. But, as with all perceptions, we must consider the possibility that savings perception could somehow be biased. For example, people with high financial literacy

could also be more financially demanding with themselves, so they may perceive their savings as lower than they actually are, and this could contribute to the absence of a significant result in our data.

Our results showed a positive effect of FTP on retirement motivation, on retirement planning, and on subjective retirement savings, which imply, as we expected, an important role for FTP concerning retirement savings. When people are more enthusiastic and optimistic about future, they seem more motivated to reach retirement goals, and more able to plan and to save for retirement. FTP is one of the psychological components given highlight in both Friedman and Scholnick's (1997) planning model and Hershey's (2004) adaptation, and research suggests that it may susceptible, in some degree, to external influences. In literature, only 23% of the variance in FTP was accounted for by personality traits (Hershey & Mowen, 2000), and people in a positive mood were more future oriented (Hornik, 1992). In our research, although explaining a small amount of variance, income was found to be a positive predictor of FTP, and this reinforces the possibility of FTP being influenced by contextual factors, hence potentially representing an important factor in driving people to plan more for their retirement.

Gender emerged as a predictor of both financial literacy and retirement planning knowledge, and women were lower on either, which is consistent with literature findings. We also found significant differences in retirement affective valence, psychological costs of retirement preparation and income regarding gender. Women presented a more negative retirement affective valence, a lower income than men and perceived higher psychological costs of retirement preparation. Altogether, these results suggest that women tend to feel a much greater difficulty in planning retirement. This is of great importance when we consider that women tend to live longer than men: Information extracted from PORDATA (2014) shows that in 2012, life expectancy at 65 was of 20.4 years for Portuguese women, but only of 17.1 years for men. The same database reveals that, in 2013, the age group of more than 65 year in Portugal was constituted by 58.6% of women. Therefore, women should clearly be a privileged target for education and training programs concerning retirement planning and savings, since they are particularly at risk of not being able to maintain their living standard in retirement.

Concerning other demographic indicators, age, income and education surfaced as predictors of motivation for retirement and financial literacy and education was also a predictor of financial literacy and of retirement planning knowledge. When both demographic

variables and cognitive and psychological constructs were considered, none of the other demographic variables was a significant predictor of either retirement planning or subjective savings, except for age. This gives some support to the claim that demographic indicators are mostly proxies for the psychological basis of savings and investing behavior.

Age is the exception in this domain, since retirement and age are by definition intrinsically related. It consistently emerged as a positive predictor of retirement planning, but explaining a small amount of variance. This corroborates findings from literature showing age to be the most reliable demographic indicator concerning retirement financial planning. It also suggests, as Cantor (2003) proposes, that some tasks are socially expected in certain moments of life and, until now, older individuals have been more encouraged to plan retirement than younger people.

As stated, we also intended to explore the relations between work status and psychological costs of retirement preparation, in addition to retirement affective valence. We were unable to find enough information in literature about work status that would permit us to formulate hypotheses but suspected that to have work (and therefore a regular income) or not could give rise to differences in psychological costs of retirement preparation and retirement affective valence. And indeed, our exploratory results showed a significantly more negative retirement affective valence, and also higher psychological costs of retirement preparation, by the no-work group.

We therefore consider we have achieved our second purpose, since our results corroborated several findings from literature and our research reveals FTP as an important factor in encouraging people to plan more for their retirement. But we give a special highlight to our results concerning gender and work status, since they suggest that both women and people without work appear to be at greater risk concerning their quality of life during retirement and deserve the utmost attention in education and training programs.

Considering savings behavior to be guided by time preference, our third goal was to investigate the relationship between impatience and relevant variables in the domain of retirement planning such as financial literacy, savings and demographic indicators (age, gender and work status), as well as the effect of retirement context on impatience, and how this effect could be related to psychological costs of retirement planning perception.

People with higher financial literacy presented lower impatience. People with high financial literacy have a higher understanding of financial products and the skills to make

informed choices, being aware of opportunities and associated risks. And, assuming the prerequisite of numeracy exists in people with high levels of financial literacy, they will also be able to calculate interest rates, know variances and obtain other financial information, and will probably be able to compare options presented to them with other remembered options available in the market. Knowledge about financial markets and the utilization of some form of calculus (e.g., a percentage), even by memory, may have weakened the contextual effects of intertemporal choice in these people's decisions, contributing to the expression of a lower impatience.

The savings behavior is considered to be strongly guided by an individual's time preference, since it involves the deliberate reduction of present consumption with the intent to increase expected future consumption (Finke, 2005). Therefore, a relationship between impatience and savings degree is assumed to exist, but was not verified. However, this could also be due to the characteristics of the savings measure we adopted. As we explained before, we measured subjective, perceived savings, and we cannot discard the possibility of some degree of bias in this perception. We noted as much when we discussed the absence of a relationship between financial literacy and subjective savings.

Regarding demographic variables, and against several empirical findings from literature, none of the predicted relations between impatience degree and gender, education degree or age and was verified. We found no significant differences in impatience degree between genders in retirement context, but found that both in neutral and retirement contexts, people without work consistently presented a higher impatience degree. These people do not receive a salary so they do not have a regular income, although it may be a temporary situation and some may receive unemployment subsidy. Research suggests that lower income could lead to a shorter future horizon due to a day-to-day money management (Hershey et al., 2007), and this could explain why these individuals are less interested in waiting to receive a larger amount of money.

As to the effect of retirement context in impatience, we found people to be consistently less impatience in this context than in a neutral one. Read et al. (2005) proposed that certain framings may change the intuitive impression of how long the delays involved are. Contextualizing choices in such a frame could increase predisposition to wait for a larger amount of money because delays may not seem so long. So, our proposal was that the retirement context, projecting people into a future where they will most certainly need their savings, would predispose them to be less impatient.

Our results also showed that people with higher psychological costs of retirement preparation presented a significantly higher variation of impatience between contexts than others. We believe this may be due to a heighten sensitivity to retirement context by people with high perceived costs. High costs signify great difficulty in planning for retirement, possibly associated with anxiety and fear of making bad investments. When confronted with a retirement context, these people could experience higher levels of anxiety that, in turn, could lead to a selective allocation of attention to aspects related to retirement and a predisposition to wait more for larger amounts in a riskless choice, and thus expressing a lower impatience.

Although we did not find a connection between impatience and subjective savings, we do consider savings behavior to be guided by time preference, and our research revealed an association between impatience and both financial literacy and work status, and an effect of retirement context on impatience. We also found a connection between psychological costs of retirement planning and the variation of impatience between contexts, and proposed this may be due to a heighten sensitivity to retirement context by people with high perceived costs. All these finding contribute to strength our notion of the importance of considering such factors when aiding people to plan and save more for their retirement, and so we believe we have accomplished our third purpose.

Finally, our fourth goal was to research if time preference was sensitive to the characteristics of language, namely to the degree of FTR in the language utilized (Chen, 2011, 2013), in both a neutral and in a retirement context, and to explore possible relations between delay, magnitude and sign, as well as age, and our predicted effect of language's FTR on impatience. This goal concerns exclusively to the fourth study, and was extensively debated in Experiment I and Experiment II specific discussions and in global discussion for Study IV. Therefore, in the general discussion we will only talk about the more relevant aspects.

For both language pairs, we found differences in impatience between languages implicating less impatience in the lower FTR language than in higher FTR language, in the neutral choice task, concerning the older people. Also, the differences between age groups, pointing to higher impatience by the older people, emerged almost exclusively in the higher FTR language of the pair. These results give some support to the idea of time preference being sensitive to the characteristics of language, specifically to its degree of future time reference.

Between Dutch and English, there were differences for large amounts, for high amount losses, and for longer delays, with lower impatience in Dutch, the language with lower degree

of FTR, than in English. This suggests that the effect of language's FTR may be stronger when remaining conditions contributed to lower impatience, known to occur with losses, larger amounts and longer delays, according to magnitude, delay and sign effects.

A possible explanation for the effect of FTR on impatience was that subjective time perceptions could vary with the degree of future reference of the languages, but results only supported this regarding the 12 month period, and only for the Dutch-English pair. Therefore, we must consider that FTR effect on impatience may not be due to contraction or expansion of the perception of time, but that it may affect impatience in a different manner, perhaps by changing the intuitive impression of the length of the delay (Read et al., 2005).

Several problems affected the forth study, posing great difficulties in the interpretation of dissimilarities between Experiment I an II results. Although languages seem to have an effect on intertemporal choice, they probably cast other influences in addition to the effect of FTR, such as effects related to the inherent structure of these languages and to cultural aspects deeply connected to each of them. So, we consider to have only partially achieved this last goal.

To finalize, the transverse objective to all our studies was to acquire knowledge that could contribute to improve any attempts of enhancing the savings for retirement, especially in view of the ageing and increased longevity of the European population in general, and Portuguese population in particular, and of what this means in terms of social security retirement pensions amounts. However, more research is still needed about the difficulties people feel in what concerns planning for retirement, and about the situational and personal factors that influence individual's predisposition to plan and save for their retirement.

One of the limitations of this research was the very high education level of the participants. Therefore, research is needed to examine the relationships between the studied variables in samples with lower educational levels, and also to further investigate personal factors that may influence these variables. For example, our results show that the unemployed consistently present higher impatience both in neutral and retirement context, and research about time perspective offers an explanation for this, suggesting that a lower income could lead to a shorter future horizon (Hershey et al., 2007). We can conjecture that unemployed people probably have a shortage of money that makes them less interested in waiting to receive more money. However, considering the five-factor model of personality (Costa Jr & McCrae, 1995; McCrae & Costa Jr, 1987, 1997, 2004), their personality traits (e.g. Conscientiousness and Neuroticism) could make more them likely candidates for

unemployment as well as more impatient. Retirement affective valence could also, beyond the aspects mentioned above, be related with individual characteristics like Neuroticism or Extraversion, and psychological costs with Conscientiousness. So, another possible avenue for further research could be to study how aspects like personality traits may relate to psychological costs, motivation, time perspective, and affect, as well as planning ability.

A final note about planning. In this thesis, we advocated the idea that planning retirement tends to improve economic situation during retirement years (Lusardi & Mitchell, 2007a), and that many of those who should already be planning for their retirement are not yet doing it (Lusardi, 2003). Furthermore, we fear that in the next five decades this low extent of planning could have a major economic effect on European countries, since some social security government programs are already near insolvency, benefit pensions are steadily declining and, until 2060, Europe faces a possible rise of over 70% in people with more than 64 years. We proposed psychological costs of planning to be important aspect of the retirement preparation process, and we believe we showed they play an important role in the degree of retirement planning that takes place.

However, we would like to point out that a low level or absence of planning could be related to several others aspects that may influence the decision of whether to plan or not for retirement, besides psychological costs. Even if a goal is determined, the individual doesn't automatically begin to plan a strategy. Very distractible individuals, for example, usually do not plan, so there may be extensive differences in the way people choose the means to achieve a goal (Scholnick & Friedman, 1987). Other aspects underlying predisposition to plan are beliefs about the task and the self ("self-efficacy"; (Bandura, 1994)), and knowing when to plan. In order to plan, individuals must believe they are able to attain their goal by their own endeavor. Otherwise, they may not plan, because they may think they will not be able to carry out the plan to reach the goal. Knowing when to plan is linked to the cultural forces already mentioned: Social, family and peer norms. Before planning, the individual considers if people usually plan in that particular situation, and if planning would be appropriate and effective, to decide if he or she ought to plan or not.

We must also consider that some people manage to save their money without any formal planning. There is no doubt that for planning to arise, self-control and capability for self-regulation must exist (Scholnick & Friedman, 1987). Some authors even defend that the effects of planning on savings are almost entirely based on self-control, by permitting

individuals with low self-control to better control expenses and therefore save (Ameriks et al., 2003). If this is true, than people who do have enough self-control may be able save with no need for planning. Nevertheless, saving money is not enough: It must be invested, or it will lose part of its value, due to inflation rate. So, these people may still face psychological costs because they must decide what to do with their savings and they may lack time or financial knowledge, or they may be confronted with an overwhelming offer of financial retirement products from were to choose, or even have feelings of anxiety and anticipatory regret associated with financial investment decisions, and postponement their financial investment decisions.

References

Adams, J., & Nettle, D. (2009). Time perspective, personality and smoking, body mass, and physical activity: An empirical study. *British Journal of Health Psychology, 14*, 83-105.

Alloway, T. P., & Corley, M. (2004). Speak before you think: The role of language in verb concepts. *Journal of Cognition and Culture, 4*(2), 319-345.

Ameriks, J., Caplin, A., & Leahy, J. (2003). Wealth accumulation and the propensity to plan. *Quarterly Journal of Economics, 118*(3), 1007-1047.

Arendt, J. (2006). Melatonin and human rhythms. *Chronobiology International, 23*(1-2), 21-37.

Bandura, A. (1994). Self-efficacy. . In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71-81). New York: Academic Press.

Bassett, W. F., Fleming, M. J., & Rodrigues, A. P. (1998). How workers use 401 (k) plans: The participation, contribution, and withdrawal decisions. *National Tax Journal, 51*(2), 263-289.

Beheydt, G. (2005). Future time reference - English and Dutch compared. In N. Delbecque, J. Van der Auwera & D. Geeraerts (Eds.), *Perspectives on variation: sociolinguistic, historical, comparative*. Berlin: Mouton de Gruyter.

Blake, B. J. (2009). Classification of languages. In K. Brown & S. Ogilvie (Eds.), *Concise encyclopedia of languages of the world*. Oxford: Elsevier Ltd.

Boroditsky, L. (2000). Metaphoric structuring: Understanding time through spatial metaphors. *Cognition, 75*(1), 1-28.

Boroditsky, L. (2001). Does language shape thought?: Mandarin and English speakers' conceptions of time. *Cognitive Psychology, 43*(1), 1-22.

Boroditsky, L., Fuhrman, O., & McCormick, K. (2011). Do English and Mandarin speakers think about time differently? *Cognition, 118*(1), 123-129.

Boyd, J. N., & Zimbardo, P. G. (2005). Time perspective, health, and risk taking. In A. Strathman & J. Joireman (Eds.), *Understanding behavior in the context of time: Theory, research, and application* (pp. 85–107). New Jersey: Lawrence Erlbaum Associates, Inc.

BP. (2010a). *Inquérito à literacia financeira da população portuguesa 2010: Apresentação dos principais resultados*. Lisboa: Banco de Portugal. Retrieved from

http://clientebancario.bportugal.pt/pt-PT/Noticias/Paginas/InqueritoLiteraciaFinanceira.aspx.

BP. (2010b). *Inquérito à literacia financeira da população portuguesa 2010: Síntese dos resultados*. Lisboa: Banco de Portugal. Retrieved from http://clientebancario.bportugal.pt/pt-PT/Noticias/Paginas/InqueritoLiteraciaFinanceira.aspx.

Cantor, N. (2003). Constructive cognition, personal goals, and the social embedding of personality. In L. G. Aspinwall & U. M. Staudinger (Eds.), *A psychology of human strengths: Fundamental questions and future directions for a positive psychology.* (pp. 49-60). Washington, DC US: American Psychological Association.

Casasanto, D., Boroditsky, L., Phillips, W., Greene, J., Goswami, S., Bocanegra-Thiel, S. et al. (2004). *How deep are effects of language on thought? Time estimation in speakers of English, Indonesian, Greek, and Spanish.* Paper presented at the 26th Annual Meeting of the Cognitive Science Society, Chicago.

Chapman, G. B. (2005). Short-term cost for long-term benefit: Time preference and cancer control. *Health Psychology, 24*(4S), S41-S41.

Chapman, G. B., Brewer, N. T., Coups, E. J., Brownlee, S., Leventhal, H., & Leventhal, E. a. (2001). Value for the future and preventive health behavior. *Journal of Experimental Psychology: Applied, 7*(3), 235-250.

Chen, J.-Y. (2007). Do Chinese and English speakers think about time differently? Failure of replicating Boroditsky (2001). *Cognition, 104*(2), 427-436.

Chen, M. (2011). *The effect of language on economic behavior: Evidence from savings rates, health behaviors, and retirement assets*. Retrieved from http://faculty.som.yale.edu/keithchen/papers/LanguageWorkingPaper.pdf

Chen, M. (2013). The effect of language on economic behavior: Evidence from savings rates, health behaviors, and retirement assets. *The American Economic Review, 103*(2), 690-731.

Chomsky, N. (1968). Language and the mind. *Psychology Today, l*(9), 48-68.

Coben, D., Dawes, M., & Lee, N. (2005). Financial literacy education and skills for life. *London: NRDC*.

Comrie, B. (1985). *Tense*. Cambridge: Cambridge University Press.

Costa Jr, P. T., & McCrae, R. R. (1995). Domains and facets: Hierarchical personality assessment using the Revised NEO Personality Inventory. *Journal of personality assessment, 64*(1), 21-50.

Dahl, Ö. (2000). The grammar of future time reference in European languages. In Ö. Dahl (Ed.), *Tense and Aspect in the Languages of Europe* (pp. 309-328). Berlin: Mouton de Gruyter.

