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The Cost-Benefit of Aging from the Perspective of Financial Well-Being

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Tese submetida ao Programa de Pós-Graduação em Ciências Contábeis do Departamento de Ciências Contábeis e Atuariais da Faculdade de Economia, Administração, Contabilidade e Gestão de Políticas Públicas da Universidade de Brasília, como requisito para a obtenção do título de Doutor em Ciências Contábeis.

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O custo-benefício do envelhecimento sob a perspectiva do bem-estar financeiro

Resumo

Nesta tese, três estudos abordam diferentes tópicos sobre “O custo-benefício do envelhecimento sob a perspectiva do bem-estar financeiro". Meu objetivo é analisar os fatores "principais" que influenciam os resultados do bem-estar financeiro: preparação para a aposentadoria e resiliência para o futuro. No estudo 1, o efeito conjunto do autocontrole e da confiança (PsyFactor1), bem como a falta de preocupação com o status social em conjunto com uma orientação para a ação (PsyFactor2), foram sugeridos como fatores psicológicos "fundamentais" que influenciam um melhor comportamento financeiro. Também, a garra e a resiliência para o futuro aparentemente melhoraram o modelo de comportamento/capacidade financeira do grupo mais velho. Além disso, a atitude de manter investimentos privados para garantir a própria velhice estava relacionada ao preparo para a aposentadoria, à resiliência para o futuro e ao bem-estar financeiro nos grupos jovem e maduro, mas não no grupo mais velho. O estudo 1 também indica que as atitudes em relação à contribuição para a aposentadoria foram associadas a altos níveis de preparo para a aposentadoria. Entretanto, parece que as variáveis de contribuição para a aposentadoria não foram consideradas tão importantes para o grupo mais velho quanto para os grupos maduro e jovem. Em geral, independente da idade, muitos acreditam que não terão uma renda de aposentadoria adequada sem uma pensão do Estado ou sem trabalhar, e poucos mantêm investimentos privados e relatam contribuir para um esquema de pensão complementar para garantir a própria aposentadoria. Além da medida objetiva da idade, no estudo 2, foi levado em conta a perspectiva de tempo futuro e reconhecido que as preferências das pessoas não se devem à idade, por si só, mas à limitações percebidas no tempo. Destaco a relação entre fatores psicológicos voltados para o futuro com decisões favoráveis de longo prazo e medidas de bem-estar financeiro. O autocontrole foi fortemente relacionado a um menor estresse atual na administração do dinheiro e a perspectiva de tempo futuro à segurança financeira futura esperada. A garra e a resiliência psicológica também foram relevantes para o preparo para a aposentadoria e para a percepção de bem-estar financeiro e, apesar de não ser o foco principal da tese, a métrica de garra mostrou-se melhor do que a resiliência psicológica em análise adicional. A variável gênero masculino também é digna de nota por aparecer em vários de nossos resultados. Ela apareceu como a única variável socioeconômica significativamente relacionada à expectativa de segurança financeira futura e à percepção de bem-estar financeiro. Por fim, no estudo 3, usando um experimento que forneceu aos participantes pensar sobre suas expectativas de bem-estar financeiro e/ou o conceito de capacidade financeira, o simples fato de chamar atenção das pessoas sobre capacidade e bem-estar financeiros alterou suas percepções em relação à preparação para a aposentadoria, resiliência para o futuro e bem-estar financeiro. Os resultados também contribuem para a literatura que examina a relação entre riqueza e seguro social. O fato de os menos ricos terem menos preparação para a aposentadoria, resiliência para o futuro e bem-estar financeiro pode aumentar as disparidades de saúde financeira entre os indivíduos em idades mais avançadas. Diante de uma população que envelhece rapidamente, esses resultados são importantes com relação à proteção financeira futura. Os resultados podem informar as instituições financeiras, formuladores de políticas e os indivíduos interessados em tomar melhores decisões financeiras essenciais para a velhice.

Palavras-chave: Envelhecimento, Capacidade Financeira, Bem-Estar Financeiro, Resiliência Psicológica, Garra.

Abstract

In this thesis, three studies address different topics on "The cost-benefit of aging from the perspective of financial well-being". My aim is to analyze the "main" factors that influence financial well-being outcomes: preparedness for retirement and resilience for the future. In study 1, the joint effect of self-control and confidence (PsyFactor1), as well as a lack of concern for social status in conjunction with an action orientation (PsyFactor2), were suggested as "key" psychological factors influencing better financial behavior. Also, grit and resilience for the future apparently improved the financial behavior/capability model of the older group. In addition, the attitude of maintaining private investments to ensure one's old age was related to preparedness for retirement, resilience for the future, and financial well-being in the young and mature groups but not in the older group. Study 1 also indicates that attitudes towards contributing to retirement were associated with high levels of preparedness for retirement. However, it seems that the retirement contribution variables were not considered as important for the older group as for the mature and young groups. In general, regardless of age, many believe that they will not have an adequate retirement income without a state pension or without working, and few maintain private investments and report contributing to a supplementary pension scheme to guarantee their own retirement. In addition to the objective measure of age, study 2 took into account the future time perspective and recognized that people's preferences are not due to age alone but to perceived limitations in time. I would highlight the relationship between future-oriented psychological factors with favorable long-term decisions and measures of financial well-being. Self-control was strongly related to less current stress in managing money and future time perspective to expected future financial security. Grit and psychological resilience were also relevant to preparedness for retirement and perceived financial well-being, and despite not being the main focus of the thesis, the grit metric proved to be better than psychological resilience in further analysis. The male gender variable is also noteworthy for its appearance in several of our results. It appeared as the only socioeconomic variable significantly related to expected future financial security and perceived financial well-being. Finally, in study 3, using an experiment that provided participants with the opportunity to think about their expectations of financial well-being and/or the concept of financial capability, the simple fact of drawing people's attention to financial capability and well-being altered their perceptions in relation to preparing for retirement, resilience for the future and financial well-being. Our results also contribute to the literature examining the relationship between wealth and insurance. The fact that the less wealthy have less preparedness for retirement, resilience for the future, and financial well-being might increase financial health disparities among individuals at older ages. In the face of a rapidly aging population, these results are important with regard to future financial protection. The results can inform financial institutions, policymakers, and individuals interested in making better financial decisions that are essential for old age.

Keywords: Aging, Financial Capability, Financial Well-Being, Psychological Resilience, Grit.

Chapter 1: Introduction

This introduction provides explanations on the structure of the thesis. The thesis is divided into three studies, beyond the theoretical chapter, concerning The Cost-Benefit of Aging from the Perspective of Financial Well-Being (FWB). More specifically, the first study evaluates how well different age groups are financially prepared for retirement in Brazil. The second study aims to analyze how the issue of time relates to measures of financial well-being. And the third study identifies if *financial capability and well-being* awareness increases reported *preparedness for retirement*, *resilience for the future,* and *FWB*. This introduction contextualizes the theme in question, presents the research problem, the general and specific purposes, theme justification, research contributions, and thesis structure.

1.1. Contextualization

Globally speaking, population aging is a dominant demographic trend of the 21st century. Never before have such large numbers of people reached old age (Bloom, 2020). This is also observed in Brazil. According to the Brazilian Institute of Geography and Statistics, Brazil's new age structure, which includes a significant increase in the elderly population, constitutes one of the most important structural changes in society (IBGE, 2015). With 215 million citizens of diverse ethnicities, Brazil is the largest and most populous nation in Latin America. The Brazilian economy is the ninth-largest in the world but the country's future appears increasingly uncertain. Despite the size of its economy, Brazil remains one of the most unequal countries on the planet (World Bank, 2020). The demographic process of changing age structure has its downsides in countries in which poverty is widespread and welfare is limited. Brazil shares many of the challenges due to aging with other countries, but there are also many problems that are specific to Brazil.

While demographic trends indicate an aging population worldwide, Brazil's rate is outstanding for its speed. Brazil's population over 60 has tripled in the last 50 years, and the expectation is that the elderly population will grow continuously. The number of elderly Brazilians aged 60 and over was 2.6 million in 1950, in 2020 increased to 29.9 million, and is expected to reach 72.4 million in 2100 - 40% of the total population. A child born in Brazil in 2015 can expect to live 20 years longer than one born just 50 years ago (World Health Organization, 2015). On the positive side, many people are living more than could have been expected a few years ago, even in developing or emerging countries like Brazil. But the aging

of the population will have a direct impact on healthcare and social security. The costs of social security and healthcare provided by official programs overload government budgets, reducing investment and expenditures in other areas, like education, infrastructure and security. Furthermore, a larger population that will live longer breaks the formula behind most pay-as-you-go retirement systems. Notably, social security itself is remarkable in Brazil because of the increasingly large pension system which works less efficiently than desired. For instance, Turra & Queiroz (2005) provides empirical evidence to support that the absence of appropriate policies in Brazil mitigate benefits of population changes and aggravate adverse effects of population aging. Besides the country has developed important policies and legal mechanisms to guarantee older adults' right to age well, the implementation has been slow and hampered by lack of coordination and resources (Neumann & Albert, 2018).

The pension system in Brazil consists of three main segments: (i) the general system (private workers), (ii) the civil servants system, and (iii) other several private funded systems. The general system is an unfunded defined-benefit programme and there is still debate regarding when it began. Nevertheless, in 1923, the Eloy Chaves Law was approved to regulate social security for both civil servants and private workers. This law decentralized the pension system, as each company was responsible for its own employees (Turra & Queiroz, 2005). Important innovations took place in social security legislation since then, but the national unification of the system occurred with the National Institute of Social Security - INSS, created in 1990. Today, the INSS is the public organization that provides social security services to Brazilian society. In 2019, Brazil underwent the most recent process of changes to its social security system to date. This change was called the New Social Security, which went into effect with the publication of Constitutional Amendment No. 103 on November 13, 2019. Among the main changes of the new welfare, the end of retirement by contribution time and an increase in retirement ages.

Nevertheless, the retirement paid by the general system in Brazil will probably be lower than the last salary of an individual, especially for those who earn more than one minimum wage. The retirement value considers the average of all wages during the contribution period, not only the last salary before retirement. Moreover, private health plans are extremely expensive and keep rising, especially for the elderly, while most retired people have fixed income. Therefore, it is important to consider the complementary pension plan as an opportunity to increase income in the retirement phase of life. With regard to complementary pension plans, the creation of Funpresp (Fundação de Previdência

Complementar do Servidor Público Federal) was a milestone in the history of Brazilian complementary welfare. It has a greater capacity to absorb changes in the social and economic scenario, such as, for example, the increase in citizens' life expectancy. Besides, the institution of automatic adhesion of federal public servants in the complementary pension fund sector became a great example of *nudge* in Brazil[1].