Dahl, Ö., & Velupillai, V. (2005). Tense and aspect. In M. Haspelmath, M. Dryer, D. Gil & B. Comrie (Eds.), *The world atlas of language structures*. New York: Oxford University Press.

Danziger, S., & Ward, R. (2010). Language changes implicit associations between ethnic groups and evaluation in bilinguals. *Psychological Science, 21*(6), 799-800.

DECO. (2010). Investimentos preferidos dos portugueses, from http://www.deco.proteste.pt/poupanca-e-investimento/investimentos-preferidos-dos-portugueses-s611921.htm

DECO. (2011a). Planos de poupança-reforma: não compensa investir, from http://www.deco.proteste.pt/poupanca-e-investimento/planos-de-poupanca-reforma-nao-compensa-investir-s632921.htm

DECO. (2011b). Poupar para a reforma: onde investir, from http://www.deco.proteste.pt/poupanca-e-investimento/poupar-para-a-reforma-onde-investir-s613581.htm

DeNavas-Walt, C., Proctor, B. D., & Lee, C. H. (2006). Income, poverty, and health insurance coverage in the United States: 2005 *Current Population Reports, P60-231*. Washington, DC: U.S. Government Printing Office.

DeNavas-Walt, C., Proctor, B. D., & Smith, J. C. (2012). Income, Poverty, and Health Insurance Coverage in the United States: 2011 *Current Population Reports, P60-243*. Washington, DC: U.S. Government Printing Office.

DeVaney, S. A., & Su, Y. (1997). Factors predicting the most important source of retirement income. *Compensation and Working Conditions, 2*(3), 25-31.

Ebert, J. E. J., & Prelec, D. (2007). The fragility of time: Time-insensitivity and valuation of the near and far future. *Management Science, 53*(9), 1423-1438.

Ellis, S., & Siegler, R. S. (1997). Planning as a strategy choice, or why don't children plan when they should. In S. L. Friedman & E. K. Scholnick (Eds.), *The developmental psychology of planning* (pp. 183-208).

Eurostat. (2011). *The 2012 ageing report: Underlying assumptions and projection methodologies*: Office for Official Publications of the European Communities.

Eurostat. (2013). EU labour force survey - methodology Retrieved 18-08-2013, from http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/EU_labour_force_survey_-_methodology#Labour_force_status_definition

Feijóo, N. R. (2006). Actitudes hacia la jubilación. [Article]. *Interdisciplinaria: Revista de Psicología y Ciencias Afines, 24*(1), 5-42.

Finke, M. S. (2005). Time orientation and economic decision making. In A. Strathman & J. Joireman (Eds.), *Understanding behavior in the context of time: Theory, research, and application* (pp. 109-123). New Jersey: Lawrence Erlbaum Associates, Inc.

Flett, G. L., Stainton, M., Hewitt, P. L., Sherry, S. B., & Lay, C. (2012). Procrastination automatic thoughts as a personality construct: An analysis of the Procrastinatory Cognitions Inventory. *Journal of Rational-Emotive & Cognitive-Behavior Therapy, 30*(4), 223-236.

Fodor, J. A. (1975). *The language of thought*. New York: Thomas Y. Cromwell Company.

Frederick, S., Loewenstein, G., & O'Donoghue, T. (2002). Time discounting and time preference: A critical review. *Journal of Economic Literature, 40*(2), 351-401.

Friedman, S. L., & Scholnick, E. K. (1997). An evolving "blueprint" for planning: Psychological requirements, task characteristics, and social-cultural influences. In S. L. Friedman & E. K. Scholnick (Eds.), *The developmental psychology of planning: Why, how, and when do we plan* (pp. 3-22).

Gentner, D., & Goldin-Meadow, S. (2003). Whither Whorf. In D. Gentner & S. Goldin-Meadow (Eds.), *Language in mind: Advances in the study of language and thought* (pp. 3–14). Cambridge: The MIT Press.

Gilleard, C. J., & Higgs, P. (2000). *Cultures of ageing: Self, citizen, and the body*: Pearson Education.

Glamser, F. D. (1976). Determinants of a positive attitude toward retirement. *Journal of Gerontology, 31*(1), 104-107.

Glass, J. C., & Kilpatrick, B. B. (1998). Gender comparisons of baby boomers and financial preparation for retirement. *Educational Gerontology, 24*, 719-745.

Goldman, B., Gwinner, E., Karsch, F., Saunders, D., Zucker, I., & Ball, G. (2004). Circannual rhythms and photoperiodism. In J. C. Dunlap, J. J. Loros & P. J. DeCoursey (Eds.), *Chronobiology: Biological timekeeping*. Sunderland: Sinauer Associates, Inc. Publishers.

Green, L., Myerson, J., Shah, A. K., Estle, S. J., & Holt, D. D. (2007). Do adjusting-amount and adjusting-delay procedures produce equivalent estimates of subjective value in pigeons? *Journal of the Experimental Analysis of Behavior, 87*(3), 337-347.

Gupta, R., Hershey, D. A., & Gaur, J. (2012). Time perspective and procrastination in the workplace: An empirical investigation. *Current Psychology, 31*(2), 195-211.

Gustman, A. L., & Steinmeier, T. L. (2005). Imperfect knowledge of social security and pensions. *Industrial Relations: A Journal of Economy and Society, 44*(2), 373-397.

Haro, A. E., & López, S. M. M. (2012). Jubilación, educación y calidad de vida. *SIPS, 20*, 245-272.

Hershey, D. A. (2004). Psychological influences on the retirement investor. *CSA: Certified Senior Advisor, 22*, 31-39.

Hershey, D. A., Henkens, K., & van Dalen, H. (2006). Mapping the minds of retirement planners. (Discussion Paper TI 2006-038/1). Amsterdam:Tinbergen Institute.

Hershey, D. A., Henkens, K., & van Dalen, H. (2010a). Aging and financial planning for retirement: Interdisciplinary influences viewed through a cross-cultural lens. *International Journal of Aging, 7*(1), 1-38.

Hershey, D. A., Henkens, K., & van Dalen, H. (2010b). What drives retirement income worries in Europe? A multilevel analysis. *European Journal of Ageing, 7*(4), 301-311.

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), 26-36.

Hershey, D. A., & Mowen, J. C. (2000). Psychological determinants of financial preparedness for retirement. *The Gerontologist, 40*(6), 687-687.

Hershey, D. A., Mowen, J. C., & Jacobs-Lawson, J. M. (2003). An experimental comparison of retirement planning intervention seminars. *Educational Gerontology, 29*(4), 339-359.

Hershey, D. A., & Walsh, D. A. (2000/2001). Knowledge versus experience in financial problem solving performance. *Current Psychology, 19*(4), 261-291.

Hilgert, M. A., Hogarth, J. M., & Beverly, S. G. (2003). Household financial management: The connection between knowledge and behavior. *Federal Reserve Bulletin*(Jul), 309-322.

Hornik, J. (1992). Time estimation and orientation mediated by transient mood. *Journal of Socio-Economics, 21*(3), 209-227.

Hung, A. A., Parker, A. M., & Yoong, J. K. (2009). *Defining and Measuring Financial Literacy*. Working Paper. RAND Labor en Population working paper series.

Hunt, E., & Agnoli, F. (1991). The Whorfian hypothesis: A cognitive psychology perspective. *Psychological Review, 98*(3), 377-389.

Hurd, M. D., & Wise, D. A. (1989). The Wealth and Poverty of Widows: Assets before and after the Husband's Death *The economics of aging* (pp. 177-200): University of Chicago Press.

Jacobs-Lawson, J. M., & Hershey, D. A. (2005). Influence of future time perspective, financial knowledge, and financial risk tolerance on retirement saving behaviors. *Financial Services Review, 14*, 331-344.

January, D., & Kako, E. (2007). Re-evaluating evidence for linguistic relativity: Reply to Boroditsky (2001). *Cognition, 104*(2), 417-426.

Jarvis, S., & Pavlenko, A. (2008). *Crosslinguistic influence in language and cognition*. New York: Routledge.

John-Steiner, V. (2007). Vygotsky on thinking and speaking. In H. Daniels, M. Cole & J. V. Wertsch (Eds.), *The Cambridge Companion to Vygotsky* (pp. 136-154). Cambridge: Cambridge University Press.

Jonsson, H., & Andersson, L. (1999). Attitudes to Work and Retirement: Generalization or Diversity? *Scandinavian Journal of Occupational Therapy, 6*(1), 29-35. doi: 10.1080/110381299443825

Kim, B. K., & Zauberman, G. (2009). Perception of anticipatory time in temporal discounting. *Journal of Neuroscience, Psychology, and Economics, 2*(2), 91-101.

Kline, R. (2005). *Principles and practice of structural equation modeling.* New York: The Guilford Press.

Laibson, D. (1997). Golden eggs and hyperbolic discounting. *Quarterly Journal of Economics, 112*(2), 443-477.

Leech, G., & Svartvik, J. (2002). *A communicative grammar of English* (3rd ed.). London: Longman - Pearson Education.

Levinson, S. (2003). Language and mind: Let's get the issues straight. In D. Gentner & S. Goldin-Meadow (Eds.), *Language in mind: Advances in the study of language and thought* (pp. 25–46). Cambridge: The MIT Press.

Lipkus, I. M., Samsa, G., & Rimer, B. K. (2001). General performance on a numeracy scale among highly educated samples. *Medical Decision Making: An International Journal of the Society for Medical Decision Making, 21*(1), 37-44.

Loewenstein, G. F. (1999). Is more choice always better? *Social Security Brief, 7*, 1-8.

Loewenstein, G. F., Prelec, D., & Weber, R. (1999). What, me worry? A psychological perspective on economic aspects of retirement. In H. J. Aaron (Ed.), *Behavioral dimensions of retirement economics* (pp. 215-246). Washington D.C.: Brookings Institution Press.

Lonigan, C. J., Vasey, M. W., Phillips, B. M., & Hazen, R. A. (2004). Temperament, Anxiety, and the Processing of Threat-Relevant Stimuli. [Article]. *Journal of Clinical Child & Adolescent Psychology, 33*(1), 8-20.

Lucy, J. (1992). *Language diversity and thought: A reformulation of the linguistic relativity hypothesis*. Cambridge: Cambridge University Press.

Lusardi, A. (1999). Information, expectations, and savings for retirement. In H. J. Aaron (Ed.), *Behavioral dimensions of retirement economics* (pp. 81-124). Washington, DC: Brookings Institution Press.

Lusardi, A. (2002). Preparing for retirement: The importance of planning costs. *National Tax Association Proceedings*, 148-154.

Lusardi, A. (2003). *Planning and saving for retirement*. (Working paper). Hanover: Dartmouth College.

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.

Lusardi, A., & Mitchell, O. S. (2008). Planning and financial literacy: how do women fare? *American Economic Review, 98*(2), 413-417.

Lusardi, A., & Mitchell, O. S. (2009). *How ordinary consumers make complex economic decisions: Financial literacy and retirement readiness*. NBER Working Papers. Working Paper No. 15350. National Bureau of Economic Research. Cambridge.

Maroco, J. (2010). *Análise de equações estruturais*. Pêro Pinheiro: ReporNumber, Lda.

Mason, C. L. J., & Wilson, R. (2000). Conceptualising financial literacy. *Business School Research Series*. Retrieved from http://hdl.handle.net/2134/2016

Mazur, J. E. (2001). Hyperbolic value addition and general models of animal choice. *Psychological Review, 108*(1), 96-112.

Mazur, J. E., & Biondi, D. R. (2009). Delay-amount tradeoffs in choices by pigeons and rats: hyperbolic versus exponential discounting. *Journal of the experimental analysis of behavior, 91*(2), 197-211.

McCarthy, I. M., & Tchernis, R. (2009). *Search costs and medicare plan choice.* Working Paper 2009-8-2. Georgia State University.

McCrae, R. R., & Costa Jr, P. T. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology, 52*(1), 81.

McCrae, R. R., & Costa Jr, P. T. (1997). Personality trait structure as a human universal. *American Psychologist, 52*(5), 509.

McCrae, R. R., & Costa Jr, P. T. (2004). A contemplated revision of the NEO Five-Factor Inventory. *Personality and Individual Differences, 36*(3), 587-596.

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

Mogg, K., Mathews, A., Bird, C., & Macgregor-Morris, R. (1990). Effects of stress and anxiety on the processing of threat stimuli. *Journal of Personality and Social Psychology, 59*(6), 1230-1237. doi: 10.1037/0022-3514.59.6.1230

Munnell, A. H., Sundén, A., & Taylor, C. (2001/2002). What determines 401 (k) participation and contributions. *Social Security Bulletin, 64*(3), 64-75.

Münz, R. (2007). Europe: Population Change and its Consequences–An Overview. *Berlin-Institut für Bevölkerung und Entwicklung*, 9.

Nelson, R. J., Badura, L. L., & Goldman, B. D. (1990). Mechanisms of seasonal cycles of behavior. *Annual Review of Psychology, 41*(1), 81-108.

Neukam, K. A., & Hershey, D. A. (2003). Financial inhibition, financial activation, and saving for retirement. *Financial Services Review, 12*(1), 19-37.

Noon, K. L., & Fogarty, G. J. (2007). *Cognitive and personality predictors of financial literacy among adult Australians.* Paper presented at the 2007 Conference of the Australian Psychological Society, Brisbane, Australia, 25-29 September, 2007.

Nunnally, J. (1978). *Psychometric methods*. New York: McGraw-Hill.

O'Donoghue, T., & Rabin, M. (1999a). Doing it now or later. *The American Economic Review, 89*(1), 103-124.

O'Donoghue, T., & Rabin, M. (1999b). Procrastination in preparing for retirement. In H. Aaron (Ed.), *Behavioral dimensions of retirement economics* (pp. 125-125). Washington D.C: Brookings Institution and Russell Sage Foundation.

OECD. (2010). Organization for Economic Co-operation and Development. *International Gateway for Financial Education (IGFE): What is financial education?* Retrieved 19-02-2010, from http://www.financial-education.org/pages/0,3417,en_39665975_39667032_1_1_1_1_1,00.html#What

Ogunnaike, O., Dunham, Y., & Banaji, M. R. (2010). The language of implicit preferences. *Journal of Experimental Social Psychology, 46*(6), 999-1003.

Padawer, E. A., Jacobs-Lawson, J. M., Hershey, D. A., & Thomas, D. G. (2007). Demographic indicators as predictors of future time perspective. *Current Psychology, 26*(2), 102-108.

Pestana, M., & Gageiro, J. (2005). *Análise de dados para ciências sociais*. Lisboa: Edições Sílabo.

Peters, E. (2008). Numeracy and the Perception and Communication of Risk. *Annals of the New York Academy of Sciences, 1128*(1), 1-7.

Peters, E., Västfjäll, D., Slovic, P., Mertz, C. K., Mazzocco, K., & Dickert, S. (2006). Numeracy and Decision Making. *Psychological Science, 17*(5), 407-413. doi: 10.1111/j.1467-9280.2006.01720.x

Petkoska, J., & Earl, J. K. (2009). Understanding the influence of demographic and psychological variables on retirement planning. *Psychology and Aging, 24*(1), 245-251. doi: 10.1037/a0014096

PORDATA. (2014). Base de Dados Portugal Contemporâneo - Anos 2012/2013 - População Residente, from http://www.pordata.pt/Home

Quick, H. E., & Moen, P. (1998). Gender, employment, and retirement quality: a life course approach to the differential experiences of men and women. *Journal of occupational health psychology, 3*, 44-64.

Read, D. (2004). Intertemporal choice. In D. Koehler & N. Harvey (Eds.), *The Blackwell handbook of judgment and decision making* (pp. 424-443). Oxford: Blackwell.

Read, D., Frederick, S., Orsel, B., & Rahman, J. (2005). Four score and seven years from now: The date/delay effect in temporal discounting. *Management Science, 51*(9), 1326-1335.

Read, D., & Read, N. L. (2004). Time discounting over the lifespan. *Organizational Behavior and Human Decision Processes, 94*(1), 22-32.

Read, D., & Roelofsma, P. H. M. P. (2003). Subadditive versus hyperbolic discounting: A comparison of choice and matching. *Organizational Behavior and Human Decision Processes, 91*(2), 140-153.

Reyna, V. F., & Brainerd, C. J. (2007). The importance of mathematics in health and human judgment: Numeracy, risk communication, and medical decision making. *Learning and Individual Differences, 17*(2), 147-159.

Rothspan, S., & Read, S. J. (1996). Present versus future time perspective and HIV risk among heterosexual college students. *Health Psychology, 15*(2), 131-134. doi: 10.1037/0278-6133.15.2.131

Schneider, E. L. (1999). Aging in the third Millennium. *Science, 283*(5403), 796-797.

Scholnick, E. K., & Friedman, S. L. (1987). The planning construct in the psychological literature. *Blueprints for thinking: The role of planning in cognitive development*, 3-38.

Scholten, M., & Read, D. (2010). The psychology of intertemporal tradeoffs. *Psychological Review, 117*(3), 925-944.

Scholten, M., & Read, D. (2011). *Descriptive models of intertemporal choice Part 2: The delay-speedup asymmetry and other anomalies*. Retrieved from http://ssrn.com/abstract=1849705

Seguino, S., & Floro, M. S. (2003). Does gender have any effect on aggregate saving? An empirical analysis. *International Review of Applied Economics, 17*(2), 147-166.

Seijts, G. H. (1998). The importance of future time perspective in theories of work motivation. *Journal of Psychology: Interdisciplinary and Applied, 132*(2), 154-168. doi: 10.1080/00223989809599156

Simpson, C. A., & Vuchinich, R. E. (2000). Reliability of a measure of temporal discounting. *The Psychological Record, 50*, 3-16.

Slobin, D. (1996). From "thought and language" to "thinking for speaking.". In I. J. J. Gumperz & S. C. Levinson (Eds.), *Rethinking linguistic relativity* (pp. 70-96). Cambridge: Cambridge University Press.

Slobin, D. (2003). Language and thought online: Cognitive consequences of linguistic relativity. In D. Gentner & S. Goldin-Meadow (Eds.), *Language in mind: Advances in the study of language and thought* (pp. 157-192). Cambridge: The MIT Press.

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

Steel, P. (2007). The nature of procrastination: A meta-analytic and theoretical review of quintessential self-regulatory failure. *Psychological Bulletin, 133*(1), 65-94.

Sundén, A. (2008). Learning from the experience of Sweden: The role of information and education in pension reform. In A. Lusardi (Ed.), *Overcoming the saving slump: How to increase the effectiveness of financial education and saving programs* (pp. 324 - 344): University of Chicago Press.

Takahashi, T. (2005). Loss of self-control in intertemporal choice may be attributable to logarithmic time-perception. *Medical Hypotheses, 65*(4), 691-693.

Takahashi, T. (2006). Time-estimation error following Weber-Fechner law may explain subadditive time-discounting. *Medical Hypotheses, 67*(6), 1372-1374.

Takahashi, T. (2009). Theoretical frameworks for neuroeconomics of intertemporal choice. *Journal of Neuroscience, Psychology, and Economics, 2*(2), 75-90.

Tesch, A., & Sanfey, A. (2008). Models and methods in delay discounting. *Annals of the New York Academy of Sciences, 1128*(1), 90-94.

Tougas, F., Lagacé, M., Sablonnière, R., & Kocum, L. (2004). A new approach to the link between identity and relative deprivation in the perspective of ageism and retirement. *International Journal of Aging and Human Development, 59*(1), 1-23.

Tse, C. S., & Altarriba, J. (2008). Evidence against linguistic relativity in Chinese and English: A case study of spatial and temporal metaphors. *Journal of Cognition and Culture, 8*, 335-357.

van Dalen, H., Henkens, K., & Hershey, D. A. (2010). Perceptions and expectations of pension savings adequacy: a comparative study of Dutch and American workers. *Ageing and Society, 30*(05), 731-754.

Vitaterna, M. H., Takahashi, J. S., & Turek, F. W. (2001). Overview of circadian rhythms. *Alcohol Research & Health, 25*(2).

Vygotsky, L. (1934/1962). Thought and word (E. Hanfmann & G. Vakar, Trans.) *Thought and language*. Cambridge: The MIT Press.

Vygotsky, L. (1934/1987). Thinking and speech (N. Minick, Trans.). In R. Rieber & A. Carton (Eds.), *The collected works of L. S. Vygotsky: Problems of general psychology* (Vol. 1). New York: Plenum Press.

Wang, M., Rieger, M. O., & Hens, T. (2009). *An International Survey on Time Discounting*. Working paper nº 597. FINRISK.

Warner, J., & Pleeter, S. (2001). The personal discount rate: Evidence from military downsizing programs. *The American Economic Review, 91*(1), 33-53.

Whorf, B. L. (1943). The relation of habitual thought and behavior to language. *Etc: a review of general semantics, 1*(1), 197-215.

Wierzbicka, A. (1997). The double life of a bilingual: a cross-cultural perspective. In M. Bond (Ed.), *Working at the Interface of Culture: Eighteen lives in social science* (pp. 113-125). London: Routledge.

Wittmann, M., & Paulus, M. P. (2008). Decision making, impulsivity and time perception. *Trends in Cognitive Sciences, 12*(1), 7-12.

Wittmann, M., & Paulus, M. P. (2009a). Intertemporal choice: Neuronal and psychological determinants of economic decisions. *Journal of Neuroscience, Psychology, and Economics, 2*(2), 71-74.

Wittmann, M., & Paulus, M. P. (2009b). Temporal horizons in decision making. *Journal of Neuroscience, Psychology, and Economics, 2*(1), 1-11.

Zauberman, G., & Kim, B. K. (2010). *Time perception and retirement saving: Lessons from behavioral decision research*. PRC WP2010-35 - Pension Research Council Working Paper. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1707666

Zauberman, G., Kim, B. K., & Malkoc, S. A. (2008). Discounting time and time discounting: Subjective time perception and intertemporal preferences. *Journal of Marketing Research, XLV*(March), 1-62.

Zauberman, G., Kim, B. K., Malkoc, S. A., & Bettman, J. (2009). Discounting time and time discounting: Subjective time perception and intertemporal preferences. *Journal of Marketing Research, XLVI*(August), 543-556.

Zimbardo, P. G., & Boyd, J. N. (1999). Putting time in perspective: A valid, reliable individual-differences metric. *Journal of Personality and Social Psychology, 77*(6), 1271-1288.

Zimbardo, P. G., Keough, K. A., & Boyd, J. N. (1997). Present time perspective as a predictor of risky driving. *Personality and Individual Differences, 23*(6), 1007-1023.

Appendices

Appendix A: Types of time perspective

Five types of time perspective have been identified: Future, Past-Positive, Present-Fatalistic, Present-Hedonistic, and Past-Negative, and at least some of them can and should co-exist, in different degrees, in each person. For instance, although future time perspective is usually associated with healthy psychological functioning (Zimbardo & Boyd, 1999), too much emphasis on the future and too little in the present can cause the failure to notice some important hedonistic aspects of life that can only be experienced at the present, leading to later regrets (Boyd & Zimbardo, 2005; Wittmann & Paulus, 2009b). Future time perspective reflects a general future orientation, dominated by an effort in reaching future objectives, goals and rewards, and is characterized by planning (Zimbardo & Boyd, 1999), emerging as an important aspect of retirement savings planning (Jacobs-Lawson & Hershey, 2005). Past-Positive time perspective manifests a warm affective and nostalgic attitude towards the past reflecting a healthy view of life. Present-Fatalistic time perspective is not focused at all, lacking the future goals, the hedonistic excitement of the present and the nostalgia or bitterness of the past revealing a hopeless fatalistic attitude towards life and believing in the predestination of the future perceiving a total lack of control. The Present Hedonistic time perspective reflects a risky and hedonistic attitude towards time and life. It suggests an orientation for pleasure and excitement in the present, associated with low impulse control and great emphasis in the newness and search of sensations, without sacrifices today to have rewards tomorrow, and with little concern for the future consequences. Finally, the Past Negative time perspective reflects a pessimistic, negative or aversive vision of the past, suggesting trauma, pain and remorse. Again, due to the reconstructive nature of the past, these negative attitudes can derive from true experiences of traumatic or disagreeable events, or to the negative reconstructions of benign events, or even a compound of both situations (Zimbardo & Boyd, 1999).

Appendix B: Study I – Stimuli for fixed choice task and examples of fixed choice and financial literacy tasks

Module 1: Fixed choice in neutral context

Table B1

Stimuli for choice task options

LL	SS	Delay	Rate
90	65	6	0,81
115	85		
180	55	24	
245	75		
270	200	6	
580	430		
920	280	24	
1870	570		

Note: Delay is in months.

Instructions

The next 8 questions allow us to understand how people think about receiving money now or in the future. Your only task is to indicate which option you prefer. There is no right or wrong answer, we are only interested in your personal opinion. Below is a sample of the questions.

Example:
Choose the option you prefer:

a) Receive € 330 in 12 months.
b) Receive € 165 today.

Example

Choose the option you prefer:

- Receive € 180 in 12 months.
- Receive € 55 today.

Module 2: Financial literacy

Instructions

In the next 5 questions you must select an answer between the four alternatives presented.

Example:

If the probability of developing a certain disease is 10%, how many people in 1000 should we expect to contract the disease?

- ❍ 100
- ❍ 10
- ❍ 110
- ❍ I don't know.

Appendix C: Statistical outputs from Study I

Retirement motivation indicator construction

Retirement motivation was measured by a composite indicator constructed based on the amount of thought about retirement, number and importance given to retirement goals, designated by BART factor score in the following tables.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,526
Bartlett's Test of Sphericity	Approx. Chi-Square	132,704
	df	3
	Sig.	,000

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1,954	65,122	65,122	1,954	65,122	65,122
2	,858	28,594	93,717			
3	,189	6,283	100,000			

Note: Extraction Method: Principal Component Analysis.

Descriptive Statistics

	N	Minimum	Maximum	Mean

BART factor score	118	-1,33252	2,39094	,0000000
Valid N (listwise)	118			

Descriptive Statistics

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
BART factor score	118	,454	,223	-1,281	,442
Valid N (listwise)	118				

Data analysis

Analysis of the PCRP scale

The factor loadings are reported in Table 2.

Reliability analysis with all of the scale items:

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,665	,668	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
1- I'm always postponing my retirement planning.	26,7391	33,861	,417	,307	,617
2- It's easy to choose a financial product to invest my retirement savings. (R)	25,8609	33,998	,451	,277	,608
3- I already started to plan my retirement. (R)	26,4348	32,879	,366	,326	,634
4- I'm afraid to make a poor financial choice and make a bad investment choice.	26,1043	33,814	,442	,371	,610
5- When I try to invest my savings, I get too anxious and I give up.	27,2870	35,084	,362	,290	,633
6- I spend a lot of time analyzing financial investment products. (R)	25,7652	37,479	,227	,108	,670
7- The information about financial products is very complex.	25,8261	36,075	,367	,257	,632

Reliability analysis with scale item 6 removed:

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,670	,677	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
1- I'm always postponing my retirement planning.	21,83	27,543	,406	,305	,626
2- It's easy to choose a financial product to invest my retirement savings. (R)	20,96	27,761	,435	,260	,617
3- I already started to plan my retirement. (R)	21,53	27,427	,310	,301	,667
4- I'm afraid to make a poor financial choice and make a bad investment choice.	21,20	26,828	,477	,371	,602
5- When I try to invest my savings, I get too anxious and I give up.	22,38	28,028	,391	,290	,631
7- The information about financial products is very complex.	20,92	28,880	,404	,254	,628

Analysis of the KFRP scale

The factor loadings are reported in Table 3.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,846	,846	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
- I am very knowledgeable about financial planning for retirement.	19,22	34,066	,759	,604	,795
- I know more than most people about retirement planning.	19,33	35,364	,644	,485	,817
- I am very confident in my ability to do retirement planning.	18,03	37,061	,592	,444	,827
- When I have a need for financial services, I know exactly where to obtain information on what to do.	18,11	35,470	,632	,484	,819
- I am knowledgeable about how Social Security works.	18,74	37,914	,487	,265	,847
- I am knowledgeable about how private investment plans work	19,23	34,685	,655	,479	,815

Analysis of the SGS scale

The factor loadings are reported in Table 4.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,839	,839	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
- Made meaningful contributions to a voluntary savings plan.	17,49	28,129	,606	,392	,817
- Relative to my peers, I have saved a great deal.	17,03	27,938	,699	,524	,790
- Accumulated substantial savings.	17,77	27,001	,723	,557	,782
- Made a conscious effort to save.	15,96	31,182	,551	,322	,829
- Based on how I plan to live my life, I have saved accordingly.	16,83	29,034	,635	,412	,808

Analysis of the FPD scale

The factor loadings are reported in Table 5.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,765	,767	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
- Participated in workshop, seminar, or course on retirement planning.	14,71	21,680	,276	,140	,767
- Read books/articles/brochures about retirement planning.	13,80	17,933	,534	,429	,728
- Visited retirement planning web sites on the Internet.	14,19	18,051	,549	,393	,726
- Assessed/reassessed my net worth.	13,41	17,893	,446	,273	,745
- Calculated the cost of living during retirement.	14,05	18,015	,544	,335	,726
- Made long-term investments.	13,36	17,968	,443	,280	,745
- Made contributions to retirement savings plans.	13,70	17,807	,413	,292	,753
- Discussed retirement financial planning with a professional in the field.	14,17	17,981	,535	,308	,728

Study I Results

Hypotheses tests

Linear regression 1

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,395[a]	,156	,150	2,617	2,047

a. Predictors: (Constant), Financial literacy

b. Dependent Variable: Impatience

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1,369	,692		1,978	,050					
	Financial literacy	,912	,180	,395	5,057	,000	,395	,395	,395	1,000	1,000

a. Dependent Variable: Impatience

Linear regression 2

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,193[a]	,037	,029	6,034	1,626

a. Predictors: (Constant), Financial literacy

b. Dependent Variable: Psy.Costs

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	29,553	1,900		15,558	,000					
	Financial literacy	-,992	,475	-,193	-2,088	,039	-,193	-,193	-,193	1,000	1,000

a. Dependent Variable: Psychological costs

Linear regression 3

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,220[a]	,049	,040	4,726	1,298

a. Predictors: (Constant), Financial literacy

b. Dependent Variable: Retirement planning

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	12,498	1,488		8,400	,000					
	Financial literacy	,895	,372	,220	2,403	,018	,220	,220	,220	1,000	1,000

a. Dependent Variable: Retirement planning

Spearman nonparametric correlations

Correlations

			Financial literacy	Retirement planning)
Spearman's rho	Financial literacy	Correlation Coefficient	1,000	,238*
		Sig. (2-tailed)	.	,010
		N	140	115
	Retirement planning)	Correlation Coefficient	,238*	1,000
		Sig. (2-tailed)	,010	.
		N	115	115

*. Correlation is significant at the 0.05 level (2-tailed).

Linear regression 4

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,016[a]	,000	-,008	6,548	2,155

a. Predictors: (Constant), Financial literacy

b. Dependent Variable: Subjective savings

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	20,869	1,994		10,468	,000
	Financial literacy	,086	,501	,016	,171	,864

a. Dependent Variable: Subjective savings

Linear regression 5

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,513[a]	,263	,256	4,160	1,412

a. Predictors: (Constant), Retirement motivation

b. Dependent Variable: Retirement planning

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	15,899	,388		40,985	,000					
	Retirement motivation	2,467	,389	,513	6,350	,000	,513	,513	,513	1,000	1,000

a. Dependent Variable: Retirement planning

Spearman nonparametric correlations

Correlations

			Retirement planning	Retirement motivation
Spearman's rho	Retirement planning	Correlation Coefficient	1,000	,544**
		Sig. (2-tailed)	.	,000
		N	115	115
	Retirement motivation	Correlation Coefficient	,544**	1,000
		Sig. (2-tailed)	,000	.
		N	115	115

**. Correlation is significant at the 0.01 level (2-tailed).

Linear regression 6

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,358[a]	,128	,120	6,153	1,796

a. Predictors: (Constant), Retirement motivation

b. Dependent Variable: Subjective savings

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	21,256	,574		37,048	,000					
	Retirement motivation	2,343	,575	,358	4,077	,000	,358	,358	,358	1,000	1,000

a. Dependent Variable: Subjective savings

Linear regression 7

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,407[a]	,166	,159	6,483	1,618

a. Predictors: (Constant), Retirement motivation

b. Dependent Variable: Retirement planning knowledge

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	22,514	,605		37,239	,000					
	Retirement motivation	2,871	,606	,407	4,742	,000	,407	,407	,407	1,000	1,000

a. Dependent Variable: Retirement planning knowledge

Linear regression 8

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,347[a]	,120	,112	5,768	2,039

a. Predictors: (Constant), Retirement motivation

b. Dependent Variable: Psychological costs

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	25,778	,538		47,923	,000
	Retirement motivation	-2,115	,539	-,347	-3,927	,000

a. Dependent Variable: Psychological costs

Linear regression 9

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,569[a]	,324	,318	5,055	2,112

a. Predictors: (Constant), Retirement planning knowledge

b. Dependent Variable: Psychological costs

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	36,878	1,581		23,324	,000			
	Retirement planning knowledge	-,493	,067	-,569	-7,363	,000	-,569	-,569	-,569

a. Dependent Variable: Psychological costs

Linear regression 10

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,389[a]	,152	,144	4,463	1,376

a. Predictors: (Constant), Psychological costs

b. Dependent Variable: Retirement planning

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	23,821	1,808		13,177	,000					
	Psychological costs	-,307	,068	-,389	-4,495	,000	-,389	-,389	-,389	1,000	1,000

a. Dependent Variable: Retirement planning

Correlations

			Retirement planning	Psychological costs
Spearman's rho	Retirement planning	Correlation Coefficient	1,000	-,383**
		Sig. (2-tailed)	.	,000
		N	115	115
	Psychological costs	Correlation Coefficient	-,383**	1,000
		Sig. (2-tailed)	,000	.
		N	115	115

**. Correlation is significant at the 0.01 level (2-tailed).

Linear regression 11

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,423[a]	,179	,172	5,971	1,987

a. Predictors: (Constant), Psychological costs

b. Dependent Variable: Subjective savings

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	32,948	2,419		13,623	,000					
	Psychological costs	-,453	,091	-,423	-4,962	,000	-,423	-,423	-,423	1,000	1,000

a. Dependent Variable: Subjective savings

T-student test 1

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Impatience	Equal variances assumed	1,305	,255	1,858	138	,065	,895	,482	-,058	1,847
	Equal variances not assumed			1,889	131,974	,061	,895	,474	-,042	1,832

Anova 1

Test of Homogeneity of Variances

Impatience

Levene Statistic	df1	df2	Sig.
1,120	2	137	,329

ANOVA

Impatience

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	31,625	2	15,813	1,990	,141
Within Groups	1088,546	137	7,946		
Total	1120,171	139			

T-student test 2

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Impatience	Equal variances assumed	,900	,344	1,109	137	,269	,575	,518	-,450	1,600
	Equal variances not assumed			1,072	77,173	,287	,575	,537	-,493	1,644

Linear regression 12

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,199[a]	,039	,031	4,676	1,990

a. Predictors: (Constant), Age

b. Dependent Variable: Retirement planning

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	12,001	1,864		6,440	,000		
	Age	,102	,048	,199	2,135	,035	1,000	1,000

a. Dependent Variable: Retirement planning

Pearson correlations

Correlations

		Impatience	Subjective savings
Impatience	Pearson Correlation	1	,111
	Sig. (2-tailed)		,240
	N	140	115
Subjective savings	Pearson Correlation	,111	1
	Sig. (2-tailed)	,240	
	N	115	115

Research questions *Q.1*, *Q.2* and *Q.3*

Because income was of optional answer and not all participants answered it, all analyses considering demographic variables were made with and without income. When income was considered, analyses were performed without and with the detected outlier. Therefore, in most of the following cases, there are three similar analyses (e.g. multiple linear regressions 13, 13a, and 13b).