A large literature from behavioral economics finds that people often make inconsistent choices, as opposed to the standard model of the rational economic agent (Kahneman & Krueger, 2006). The behaviors can depart from the predictions of the conventional economic model (Lusardi & Mitchell, 2021). This means that people's behavior is not guided by what they are able to compute, but by what they happen to see at a given moment. For instance, people tend to prefer immediate and concrete well-being over abstract security in the distant future (Riitsalu, 2018). In fact, not always the logic of costs and benefits does explain individuals choices very well (Duckworth, 2016). Therefore, sometimes people resort to cost-benefit analysis to make choices. They take into consideration how they can benefit, what the cost will be, and the likelihood that these benefits and costs will actually be what they imagine. At other times they do not reflect on the consequences of their actions (March, 1991). The remedy has long been thought to be financial education, and the ultimate objective of financial education is increasing FWB (Bureau, 2015; Riitsalu & Raaij, 2020).

The interest for FWB is growing in many countries. The focus is predominantly on factors leading to increased well-being among the population, and the policy measures to achieve it. However, research on FWB is only beginning to be conducted (Riitsalu & Raaij, 2020). Also, there are some important gaps in research relating to FWB. According to Kempson and Poppe (2018), no previous research appears to have broadly examined the relative importance of *knowledge* (financial literacy), *behaviors* (financial capability), and *psychological factors* in determining FWB. All this context is relevant for the decisions related to retirement and social security. As the age group of sixty years old and older is growing faster than any other age group (United Nations, 2019), promoting health and well-being becomes a priority for aging well (World Health Organization, 2022).

This study aims at analyzing the drivers of FWB to help people achieve *preparedness for retirement* and r*esilience for the future*. Through an updated modeling approach, I[2] seek to

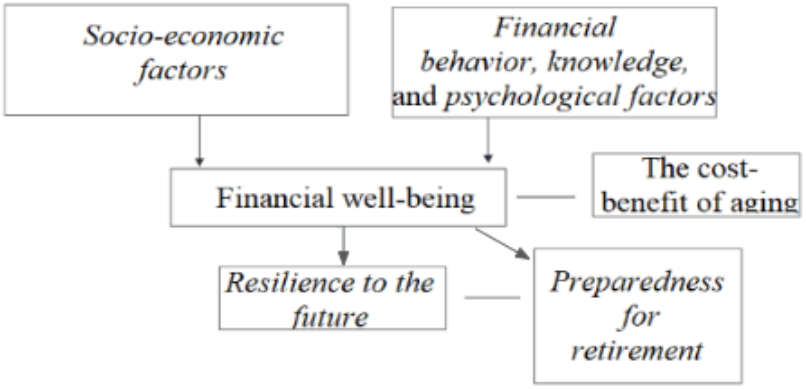
[1] Nudge is a stimulus to promote change in people's behavior in a predictable way, without creating prohibitions or changing economic incentives (Thaler & Sunstein, 2009).

[2] The first person tense is used in the introduction and general conclusion of the thesis. In the three articles, as we are going for a co-authored publication, we have chosen to use the third person.

have a better understanding of which *factors* are key to improve FWB throughout life and potentially alter financial choices relevant for old age. Importantly, I take into account the considerable evolution in thinking about FWB internationally in recent years: the shift from knowledge-based financial literacy framework to behaviourally-based financial capability framework. Behavior has an important role to play in FWB and is key to ensuring we have the financial *resilience* to lessen the impact of socioeconomic disruptions. Nevertheless, financial literacy can not be disregarded as a way of increasing the responsibility of individual citizens in the design of their own retirement strategies. The literature has shown both personality characteristics and financial knowledge were significant predictors of pre-retirement planning (e.g. Hershey and Mowen, 2000; Lusardi & Mitchell, 2021) Therefore, educational efforts should be developed for individuals who are differentially prone toward saving, both in terms of knowledge and behavior.

1.2 Research Problem

I am following the theoretical assumptions of Kempson & Poppe (2018), who developed a meaningful overall concept of FWB and showed how it can be measured and identified by a set of determinants, i.e: *demographic and socioeconomic, financial knowledge and experience, financial behavior and attitudes,* and *psychological factors*. These determinants work as drivers of FWB and enhance the understanding of the underlying mechanisms responsible for the unequal spread of well-being across the population. I also follow Kempson & Poppe (2018, pg. 13) definition of FWB: "the extent to which someone is able to meet all their current commitments and needs comfortably, and has the financial *resilience* to maintain this in the future" (italics as an emphasis added). This *objective* definition is useful for the present study because it measures two separate outcomes of FWB: *preparedness for retirement* and *resilience for the future* - which are related to how well people are financially prepared for retirement.



Source: Prepared by the author.

Figure 1.1: Research Structure

Notably, in academic literature there have been a number of attempts to define FWB as a *current* state and an expectation for the *future,* that is, a *subjective* or *perceived* evaluation of the financial situation of a person or household (e.g. Brüggen et al., 2017; Riitsalu & Raaij, 2020). In the present study, I also discuss the *perceived* FWB concept as the result of two distinct yet related assessments: *current money management stress* and e*xpected future financial security* - the two components of *perceived* FWB conceptualized by Netemeyer et al. (2018). Their research revealed that *perceived FWB* is a key predictor of overall wellbeing and comparable in magnitude to the combined effect of other life domains (Netemeyer et al., 2018). Furthermore, research has provided findings that subjective well-being has beneficial effects on health and longevity (Xu & Roberts, 2010; Diener, 2013; Kushlev et al., 2020). Various measures of well-being are useful for different purposes, but it is important to recognize that *subjective/perceived* well-being measures features of individuals' perceptions of their experiences, not their utility as economists typically conceive of it. For instance, Prawitz et al. (2006) argue that between *objective* and *subjective* measures in an attempt to describe the financial condition of individuals and families, perhaps even more helpful would be knowing an individual's judgments about and emotional responses to his or her financial condition. I agree with Ponchio, et al. (2019) argument that this stream of literature is relevant because the study of such factors may support the development of tools to enhance personal awareness of and responsibility for one's financial future. If the degree of *perceived* FWB is known, purposeful interventions like communications, treatments, and programs can be designed and delivered to help reduce distress about personal finances and to help improve FWB.

Moreover, the assessment of *perceived* FWB has been associated with *personal factors*. For instance, it is assumed in literature that *future time perspective* and *self-control* were correlated with *perceived* FWB (Ponchio et al., 2019; Riitsalu & Raaij, 2020), and that an increase in *future time perspective* was positively associated with retirement planning or adjustment (Hershey & Mowen, 2000; Earl et al., 2015; Tomar et al., 2021; Xia et al., 2023). I predict that future-oriented *psychological factors* will be positively associated with *preparedness for retirement, resilience for the future,* and *FWB*. In addition, the literature has shown that the experience of well-being encourages individuals to pursue goals that are capacity-building to meet future challenges. This capacity-building is perceived as a dynamic process that evolves over a lifetime (Hammond, 2010). Beyond long-term and forward-looking thinking, I add *resilience* measures as a new initiative to FWB analyses. Financial Resilience and Psychological Resilience appeared as mediator variables in the relationship between income shock and FWB (Kulshreshtha et al., 2023); and, individuals' insecure attachments – anxious and avoidant – were negatively related to their income security and FWB (Smith & Eng, 2024). I suggest that *psychological resilience* is relevant to increase *perceived* FWB, or in times of economic hardship. Thus, I argue that the cost-benefit of aging is expressed by *demographic and socioeconomic* aspects*, behavior and attitudes, knowledge and experience,* and 'key' *psychological factors*. Therefore, regarding the extension of scope, the thesis sought to further the FWB research with a main focus on key factors related to financial *preparedness for retirement* and *resilience for the future* (FWB outcomes). To that end, I am exploring the following research question:

What is the cost-benefit of aging from the perspective of financial well-being?

1.3 General and Specific Purposes

This thesis aims to analyze key drivers of FWB to help people achieve *preparedness for retirement* and r*esilience for the future* - FWB outcomes. I conducted three studies with the following purposes:

Study 1: Evaluating how well different age groups are financially prepared for retirement in Brazil;

Study 2: Analyzing how the issue of time relates to measures of financial well-being;.

Study 3: Identifying if *financial capability and well-being* awareness increases *preparedness for retirement*, *resilience for the future,* and *FWB*.

In this research my thesis is that *socioeconomic* aspects, financial *behavior*, financial *knowledge* and "key" *psychological factors* help to understand the lack of early saving for retirement. Therefore, my work focuses mainly on *psychological factors*, which the literature has pointed out as the factor that leads financial *knowledge* to *behavior*. This union between financial *knowledge* and *behavior* has been referred to as "*financial capability*", and this term is also highly relevant in this work.

1.4 Theme Justification

The well-being literature acknowledges finances as one of the domains of general well-being (Van Praag et al., 2003; Netemeyer et al., 2018). Older people face an array of vulnerabilities. Among these is lack of income, as older people are less likely to have paid employment than younger adults. The well-being of older people depends on how they derive their income and the reliability of the flow. However, there is evidence of people not being capable nor motivated for securing their FWB both in the short and long-term (Riitsalu & Raaij, 2020). Also, in many cases, older people often rely for income on a combination of small savings, support from family members, and government programs such as pensions (Bloom *et al*., 2013). Pensions can be essential, but they tend to be small and coverage is spotty (Bloom *et al*., 2013). Plus, in many countries around the world, such as Brazil, the working population will have to support an increasing number of elderly who will represent an ever higher proportion of the population, as discussed above (section 1.1). Despite having lifted many people out of poverty, the Brazilian public pension program may not provide sufficient income for most people during retirement (Jorgensen, Rocha & Fruttero, 2011).

Furthermore, the Brazilian FWB Indicator, based on a model developed by the Consumer Financial Protection Bureau - U.S. consumer protection agency, showed that the great challenge for Brazilians is still related to preparing for the future (Bureau, 2015). On a daily basis, the consumer survives, but neglects the formation of a financial reserve, being at the mercy of eventual unforeseen events. This is the item in which Brazilians have the lowest performance: only 9.1% could afford an unexpected contingency, while 67.9% could not. The survey also shows that only 18% say they are ensuring their financial future, compared to 56.6% who are not (Credit Protection Service, 2019). In this thesis, results also illustrated low

levels of private retirement savings across the sample, even with low reliance on state pensions. Low saving rates and inadequate long-term financial planning for retirement have made FWB an important topic for individuals as well as for societies. The process of elderly population growing rapidly in developing countries, such as Brazil, and the well-being of the elderly in these countries have not been a policy priority until recently. Improving welfare will require paying more attention to this forgotten group. This calls for a strong research and policy agenda for this group. Moreover, FWB is an emerging research area and remains scarce and scattered across disciplines (Brüggen, et al., 2017). There is an abundant opportunity for further research on this topic, as prior research on overall well-being sheds little light on the role of FWB (Riitsalu & Raaij, 2020).