Income * Gender Crosstabulation

Count

		Gender		
		Male	Female	Total
Income	Less than 700	1	6	7
	700-1399	9	26	35
	1400-2099	12	12	24
	2100-2799	8	9	17
	2800-3499	7	3	10
	3500-4199	4	3	7
	4200-4899	2	1	3
	4900-5599	2	1	3
	5600-6299	0	3	3
	7000 or more	1	0	1
Total		46	64	110

Symmetric Measures

		Value	Approx. Sig.	Exact Sig.
Nominal by Nominal	Phi	,379	,072	,052
	Cramer's V	,379	,072	,052
N of Valid Cases		110		

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Financial literacy	Equal variances assumed	9,136	,003	4,702	138	,000	,923	,196	,535	1,311
	Equal variances not assumed			4,976	137,599	,000	,923	,185	,556	1,289
Retirement planning knowledge	Equal variances assumed	,140	,709	1,842	113	,068	2,411	1,309	-,182	5,003
	Equal variances not assumed			1,830	106,818	,070	2,411	1,317	-,200	5,022

Multiple linear regressions 13, 13a, and 13b (Retirement motivation)

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,307[a]	,094	,084	,96153928	
2	,366[b]	,134	,114	,94553269	
3	,431[c]	,186	,157	,92228448	2,093

a. Predictors: (Constant), Age

b. Predictors: (Constant), Age, Income

c. Predictors: (Constant), Age, Income, Education

d. Dependent Variable: Retirement motivation

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-1,200	,407		-2,947	,004					
	Age	,032	,011	,307	3,029	,003	,307	,307	,307	1,000	1,000
2	(Constant)	-1,257	,401		-3,132	,002					
	Age	,046	,013	,441	3,673	,000	,307	,366	,366	,690	1,450
	Income	-,131	,065	-,240	-2,001	,048	,005	-,210	-,200	,690	1,450
3	(Constant)	-2,150	,548		-3,927	,000					
	Age	,051	,012	,482	4,066	,000	,307	,402	,396	,675	1,482
	Income	-,182	,068	-,334	-2,699	,008	,005	-,279	-,263	,617	1,622
	Education	,130	,056	,240	2,333	,022	,165	,244	,227	,892	1,121

a. Dependent Variable: Retirement motivation

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,307[a]	,094	,084	,96153928	
2	,366[b]	,134	,114	,94553269	
3	,431[c]	,186	,157	,92228448	2,093

a. Predictors: (Constant), Age

b. Predictors: (Constant), Age, Income

c. Predictors: (Constant), Age, Income, Education

d. Dependent Variable: Retirement motivation

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-1,200	,407		-2,947	,004					
	Age	,032	,011	,307	3,029	,003	,307	,307	,307	1,000	1,000
2	(Constant)	-1,257	,401		-3,132	,002					
	Age	,046	,013	,441	3,673	,000	,307	,366	,366	,690	1,450
	Income	-,131	,065	-,240	-2,001	,048	,005	-,210	-,200	,690	1,450
3	(Constant)	-2,150	,548		-3,927	,000					
	Age	,051	,012	,482	4,066	,000	,307	,402	,396	,675	1,482
	Income	-,182	,068	-,334	-2,699	,008	,005	-,279	-,263	,617	1,622
	Education	,130	,056	,240	2,333	,022	,165	,244	,227	,892	1,121

a. Dependent Variable: Retirement motivation

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,309[a]	,096	,088	,95788948	1,961

a. Predictors: (Constant), Age

b. Dependent Variable: Retirement motivation

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-1,211	,363		-3,333	,001					
	Age	,032	,009	,309	3,456	,001	,309	,309	,309	1,000	1,000

a. Dependent Variable: Retirement motivation

Multiple linear regressions 14, 14a and 14b (Financial literacy)

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,420[a]	,176	,168	1,111	
2	,522[b]	,273	,259	1,049	
3	,570[c]	,324	,305	1,015	
4	,597[d]	,356	,331	,996	1,874

a. Predictors: (Constant), Age

b. Predictors: (Constant), Age, Gender

c. Predictors: (Constant), Age, Gender, Education

d. Predictors: (Constant), Age, Gender, Education, Income

e. Dependent Variable: Financial literacy

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1,929	,365		5,292	,000					
	Age	,049	,010	,420	4,781	,000	,420	,420	,420	1,000	1,000
2	(Constant)	2,696	,400		6,736	,000					
	Age	,040	,010	,343	4,020	,000	,420	,364	,333	,943	1,061
	Gender	-,788	,210	-,320	-3,752	,000	-,402	-,342	-,311	,943	1,061
3	(Constant)	1,817	,496		3,664	,000					
	Age	,036	,010	,307	3,669	,000	,420	,337	,294	,921	1,086
	Gender	-,811	,204	-,329	-3,983	,000	-,402	-,362	-,319	,941	1,062
	Education	,151	,053	,230	2,840	,005	,275	,267	,228	,977	1,024
4	(Constant)	1,841	,487		3,781	,000					
	Age	,026	,010	,226	2,530	,013	,420	,241	,199	,774	1,292
	Gender	-,765	,201	-,311	-3,809	,000	-,402	-,350	-,300	,932	1,073
	Education	,123	,054	,188	2,299	,024	,275	,220	,181	,925	1,081
	Income	,132	,058	,204	2,255	,026	,413	,216	,177	,753	1,328

a. Dependent Variable: Financial literacy

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,422[a]	,178	,170	1,106	
2	,522[b]	,273	,259	1,045	
3	,571[c]	,325	,306	1,011	2,025

a. Predictors: (Constant), Age

b. Predictors: (Constant), Age, Gender

c. Predictors: (Constant), Age, Gender, Education

d. Dependent Variable: Financial literacy

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1,934	,359		5,391	,000					
	Age	,048	,010	,422	4,832	,000	,422	,422	,422	1,000	1,000
2	(Constant)	2,659	,391		6,810	,000					
	Age	,040	,010	,352	4,161	,000	,422	,373	,343	,951	1,051
	Gender	-,774	,207	-,316	-3,739	,000	-,394	-,340	-,308	,951	1,051
3	(Constant)	1,790	,484		3,701	,000					
	Age	,036	,010	,312	3,766	,000	,422	,343	,300	,925	1,081
	Gender	-,803	,201	-,328	-4,002	,000	-,394	-,362	-,319	,949	1,054
	Education	,152	,053	,233	2,878	,005	,278	,269	,230	,973	1,028

a. Dependent Variable: Financial literacy

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,375[a]	,141	,133	1,112	
2	,455[b]	,207	,192	1,073	
3	,514[c]	,265	,244	1,038	2,039

a. Predictors: (Constant), Gender

b. Predictors: (Constant), Gender, Education

c. Predictors: (Constant), Gender, Education, Age

d. Dependent Variable: Financial literacy

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	4,288	,154		27,812	,000		
	Gender	-,895	,210	-,375	-4,265	,000	1,000	1,000
2	(Constant)	3,103	,419		7,397	,000		
	Gender	-,873	,203	-,366	-4,306	,000	,999	1,001
	Education	,169	,056	,257	3,023	,003	,999	1,001
3	(Constant)	1,792	,604		2,968	,004		
	Gender	-,744	,201	-,312	-3,704	,000	,951	1,052
	Education	,174	,054	,264	3,214	,002	,998	1,002
	Age	,032	,011	,247	2,930	,004	,952	1,051

a. Dependent Variable: Financial literacy

Multiple linear regressions 15, 15a and 15b (Retirement planning knowledge)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,255[a]	,065	,057	6,864	2,300

a. Predictors: (Constant), Education

b. Dependent Variable: Retirement planning knowledge

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	15,592	2,555		6,102	,000					
	Education	,999	,356	,255	2,805	,006	,255	,255	,255	1,000	1,000

a. Dependent Variable: Retirement planning knowledge

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,308[a]	,095	,085	6,758	
2	,368[b]	,135	,115	6,644	2,289

a. Predictors: (Constant), Education

b. Predictors: (Constant), Education, Gender

c. Dependent Variable: Retirement planning knowledge

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	14,254	2,814		5,066	,000					
	Education	1,176	,387	,308	3,037	,003	,308	,308	,308	1,000	1,000
2	(Constant)	15,707	2,859		5,494	,000					
	Education	1,188	,381	,311	3,123	,002	,308	,317	,311	1,000	1,000
	Gender	-2,832	1,406	-,201	-2,014	,047	-,196	-,211	-,201	1,000	1,000

a. Dependent Variable: Retirement planning knowledge

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,308[a]	,095	,085	6,758	
2	,368[b]	,135	,115	6,644	2,289

a. Predictors: (Constant), Education

b. Predictors: (Constant), Education, Gender

c. Dependent Variable: Retirement planning knowledge

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	14,254	2,814		5,066	,000					
	Education	1,176	,387	,308	3,037	,003	,308	,308	,308	1,000	1,000
2	(Constant)	15,707	2,859		5,494	,000					
	Education	1,188	,381	,311	3,123	,002	,308	,317	,311	1,000	1,000
	Gender	-2,832	1,406	-,201	-2,014	,047	-,196	-,211	-,201	1,000	1,000

a. Dependent Variable: Retirement planning knowledge

Multiple linear regression 16 (Psychological costs)

No variables were entered into the equation.

Multiple linear regressions 17, 17a and 17b (Retirement planning)

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,510[a]	,260	,252	4,368	
2	,606[b]	,368	,353	4,061	1,635

a. Predictors: (Constant), Retirement planning knowledge

b. Predictors: (Constant), Retirement planning knowledge, Retirement motivation

c. Dependent Variable: Retirement planning

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	7,780	1,546		5,031	,000					
	Retirement planning knowledge	,364	,066	,510	5,561	,000	,510	,510	,510	1,000	1,000
2	(Constant)	10,117	1,561		6,482	,000					
	Retirement planning knowledge	,261	,067	,365	3,921	,000	,510	,388	,334	,837	1,194
	Retirement motivation	1,802	,468	,359	3,849	,000	,506	,381	,328	,837	1,194

a. Dependent Variable: Retirement planning

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,510[a]	,260	,252	4,368	
2	,606[b]	,368	,353	4,061	1,635

a. Predictors: (Constant), Retirement planning knowledge

b. Predictors: (Constant), Retirement planning knowledge, Retirement motivation

c. Dependent Variable: Retirement planning

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	7,780	1,546		5,031	,000					
	Retirement planning knowledge	,364	,066	,510	5,561	,000	,510	,510	,510	1,000	1,000
2	(Constant)	10,117	1,561		6,482	,000					
	Retirement planning knowledge	,261	,067	,365	3,921	,000	,510	,388	,334	,837	1,194
	Retirement motivation	1,802	,468	,359	3,849	,000	,506	,381	,328	,837	1,194

a. Dependent Variable: Retirement planning

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,515[a]	,265	,259	4,153	
2	,613[b]	,375	,364	3,846	
3	,632[c]	,400	,384	3,787	1,695

a. Predictors: (Constant), Retirement planning knowledge

b. Predictors: (Constant), Retirement planning knowledge, Retirement motivation

c. Predictors: (Constant), Retirement planning knowledge, Retirement motivation, Financial literacy

d. Dependent Variable: Retirement planning

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	7,991	1,299		6,151	,000					
	Retirement planning knowledge	,352	,055	,515	6,389	,000	,515	,515	,515	1,000	1,000
2	(Constant)	10,257	1,307		7,849	,000					
	Retirement planning knowledge	,251	,056	,367	4,490	,000	,515	,391	,335	,834	1,199
	Retirement motivation	1,748	,393	,363	4,442	,000	,513	,387	,332	,834	1,199
3	(Constant)	8,271	1,589		5,204	,000					
	Retirement planning knowledge	,229	,056	,336	4,107	,000	,515	,363	,302	,808	1,238
	Retirement motivation	1,798	,388	,374	4,634	,000	,513	,403	,341	,831	1,204
	Financial literacy	,645	,303	,159	2,128	,036	,220	,198	,156	,968	1,033

a. Dependent Variable: Retirement planning

Multiple linear regressions 18,18a and 18b

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,421[a]	,177	,168	6,033	
2	,475[b]	,226	,208	5,886	
3	,526[c]	,276	,251	5,723	1,930

a. Predictors: (Constant), Psychological costs

b. Predictors: (Constant), Psychological costs, Retirement motivation

c. Predictors: (Constant), Psychological costs, Retirement motivation, Age

d. Dependent Variable: Subjective savings

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	32,951	2,711		12,156	,000					
	Psychological costs	-,440	,101	-,421	-4,354	,000	-,421	-,421	-,421	1,000	1,000
2	(Constant)	30,800	2,801		10,994	,000					
	Psychological costs	-,357	,105	-,342	-3,408	,001	-,421	-,343	-,322	,885	1,130
	Retirement motivation	1,538	,660	,234	2,330	,022	,350	,242	,220	,885	1,130
3	(Constant)	36,891	3,683		10,016	,000					
	Psychological costs	-,358	,102	-,343	-3,517	,001	-,421	-,355	-,323	,885	1,130
	Retirement motivation	2,015	,670	,306	3,005	,003	,350	,308	,276	,811	1,233
	Age	-,164	,067	-,237	-2,457	,016	-,106	-,256	-,225	,906	1,104

a. Dependent Variable: Subjective savings

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,421[a]	,177	,168	6,033	
2	,475[b]	,226	,208	5,886	
3	,526[c]	,276	,251	5,723	1,930

a. Predictors: (Constant), Psychological costs

b. Predictors: (Constant), Psychological costs, Retirement motivation

c. Predictors: (Constant), Psychological costs, Retirement motivation, Age

d. Dependent Variable: Subjective savings

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	32,951	2,711		12,156	,000					
	Psychological costs	-,440	,101	-,421	-4,354	,000	-,421	-,421	-,421	1,000	1,000
2	(Constant)	30,800	2,801		10,994	,000					
	Psychological costs	-,357	,105	-,342	-3,408	,001	-,421	-,343	-,322	,885	1,130
	Retirement motivation	1,538	,660	,234	2,330	,022	,350	,242	,220	,885	1,130
3	(Constant)	36,891	3,683		10,016	,000					
	Psychological costs	-,358	,102	-,343	-3,517	,001	-,421	-,355	-,323	,885	1,130
	Retirement motivation	2,015	,670	,306	3,005	,003	,350	,308	,276	,811	1,233
	Age	-,164	,067	-,237	-2,457	,016	-,106	-,256	-,225	,906	1,104

a. Dependent Variable: Subjective savings

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,428[a]	,183	,176	5,956	
2	,480[b]	,231	,217	5,806	
3	,520[c]	,270	,250	5,681	
4	,573[d]	,328	,304	5,474	1,827

a. Predictors: (Constant), Retirement planning knowledge

b. Predictors: (Constant), Retirement planning knowledge, Psychological costs

c. Predictors: (Constant), Retirement planning knowledge, Psychological costs, Age

d. Predictors: (Constant), Retirement planning knowledge, Psychological costs, Age, Retirement motivation

e. Dependent Variable: Subjective savings

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	12,322	1,863		6,614	,000					
	Retirement planning knowledge	,397	,079	,428	5,032	,000	,428	,428	,428	1,000	1,000
2	(Constant)	22,811	4,379		5,210	,000					
	Retirement planning knowledge	,257	,094	,277	2,745	,007	,428	,251	,227	,676	1,480
	Psychological costs	-,284	,108	-,265	-2,633	,010	-,423	-,241	-,218	,676	1,480
3	(Constant)	27,914	4,766		5,856	,000					
	Retirement planning knowledge	,267	,092	,288	2,914	,004	,428	,267	,236	,674	1,483
	Psychological costs	-,293	,106	-,273	-2,767	,007	-,423	-,254	-,224	,675	1,481
	Age	-,134	,055	-,199	-2,443	,016	-,157	-,226	-,198	,993	1,007
4	(Constant)	30,396	4,662		6,519	,000					
	Retirement planning knowledge	,190	,092	,205	2,070	,041	,428	,194	,162	,625	1,601
	Psychological costs	-,245	,103	-,229	-2,376	,019	-,423	-,221	-,186	,660	1,515
	Age	-,186	,056	-,276	-3,354	,001	-,157	-,305	-,262	,901	1,109
	Retirement motivation	1,837	,595	,281	3,090	,003	,358	,283	,241	,740	1,352

a. Dependent Variable: Subjective savings

Pearson correlations

Correlations

		Subjective savings	Retirement planning
Subjective savings	Pearson Correlation	1	,473**
	Sig. (2-tailed)		,000
	N	90	90
Retirement planning	Pearson Correlation	,473**	1
	Sig. (2-tailed)	,000	
	N	90	90

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations

		Subjective savings	Retirement planning
Subjective savings	Pearson Correlation	1	,437**
	Sig. (2-tailed)		,000
	N	115	115
Retirement planning	Pearson Correlation	,437**	1
	Sig. (2-tailed)	,000	
	N	115	115

**. Correlation is significant at the 0.01 level (2-tailed).

Multiple linear regression 19 e 19a

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,568[a]	,323	,315	5,240	2,057

a. Predictors: (Constant), Retirement planning knowledge

b. Dependent Variable: Psychological costs

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	37,558	1,855		20,247	,000		
	Retirement planning knowledge	-,509	,079	-,568	-6,476	,000	1,000	1,000

a. Dependent Variable: Psychological costs

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,569[a]	,324	,318	5,055	2,070

a. Predictors: (Constant), Retirement planning knowledge

b. Dependent Variable: Psychological costs

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	36,878	1,581		23,324	,000		
	Retirement planning knowledge	-,493	,067	-,569	-7,363	,000	1,000	1,000

a. Dependent Variable: Psychological costs

Appendix D: Study II – Stimuli and examples of fixed choice questions in neutral and retirement context

Table D1

Stimuli for the choice task options

Group 1			Group 2		
Annual rate	4,0%	6,0%	Annual rate	4,0%	6,0%
Delay (years)	3	3	Delay (years)	3	3
Investment	5120	5100	Investment	5110	5130
Value	5759	6074	Value	5748	6110
Rounded to	**5760**	**6070**	Rounded to	**5750**	**6110**
Annual rate	4,0%	6,0%	Annual rate	4,0%	6,0%
Delay (years)	3	3	Delay (years)	3	3
Investment	10100	10120	Investment	10130	10110
Value	11361	12053	Value	11395	12041
Rounded to	**11360**	**12050**	Rounded to	**11400**	**12040**
Annual rate	4,0%	6,0%	Annual rate	4,0%	6,0%
Delay (years)	6	6	Delay (years)	6	6
Investment	5100	5120	Investment	5130	5110
Value	6453	7263	Value	6491	7249
Rounded to	**6450**	**7260**	Rounded to	**6490**	**7250**
Annual rate	4,0%	6,0%	Annual rate	4,0%	6,0%
Delay (years)	6	6	Delay (years)	6	6
Investment	10120	10100	Investment	10110	10130
Value	12805	14327	Value	12792	14370
Rounded to	**12810**	**14330**	Rounded to	**12790**	**14370**

Group 1 Example

In the next 8 questions, your task is to choose the option you prefer. You have money to receive. You can receive it now, or wait and obtain more. There is no right or wrong answer. We just want to know toy personal opinion.

Q1 You have money to receive. Chose the option you prefer:

- ❍ Receive € 5.120 today. (0)
- ❍ Obtain € 5.760 in 3 years. (1)

Group 2 example

We now ask you to think about the next 8 questions as decisions about whether, or not, to invest in retirement. You have money to receive. You can receive it now, or invest it for retirement and obtain more in the future. Consider these to be term investments by the period of time expressed in the "…invest…" option, with a guaranteed minimum return. As before, there is no right or wrong answer, we just want to know toy personal opinion

Q1 You have money to receive. Chose the option you prefer:

- Receive € 5.100 today. (0)
- Invest € 5.100 today for retirement and obtain € 5.740 in 3 years. (1)

Appendix E: Statistical outputs from Study II

Data analysis

Analysis of the PCRP scale

The factor loadings are reported in Table 8.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,694	,698	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
1- I'm always postponing my retirement planning.	22,4158	32,964	,340	,242	,680
2- It's easy to choose a financial product to invest my retirement savings. (R)	21,3316	30,170	,486	,264	,634
3- I already started to plan my retirement. (R)	21,9684	31,290	,325	,294	,692
4- I'm afraid to make a poor financial choice and make a bad investment choice.	21,4000	29,384	,546	,389	,614
5- When I try to invest my savings, I get too anxious and I give up.	22,5842	30,096	,519	,357	,624
6- The information about financial products is very complex.	21,2474	33,277	,357	,317	,674

Study II Results

Hypotheses tests

H1.

Imp is impatience in neutral context, *Imp2* is impatience in retirement context and *Imp_Dif* is the variation of impatience between contexts.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Imp - Imp2	-2,186	2,985	,214	-2,608	-1,763	-10,199	193	,000

H2 .

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,143[a]	,020	,015	2,97759	2,189

a. Predictors: (Constant), Psychological costs

b. Dependent Variable: Imp_Dif

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,484	,898		,539	,590
	Psychological costs	,396	,200	,143	1,980	,049

a. Dependent Variable: Imp_Dif

H2.1

Tests of Between-Subjects Effects

Dependent Variable:Imp_Dif

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	58,838[a]	2	29,419	3,349	,037	,035	6,698	,627
Intercept	508,331	1	508,331	57,865	,000	,236	57,865	1,000
PsyCosts_group	58,838	2	29,419	3,349	,037	,035	6,698	,627
Error	1642,741	187	8,785					
Total	2630,000	190						
Corrected Total	1701,579	189						

a. R Squared = ,035 (Adjusted R Squared = ,024)

b. Computed using alpha = ,05

Multiple Comparisons

Dependent Variable:Imp_Dif

	(I) PsyCosts_group	(J) PsyCosts_group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Dunnett t (<control)	Low	High	-1,7500*	,77208	,023		-,2535
	Medium	High	-1,0088*	,48366	,036		-,0713

Based on observed means.

The error term is Mean Square(Error) = 8,785.

*. The mean difference is significant at the ,05 level.

H3.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,283[a]	,080	,075	1,544	2,210

a. Predictors: (Constant), Psychological costs

b. Dependent Variable: Affective valence

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	5,799	,466		12,447	,000		
	Psychological costs	-,419	,104	-,283	-4,046	,000	1,000	1,000

a. Dependent Variable: Affective valence

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions	
				(Constant)	Psychological costs
1	1	1,971	1,000	,01	,01
	2	,029	8,194	,99	,99

a. Dependent Variable: Affective valence

Correlations

		Psychological costs	Affective valence
Psychological costs	Pearson Correlation	1	-,283**
	Sig. (2-tailed)		,000
	N	190	190
Affective valence	Pearson Correlation	-,283**	1
	Sig. (2-tailed)	,000	
	N	190	194

**. Correlation is significant at the 0.01 level (2-tailed).

H3.1

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Affective valence

F	df1	df2	Sig.
.744	2	187	.477

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + PsyCosts_group

Tests of Between-Subjects Effects

Dependent Variable:Affective valence

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	37.753[a]	2	18.876	7.913	.001	.078	15.827	.952
Intercept	1951.792	1	1951.792	818.246	.000	.814	818.246	1.000
PsyCosts_group	37.753	2	18.876	7.913	.001	.078	15.827	.952
Error	446.058	187	2.385					
Total	3476.000	190						
Corrected Total	483.811	189						

a. R Squared = .078 (Adjusted R Squared = .068)

b. Computed using alpha = .05

Multiple Comparisons

Affective valence

Dunnett t (<control)

(I) PsyCosts_group	(J) PsyCosts_group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Upper Bound
Medium	Low	-.61	.374	.079	.09
High	Low	-1.41*	.402	.001	-.66

Based on observed means.

The error term is Mean Square(Error) = 2.385.

*. The mean difference is significant at the .05 level.

One-Sample Test

	Test Value = 4					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference Lower	Upper
Affective valence	-3,161	55	,003	-,661	-1,08	-,24

H3.2

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,381[a]	,145	,139	1,499	
2	,462[b]	,213	,202	1,443	1,940

a. Predictors: (Constant), Psychological costs

b. Predictors: (Constant), Psychological costs, Income

c. Dependent Variable: Affective valence

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	6,629	,538		12,322	,000		
	Psychological costs	-,586	,118	-,381	-4,956	,000	1,000	1,000
2	(Constant)	5,423	,620		8,744	,000		
	Psychological costs	-,482	,118	-,313	-4,096	,000	,937	1,067
	Income	,181	,051	,270	3,534	,001	,937	1,067

a. Dependent Variable: Affective valence

Correlations

		Psychological costs	Income
Psychological costs	Pearson Correlation	1	-.251**
	Sig. (2-tailed)		.002
	N	190	147
Income	Pearson Correlation	-.251**	1
	Sig. (2-tailed)	.002	
	N	147	151

**. Correlation is significant at the 0.01 level (2-tailed).

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	Psychological costs	Income
1	1	1,973	1,000	,01	,01	
	2	,027	8,589	,99	,99	
2	1	2,767	1,000	,00	,01	,03
	2	,211	3,619	,01	,06	,76
	3	,022	11,342	,98	,93	,22

a. Dependent Variable: Affective valence

H4.1

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Affective valence

F	df1	df2	Sig.
,110	1	192	,740

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Gender

Tests of Between-Subjects Effects

Dependent Variable: Affective valence

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	17,483[a]	1	17,483	6,988	,009	,035	6,988	,749
Intercept	2991,833	1	2991,833	1195,907	,000	,862	1195,907	1,000
Gender	17,483	1	17,483	6,988	,009	,035	6,988	,749
Error	480,332	192	2,502					
Total	3554,000	194						
Corrected Total	497,814	193						

a. R Squared = ,035 (Adjusted R Squared = ,030)

b. Computed using alpha = ,05

One-Sample Test

	Test Value = 4					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Affective valence	1,964	73	,053	,351	-,01	,71

One-Sample Test

	Test Value = 4					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Affective valence	-1,817	119	,072	-,267	-,56	,02

H4.2

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Psychological costs

F	df1	df2	Sig.
,261	1	188	,610

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Gender

Tests of Between-Subjects Effects

Dependent Variable: Psychological costs

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	8,744[a]	1	8,744	7,699	,006	,039	7,699	,788
Intercept	3324,711	1	3324,711	2927,465	,000	,940	2927,465	1,000
Gender	8,744	1	8,744	7,699	,006	,039	7,699	,788
Error	213,511	188	1,136					
Total	3842,222	190						
Corrected Total	222,255	189						

a. R Squared = ,039 (Adjusted R Squared = ,034)

b. Computed using alpha = ,05

H4.3

Income * Gender Crosstabulation

Count

		Gender		
		Male	Female	Total
Income	Less than 700	1	8	9
	700-1399	7	30	37
	1400-2099	10	20	30
	2100-2799	10	8	18
	2800-3499	10	12	22
	3500-4199	10	7	17
	4200-4899	4	1	5
	4900-5599	1	2	3
	5600-6299	1	2	3
	6300-6999	0	1	1
	7000 or more	1	5	6
Total		55	96	151

Symmetric Measures

		Value	Approx. Sig.	Exact Sig.
Nominal by Nominal	Phi	,369	,025	,016
	Cramer's V	,369	,025	,016
N of Valid Cases		151		

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Imp	Male	74	2,22	2,726	,317
	Female	120	1,93	2,518	,230
Imp2	Male	74	4,35	2,935	,341
	Female	120	4,14	3,027	,276

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Imp	Equal variances assumed	1,986	,160	,758	192	,449	,291	,384	-,466	1,049
	Equal variances not assumed			,744	145,323	,458	,291	,391	-,483	1,065
Imp2	Equal variances assumed	,166	,684	,474	192	,636	,210	,442	-,663	1,082
	Equal variances not assumed			,478	158,384	,634	,210	,439	-,658	1,077

Research questions *Q.1*, *Q.2* and *Q.3*

Levene's Test of Equality of Error Variances[a]

Dependent Variable:Imp2

F	df1	df2	Sig.
,000	1	192	,992

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Work status

Tests of Between-Subjects Effects

Dependent Variable:Imp2

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	32,313[a]	1	32,313	3,673	,057	,019	3,673	,479
Intercept	1867,571	1	1867,571	212,280	,000	,525	212,280	1,000
Work status	32,313	1	32,313	3,673	,057	,019	3,673	,479
Error	1689,156	192	8,798					
Total	5179,000	194						
Corrected Total	1721,469	193						

a. R Squared = ,019 (Adjusted R Squared = ,014)

b. Computed using alpha = ,05

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Imp

F	df1	df2	Sig.
1,901	1	192	,170

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Work status

Tests of Between-Subjects Effects

Dependent Variable:Imp

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	19,438[a]	1	19,438	2,913	,090	,015	2,913	,397
Intercept	393,170	1	393,170	58,915	,000	,235	58,915	1,000
Work status	19,438	1	19,438	2,913	,090	,015	2,913	,397
Error	1281,310	192	6,673					
Total	2105,000	194						
Corrected Total	1300,747	193						

a. R Squared = ,015 (Adjusted R Squared = ,010)

b. Computed using alpha = ,05

Correlations

		Imp neutral	Income
Imp	Pearson Correlation	1	,185*
	Sig. (2-tailed)		,023
	N	194	151
Income	Pearson Correlation	,185*	1
	Sig. (2-tailed)	,023	
	N	151	151

*. Correlation is significant at the 0.05 level (2-tailed).

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Psychological costs

F	df1	df2	Sig.
2,530	1	188	,113

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Work status

Tests of Between-Subjects Effects

Dependent Variable: Psychological costs

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	7,804[a]	1	7,804	6,841	,010	,035	6,841	,740
Intercept	2296,145	1	2296,145	2012,929	,000	,915	2012,929	1,000
Work status	7,804	1	7,804	6,841	,010	,035	6,841	,740
Error	214,451	188	1,141					
Total	3842,222	190						
Corrected Total	222,255	189						

a. R Squared = ,035 (Adjusted R Squared = ,030)

b. Computed using alpha = ,05

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Affective valence

F	df1	df2	Sig.
,017	1	192	,898

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Work status

Tests of Between-Subjects Effects

Dependent Variable: Affective valence

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	20,168[a]	1	20,168	8,107	,005	,041	8,107	,809
Intercept	1693,240	1	1693,240	680,633	,000	,780	680,633	1,000
Work status	20,168	1	20,168	8,107	,005	,041	8,107	,809
Error	477,646	192	2,488					
Total	3554,000	194						
Corrected Total	497,814	193						

a. R Squared = ,041 (Adjusted R Squared = ,036)

b. Computed using alpha = ,05

One-Sample Test

	Test Value = 4					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Affective valence	-2.796	37	.008	-.684	-1.18	-.19

One-Sample Test

	Test Value = 4					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Affective valence	1.005	155	.316	.128	-.12	.38

Appendix F: Statistical outputs from Study III

Retirement motivation indicator construction

Retirement motivation was measured by a composite indicator constructed based on number and importance given to retirement goals, designated by BART factor score in the following tables.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,500
Bartlett's Test of Sphericity	Approx. Chi-Square	78,079
	df	1
	Sig.	,000

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1,689	84,427	84,427	1,689	84,427	84,427
2	,311	15,573	100,000			

Extraction Method: Principal Component Analysis.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
BART factor score	124	-1,88027	1,79828	,0000000	1,00000000
Valid N (listwise)	124				

Descriptive Statistics

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
BART factor score	124	-,145	,217	-,237	,431
Valid N (listwise)	124				

Data analysis

Analysis of the FTP scale

The factor loadings are reported in Table 9.