1.5 Research Contributions

There are still few studies on the issue in question, whether in the national or international context. Thus, one of the contributions of this research is to increase the studies on FWB research. The fact that the thesis is structured in three related researches, addressing different and complementary aspects, helps to link knowledge to this still limited research area. Also, by proposing the personal characteristics of *grit* and *psychological resilience* as factors capable of increasing *preparedness for retirement* and *resilience for the future*, I propose an innovative perspective on FWB research that helps to expand the scope of the subject. The present research uses concepts derived from *psychological resilience theory* to analyze *subjective* mechanisms capable of influencing to increase *preparedness for retirement* and *resilience for the future* of individuals.

This thesis also contributes to society in the comprehension of 'key' *factors* to *FWB* in old age. I argue that *demographics and socioeconomic* aspects, *behavioral and attitudes*, *knowledge and experience*, and 'key' *psychological factors* help us to understand some issues that make it difficult to save in advance for retirement. It is worth mentioning that in this study the cost-benefit of aging is focused on the financial issues of retirement and on attitudes toward preparing oneself throughout life, although in practice it is not limited to this. The results also contribute by providing new insights on how *retirement contributions* choices can affect the potential of aging well. From evidence, I show that looking at different age groups seems to be a key factor for both *financial behaviors* and *FWB*. Furthermore, I present evidence on forward-looking *psychological factors* to favor long-term decisions and *FWB* measures. Additionally, I point out the importance of drawing people's attention to their

financial capability and well-being in order to increase reported *preparedness for retirement, resilience for the future* and *FWB*.

Also, financial practitioners and service providers, among others, must know what factors determine FWB, to develop strategies to help individuals achieve and maintain it. Service providers are encouraged to collaborate with practitioners and offer a supporting role in this process. For instance, in 2016 the Ministry of Social Development of New Zealand began funding services and initiatives that focused on building people's overall financial capability, rather than just budgeting (MSD, 2021). They fund providers who have a core workforce to help people achieve their financial goals and ensure their FWB.

With regard to the contribution to Accounting Science, decision theory is relevant to accounting because financial statements provide additional information that is useful for many decisions. For instance, Scott (2015, pg. 82) argues that "Information is evidence that has the potential to affect an individual's decision"; and that "the definition of information should be interpreted net of cost. An information source may have the potential to affect an individual's decision but, if it is too costly, *it is not information since it will not be used*." (italic as an emphasis added). I suggest financial education, whose ultimate objective is increasing FWB, can benefit the best use of the information available in this specific decision-making environment. Financial knowledge proved to help individuals make investment decisions and better allocate financial resources (Lusardi et al., 2017). And the lack of financial literacy can lead to inadequate financial planning for both the short- and the long-term (Lusardi & Mitchell, 2011, 2014). This is the connection I do between accounting and personal finance. As a way of bringing even more light to this connection, attached as Appendix A is a printout of an email I asked Annamaria Lusardi about her vision of the interconnection between personal finances and accounting. I transcribed below her answer:

> "I think there are many connections between personal finance and accounting. For example, individuals know little about how to take care of the accounting of their families (do a balance sheet or an income and expense statement), also have difficulties making financial decisions in the way we normally advise: calculate the net present value of projects and compare them and as my Big three financial literacy questions show, they know little about the basic principles of finance that are

> important for both accounting and personal finance." (A. Lusardi, personal communication, March 3, 2024).

1.6 Basic concepts

In this thesis I use the Financial Capability and Well-Being Model by Kempson and Poppe (2018) and Kempson and Evans (2021). Thus, the description of the method of the current research partially reproduces their wording. The analysis I undertook was informed by the conceptual model given in Figure 1.2 below.

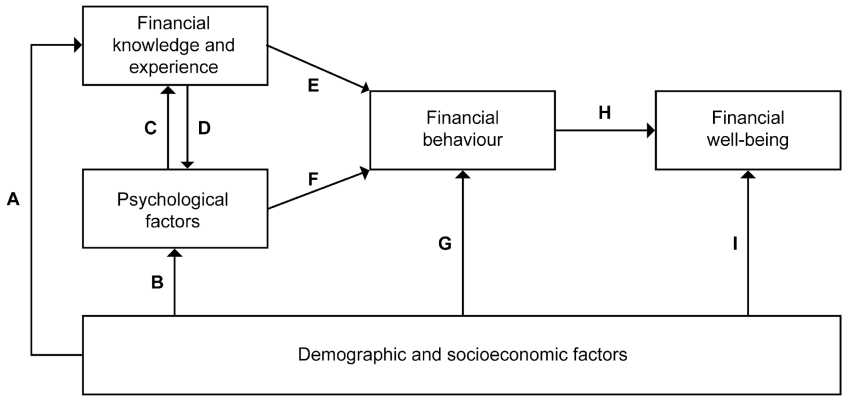
However, as an innovation to this model, in the thesis I establish *financial behavior* (of different age groups) as an exploratory variable in a first moment of analysis. I also propose *grit* and *psychological resilience* as forward looking *psychological factors*, and the attitude of *retirement contributions,* as relevant in explaining the *preparedness for retirement* and *resilience for the future* (*FWB* outcomes).[3]

I decided to use Ordinary Least Squares (OLS) to better establish multivariate links through these exploratory propositions. I also decided to use Principal Component Analysis (PCA) in a further analysis because it was possible to reduce into single components a number of issues (from the self-perception questionnaires that make up our variables). PCA identifies groups of questions that correlate with one another and can be considered as measuring an underlying 'component' of the data.

From the figure 1.2 next, the independent variables of the OLS model are *demographic and socioeconomic*, *behaviors and attitudes*, *knowledge and experience*, and *psychological factors*. The dependent variables are *preparedness for retirement, resilience for the future* and *FWB*. The main constructs used are conceptualized below.

[3] The thesis theme has a very interesting aspect, which could be researched in the future, in Mental Accounting, developed by Richard Thaler. Thaler shows that people create separate mental accounts for different objectives or sources through mental accounting. This segmentation can lead to decisions that may not be the most economically rational. Thaler's research is already well-established in the behavioral economic literature, but I won't go into it, although I recognize its relevance.

Figure 1.2 Financial Capability and Well-Being Model



Demographic and socioeconomic: Include age, gender, place of residence, employment status, schooling, income, and family type. The last group includes couples with children or dependents, living alone, living with parents or other relatives/friends, principal source of family income, own residence, solo parent, access to financial support from friends/family, and learned to manage/save money as a child.

Financial knowledge and experience: Knowledge of money management, Experience of money management, Knowledge how to compare financial products, Financial inclusion, and Understanding of risk.

Financial behavior and attitudes: Keeping track of money, Planning use of income, Spending restraint, Active saving, Not borrowing for day-to-day expenses, Restrained use of consumer credit, Informed financial decision-making, and Informed product choice.

Psychological factors: Composed of the financial locus of control (the belief that one holds a level of control over one's financial situation); financial confidence; action orientation (tendency to procrastinate or not); attitudes toward saving, spending, and borrowing; long-term thinking; self-control; impulsivity control; and lack of concern about social status.

Grit: The extent to which individuals are able to persevere in obtaining long-term goals.

Psychological resilience: A protective factor that helps to balance out risk factors.

Financial capability: The ability to manage money well. In practice, financial capability is a complex set of behaviors, knowledge and attitudes, as wide-ranging as budgeting, understanding financial products, having a long-term perspective, regular saving, doing research, and confidence in one's ability to make good financial decisions.

Financial well-being (FWB): The outcome of financial capability is financial well-being. Financial well-being is defined as the extent to which someone is able to meet all their current commitments and needs comfortably, and has the financial resilience to maintain this in the future. It is a meaningful overall concept that can be measured and identified by a set of determinants. Also, it has been shown that financial well-being can usefully be disaggregated into three distinct dimensions: meeting current commitments, being comfortable financially and having resilience for the future.

Preparedness for retirement: Measures how well people are financially prepared for retirement. This is a separate outcome measure and is not part of the measurement of overall financial well-being.

Resilience for the future: It is a sub-component of FWB, which is heavily influenced by income and expenses.

With regard to *perceived FWB* concept, I use the two components of *perceived FWB* conceptualized by Netemeyer et al. (2018) - *current money management stress* and e*xpected future financial security*. van Raaij et al. (2023) found *self-control* as the main determinant of *current money management stress*, and *future time perspective* as the main determinant of *expected future financial security.* I also account for *procrastination* to further explore key *psychological factors* relevant to time processing of long term thinking.

Self-control: A five-point scale item ("nothing to do with me" to "totally me")*:* I have a hard time breaking bad habits. I get distracted easily. I'm good at resisting temptation. I do things that feel good in the moment but regret later on. I often act without thinking through all the alternatives.

Future time perspective: The perception of time left to live, whether for the elderly or individuals of all ages. It is a five-point scale from "nothing to do with me" to "totally me": I generally plan for the future. I take each day as it comes. I like planning and preparing for the future.

Procrastination: The tendency to put off decisions or actions that are difficult to perform, may be due to a lack of self-control, short-sightedness, or difficulties navigating the complex intertemporal decisions of saving for retirement.

Current money management stress: Stress related to the management of money today. Current money management stress is predicted by short-term traits and behaviors.

Expected future financial security: A sense of security in one's financial future. Behaviors and traits that reflect longer-term thinking, such as planning for money long-term and a willingness to take investment risks, are significantly related to expected future financial security.

Perceived FWB: Perceived financial well-being is the result of two distinct, yet related assessments: Current money management stress (How am I doing today?) and Expected future financial security (How do I expect I will be doing in the future?).

1.7 Thesis Structure

I decided to structure the thesis as a set of studies (papers) listing the most relevant themes for the study concerning The Cost-Benefit of Aging from the Perspective of FWB. Although the thesis is divided into three empirical studies, it had two main phases: an exploratory phase with screening, synthesis, and validation of results from empirical data samples; and an intervention phase, with design, implementation, and evaluation of an experiment. The surveys were important to identify priority areas for interventions or gaps that need to be filled and then proceed with the experiment.

In Study 1, I used an online sample in order to ensure different individuals from a wide range of age groups, income, school levels, among other things. Study 1 evaluated how well different age groups are financially prepared for retirement in Brazil. In general, empirical data were analyzed to evaluate the objective Financial Capability and Well-Being

Model (Kempson & Poppe, 2018). In Study 2, I also wanted to analyze the subjective or Perceived Financial Well-Being Scale (Netemeyer, et al., 2018). Study 2 aimed to analyze how the issue of time relates to measures of financial well-being. I cross responses between online activities performed by students and responses to a survey questionnaire. Study 3 derived from an experiment which proposed to identify if *financial capability and well-being* awareness increases *preparedness for retirement*, *resilience for the future,* and *FWB*.