Reliability analysis with all the scale items:

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,602	,599	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
1-I follow the advice to save for a rainy day.	21,28	23,391	,227	,176	,596
2-I enjoy thinking about how I will live years from now in the future.	21,71	21,069	,380	,204	,544
3-The distant future is too uncertain to plan for. (R)	22,83	17,833	,428	,241	,514
4-The future seems very vague and uncertain to me. (R)	23,70	23,349	,115	,126	,644
5-I pretty much live on a day-to-day basis. (R)	23,27	18,327	,412	,255	,522
6-I enjoy living for the moment and not knowing what tomorrow will bring. (R)	21,77	18,977	,481	,324	,497

Reliability analysis with scale item 4 removed:

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,644	,650	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
1-I follow the advice to save for a rainy day.	18,07	18,881	,304	,157	,631
2-I enjoy thinking about how I will live years from now in the future.	18,50	17,293	,400	,204	,592
3-The distant future is too uncertain to plan for. (R)	19,62	15,506	,340	,167	,628
5-I pretty much live on a day-to-day basis. (R)	20,06	14,704	,433	,254	,574
6-I enjoy living for the moment and not knowing what tomorrow will bring. (R)	18,56	14,981	,543	,322	,520

Analysis of the FPD scale

The factor loadings are reported in Table 10.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,819	,820	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
- Participated in workshop, seminar, or course on retirement planning.	15,66	31,299	,388	,221	,817
- Read books/articles/brochures about retirement planning.	14,90	27,997	,540	,458	,798
- Visited retirement planning web sites on the Internet.	15,19	28,234	,558	,419	,796
- Assessed/reassessed my net worth.	14,60	26,615	,549	,382	,798
- Calculated the cost of living during retirement.	14,95	27,916	,543	,332	,798
- Made long-term investments.	14,55	26,998	,590	,454	,791
- Made contributions to retirement savings plans.	14,72	27,017	,520	,353	,802
- Discussed retirement financial planning with a professional in the field.	15,34	27,559	,632	,421	,786

Analysis of the PCRP scale

The factor loadings are reported in Table 11.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,682	,687	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
- I'm always postponing my retirement planning.	21,30	26,962	,558	,506	,591
- I already started to plan my retirement. (R)	20,95	30,444	,267	,427	,694
- I'm afraid to make a poor financial choice and make a bad investment choice.	20,09	28,992	,449	,351	,629
- When I try to invest my savings, I get too anxious and I give up.	21,44	30,999	,310	,264	,674
- It's easy to choose a financial product to invest my retirement savings. (R)	20,04	28,820	,443	,280	,631
- The information about financial products is very complex.	19,99	28,295	,472	,350	,621

Analysis of the SRS scale

The factor loadings are reported in Table 12.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,908	,909	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
- Made meaningful contributions to a voluntary retirement savings plan.	14,76	37,502	,731	,557	,897
- Relative to my peers, I have saved a great deal for retirement.	14,70	40,553	,746	,561	,893
- Accumulated substantial savings for retirement.	15,12	39,375	,758	,581	,890
- Made a conscious effort to save for retirement.	14,05	37,298	,830	,711	,875
- Based on how I plan to live my life in retirement, I have saved accordingly.	14,44	37,370	,788	,662	,884

Study III Results

Hypotheses tests

Linear regression 1

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,313[a]	,098	,089	4,45658	1,636

a. Predictors: (Constant), Income

b. Dependent Variable: FTP

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	20,591	1,054		19,545	,000			
	Income	,896	,279	,313	3,215	,002	,313	,313	,313

a. Dependent Variable: FTP

Linear regression 2

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,167[a]	,028	,018	4,75529	1,652

a. Predictors: (Constant), Income

b. Dependent Variable: FTP

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	22,070	1,004		21,971	,000			
	Income	,414	,248	,167	1,671	,098	,167	,167	,167

a. Dependent Variable: FTP

Linear regression 3

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,429[a]	,184	,178	,91058592	1,842

a. Predictors: (Constant), FTP

b. Dependent Variable: Retirement motivation

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-2,141	,418		-5,126	,000					
	FTP	,090	,017	,429	5,229	,000	,429	,429	,429	1,000	1,000

a. Dependent Variable: Retirement motivation

Linear regression 4

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,347[a]	,121	,113	5,63861	2,013

a. Predictors: (Constant), FTP

b. Dependent Variable: Retirement planning

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	6,789	2,586		2,626	,010					
	FTP	,434	,107	,347	4,073	,000	,347	,347	,347	1,000	1,000

a. Dependent Variable: Retirement planning

Linear regression 5

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,309[a]	,095	,088	7,33184	1,616

a. Predictors: (Constant), FTP

b. Dependent Variable: Retirement savings

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	6,535	3,362		1,944	,054					
	FTP	,495	,139	,309	3,572	,001	,309	,309	,309	1,000	1,000

a. Dependent Variable: Retirement savings

Linear regression 6

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,134[a]	,018	,009	6,26466	,038

a. Predictors: (Constant), FTP

b. Dependent Variable: Psychological Cost

Correlations

			Psychological Cost	FTP
Spearman's rho	Psychological Cost	Correlation Coefficient	1,000	-,163
		Sig. (2-tailed)	.	,085
		N	112	112
	FTP	Correlation Coefficient	-,163	1,000
		Sig. (2-tailed)	,085	.
		N	112	112

Linear regression 7

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,446[a]	,199	,192	5,38241	1,895

a. Predictors: (Constant), Retirement motivation

b. Dependent Variable: Retirement planning

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	17,113	,485		35,262	,000		
	Retirement motivation	2,658	,485	,446	5,477	,000	1,000	1,000

a. Dependent Variable: Retirement planning

Linear regression 8

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,428[a]	,183	,176	6,96865	1,963

a. Predictors: (Constant), Retirement motivation

b. Dependent Variable: Retirement savings

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	18,308	,628		29,137	,000		
	Retirement motivation	3,269	,628	,428	5,202	,000	1,000	1,000

a. Dependent Variable: Retirement savings

Linear regression 9

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,251[a]	,063	,054	6,12012	,078

a. Predictors: (Constant), Retirement motivation

b. Dependent Variable: Psychological Cost

Spearman correlation

Correlations

			Retirement motivation	Psychological Cost
Spearman's rho	Retirement motivation	Correlation Coefficient	1,000	-,243**
		Sig. (2-tailed)	.	,010
		N	122	112
	Psychological Cost	Correlation Coefficient	-,243**	1,000
		Sig. (2-tailed)	,010	.
		N	112	112

**. Correlation is significant at the 0.01 level (2-tailed).

Linear regression 10

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,316[a]	,100	,092	7,27949	,893

a. Predictors: (Constant), Psychological Cost

b. Dependent Variable: Retirement savings

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	27,786	2,799		9,927	,000		
	Psychological Cost	-,384	,110	-,316	-3,508	,001	1,000	1,000

a. Dependent Variable: Retirement savings

Linear regression 11

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,352[a]	,124	,116	5,70453	1,518

a. Predictors: (Constant), Psychological Cost

b. Dependent Variable: Retirement planning

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	25,616	2,194		11,678	,000		
	Psychological Cost	-,341	,086	-,352	-3,968	,000	1,000	1,000

a. Dependent Variable: Retirement planning

ANOVA 1

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Retirement planning

F	df1	df2	Sig.
,415	2	110	,661

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Psy. Costs group

Tests of Between-Subjects Effects

Dependent Variable: Retirement planning

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	305,794[a]	2	152,897	4,404	,014	,074	8,809	,749
Intercept	20974,206	1	20974,206	604,180	,000	,846	604,180	1,000
Psy. Costs group	305,794	2	152,897	4,404	,014	,074	8,809	,749
Error	3818,667	110	34,715					
Total	37465,000	113						
Corrected Total	4124,460	112						

a. R Squared = ,074 (Adjusted R Squared = ,057)

b. Computed using alpha = ,05

Multiple Comparisons

Dependent Variable: Retirement planning

	(I) Psy. Costs group	(J) Psy. Costs group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Dunnett t (>control)	-1,00	1,00	5,7619*	1,99184	,004	1,9301	
	,00	1,00	3,1905*	1,45050	,027	,4001	

Based on observed means.

The error term is Mean Square(Error) = 34,715.

*. The mean difference is significant at the ,05 level.

ANOVA 2

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Retirement savings

F	df1	df2	Sig.
,859	2	110	,426

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Psy. Costs group

Tests of Between-Subjects Effects

Dependent Variable: Retirement savings

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	553,743[a]	2	276,871	5,093	,008	,085	10,185	,812
Intercept	22405,841	1	22405,841	412,127	,000	,789	412,127	1,000
Psy. Costs group	553,743	2	276,871	5,093	,008	,085	10,185	,812
Error	5980,293	110	54,366					
Total	44234,000	113						
Corrected Total	6534,035	112						

a. R Squared = ,085 (Adjusted R Squared = ,068)

b. Computed using alpha = ,05

Multiple Comparisons

Dependent Variable: Retirement savings

	(I) Psy. Costs group	(J) Psy. Costs group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Dunnett t (>control)	-1,00	1,00	6,8381*	2,49265	,007	2,0428	
	,00	1,00	5,2771*	1,81519	,004	1,7851	

Based on observed means.

The error term is Mean Square(Error) = 54,366.

*. The mean difference is significant at the ,05 level.

Linear regression 12

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,194[a]	,038	,030	5,89834	1,758

a. Predictors: (Constant), Age

b. Dependent Variable: Retirement planning

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	12,934	1,993		6,491	,000			
	Age	,104	,048	,194	2,176	,031	,194	,194	,194

a. Dependent Variable: Retirement planning

Linear regression 13

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,511[a]	,262	,241	6,65296	2,199

a. Predictors: (Constant), Psychological Cost, Age, Retirement motivation

b. Dependent Variable: Retirement savings

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	17,721	4,025		4,403	,000			
	Age	,177	,072	,205	2,447	,016	,288	,228	,201
	Retirement motivation	2,605	,672	,332	3,876	,000	,416	,348	,319
	Psychological Cost	-,249	,104	-,204	-2,393	,018	-,316	-,223	-,197

a. Dependent Variable: Retirement savings

Appendix G: Study IV - Stimuli construction and examples for fixed choice and open end choice in neutral context

Fixed choice in neutral context

The SS and LL options utilized in this choice task were adapted from Scholten and Read's (2011) *online* questionnaire. The time delay of the choice options was short (S_I - 6 months), or long (L_I- 24 months) and the size of the amounts involved was also small (S_A) or large (L_A) (see table E1). The present values for each pair of options were computed as $x_S = x_R/(1+r)^{t_L/2}$ and $x_L = x_R(1+r)^{t_L/2}$, were r=0.05 (with t_L express in months), x_R=100 for small values, and x_R=500 (approximately) for larger values. The values x_S e x_L were rounded to the nearest 5 (Scholten & Read, 2011). Regarding the currency, Dollars and Euros were considered equivalent, being presented exactly the same amounts as dollars in the EUA and as euros in the Nederland.

Table G1
Stimuli for fixed choice in neutral context

Question nº	S_A	L_A	Delay (in months)	Delay size
1	55	180	24	L_I
2	85	115	6	S_I
3	-55	-180	24	L_I
4	-85	-115	6	S_I
5	280	895	24	L_I
6	430	575	6	S_I
7	-280	-895	24	L_I
8	-430	-575	6	S_I

Example (Question nº.1):

You have money to receive. Please choose the option you prefer:
- Receive € 55 today.
- Receive € 180 in 24 months.

Open end delayed and immediate choice in neutral context

Table G2

Stimuli for the neutral context fill-in task

SS	LL	Delay
900	Fill in	24
900	Fill in	6
100	Fill in	24
100	Fill in	6
Fill in	900	24
Fill in	900	6
Fill in	100	24
Fill in	100	6

Note. The SS values are the smaller-sooner - in this case, immediate – rewards and LL are the larger-later rewards to be received according to the stated delay (unit is months).

Instructions

We will now ask you to convert an amount of money from the present to the future.
An example is the following: Below, specify the monetary value for which the statement best applies to you.
For me, receiving € 300 today is as good as receiving € _____ in 12 months.

The value you specify must be greater than € 300, because it is always better to receive € 300 today than to receive € 300 in 12 months. There is no right or wrong answer, because the specified value (greater than € 300) depends on your personal opinion. That is what we are interested in.

Question example:

For me, receiving € 100 today is as good as receiving € _____ in 6 months.

Appendix H: Study IV – Stimuli and retirement savings / investment context generic question

Table H1

Stimuli for the retirement context

Annual interest rate	2,0%	4,0%	6,0%
Initial amount		10.000,00 €	
2 years delay Final amount	10.404 €	10.816 €	11.236 €
3 years delay Final amount	10.612 €	11.249 €	11.910 €
5 years delay Final amount	11.041 €	12.167 €	13.382 €

Note. This table shows the final values of the rewards, according to each interest rate and delay period chosen and considering an initial investment of €10,000.

Instructions

The following 6 questions serve to better understand how people make decisions when faced with investment opportunities. There is no right or wrong answer.

<u>Generic question for G1 - participants with 59 or less years:</u>

Suppose you had a windfall of € 10000.
What do you prefer:

1. Deposit it in your current account, free to spend.
2. Invest it in a financial product over 5 years, to receive € X in the end.

3a. Apply it in a retirement savings scheme until age 65, to receive € X at that time.

<u>Generic question for G2 - participants aged 60 years or more:</u>

Suppose you had a windfall of € 10000.
What do you prefer:

1. Deposit it in your current account, free to spend.
2. Invest it in a financial product over 3 years, to receive € X in the end.

3b. Invest it in a financial product over 2 years, to receive € X in the end.

(Option 3a concerns to retirement context, and option 3b concerns to investment context.)

Appendix I: Study IV - Subjective time perception task

As was explained before, the subjective perception of temporal distance to the outcomes (e.g., perception of duration until the receipt of delayed outcomes) is to be measured by a visual "cue". Using the example given before, participants would be asked to consider the duration of the time period starting today and ending 12 months from now. Then, on screen, they would view a line with endpoints labeled “short” on the left end and “long” on the right end (see Figure H1).

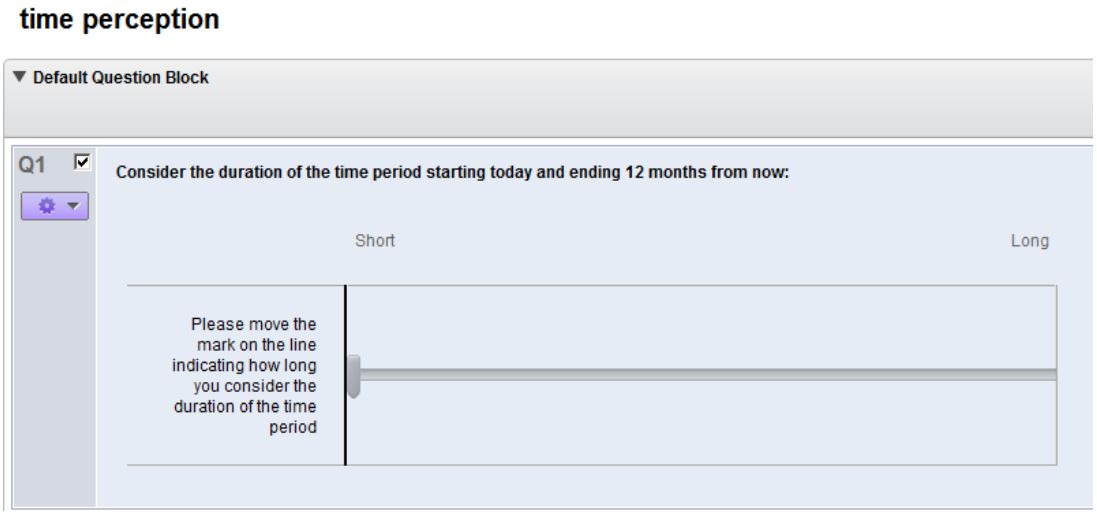

Figure H1. This figure presents the design of the online questionnaire.

They would then be asked to move a slider mark along the line indicating how long they would consider the duration of the time period. The distance from the left end of the scale to the mark would be measured and used as an indicator of subjective time interval estimation (Zauberman et al., 2009), to be compared between languages.

Appendix J: Study IV - Indicators for data from fixed choice in neutral context

The indicators constructed regarding the data from fixed choice in neutral context are presented in table J1.

Table J1

Names of indicators and construction

Indicator	Score type
Total	Total score
Large	Score for larger amounts
Small	Score for smaller amounts
Gain	Score for gains
Loss	Score for losses
Sdelay	Score for shorter delays
Ldelay	Score for longer delays
GainLarge	Score for gains and larger amounts
GainSmall	Score for gains and smaller amounts
GainLdelay	Score for gains and longer delays
GainSdelay	Score for gains and shorter delays
LossLarge	Score for losses and larger amounts
LossSmall	Score for losses and smaller amounts
LossLdelay	Score for losses and longer delays
LossSdelay	Score for losses and shorter delays

Appendix L: Study IV – Indicators for retirement savings/investment context questions

The meaning of names given to indicators regarding the data from fixed choice in retirement context is presented in table L1, and in investment context is presented in table L2.