Beyond this introductory chapter, the thesis is organized in four more chapters. In the next chapter I develop the theoretical background and the research hypothesis. The following three chapters bring the empirical studies proposed in this research. Each empirical study contains the method that was used, the results found and the conclusions. Finally, a general conclusion combines the answer of the central research question - what is the cost-benefit of aging from the perspective of financial well-being? - with the three studies that were carried on. Table 1.1 below aims to summarize the main topics developed next in order to broadly discuss The Cost-Benefit of Aging from the perspective of FWB:

Table 1.1 The Cost-Benefit of Aging from the perspective of FWB

Cost-Benefit	**Aging**	**FWB**
Preparedness for retirement	Age groups	Objective [Longevity]
Resilience for the future	Future Time Perspective	Subjective [Awareness]

Source: Prepared by the author.

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Appendix A

Dear Professor Annamaria,

My name is Eduarda and I was at today's EAA conference. At the end of the conference I asked a second question in the chat, but due to lack of time it wasn't answered. My degree is in Accounting, and I'm writing my thesis on Financial Well-being. I've been studying personal finance since I was an undergraduate and one question that always comes up in my final exams is the connection between personal finance and accounting. Please let me have your thoughts on this.

Thank you very much!

Annamaria Lusardi 3 Mar 2024, 22:33

to me

Hi Eduarda,

I think there are many connections between personal finance and accounting. For example, individuals know little about how to take care of the accounting of their families (do a balance sheet or an income and expense statement), also have difficulties making financial decisions in the way we normally advise: calculate the net present value of projects and compare them and as my Big three financial literacy questions show, they know little about the basic principles of finance that are important for both accounting and personal finance.

Best regards,

Figure 1.3 - Connections between personal finance and accounting by Annamaria Lusardi

Chapter 2: Theoretical background

To analyze the *preparedness for retirement* and *resilience for the future* (FWB outcomes and the cost-benefit of aging *proxies*), I carried out three empirical studies. Before them, I engaged in a literature review of the role of *psychological resilience* and *grit* in FWB research. My attempt at conceptual use of these terms highlights that specific individual characteristics are necessary for a good maintenance of one's orientation toward purposes (Sisto et al., 2019). The term 'purpose' here refers to long-term objectives. This theoretical background section also includes the research hypotheses for studies 1, 2 and 3.

2.1 The role of *psychological resilience* and *grit* measures on FWB

The *psychological resilience* term was popularized in the 1980s by psychologist Emmy Werner as she conducted a forty-year-long study of children from low socioeconomic status backgrounds (Werner, 1989; Werner, 1995). Among Werner's most significant findings was that one-third of all high-risk children displayed resilience despite their problematic development histories. She and her fellow researchers identified a number of protective factors in the lives of these resilient individuals that helped to balance out risk factors. Notably, most research now shows that resilience is the result of individuals being able to interact with their environments and participate in processes that either promote well-being or protect them against the overwhelming influence of relative risk (Zautra et al., 2010).

Analysis from the literature shows that the *psychological resilience* construct does not have a single meaning and has been described depending on the perspective from which it is analyzed. For instance, in the field of resilience studies, there is a heated debate among scholars in particular between those who consider resilience as a trait of personality that is fixed and stable over time and those who do not consider it a personality trait but rather as a dynamic process evolving over time (Sisto et al., 2019). This last perspective is highly significant because it suggests that resilience is a malleable phenomenon, and as such it is suitable for intervention (Robertson et al., 2015). Furthermore, from this dynamic perspective, previous work suggests that there is a somewhat paradoxical pattern of discrepant late-life change trends related to *subjective* well-being.

This paradox may be characterized—in line with previous research and conceptions (e.g. Smith, Loewenstein, Jankovic, & Ubel, 2009)— by pronounced decline in *objective* functioning indicators, but overall stability (or minor declines) in indicators of *subjective*

health and well-being. Evidence for successful late-life adaptation (Schilling et al., 2013) and rather high subjective well-being (Jopp & Rott, 2006) would result in this late-life well-being paradox. Notably, resilience adds an element of *future* proofing to a well-being analysis. A resilience focus, taken alongside a well-being lens, can help us predict future risks. If resilience contributes as a protective factor which increases subjective well-being, then it suggests that resilience is also relevant to increase FWB - also in times of economic hardship (Mguni, et al., 2012).

Two commonly used measures of resilience include self-report scales such as the Connor–Davidson Resilience Scale and the Grit Scale. The Connor–Davidson Resilience Scale was developed as a brief self-rated assessment to help quantify resilience in a valid and reliable way (Connor & Davidson, 2003). For its turn, the Grit Scale measures the extent to which individuals are able to persevere in obtaining long-term goals. It is a reliable predictor of goal attainment and designates an internal source of strength - a kind of psychological heritage. Notably, data from Duckworth's (2016) survey reveals that grit scores vary with age; it is possible that as people get older, they develop grit in the long run. Therefore, this demonstrates what researchers call the maturity principle (Duckworth, 2016).

Some recent studies investigated the role of *grit* in predicting well-being. Hoffmann et al. (2022) examined the mental, social, functional, and FWB of 2,100 individuals across Australia, France, Germany, and South Africa by means of a survey administered during May of 2021. Their work suggested that positive health and financial behaviors were positively associated with well-being during the COVID-19 pandemic. Disabato et al., (2019) tested the reliability of *grit* scores across the globe and examined how differently each *grit* facet related to well-being. Their analyses showed that perseverance of effort was moderately to strongly related to subjective well-being. Park (2019) researched the mediation effect of consumer grit level between capability and quality of life; and Yeo & Lee (2019) found that the biggest impact on life satisfaction among older adults was FWB.

However, little research looks at the moderating effect of *grit* on FWB. Prior savings are among the most important correlates of general FWB, yet an alarming number of people are ill-prepared for financial emergencies and retirement. While attempts to address this issue typically involve direct financial support or behavioral interventions, these approaches often overlook the broad individual differences that can shape savings behaviors (Hall, 2021). I attempted to take a *grit* approach to measure *FWB* in a more subjective / individualized way. For example, in Study 1, *grit* and *resilience for the future* apparently improved the financial

behavior model of the older group. The *psychological resilience theory* was the theoretical basis to link what kind of mechanisms and triggers are involved in the process of aging financially well and what "key" *factors* are associated with adaptations in the face of risks (costs) and opportunities (benefits) for *FWB* in older age.

2.2 Research hypothesis

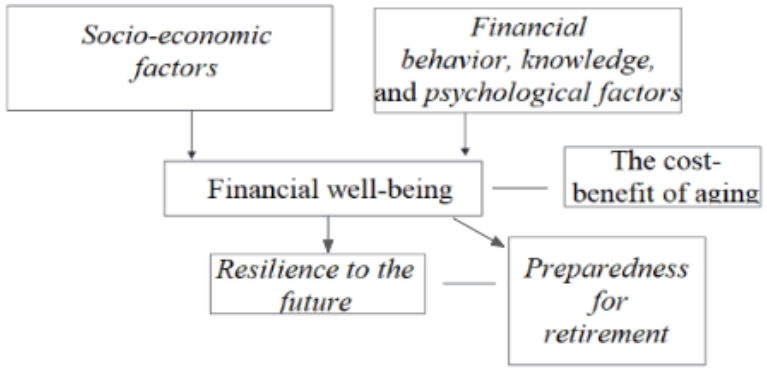
The Organisation for Economic Co-operation and Development (OECD) defines Financial Education as a process in which individuals make *conscious choices* and keep themselves *well informed* about the economy in order to handle the best way for their money (OECD, 2013). Financial education takes into account the varied needs of individuals in different *socioeconomic* contexts and results in *financial literacy* (OECD, 2013). This concept, also defined by the OECD, expresses the combination of *awareness*, *knowledge*, *skills*, *attitude* and *behaviors* needed to make informed financial decisions and ultimately achieve individual FWB (OECD, 2013). Financial literacy is broader than financial education because it is linked to real-life application with effective decision-making (see Potrich et al., 2015; Borges & Botelho, 2020). Brazil received OECD approval for new legal instruments related to Financial Education and has adhered to the OECD's recommendations. The country has taken some initial steps towards this goal with ENEF-Estratégia Nacional de Educação Financeira, the proposal for a financial education programme publicly launched by the federal government in August 2011. Notably, according to OECD (2013), to their knowledge, this is the first financial education national programme to include economic psychology/behavioral economics to this extent. Nevertheless, behavioral biases is only one aspect of the overall problem of poor household financial decision making (OECD, 2013).

According to Lusardi (2019) - author considered an expert in the field and who has published widely on financial literacy, financial education and social security (Goyal & Kumar, 2021) - an essential indicator of people's ability to make financial decisions is their level of financial literacy; and her findings around the world are sobering. It shows that financial literacy is low even in advanced economies; on average, about one third of the global population has familiarity with the basic concepts that underlie everyday financial decisions (Lusardi and Mitchell, 2011c). Lusardi (2019) work also calls our attention for financial literacy refers to both *knowledge* and financial *behavior*, and this thesis will consider research on both topics. However, if the emotional component is not taken into account, it is unlikely that any transformation will be possible (Ferreira, 2008). For this

reason, my emphasis will mainly lay on *psychological factors* that are essential to long-term decisions related to financially preparing for retirement. For instance, there is evidence of a lack of *confidence*, particularly among women, and this has implications for how subgroups more vulnerable to the population approach and make financial decisions. Financial *confidence* and the *ability* to apply financial *knowledge* have been shown to be means that lead *knowledge* to *behavior* (Goyal & Kumar, 2021). There is still much to learn about the ways to build the bridge between poor and better financial decisions. For example, Goyal & Kumar (2021) did a systematic review, coupled with bibliometric analysis, to take a meticulous approach intended at presenting quantitative and qualitative knowledge on the ever-emerging subject of financial literacy. The study comprises a review of 502 articles - published in peer-reviewed journals from 2000 to 2019. Emerging themes identified include financial capability, financial inclusion, gender gap, tax & insurance literacy, and digital financial education. Lusardi & Mitchell (2014) points out that outcomes beyond what have been studied to date are likely to be of interest, including, for instance, investment in health, and when to claim social security benefits, decisions that have far-reaching economic consequences. The conceptual framework I am following in this thesis has the intention to portray a wide-ranging picture (*demographic and socioeconomic, knowledge and experience*, *behaviors and attitudes*, and "key" *psychological factors*), following Kempson & Poppe (2018) and some of the potential areas that have been suggested in the literature research.

Conforming disparity in FWB across different socioeconomic environments have previously been associated in FWB research (Kempson & Poppe, 2018). But no previous study seems to relate the separate outcomes measures of *preparedness for retirement* and *resilience for the future* to other components of *FWB.* Some related studies are Lusardi & Mitchell (2011), who worked on the implications of financial literacy and planning for retirement well-being; Prast & van Soest (2016) research on the extent to which financial literacy is an important determinant of financial protection in the older pre-retirement population; Miller & Miller (2020) research on retirement planning and economic security among older adults with debt; Agabalinda & Isoh (2020) who found specific behaviors, knowledge, and skills, but not attitudes, as predictors of retirement preparedness in Uganda; and Qi et al. (2022) indicating income, risk tolerance, and attainment of a college education as positively associated with retirement preparedness in the United States. In Brazil, we highlight Nalin & França (2015) evidence on greater resilience and socioeconomic satisfaction to greater perception of well-being during retirement. Through hierarchical

regression they revealed determined resilience as the principal predictor of subjective well-being. For my turn, I suggest *psychological resilience* and *grit* relevance for *FWB* efforts in the long run. The overall *FWB* used in the present study (which is a combination of meeting commitments, being financially comfortable, and *resilience for the future*) includes a separate outcome measure on how well people are financially prepared for retirement - *preparedness for retirement*, which has a direct connection with long-term thinking. I conducted ordinary least squares regression analysis using the Financial Capability and Well-Being Model (Kempson & Poppe, 2018) as shown in Figure 2.1.



Source: Prepared by the author.

Figure 2.1: Research Structure

The dependent variables of the models are *preparedness for retirement, resilience for the future* and *FWB*. Regarding the independent variables, evidence on *socioeconomic factors* in low-and-middle-income countries showed that equipping human-service practitioners with basic financial skills could significantly improve the socioeconomic well-being of marginalized populations in Africa and Asia (Ansong et al., 2020); preliminary results demonstrated how increased financial literacy correlated with poverty reduction. Ansong et al. (2021) also analyzed the role of savings and other income sources in the education financing choices of families from 59 low-and-middle-income countries; and Sehrawat et al. (2021) researched to identify the specific constituents of financial literacy, financial behavior, and personality traits that affect the FWB (perceived and objective) of an individual in Indian context. In general, literature shows that *financial behavior* matters, and people in the same *socioeconomic* circumstances will achieve different *FWB* outcomes if their behavior differs (Kempson, et al., 2017). Rahman et al. (2021), for example, demonstrated that financial

behavior is the key antecedent followed by financial stress and financial literacy in predicting FWB. Plus, Riyazahmed (2021) identified that behavioral factors like future security, savings and investments, credit indiscipline, and financial consciousness have a significant impact on the FWB of an individual in the Indian scenario. However, on *psychological factors*, Shobha & Chakraborty (2017) review of literature for FWB indicated that beyond the demographic, social, and economic factors, it is the psychological factors that have a greater impact on the FWB of an individual. The authors defend that these psychological factors needed further investigation to identify specific psychological factors affecting FWB. Yet, only a few related studies were found. One relating preparedness and confidence toward retirement in Malaysia (Shanmugam & Zainal Abidin, 2013); and Hershey & Mowen (2000) which adopted a structural analysis model that revealed personality constructs and financial knowledge as significant predictors of pre-retirement planning in the United States.

Therefore, in line with Kempson and Poppe (2018) *FWB* outcomes, *preparedness for retirement* and *resilience for the future,* and seeking to enhance the understanding of the underlying mechanisms responsible for the unequal spread of well-being across different age groups, especially the older population, the following research hypothesis was elaborated for Studies 1, 2, and 3: H1: *Socioeconomic* aspects, financial *knowledge*, and *psychological factors* are explanatory variables for financial *behavior* (financial capability) in different age groups; H2: *Socioeconomic* aspects and financial *behavior* (financial capability) are explanatory variables for *preparedness for retirement*, *resilience for the future,* and *FWB* in different age groups. H3: *self-control*, *future time perspective, procrastination, grit,* and *psychological resilience* (*personal time proxies*) are related to *FWB* measures; H4: *financial capability and well-being* awareness increase reported *preparedness for retirement*, *resilience for the future,* and *FWB.* These hypotheses were supported by the data, as illustrated in the three empirical studies, and summarized in Chapter 6 (see Table 6).

Next, Chapter 3 of this study contains Study 1 “The Cost-Benefit of Aging: Financial Well-Being Across Age Groups in Brazil.” It sought to investigate how well different age groups are financially prepared for retirement in Brazil. Chapter 4 contains Study 2 “The Cost-Benefit of Aging: The Role of Personal Time on Financial Well-Being Measures.”. I analyzed the influence of *self-control*, *future time perspective*, *procrastination*, *psychological resilience,* and *grit* on *FWB* measures. And Chapter 5 contains Study 3 “The Cost-Benefit of Aging: Financial Capability and Well-Being Awareness.” An experiment to identify if

financial capability and well-being awareness increase *preparedness for retirement*, *resilience for the future,* and *FWB*. Finally, Chapter 6 concludes the thesis.

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Chapter 3: Study 1 (Journal of Aging Research)

Next, Study 1 evaluates how well different age groups are financially prepared for retirement in Brazil. In particular, I am following two assumptions related to FWB research: H1: *Socioeconomic* aspects, *financial knowledge*, and *psychological factors* are explanatory variables for the *financial behavior* (financial capability) of different age groups. H2: *Socioeconomic* aspects and *financial behavior* are explanatory variables for the *preparedness for retirement*, *resilience for the future*, and *FWB* of different age groups. Study 1 is structured according to the Journal of Aging Research rules. Despite being a gerontology and geriatric medicine journal, it welcomes reviews focused on societal and socioeconomic health issues affecting older adults. It is an interesting journal to deal with issues related to *preparedness for retirement* and *resilience for the future* across age groups. This research has been published: https://www.hindawi.com/journals/jar/2023/2020189/.

The Cost–Benefit of Aging: Financial Capability and Well-Being Across Age Groups in Brazil

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Abstract

A large proportion of older persons in developing countries do not have access to pension, which also constrains their ability to afford healthcare services and entails extensive challenges to the well-being of older people. This study aimed to analyze the financial preparedness of different age groups for retirement in Brazil. Data were derived from a survey to empirically validate the proposed relationships between *preparedness for retirement* and *resilience for the future* (financial well-being [FWB] outcomes) on the one hand and among *demographic and socio-economic* aspects, *behaviors and attitudes*, *knowledge and experience*, and "key" *psychological factors* on the other hand. The sample consisted of 412 individuals aged between 22 and 79 years. FWB was measured using the Financial Capability

and Well-Being Model and regressed a number of sociodemographic and psychological variables using linear regression analyses. The results demonstrated that *preparedness for retirement* was strongly related to older age. Additionally, age was correlated with *resilience for the future* close to zero, which indicates no relationship. *Knowledge* and the *psychological factors* self-control and confidence were positively and strongly related to better *financial behavior* for all age groups. In addition, g*rit* and *resilience for the future* were positively related to better *financial behavior* in the older age group. Furthermore, the variables of retirement contribution were seemingly not viewed as important to the older group compared with their young and mature counterparts. Multidimensional interventions, especially targeting *behaviors* and *psychological* patterns could, therefore, be recommended in advance to young and mature groups to prepare them to secure their old age and achieve FWB.

Introduction

Lifespans are far longer than they were a century ago. However, aging poses major challenges and will be a dominant theme for development in the 21st century. Today's young people will be part of the 2 billion older persons in 2050, and 80% of them will live in developing countries [1, 2]. Because of the increasing number of older people, inequality and economic insecurity among older adults is also a major concern [3]. Old-age pensions and access to health care are critical in reducing poverty and inequality among older people. However, nearly half (48%) of all people over pensionable age do not receive a pension. For many of those who do receive a pension, pension levels are inadequate. Thus, the majority of the world's older population has no income security [4].

Notably, Brazil is set to age rapidly over the next several decades, which will be driven by improved life expectancy and declining fertility rates [5]. The aging of the population will directly impact healthcare and social security, and the Brazilian public pension program (INSS) may be unable to provide sufficient income for the majority of people during retirement [6]. For instance, the Global Retirement Index [7] measures critical aspects of welfare in the retirement of older demographic retiree groups in countries across the world. In particular, Brazil comes in below average for the majority of factors, scores extremely low for "material well-being" (income equality index, income per capita index, and unemployment index), and ranked second to last in the Global Retirement Index, which is only ahead of India out of 44 countries analyzed. Moreover, in one of the economic indicators that best capture the multiple dimensions of economic and social progress created by the Organization for Economic Co-operation and Development, Brazil underperforms in average income, job, education, health, social connection, and life satisfaction [8].

This study evaluates the financial preparedness of various age groups for retirement in Brazil. The sample comprised 412 individuals aged 22–79 years. Data were derived from a survey to empirically validate the proposed relationships between *preparedness for retirement* and *resilience for the future* (financial well-being [FWB] outcomes) and among *demographic and socio-economic* aspects, *behaviors and attitudes*, *knowledge and experience*, and "key" *psychological factors*. FWB is an essential component of aging well [9]; thus, its provision is a central requirement for overcoming the challenges of an aging population [10]. However, the literature provides neither an accepted definition of the FWB construct nor a standard measure of FWB [11, 12]. Therefore, a rigorously identified link among *knowledge* (financial literacy), *behaviors* (financial capability), *psychological factors*, and *demographic and socio-economic factors* (e.g., age group) should be established in determining FWB. In this study, we mainly highlighted the importance of monitoring the *behavioral* and *psychological* aspects among age groups regarding saving for retirement as early as possible.

In a number of attempts to define FWB, several academic researchers on the topic note a two-component view of a current state and an expectation for the future. Notably, this expectation about financial security allows individuals to feel optimistic about handling future health-related events [12]. For instance, a study by the CFPB [11] posited a likely link between expected future financial security and overall well-being. The overall FWB used in the present study (which is a combination of meeting commitments, being financially comfortable and *resilience for the future*) includes a separate outcome measure on how well people are financially prepared for retirement - *preparedness for retirement*, which has a direct connection with long-term thinking.

We adopted the *psychological resilience theory* in this study because it is a relatively positive and developmental outlook in that resilient people, according to the theory, tend to maintain high levels of well-being. Consequently, psychological resilience could be a personal factor for improving FWB and "preparedness for future retirement." One commonly used measure of resilience is the self-report grit scale. *Grit* is a noncognitive trait, which is defined as perseverance and passion for long-term goals [13]. It represents a combination of educational, behavioral, and psychological factors and is dependent on the prospect of a better tomorrow than today, which is the connection made in this study. In addition, prior research reveals that *grit* scores vary with age, that is, adults with the most *grit* were in their sixties or older, and those with a bit of *grit* were in their twenties [14], as people may develop *grit* in the long run. This concept is the so-called maturity principle. However, Sigmundsson

et al. [15] reports relatively conflicting findings about grit increases–decreases across the life span; Sanders et al. [16] demonstrates significant evidence that the negative-parabolic shape of the grit-age profile is driven by generational variation, not age variation; and Morell et al. [17] claims that no evidence indicates that a consistent grit factor or factors exist across age groups. Thus, the need for a consensus about the maturity principle continues, and this issue remains open for further investigation.