Table L1

Indicators and construction in retirement context

Indicator	Score type
Total	Total score
Y3delay	Score for 3 year delay LL_a option
Y5delay	Score for 5 year delay LL_a option
Rate2	Score for 2% return rate
Rate4	Score for 4% return rate
Rate6	Score for 6% return rate

Table L2

Indicators and construction in investment context

Indicator	Score type
Total	Total score
Y3delay	Score for 3 year delay XLL_b option
Y5delay	Score for 5 year delay XLL_b option
Rate2	Score for 2% return rate
Rate4	Score for 4% return rate
Rate6	Score for 6% return rate

Appendix M: Statistical outputs from Study IV – Experiment I

The indicators utilized in the following analyses are presented in Tables I1, J1 and J2. Concerning the indicators for the time period length estimations, TP3m stands for 3 months estimation, TP6m for 6 months estimation, TP12m for 12 months estimation and TP24m for 24 months estimation. Concerning languages, Dutch is denoted by D, and En denotes English.

Table M1

Indicators for time period length estimation in Experiment I

Abbreviation	Meaning
Total_k	Total *k*
k_6	*k* for 6 months delays
log10k_6	Log_{10} transformation of *k* for 6 months delays
k_24	*k* for 24 months
Total_d	Total δ
d_6	δ for 6 months
d_24	δ for 24 months

Hypotheses tests

H1.1

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Total_D - Total_En	,208	1,482	,175	-,140	,557	1,193	71	,237

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Large_D - Large_En	,194	,850	,100	-,005	,394	1,941	71	,056
Pair 2	LdelayTotal_D - LdelayTotal_En	,139	,793	,093	-,047	,325	1,487	71	,142
Pair 3	GainLdelay_D - GainLdelay_En	,097	,585	,069	-,040	,235	1,410	71	,163
Pair 4	LossLarge_D - LossLarge_En	,097	,449	,053	-,008	,203	1,837	71	,070

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Total_k_D - Total_k_En	1,29470	60,53635	7,94881	-14,62252	17,21192	,163	57	,871
Pair 2	k_24_D - k_24_En	3,28664	41,17647	5,40674	-7,54016	14,11344	,608	57	,546
Pair 3	d_D - d_En	-,01216	,08834	,01160	-,03539	,01107	-1,048	57	,299
Pair 4	d_6_D - d_6_En	-,01630	,12161	,01597	-,04827	,01568	-1,021	57	,312
Pair 5	d_24_D - d_24_En	-,00803	,06459	,00848	-,02501	,00896	-,946	57	,348
Pair 6	Log10k_6_D – log10k_6_En	,02169	,44061	,05836	-,09522	,13860	,372	56	,712

Test Statistics[c]

	Total_k _En - Total_k _D	k_6_En - k_6_D	k_24_En - k_24_D	d_En - d_D	d_6_En - d_6_D	d_24_En - d_24_D

Z	-,696[a]	-,115[a]	-,345[a]	-1,068[b]	-1,143[b]	-,622[b]
Asymp. Sig. (2-tailed)	,486	,908	,730	,286	,253	,534
Exact Sig. (2-tailed)	,489	,910	,733	,289	,255	,537
Exact Sig. (1-tailed)	,245	,455	,366	,144	,128	,269
Point Probability	,001	,001	,001	,001	,001	,001

a. Based on positive ranks.

b. Based on negative ranks.

c. Wilcoxon Signed Ranks Test

H1.2

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1 TP12mD - TP12mEn	-51,7360152	228,7005018	28,1510858	-107,9576157	4,4855854	-1,838	65	,071

Research questions *Q.1*, *Q.2* and *Q.3*
G1 - neutral context

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Total_D - Total_En	,041	1,499	,214	-,390	,472	,191	48	,850
Pair 2	Large_D - Large_En	,061	,801	,114	-,169	,291	,535	48	,595
Pair 3	Small_D - Small_En	-,020	1,010	,144	-,311	,270	-,141	48	,888
Pair 4	Gain_D - Gain_En	,020	1,108	,158	-,298	,339	,129	48	,898
Pair 5	Loss_D - Loss_En	,020	,777	,111	-,203	,244	,184	48	,855
Pair 6	LdelayTotal_D - LdelayTotal_En	,041	,763	,109	-,178	,260	,375	48	,710
Pair 7	Sdelay_D - Sdelay_En	,000	1,041	,149	-,299	,299	,000	48	1,000
Pair 8	GainLdelay_D - GainLdelay_En	,041	,538	,077	-,114	,195	,531	48	,598
Pair 9	LossLdelay_D - LossLdelay_En	,000	,408	,058	-,117	,117	,000	48	1,000
Pair 10	GainSdelay_D - GainSdelay_En	-,020	,878	,125	-,273	,232	-,163	48	,871
Pair 11	LossSdelay_D - LossSdelay_En	,020	,478	,068	-,117	,158	,299	48	,766
Pair 12	GainLarge_D - GainLarge_En	-,020	,595	,085	-,191	,150	-,240	48	,811
Pair 13	LossLarge_D - LossLarge_En	,082	,493	,070	-,060	,223	1,159	48	,252
Pair 14	GainSmall_D - GainSmall_En	,041	,789	,113	-,186	,268	,362	48	,719
Pair 15	LossSmall_D - LossSmall_En	-,061	,475	,068	-,198	,075	-,903	48	,371

Age group - Repeated measures ANOVA with amount size

Tests of Within-Subjects Effects

Measure:MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Signal	Sphericity Assumed	247,485	1	247,485	216,891	,000	,756	216,891	1,000
Signal * Age_group	Sphericity Assumed	,041	1	,041	,036	,850	,001	,036	,054
Error(Signal)	Sphericity Assumed	79,874	70	1,141					
Amount	Sphericity Assumed	2,457	1	2,457	15,599	,000	,182	15,599	,973
Amount * Age_group	Sphericity Assumed	,513	1	,513	3,256	,075	,044	3,256	,429
Error(Amount)	Sphericity Assumed	11,027	70	,158					
Language	Sphericity Assumed	,719	1	,719	2,655	,108	,037	2,655	,362
Language * Age_group	Sphericity Assumed	,538	1	,538	1,988	,163	,028	1,988	,285
Error(Language)	Sphericity Assumed	18,946	70	,271					
Signal * Amount	Sphericity Assumed	1,110	1	1,110	6,281	,015	,082	6,281	,696
Signal * Amount * Age_group	Sphericity Assumed	,041	1	,041	,232	,632	,003	,232	,076
Error(Signal*Amount)	Sphericity Assumed	12,374	70	,177					
Signal * Language	Sphericity Assumed	,092	1	,092	,529	,470	,007	,529	,111
Signal * Language * Age_group	Sphericity Assumed	,092	1	,092	,529	,470	,007	,529	,111
Error(Signal*Language)	Sphericity Assumed	12,239	70	,175					
Amount * Language	Sphericity Assumed	,438	1	,438	3,650	,060	,050	3,650	,470
Amount * Language * Age_group	Sphericity Assumed	,188	1	,188	1,565	,215	,022	1,565	,235
Error(Amount*Language)	Sphericity Assumed	8,394	70	,120					
Signal * Amount * Language	Sphericity Assumed	,000	1	,000	,003	,956	,000	,003	,050
Signal * Amount * Language * Age_group	Sphericity Assumed	,348	1	,348	3,047	,085	,042	3,047	,406
Error(Signal*Amount* Language)	Sphericity Assumed	7,984	70	,114					

a. Computed using alpha = ,05

Age group - Repeated measures ANOVA with delay size

Tests of Within-Subjects Effects

Measure:MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Language	Sphericity Assumed	,719	1	,719	2,655	,108	,037	2,655	,362
Language * Age_group	Sphericity Assumed	,538	1	,538	1,988	,163	,028	1,988	,285
Error(Language)	Sphericity Assumed	18,946	70	,271					
Signal	Sphericity Assumed	247,485	1	247,485	216,891	,000	,756	216,891	1,000
Signal * Age_group	Sphericity Assumed	,041	1	,041	,036	,850	,001	,036	,054
Error(Signal)	Sphericity Assumed	79,874	70	1,141					
Delay	Sphericity Assumed	1,452	1	1,452	7,695	,007	,099	7,695	,781
Delay * Age_group	Sphericity Assumed	,744	1	,744	3,942	,051	,053	3,942	,499
Error(Delay)	Sphericity Assumed	13,213	70	,189					
Language * Signal	Sphericity Assumed	,092	1	,092	,529	,470	,007	,529	,111
Language * Signal * Age_group	Sphericity Assumed	,092	1	,092	,529	,470	,007	,529	,111
Error(Language*Signal)	Sphericity Assumed	12,239	70	,175					
Language * Delay	Sphericity Assumed	,057	1	,057	,549	,461	,008	,549	,113
Language * Delay * Age_group	Sphericity Assumed	,016	1	,016	,150	,699	,002	,150	,067
Error(Language*Delay)	Sphericity Assumed	7,316	70	,105					
Signal * Delay	Sphericity Assumed	4,250	1	4,250	19,196	,000	,215	19,196	,991
Signal * Delay * Age_group	Sphericity Assumed	3,851E-5	1	3,851E-5	,000	,990	,000	,000	,050
Error(Signal*Delay)	Sphericity Assumed	15,498	70	,221					
Language * Signal * Delay	Sphericity Assumed	,003	1	,003	,025	,874	,000	,025	,053
Language * Signal * Delay * Age_group	Sphericity Assumed	,031	1	,031	,274	,602	,004	,274	,081
Error(Language*Signal* Delay)	Sphericity Assumed	7,829	70	,112					

a. Computed using alpha = ,05

Q.2 – Investment context

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Total_D - Total_En	,56522	3,39553	,70802	-,90312	2,03356	,798	22	,433
Pair 2	Y3delay_D - Y3delay_En	,43478	1,75360	,36565	-,32353	1,19309	1,189	22	,247
Pair 3	Y5delay_D - Y5delay_En	,13043	1,89027	,39415	-,68698	,94785	,331	22	,744
Pair 4	Rate2_D - Rate2_En	-,21739	,95139	,19838	-,62880	,19402	-1,096	22	,285
Pair 5	Rate4_D - Rate4_En	,47826	1,47308	,30716	-,15875	1,11527	1,557	22	,134
Pair 6	Rate6_D - Rate6_En	,30435	1,36298	,28420	-,28505	,89374	1,071	22	,296

Repeated measures ANOVA with rate size

Mauchly's Test of Sphericity[b]

Measure:MEASURE_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[a] Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Language	1,000	,000	0	.	1,000	1,000	1,000
Rate	,854	3,314	2	,191	,873	,942	,500
Language * Rate	,894	2,363	2	,307	,904	,980	,500

a. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

b. Design: Intercept

Within Subjects Design: Language + Rate + Language * Rate

Tests of Within-Subjects Effects

Measure:MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Language	Sphericity Assumed	1,225	1	1,225	,637	,433	,028	,637	,119
Error(Language)	Sphericity Assumed	42,275	22	1,922					
Rate	Sphericity Assumed	32,406	2	16,203	15,987	,000	,421	31,974	,999
Error(Rate)	Sphericity Assumed	44,594	44	1,014					
Language * Rate	Sphericity Assumed	3,014	2	1,507	5,533	,007	,201	11,067	,828
Error(Language* Rate)	Sphericity Assumed	11,986	44	,272					

a. Computed using alpha = ,05

Repeated measures ANOVA with delay size

Tests of Within-Subjects Effects

Measure:MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Language	Sphericity Assumed	1,837	1	1,837	,637	,433	,028	,637	,119
Error(Language)	Sphericity Assumed	63,413	22	2,882					
Delay	Sphericity Assumed	,533	1	,533	,796	,382	,035	,796	,137
Error(Delay)	Sphericity Assumed	14,717	22	,669					
Language * Delay	Sphericity Assumed	,533	1	,533	1,206	,284	,052	1,206	,183
Error(Language*Delay)	Sphericity Assumed	9,717	22	,442					

a. Computed using alpha = ,05

Q.3 - Retirement context with total sample (*n*=49)

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1 Total_D - Total_En	-,20408	3,22089	,46013	-1,12923	,72107	-,444	48	,659
Pair 2 Y3delay_D - Y3delay_En	-,08163	1,80089	,25727	-,59891	,43564	-,317	48	,752
Pair 3 Y5delay_D - Y5delay_En	-,12245	1,78690	,25527	-,63571	,39081	-,480	48	,634
Pair 4 Rate2_D - Rate2_En	-,26531	1,38106	,19729	-,66199	,13138	-1,345	48	,185
Pair 5 Rate4_D - Rate4_En	,16327	1,44837	,20691	-,25276	,57929	,789	48	,434
Pair 6 Rate6_D - Rate6_En	-,10204	1,47542	,21077	-,52583	,32175	-,484	48	,631

$G1_a$

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1 Total_D - Total_En	,66667	3,21056	,61787	-,60339	1,93672	1,079	26	,291
Pair 2 Y3delay_D - Y3delay_En	,33333	1,86052	,35806	-,40266	1,06933	,931	26	,360
Pair 3 Y5delay_D - Y5delay_En	,33333	1,64083	,31578	-,31576	,98242	1,056	26	,301
Pair 4 Rate2_D - Rate2_En	-,03704	,89792	,17281	-,39224	,31817	-,214	26	,832
Pair 5 Rate4_D - Rate4_En	,33333	1,44115	,27735	-,23677	,90343	1,202	26	,240
Pair 6 Rate6_D - Rate6_En	,37037	1,41824	,27294	-,19067	,93141	1,357	26	,186

Retirement context - Age group (by delay until 65 years of age)

Mauchly's Test of Sphericity[b]

Measure:MEASURE_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[a]		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Language	1,000	,000	0	.	1,000	1,000	1,000
Rate	,892	5,252	2	,072	,903	,956	,500
Language * Rate	,942	2,742	2	,254	,945	1,000	,500

a. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

b. Design: Intercept + Age_group

Within Subjects Design: Language + Rate + Language * Rate

Tests of Within-Subjects Effects

Measure:MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Language	Sphericity Assumed	,742	1	,742	,463	,500	,010	,463	,102
Language * Age_group	Sphericity Assumed	7,599	1	7,599	4,737	,035	,092	4,737	,568
Error(Language)	Sphericity Assumed	75,394	47	1,604					
Rate	Sphericity Assumed	154,854	2	77,427	59,423	,000	,558	118,846	1,000
Rate * Age_group	Sphericity Assumed	1,915	2	,957	,735	,482	,015	1,470	,171
Error(Rate)	Sphericity Assumed	122,480	94	1,303					
Language * Rate	Sphericity Assumed	2,405	2	1,202	1,771	,176	,036	3,541	,362
Language * Rate * Age_group	Sphericity Assumed	1,548	2	,774	1,140	,324	,024	2,279	,245
Error(Language* Rate)	Sphericity Assumed	63,827	94	,679					

a. Computed using alpha = ,05

Pairwise Comparisons

Measure:MEASURE_1

(I) Rate_size	(J) Rate_size	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
1	2	-1,090*	,152	,000	-1,466	-,713
	3	-1,771*	,189	,000	-2,240	-1,303
2	1	1,090*	,152	,000	,713	1,466
	3	-,682*	,148	,000	-1,050	-,314
3	1	1,771*	,189	,000	1,303	2,240
	2	,682*	,148	,000	,314	1,050

Based on estimated marginal means. Rate 1 is 2%, rate 2 is 4% and rate 3 is 6%.

*. The mean difference is significant at the ,05 level.

a. Adjustment for multiple comparisons: Bonferroni.

Tests of Within-Subjects Effects

Measure:MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Language	Sphericity Assumed	1,113	1	1,113	,463	,500	,010	,463	,102
Language * Age group	Sphericity Assumed	11,399	1	11,399	4,737	,035	,092	4,737	,568
Error(Language)	Sphericity Assumed	113,091	47	2,406					
Delay	Sphericity Assumed	,645	1	,645	1,593	,213	,033	1,593	,235
Delay * Age group	Sphericity Assumed	,237	1	,237	,585	,448	,012	,585	,116
Error(Delay)	Sphericity Assumed	19,029	47	,405					
Language * Delay	Sphericity Assumed	,025	1	,025	,039	,844	,001	,039	,054
Language * Delay * Age group	Sphericity Assumed	,025	1	,025	,039	,844	,001	,039	,054
Error(Language* Delay)	Sphericity Assumed	29,955	47	,637					

a. Computed using alpha = ,05

Appendix N: Statistical outputs from Study IV – Experiment II

The indicators utilized in the following analyses are presented in Tables I1, J1 and J2. Other indicator's notation is presented in Appendices J and L. Concerning the indicators for the time period length estimations, TP3m stands for 3 months estimation, TP6m for 6 months estimation, TP12m for 12 months estimation and TP24m for 24 months estimation. Regarding Languages, Portuguese is denoted by Pt, and En denotes English.