Previous studies revealed a positive association between the total score for *grit* with various variables of successful aging (physical, emotional, social functioning, energy, and general health) and presented *grit* as a protective factor that promotes active adaptation to the developmental challenges of aging [18]. Notably, the results of Kim and Lee [19] demonstrated the larger influence of "perseverance" than those of health and economic level on successful aging. The authors argued that health and economic levels clearly exert a meaningful influence on the successful aging of the elderly, but the result of a sub-component of *grit*–perseverance–as the most influential variable provides significant implications. Thus, scholars suggested the establishment of targets and psychological aspects for accomplishing these objectives as important for success in one's later years. Grit is also a useful construct to study because this trait affects long-term achievement that might be amenable to intervention. To aid in instilling and developing grit, the literature must clarify the natural motivators of gritty individuals [20]. Scholars also suggest prospective longitudinal studies across the life course to examine how individuals develop superordinate goals of such compelling personal significance that they inspire lifelong allegiance despite innumerable alternative pursuits and inevitable mistakes, failures, and other obstacles [21].

In summary, FWB is an emerging research area and remains scarce and scattered across disciplines [22], which is a trend that can also be observed in Brazil, which, thus, motivates further examination. This study tested the hypothesis that FWB is associated with *demographic and socio-economic* aspects, *behavior and attitudes*, *knowledge and experience*, and *"key" psychological factors.* In particular, we are following two assumptions related to FWB research: H1: Socio-economic aspects, financial knowledge, and psychological factors are explanatory variables for the financial behavior (financial capability) of different age groups. H2: Socio-economic aspects and financial behavior are explanatory variables for the *preparedness for retirement*, *resilience for the future*, and FWB of different age groups.

Materials and methods

Procedures

This study uses the method of Kempson and Poppe [23] and Kempson and Evans [24]. Thus, the description of the method of the current study partially reproduces their wording. To evaluate the financial preparedness of different age groups for retirement in Brazil, we conducted ordinary least squares regression analysis using the Financial Capability and Well-Being Model [23, 24] as shown in Figure 3.1. The independent variables of the model are *demographic and socio-economic*, *behaviors and attitudes*, *knowledge and experience*, and *psychological factors*. The dependent variables are *preparedness for retirement* and *resilience for the future* as the outcomes of FWB. As an innovation to the methodology used in [23, 24], the current study also establishes *financial behavior* as an exploratory variable in the first moment of analysis. In addition, we propose *grit*, *resilience for the future*, and *retirement contribution* as variables relevant in explaining the *financial behavior* of the different age groups.

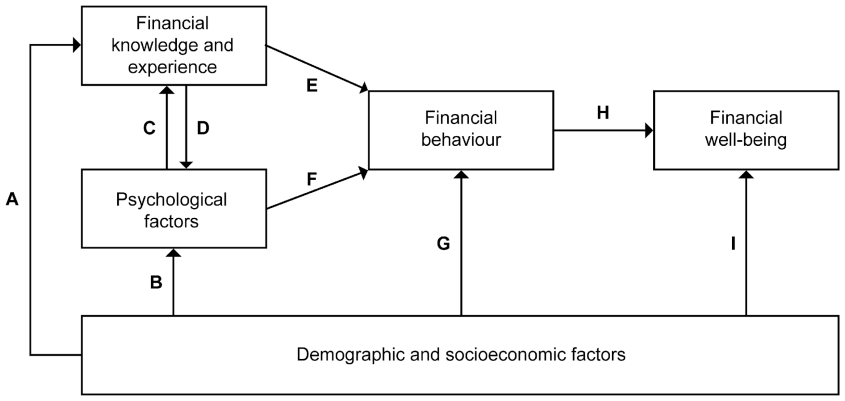


Figure 3.1 Financial Capability and Well-Being Model [24]

The *demographic and socio-economic* data include age, gender, place of residence, employment status, schooling, income, and family type. The last group includes couples with children or dependents, living alone, living with parents or other relatives/friends, principal source of family income, own residence, solo parent, access to financial support from friends/family, and learned to manage/save money as a child. Controlling for age and other relevant variables, we can examine the effect of different *financial behaviors*, *knowledge*, and *psychological factors* in comparing people in similar socio-economic situations.

Regarding *financial behavior*, people who save regularly are more likely to have an emergency fund, for example. Thus, better *financial behavior* results in higher FWB. However, more is required to change behavior, because a number of financial behaviors require prior knowledge. Thus, distinguishing between knowledge and behavior enables the identification of whether or not the issue is insufficient knowledge or barriers exist to the practical implementation of such knowledge. An important point is that financial knowledge is not the sole determinant of financial behavior, because *knowledge and experience* are sometimes insufficient for changing behavior. Research suggests that psychological factors may be part of the "missing link" between knowledge and behavior (e.g., [25]).

The data for *psychological factors* are composed of the financial locus of control (the belief that one holds a level of control over one's financial situation); financial confidence; action orientation (tendency to procrastinate or not); attitudes toward saving, spending, and borrowing; long-term thinking; self-control; impulsivity control; and lack of concern about social status. The psychological factors are added in part IV of the questionnaire (in the Appendix) and have been adopted from the study by Kempson and Poppe [23] and Kempson and Evans [24].

Psychological factors influence a person's willingness to perform certain actions and thereby influence *knowledge and experience*. For example, a person with a low level of financial locus of control may believe that learning about money is useless. In turn, financial *knowledge and experience* can shift psychological factors; for example, acquiring financial *knowledge and experience* can increase financial confidence. In addition, *psychological factors* can affect financial behavior. For example, younger people tend to have shorter time horizons, but triggering a shift to longer-term thinking is possible by asking a person to imagine their life at retirement.

Preparedness for retirement is a separate outcome measure of the overall FWB. Its score alerts us to the public and private retirement savings of the population. Its results also illustrate the expectations and reliance on the governmental retirement income for workers in Brazil (INSS). Unfortunately, *preparedness for retirement* is a new measure, such that the availability of comparable data from other countries is limited. Nevertheless, it demonstrates the importance of examining this variable, because it contributes to the available data and helps in future comparisons across countries. *Resilience for the future* is a sub-component of FWB, which is heavily influenced by income and expenses. We measure it as the length of time in which individuals can cover their cost of living in the case that they lose their primary

source of income and without asking for a loan. *Preparedness for retirement* and *resilience for the future* are FWB outcomes [24].

We also included the personal factor *grit* as an innovation in FWB research. We used the Brazilian translated version of Duckworth's book [14] to measure the *grit* scale. In calculating the total grit score, all the points from the chosen options are added together, and the result is divided by 10. The maximum score on this scale is 5 (with a lot of grit), and the lowest score is 1 (no grit). The questions measuring grit elicit the consistency with which individuals dedicate themselves to long-term goals, which is the main reason for the relationship between the grit measure and this study. It is noteworthy that the Brazilian version of the grit scale has been previously used in the literature.

Finally, we collected data on current retirement contributions. Respondents could select more than one option from the following statements: I do not contribute to any regime; I contribute to general social security (INSS); I contribute to the social security for public servants; I contribute to a complementary plan (non-mandatory in Brazil); and I make investments to ensure my old age (e.g., real estate, fixed income, and government bonds). These items were constructed to reflect the Brazilian reality. Notably, INSS is mandatory for Brazilian workers with signed contracts, but the last two statements aim to collect data on the choice of making private investments to ensure financial security at retirement. In this manner, verifying whether or not age is a relevant factor to the attitude of making investments to secure one's old age is possible.

The Appendix contains the questionnaire. We used the online platform Google Forms to collect the data divided in parts. The first part consisted of presenting the research and ensuring consent to participate. The second part aimed to collect information about the level of grit followed by *resilience for the future*. We then collected data on *preparedness for retirement*, *psychological factors*, *financial knowledge and experience*, *behaviors and attitudes*, and *demographic and socio-economic factors*.

Research projects involving humans in Brazil must comply with Resolution 466/12 of the Brazilian National Health Council. Therefore, we sought to ensure the rights of the participants and their free and informed consent to participate. The study conducted a pre-test with two participants to collect their opinions about the wording and comprehensibility of the items, to identify possible inconsistencies, and to make adjustments accordingly. Subsequently, the questionnaire was disseminated via social media for one month (between April and May of 2022) and obtained 415 responses. After this period, we realized that the

amount of responses was already expressive and representative for the regions of Brazil, and we were no longer receiving responses.

Three participants failed to provide correct information on their age; therefore, the final sample included 412 valid responses. After the application of the questionnaire, a reliability test (Cronbach's alpha) was conducted for all original variables presenting a result of 0.7614, which was above the lower limit of acceptability.

Data analysis

To verify the relationships established in Figure 3.1, we used different quantitative models calculated from the responses to the questionnaires. First, we examined whether *demographic and socio-economic*, financial *knowledge and experience*, and *psychological factors* influence *financial behavior*. Figure 3.1 suggests relationships among E, F, and G. Subsequently, we checked whether *financial behavior* and *demographic and socio-economic* factors influenced *preparedness for retirement* and *resilience for the future*. The second step corresponds to rows H and I in Figure 1.

We use principal component analysis (PCA) to identify and construct a few of the variables of the survey, including the FWB measure. PCA is one of many analytical techniques used to explore patterns that naturally occur within the data. It considers the responses of participants to identify commonalities and reduce the variables of underlying components. It is suitable for exploratory analysis without prior assumptions regarding the correlation of variables [26]. As criteria for selecting components, we used eigenvalues >1 [27].

We also conducted PCA using the 23 items in part IV of the questionnaire (Appendix). First, we grouped the 23 questions in Part IV of the questionnaire into eight groups: locus of control, financial confidence, action orientation, saving/spending/borrowing attitudes, long-term thinking, self-control, impulsivity control, and lack of concern for social status. Then, we calculated a PCA from the eight groups created, which further reduced the items into two components, namely PsyFactor 1 and 2 (Table 3.7). The first pertains to a strong presence of factors related to one's control and confidence (called the psychological factor of control [PsyFactor1]). The second is more linked to the potential lack of concern for social status in conjunction with an orientation for action (called the psychological factor of action [PsyFactor2]).

Results

Descriptive analysis

The *demographic and socio-economic* variables, *behavior and attitudes*, *knowledge and experience*, and *psychological factors* were analyzed in view of the descriptive aspects (Figure 3.1). The youngest and oldest participants are aged 22 and 79 years, respectively, with an average age of 45 years. The majority are female (57.5%), have achieved college degrees of higher education (31.3%), and report wages that exceed the average wage of Brazilian workers (34.2%). Regarding the current employment status, the majority work in the public sector (34.9%). In addition, the majority of the participants live in their own homes (71.3%), are the primary source of family income (54.3%), and contribute to the social security of the Brazilian government (INSS; 50.2%). For a better understanding of the sample, Tables 3.1 and 3.2 provide a comprehensive image analysis.

Regarding *financial behaviors and attitudes*, an average participant reports taking an active role in making household financial decisions and planning to manage household finances (80.6%). The average participant also reports not borrowing for daily expenses (60.7%), uses credit carefully (67.9%), and is informed to make decisions and choose financial products (69.9%). On *financial knowledge and experience*, the average number of participants who reported knowing financial management (49.0%), comparing financial products (52.2%), having experience with financial management (38.9%), feeling included in financial matters (42.7%), and understanding the role of financial risk (58.2%), was lower but still represents the majority of the sample.

Furthermore, the study observed a strong relationship between the variables. The correlation between *financial behaviors and attitudes* and *financial knowledge and experience* is 0.50 for a two-tailed 5% critical value of 0.097. In addition, *behavior* and *knowledge* demonstrated a correlation with the *psychological factor of control* (0.48 and 0.51, respectively) and *psychological factor of action* (0.18 and 0.08, respectively) in this order.

Resilience for the future indicates that many people need to prepare for unexpected short-term expenses or decreases in income. The majority of respondents have less than a month's income savings, and 47% would only last three months without borrowing if their income decreased by one-third.

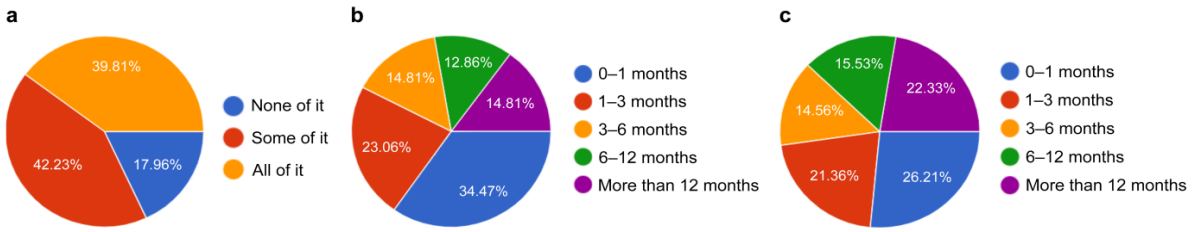


Figure 3.2 Resilience for the Future

Regarding *preparedness for retirement*, notably, while many believe they will have adequate retirement income without working, nearly 50% do not rely on state pension-INSS (Figure 3.2). Nonetheless, the results also illustrate low levels of private retirement savings across the Brazilian population. Even with low reliance on state pension, only 23.6% have a complementary pension plan, and only 35.7% report private investments to secure their retirement (Figure 3.4).

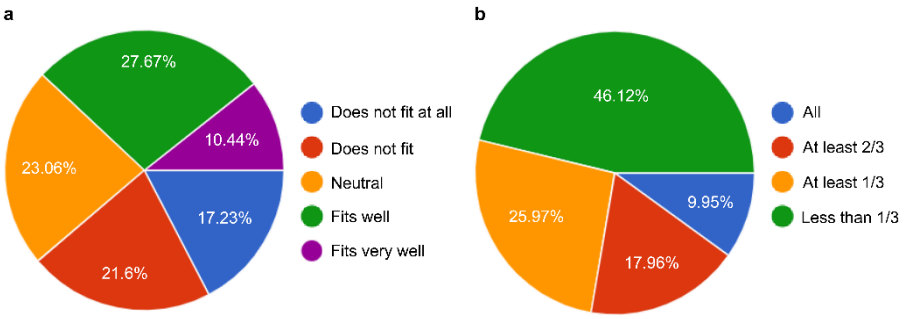


Figure 3.3 Preparedness for retirement

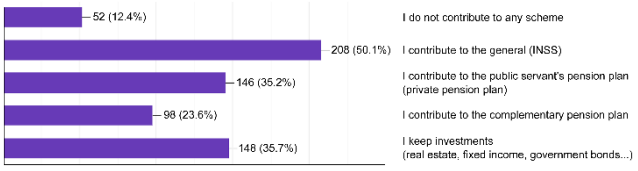


Figure 3.4 Retirement contribution

Regression analyses

Table 3.3 presents the regression analyses. Multiple regression obtained heteroskedasticity problems; thus, we used a model with correction (HC). In the first model, which includes the *demographic and socio-economic*, financial *knowledge*, and *psychological factors* as explanatory variables for financial *behavior*, age was not associated with *behavior*. Better financial *behavior* was significantly associated with a high level of financial

knowledge, PsyFactor1, PsyFactor2, being female, higher income, not living with others, and not being a single parent. Model 2 included *grit*, *resilience for the future*, and *retirement contribution* in the Financial Capability and Well-Being Model. Interestingly, age displayed a negative relationship with *behavior*, and being the main source of family income appeared as an explanatory variable of better *financial behavior*.

Older age was related to *preparedness for retirement* (model 3) and FWB (model 5) but was not significant for *resilience for the future* (model 4). Data not presented here revealed that age correlates with *resilience* at nearly zero (0.03), which indicates the lack of a statistical relationship despite being significant at 5% two-tailed for *preparedness* (0.36) and FWB (0.25). Out of the other socio-economic variables, higher income, own residence, not being a single parent, contributing to a pension plan, and keeping private investments to secure old age were related to *preparedness for retirement*. Nevertheless, financial *behavior* was not an explanatory variable for *preparedness for retirement*. Better financial *behavior* was significantly associated with *resilience for the future* and FWB. Being male, higher income, living with others, not being a solo parent, being taught to handle money as a child, and retirement contribution variables were relevant for *resilience for the future* and higher income, not being a solo parent, and retirement contribution for FWB.

Tables 3.4, 3.5, and 3.6 depict the results for the different age groups. The first age group consists of respondents aged less than 37 years. This age group corresponds to nearly one-third of the sample and mostly encompasses individuals who have recently entered the labor market. We expect people in this "young group" to retire in two or three decades, which mean that their time horizon until leaving the labor market is very long. The second group consists of people between the ages of 37 and 51 years. These respondents are likely to be in the labor market, and we refer to them as the "mature group." Finally, people aged 52 years or older are expected to be close to retirement or already retired (older group). In summary, financial *knowledge* and *PsyFactor1* were significantly related to better financial behavior for all age groups. The young and older age groups illustrated tendencies for being female to be related to better financial behavior and for being male to be related to *resilience for the future* and FWB. Additionally, *grit* and *resilience for the future* appeared as explanatory variables for better financial *behavior* in the older group, and this model had the best explanatory power of all.

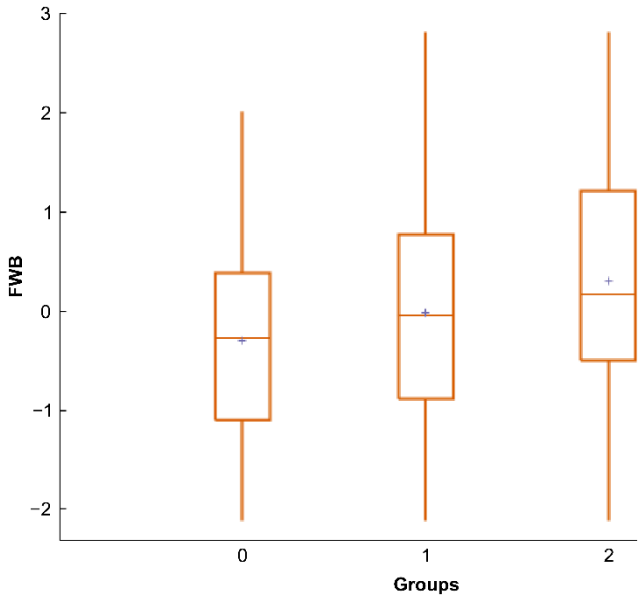
Notably, the attitude toward keeping private investments for retirement was an explanatory variable for better *preparedness for retirement*, *resilience for the future*, and

FWB for the young and mature groups. However, it seems that the retirement contribution variables were not considered as important for the older group as for the mature and young groups. In summary, we noted that a number of results were more clear when the sample was divided according to age group. This finding indicates that the links between the proposed variables–grit, resilience, and retirement contribution–with the Financial Capability and Well-Being Model proposed in Figure 3.1, which is the basis of this research, were better understood when viewed from the perspective of the different age groups.

Figure 3.5 below depicts the strong positive association between age and FWB. We can attribute this result to the strong association between age and *preparedness for retirement*, because *resilience for the future* displayed no significant association with age.[4] On the one hand, these results are in agreement with a study conducted by the Consumer Financial Protection Bureau [28], among other studies of measures of FWB in which older adults exhibited higher average scores for FWB than did younger adults. On the other hand, previous studies also showed an inverted U-shaped FWB across the life cycle (e.g., [29]). An unambiguous explanation for why FWB would be lower in old age is lacking, but vulnerability to emergency health expenditures and financial stress are two potential explanations. For example, Huang et al. [30] illustrated that subjectively and objectively measured financial stress is inversely associated with good self-reported health, quality of life, and life satisfaction and positively associated with self-reported depression among older adults in developing countries. Interestingly, previous studies also indicate that many old individuals are capable of maintaining psychological stability and well-being despite their experiences with poorer financial situations, among other adverse events [31]. High levels of resilience in older age are a phenomenon that is close to the concept that a few authors refer to as "the paradox of subjective well-being," This concept states that levels of psychological

[4] We found the absence of a relationship between age and *resilience for the future* in the research, which the researchers did not expect. The correlation between the two variables was 0.03. Furthermore, Model (5) indicated that the variable age was not significant. We further analyzed this model by adding age-interacting variables with significant independent variables. The result, not presented here, shows that of the eight independent variables alone, six lost significances (the exception being INCOME, PARENTSTAUGHT). In the new model, WITHCHILDREN and MAINSOURCE become significant. Notably, the interactive variables of AGE with PARENTSTAUGHT, BEHAV, and ANYSCHEME appear significant. We suggest that the lack of significance in the age variable in Model (5) was due to the effects of this characteristic being indirectly embedded in the other variables in the model.

well-being remain stable across old age (e.g., [32]). Hence, deepening one's knowledge about FWB, especially among older people, is seemingly of importance.



Source: Prepared by the authors.