Table N1

Indicators for time period length estimation in Experiment II

Abbreviation	Meaning
Total_k	Total *k*
k_6	*k* for 6 months Delays
k_24	*k* for 24 months
Total_d	Total δ
d_6	δ for 6 months
d_24	δ for 24 months

Hypotheses tests

H1.1a

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Total_Pt - Total_En	,016	1,520	,193	-,370	,402	,084	61	,934
Pair 2	Large_Pt - Large_En	,016	1,094	,139	-,262	,294	,116	61	,908
Pair 3	Small_Pt - Small_En	,000	,958	,122	-,243	,243	,000	61	1,000
Pair 4	Gain_Pt - Gain_En	,177	1,079	,137	-,097	,451	1,294	61	,200
Pair 5	Loss_Pt - Loss_En	-,161	1,217	,155	-,470	,148	-1,043	61	,301
Pair 6	LDelay_Pt - LDelay_En	,065	1,006	,128	-,191	,320	,505	61	,615
Pair 7	GainLDelay_Pt - GainLDelay_En	,145	,674	,086	-,026	,316	1,696	61	,095
Pair 8	LossLDelay_Pt - LossLDelay_En	-,081	,635	,081	-,242	,081	-1,000	61	,321
Pair 9	SDelay_Pt - SDelay_En	-,048	,982	,125	-,298	,201	-,388	61	,699
Pair 10	GainSDelay_Pt - GainSDelay_En	,032	,746	,095	-,157	,222	,341	61	,735
Pair 11	LossSDelay_Pt - LossSDelay_En	-,081	,795	,101	-,283	,121	-,798	61	,428
Pair 12	GainLarge_Pt - GainLarge_En	,081	,731	,093	-,105	,266	,869	61	,388
Pair 13	LossLarge_Pt - LossLarge_En	-,065	,787	,100	-,264	,135	-,646	61	,521
Pair 14	GainSmall_Pt - GainSmall_En	,097	,694	,088	-,080	,273	1,097	61	,277
Pair 15	LossSmall_Pt - LossSmall_En	-,097	,694	,088	-,273	,080	-1,097	61	,277

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Total_k_Pt - Total_k_En	6,9880	153,5085	21,7094	-36,6386	50,6146	,322	49	,749
Pair 2	k_6_Pt - k_6_En	16,6000	237,3881	33,5717	-50,8650	84,0650	,494	49	,623
Pair 3	k_24_Pt - k_24_En	-2,6120	97,8715	13,8411	-30,4268	25,2028	-,189	49	,851

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Total_d_Pt - Total_d_En	-,00179	,11288	,01278	-,02725	,02366	-,140	77	,889
Pair 2	d_6_Pt - d_6_En	-,00654	,15262	,01728	-,04095	,02787	-,378	77	,706
Pair 3	d_24_Pt - d_24_En	,00231	,09154	,01036	-,01833	,02295	,223	77	,824

H1.2a

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	TP3mPt - TP3mEn	,2989067	1,7991610	,2322707	-,1658659	,7636792	1,287	59	,203
Pair 2	TP6mPt - TP6mEn	,1957279	2,0198142	,2586107	-,3215706	,7130263	,757	60	,452
Pair 3	TP12mPt - TP12mEn	,4023131	2,4849372	,3181636	-,2341088	1,0387351	1,264	60	,211
Pair 4	TP24mPt - TP24mEn	,3574750	3,3795851	,4363026	-,5155644	1,2305144	,819	59	,416

Research questions *Q.1, Q.2* and *Q.3*

G1 - neutral context

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Total_Pt - Total_En	,080	1,563	,221	-,364	,524	,362	49	,719
Pair 2	Large_Pt - Large_En	,040	1,142	,162	-,285	,365	,248	49	,805
Pair 3	Small_Pt - Small_En	,040	,989	,140	-,241	,321	,286	49	,776
Pair 4	Gain_Pt - Gain_En	,200	1,107	,156	-,114	,514	1,278	49	,207
Pair 5	Loss_Pt - Loss_En	-,120	1,304	,184	-,491	,251	-,651	49	,518
Pair 6	LDelay_Pt - LDelay_En	,120	1,043	,147	-,176	,416	,814	49	,420
Pair 7	GainLDelay_Pt - GainLDelay_En	,160	,681	,096	-,034	,354	1,661	49	,103
Pair 8	LossLDelay_Pt - LossLDelay_En	-,040	,669	,095	-,230	,150	-,423	49	,674
Pair 9	SDelay_Pt - SDelay_En	-,040	1,009	,143	-,327	,247	-,280	49	,780
Pair 10	GainSDelay_Pt - GainSDelay_En	,040	,781	,111	-,182	,262	,362	49	,719
Pair 11	LossSDelay_Pt - LossSDelay_En	-,080	,853	,121	-,323	,163	-,663	49	,510
Pair 12	GainLarge_Pt - GainLarge_En	,080	,752	,106	-,134	,294	,753	49	,455
Pair 13	LossLarge_Pt - LossLarge_En	-,040	,832	,118	-,276	,196	-,340	49	,735
Pair 14	GainSmall_Pt - GainSmall_En	,120	,689	,097	-,076	,316	1,231	49	,224
Pair 15	LossSmall_Pt - LossSmall_En	-,080	,752	,106	-,294	,134	-,753	49	,455

G2

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Total_Pt - Total_En	-,364	1,362	,411	-1,279	,551	-,886	10	,397
Pair 2	Large_Pt - Large_En	-,091	,944	,285	-,725	,543	-,319	10	,756
Pair 3	Small_Pt - Small_En	-,273	,786	,237	-,801	,255	-1,150	10	,277
Pair 4	Gain_Pt - Gain_En	,000	1,000	,302	-,672	,672	,000	10	1,000
Pair 5	Loss_Pt - Loss_En	-,364	,809	,244	-,907	,180	-1,491	10	,167
Pair 6	LDelay_Pt - LDelay_En	-,273	,786	,237	-,801	,255	-1,150	10	,277
Pair 7	GainLDelay_Pt - GainLDelay_En	,000	,632	,191	-,425	,425	,000	10	1,000
Pair 8	SDelay_Pt - SDelay_En	-,091	,944	,285	-,725	,543	-,319	10	,756
Pair 9	GainSDelay_Pt - GainSDelay_En	,000	,632	,191	-,425	,425	,000	10	1,000
Pair 10	LossSDelay_Pt - LossSDelay_En	-,091	,539	,163	-,453	,271	-,559	10	,588
Pair 11	GainLarge_Pt - GainLarge_En	,091	,701	,211	-,380	,562	,430	10	,676
Pair 12	LossLarge_Pt - LossLarge_En	-,182	,603	,182	-,587	,223	-1,000	10	,341
Pair 13	GainSmall_Pt - GainSmall_En	-,091	,701	,211	-,562	,380	-,430	10	,676

Age group - Repeated measures ANOVA with amount size

Tests of Within-Subjects Effects

Measure:MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Amount	Sphericity Assumed	7,875	1	7,875	18,431	,000	,238	18,431	,988
Amount * Age_group	Sphericity Assumed	,006	1	,006	,014	,907	,000	,014	,052
Error(Amount)	Sphericity Assumed	25,207	59	,427					
Language	Sphericity Assumed	,181	1	,181	,310	,580	,005	,310	,085
Language * Age_group	Sphericity Assumed	,444	1	,444	,757	,388	,013	,757	,137
Error(Language)	Sphericity Assumed	34,556	59	,586					
Amount * Language	Sphericity Assumed	,075	1	,075	,152	,698	,003	,152	,067
Amount * Language * Age_group	Sphericity Assumed	,075	1	,075	,152	,698	,003	,152	,067
Error(Amount* Language)	Sphericity Assumed	28,909	59	,490					

a. Computed using alpha = ,05

Age group - Repeated measures ANOVA with delay size

Tests of Within-Subjects Effects

Measure:MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Delay	Sphericity Assumed	2,015	1	2,015	4,218	,044	,067	4,218	,524
Delay * Age_group	Sphericity Assumed	,048	1	,048	,100	,753	,002	,100	,061
Error(Delay)	Sphericity Assumed	28,182	59	,478					
Language	Sphericity Assumed	,181	1	,181	,310	,580	,005	,310	,085
Language * Age_group	Sphericity Assumed	,444	1	,444	,757	,388	,013	,757	,137
Error(Language)	Sphericity Assumed	34,556	59	,586					
Delay * Language	Sphericity Assumed	,001	1	,001	,003	,960	,000	,003	,050
Delay * Language * Age_group	Sphericity Assumed	,263	1	,263	,632	,430	,011	,632	,122
Error(Delay*Language)	Sphericity Assumed	24,589	59	,417					

a. Computed using alpha = ,05

Q.2 – Investment context

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Total_Pt - Total_En	1,54545	3,77793	1,13909	-,99259	4,08350	1,357	10	,205
Pair 2	Rate2_Pt - Rate2_En	,72727	1,55505	,46887	-,31742	1,77197	1,551	10	,152
Pair 3	Rate4_Pt - Rate4_En	,45455	1,75292	,52853	-,72308	1,63217	,860	10	,410
Pair 4	Rate6_Pt - Rate6_En	,36364	,92442	,27872	-,25739	,98467	1,305	10	,221
Pair 5	Y3delay_Pt - Y3delay_En	1,00000	2,19089	,66058	-,47186	2,47186	1,514	10	,161
Pair 6	Y5delay_Pt - Y5delay_En	,54545	1,63485	,49293	-,55285	1,64376	1,107	10	,294

Repeated measures ANOVA with delay size

Tests of Within-Subjects Effects

Measure:MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Language	Sphericity Assumed	6,568	1	6,568	1,841	,205	,155	1,841	,233
Error(Language)	Sphericity Assumed	35,682	10	3,568					
Delay	Sphericity Assumed	,205	1	,205	,226	,645	,022	,226	,072
Error(Delay)	Sphericity Assumed	9,045	10	,905					
Language * Delay	Sphericity Assumed	,568	1	,568	3,378	,096	,253	3,378	,383
Error(Language* Delay)	Sphericity Assumed	1,682	10	,168					

a. Computed using alpha = ,05

Repeated measures ANOVA with rate size

Mauchly's Test of Sphericity[b]

Measure:MEASURE_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[a]		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Language	1,000	,000	0	.	1,000	1,000	1,000
Rate	,467	6,845	2	,033	,652	,710	,500
Language * Rate	,919	,758	2	,684	,925	1,000	,500

a. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

b. Design: Intercept

Within Subjects Design: Language + Rate + Language * Rate

Tests of Within-Subjects Effects

Measure:MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
language	Sphericity Assumed	4,379	1	4,379	1,841	,205	,155	1,841	,233
	Greenhouse-Geisser	4,379	1,000	4,379	1,841	,205	,155	1,841	,233
Error(language)	Sphericity Assumed	23,788	10	2,379					
	Greenhouse-Geisser	23,788	10,000	2,379					
rate	Sphericity Assumed	8,818	2	4,409	4,678	,022	,319	9,357	,719
	Greenhouse-Geisser	8,818	1,305	6,757	4,678	,042	,319	6,105	,577
Error(rate)	Sphericity Assumed	18,848	20	,942					
	Greenhouse-Geisser	18,848	13,050	1,444					
language * rate	Sphericity Assumed	,394	2	,197	,496	,616	,047	,992	,120
	Greenhouse-Geisser	,394	1,850	,213	,496	,603	,047	,918	,117
Error(language*rate)	Sphericity Assumed	7,939	20	,397					
	Greenhouse-Geisser	7,939	18,504	,429					

a. Computed using alpha = ,05

Q.3 - Retirement savings context with total sample (*n*=50)

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1 Total_Pt - Total_En	-,72000	3,70901	,52453	-1,77409	,33409	-1,373	49	,176
Pair 2 Rate2_Pt - Rate2_En	-,10000	1,35902	,19219	-,48623	,28623	-,520	49	,605
Pair 3 Rate4_Pt - Rate4_En	-,42000	1,60471	,22694	-,87605	,03605	-1,851	49	,070
Pair 4 Rate6_Pt - Rate6_En	-,20000	1,80702	,25555	-,71355	,31355	-,783	49	,438
Pair 5 Y3delay_Pt - Y3delay_En	-,20000	1,90595	,26954	-,74167	,34167	-,742	49	,462
Pair 6 Y5delay_Pt - Y5delay_En	-,52000	2,01261	,28463	-1,09198	,05198	-1,827	49	,074

$G1_a$

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1 Total_Pt - Total_En	,12903	3,35402	,60240	-1,10123	1,35930	,214	30	,832
Pair 2 Rate2_Pt - Rate2_En	-,06452	1,41269	,25373	-,58270	,45366	-,254	30	,801
Pair 3 Rate4_Pt - Rate4_En	-,06452	1,45912	,26207	-,59973	,47069	-,246	30	,807
Pair 4 Rate6_Pt - Rate6_En	,25806	1,65263	,29682	-,34812	,86425	,869	30	,392
Pair 5 Y3delay_Pt - Y3delay_En	,25806	1,78825	,32118	-,39787	,91400	,803	30	,428
Pair 6 Y5delay_Pt - Y5delay_En	-,12903	1,82102	,32707	-,79699	,53892	-,395	30	,696

$G1_b$

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1 Total_Pt - Total_En	-2,10526	3,92845	,90125	-3,99872	-,21181	-2,336	18	,031
Pair 2 Y3delay_Pt - Y3delay_En	-,94737	1,89952	,43578	-1,86291	-,03183	-2,174	18	,043
Pair 3 Y5delay_Pt - Y5delay_En	-1,15789	2,19249	,50299	-2,21464	-,10115	-2,302	18	,033
Pair 4 Rate4_Pt - Rate4_En	-1,00000	1,69967	,38993	-1,81922	-,18078	-2,565	18	,019
Pair 5 Rate6_Pt - Rate6_En	-,94737	1,84010	,42215	-1,83427	-,06047	-2,244	18	,038

Retirement context - Age group (by delay until 65 years of age)

Mauchly's Test of Sphericity[b]

Measure:MEASURE_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[a] Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Language	1,000	,000	0	.	1,000	1,000	1,000
Rate	,801	10,457	2	,005	,834	,878	,500
Language * Rate	,964	1,712	2	,425	,965	1,000	,500

a. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

b. Design: Intercept + Age_group

Within Subjects Design: Language + Rate + Language * Rate

Tests of Within-Subjects Effects

Measure:MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Language	Sphericity Assumed	7,668	1	7,668	3,589	,064	,070	3,589	,459
	Greenhouse-Geisser	7,668	1,000	7,668	3,589	,064	,070	3,589	,459
Language * Age_group	Sphericity Assumed	9,801	1	9,801	4,588	,037	,087	4,588	,555
	Greenhouse-Geisser	9,801	1,000	9,801	4,588	,037	,087	4,588	,555
Error(Language)	Sphericity Assumed	102,546	48	2,136					
	Greenhouse-Geisser	102,546	48,000	2,136					
Rate	Sphericity Assumed	69,125	2	34,562	33,628	,000	,412	67,256	1,000
	Greenhouse-Geisser	69,125	1,667	41,457	33,628	,000	,412	56,070	1,000
Rate * Age_group	Sphericity Assumed	2,725	2	1,362	1,326	,270	,027	2,651	,280
	Greenhouse-Geisser	2,725	1,667	1,634	1,326	,269	,027	2,210	,256
Error(Rate)	Sphericity Assumed	98,668	96	1,028					
	Greenhouse-Geisser	98,668	80,034	1,233					
Language * Rate	Sphericity Assumed	2,097	2	1,048	1,397	,252	,028	2,794	,294
	Greenhouse-Geisser	2,097	1,931	1,086	1,397	,252	,028	2,698	,288
Language * Rate * Age_group	Sphericity Assumed	3,963	2	1,982	2,641	,076	,052	5,282	,514
	Greenhouse-Geisser	3,963	1,931	2,053	2,641	,079	,052	5,100	,504
Error(Language* Rate)	Sphericity Assumed	72,030	96	,750					
	Greenhouse-Geisser	72,030	92,684	,777					

a. Computed using alpha = ,05

Pairwise Comparisons

Measure:MEASURE_1

(I) Rate	(J) Rate	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
1	2	-,685*	,157	,000	-1,074	-,296
	3	-1,208*	,169	,000	-1,626	-,789
2	1	,685*	,157	,000	,296	1,074
	3	-,522*	,111	,000	-,798	-,247
3	1	1,208*	,169	,000	,789	1,626
	2	,522*	,111	,000	,247	,798

Based on estimated marginal means. Rate 1 is 2%, rate 2 is 4% and rate 3 is 6%.

*. The mean difference is significant at the ,05 level.

a. Adjustment for multiple comparisons: Bonferroni.

Tests of Within-Subjects Effects

Measure:MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Language	Sphericity Assumed	11,502	1	11,502	3,589	,064	,070	3,589	,459
Language * Age_group	Sphericity Assumed	14,702	1	14,702	4,588	,037	,087	4,588	,555
Error(Language)	Sphericity Assumed	153,818	48	3,205					
Delay	Sphericity Assumed	,340	1	,340	,569	,454	,012	,569	,115
Delay * Age_group	Sphericity Assumed	,020	1	,020	,033	,857	,001	,033	,054
Error(Delay)	Sphericity Assumed	28,660	48	,597					
Language * Delay	Sphericity Assumed	1,052	1	1,052	2,572	,115	,051	2,572	,349
Language * Delay * Age_group	Sphericity Assumed	,092	1	,092	,225	,638	,005	,225	,075
Error(Language* Delay)	Sphericity Assumed	19,628	48	,409					

a. Computed using alpha = ,05