Figure 3.5 Financial well-being by age group

Discussion

This study aimed to evaluate the financial preparedness of different age groups for retirement in Brazil. The results demonstrated that *preparedness for retirement* was strongly related to older age. In addition, the *socio-economic* aspects of higher income, own residence, not being a single parent, contributing to retirement plans, and keeping private investments to secure old age could explain a large proportion of variance in *preparedness for retirement*. Nonetheless, better financial *behavior* was not an explanatory variable for *preparedness for retirement* in the overall empirical data. The analyses, including different age groups, additionally provided nuanced information on factors that influence the outcomes of FWB. For example, when comparing the regression models, better *financial behavior* was slightly related to *preparedness for retirement* in the young group. In the mature group, all variables of *contribution to retirement* were relevant for *preparedness for retirement*, whereas other socio-economic aspects appeared as explanatory variables for *preparedness for retirement*, such as having children and being taught to manage money as a child, in the older group.

A number of classic behavioral explanations can be applied to the result of the relationship between age and *preparedness for retirement*. For example, Thaler [33] provided

empirical evidence that people overvalue the more proximate satisfaction relative to more distant ones. This behavioral bias can lead to a lack of concern about retirement, because this future prospect for young people extends over a long period of time. Furthermore, one of the most consistent, prevalent, and robust biases documented in behavioral economics is "optimism bias." In terms of predicting future events, people tend to overestimate the likelihood of positive events and underestimate the negative ones [34]. The phenomenon of the "illusion of control," which predicts that factors from skill situations introduced into probability situations will cause people to feel inappropriately confident, is related to this notion [35]. These expectations of an inappropriately higher probability of personal success than those warranted by objective probability could also lead to a lack of concern about future retirement. Notably, Weinstein [36] suggested that these optimistic biases may be much less prevalent among older people. This explanation would be possible for the greater preparedness among older people.

The results between age and *preparedness* are in line with those of Munnell et al. [37], whose projections indicated that approximately 35% of Early Boomers (those born between 1948 and 1954) would lack an adequate retirement income, vis-a-vis 44% for Late Boomers (those born between 1955 and 1964), which increases to 48% for Generation Xers (those born between 1965 and 1974). However, the results of the present study are in contrast with those of a recent study by Qi et al. [38], which found no significant difference in retirement adequacy between Generation X (40–54 years old) relative to their Baby Boomer and Millennial peers. However, their results indicated that Generation X is better prepared for retirement than Millennials are in safer portfolio allocations. Notably, the Board of Governors of the Federal Reserve System of the United States [39] found that people have different savings thresholds to feel that they are on track to an adequate retirement. Furthermore, economic well-being substantially varies with the reason for retirement for those in retirement. This finding implies that a subjective as well as an objective evaluation of FWB is important when examining "successful" aging. In addition, goal clarity and involvement in financial activities was previously associated with the prediction of the retirement preparedness of working individuals [40]. This study additionally indicates that attitudes toward retirement contribution were associated with high levels of *preparedness for retirement*.

When comparing the financial *behavior* regression models, greater self-rated financial *knowledge* illustrated a strong relationship with better financial *behavior* for all age groups,

which is in line with the results of previous studies [41, 42]. However, the findings of Pahlevan et al. [43] revealed that financial literacy did not influence the financial behavior of approximately 500 young adults in Malaysia. Furthermore, the inclusion of the variables, *grit* and *resilience for the future*, were relevant for better *behavior* in the older age group. These results follow the findings of Frankham et al. [44] in that skills related to personal agency, self-esteem, and coping were most frequently and reliably associated with the relationship between financial hardship and mental health outcomes. Research has increasingly viewed psychological resilience as a dynamic process by which people do not only bounce back from adversity and avoid the development of psychopathology but also ideally grow over time through experience [45]. To better understand this process and the conditions under which positive functioning and adaptive behaviors develop, the need emerges to understand the dynamic interplay and changes over the lifetime. In contrast with previous studies on financial behavior and age [46, 47], age was negatively associated with better financial *behavior* in the present study. However, the association between age and *behavior* did not remain when controlling for the different age groups, which highlights the importance of focusing on the association between age and behavior in future studies.

Out of the other *socio-economic* variables included in the study, being female was highly associated with better financial *behavior*, while being male was significantly associated with *resilience for the future*, especially when controlling for age groups. Previous studies highlighted that the financial behaviors of men and women significantly differ [48]. In general, women were identified as less likely to engage in any of the financial behaviors than men do [49]. However, other studies reported no differences between men and women in this regard (e.g., [50]). In addition, although previous studies found that the teaching of parents directly informs the financial behavior of young adults [43], the current findings pointed to the importance of being taught to manage money as a child for *preparedness for retirement*, *resilience for the future*, and FWB among the older group. Nevertheless, apart from the retirement contribution variables, which were non-statistically significant in improving the overall *behavior* (financial capability) model, and when controlling for the different age groups, a clear finding is that the attitude toward financially securing one's own old age should be considered to promote *preparedness for retirement*, *resilience for the future*, and FWB.

These findings support the notion that the cost–benefit of aging differs among age groups relative to certain *demographic and socio-economic* aspects, *behavior and attitudes*,

knowledge and experience, and *key psychological factors*. Notably, the socio-economic aspects of being women, not having children, and being the main source of family income were associated with better financial *behavior* for the young group. Higher income, not being a single parent, and retirement contribution were related to better financial *behavior* in the mature group. Regarding the older group, we highlight the so-called maturity principle as a possible explanation for the strong positive association between the variables, *grit* and *resilience for the future*, with better financial *behavior*. Beyond that, financial *knowledge* and the *psychological factor of control* (PsyFactor1) were explanatory variables for better financial *behavior* of all age groups. Better financial *behavior* was not an explanatory variable for *preparedness for retirement* but for *resilience for the future* and FWB in nearly all age groups. Finally, the attitude of keeping private investments to secure old age was related to *preparedness for retirement*, *resilience for the future*, and FWB in the young and mature groups but not in the older group. We attribute this result to different "future time perspectives," which would also be an interesting topic for future research.

Limitations

The study was based on a sample of individuals aged 22–79 years and contributed to an increased understanding of *preparedness for retirement* and *resilience for the future* of different age groups in Brazil. However, a few points need to be considered when interpreting the results. To a certain extent, the sample is wealthier than the overall Brazilian population given that factors such as access to computers/smartphones and the internet are likely to influence the probability of participating in the survey. For the same reason, we also expect the sample to report higher levels of education than those of the general Brazilian population.

Furthermore, the COVID-19 crisis, which began two years prior to the survey, may have depleted the savings of a number of people. Thus, low scores may be more likely for financial preparedness and resilience among those who experienced a decrease in income in the last two years, especially if they lost their jobs and are renting. For example, financial capability services in New Zealand have reported more clients experiencing more mental health issues and complex financial situations due to changing incomes due to the COVID-19 pandemic [35]. We collected data on the housing and employment status of the respondents; however, future research can verify the financial consequences of the COVID-19 pandemic in Brazil.

In addition, findings in the literature support that the transition from the third to the fourth age, which frequently occurs in individuals aged 80–85 years, entails extensive challenges to well-being [51]. Future research may further expand analyses by age. The findings of Näsman et al. [51] also highlighted that the subjective as well as objective evaluation of the economic situation is important when considering the life situation of older adults. Therefore, another interesting direction for future research would be the analysis of the subjective measure of FWB among different age groups in Brazil or in a comparison across countries. Furthermore, another interesting avenue for research would be a longitudinal study that will track whether or not and how FWB as well as SWB change over the lifetime of an individual.

Conclusions

The results deepened the knowledge about the proposed links among *demographic and socio-economic* aspects, financial *knowledge and experience*, *behaviors and attitudes*, and "key" *psychological factors* in determining an objective measure for FWB. The joint effect of self-control and confidence (*PsyFactor1*) as well as the lack of concern for social status in conjunction with an orientation for action (*PsyFactor2*) were suggested as "key" psychological factors that influence better financial *behavior*. In addition, *grit* and *resilience for the future* seemingly improved the financial *behavior*/capability model for the older group. We mainly highlight the importance of monitoring the *behavioral* and *psychological* aspects among different age groups to save for retirement as early as possible and avoid the so-called maturity principle, which can lead to low savings toward old age. Additionally, by providing empirical data from Brazil, this research contributes to the international comparison in this field of study.

Data availability

The results of the questionnaires are available on GitHub.

Conflicts of interest

There is no conflict of interest between the researchers and the research topic. The participants completed the questionnaire on an optional basis.

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Tables

Table 3.1 Descriptive analysis (n = 412)

Alternatives	Frequency	N
	Gender	
Female	57.52%	237
Male	42.48%	175
	Home location	
Center-West	61.89%	255
Other	38.11%	157
	Employment status	
Retired	13.11%	54
Unemployed and looking for work	2.67%	11
Housewife	0.97%	4
Student	1.94%	8
Not working due to long-term illness, disability, or other reason	0.49%	2
Partially retired	3.64%	15
Civil servant	34.95%	144
Self-employed or entrepreneur	20.87%	86
Work with a registered job in the private sector or third sector	21.36%	88
	Schooling	
Incomplete elementary school	0.00%	0
Complete elementary school	0.49%	2
Incomplete high school	0.49%	2
Complete high school	4.13%	17
Incomplete higher education	7.28%	30
Complete higher education	19.66%	81
Post-Graduation (lato sensu)	31.31%	129

Incomplete master's degree	4.13%	17
Complete master's degree	15.29%	63
Incomplete doctorate	6.31%	26
Complete doctorate	10.92%	45
	Income	
Far below average	5.34%	22
Below average	4.85%	20
Average	21.84%	90
Above average	33.74%	139
Way above average	34.22%	141
	Family type	
Couple with children or dependents	49.27%	209
Lives alone	17.72%	73
Lives with parents or other relatives/friends	32.52%	134
You are the main source of your family income	54.3%	224
You live in your own residence	71.36%	294
You are a single parent	16.50%	68
You have access to financial support from friends and family	38.11%	157
Your parents talked about managing money or saving when you were a child	49.27%	203
	Retirement contribution	
I do not contribute to any scheme	11.89%	49
I contribute to the general social security system (INSS)	50.24%	207
I contribute to the public servant's pension plan (private system)	34.95%	144
I contribute to a supplementary pension plan	23.54%	97
I have investments to secure my old age	35.44%	146

Source: Prepared by the authors.

Table 3.2 Age

Mean	Minimum	Maximum	Standard Deviation	Coefficient of Variation
45	22	79	13.12	0.29

Source: Prepared by the authors.

Table 3.3 Regression analyses (n = 412)

	Model 1		Model 2		Model 3		Model 4		Model 5	
Depend	Behavior		Behavior		Preparedness		Resilience		FWB	
Model	HC		HC		HC		HC		HC	
Const	2.603	** *	2.664	** *	−0.109		−1.041		−2.332	** *
Behavior					0.049		0.774	***	0.162	** *
Knowledge	0.225	** *	0.233	** *						
PsyFactor1	0.154	** *	0.129	** *						
PsyFactor2	0.086	** *	0.088	** *						
Grit			−0.017							
Resilience										
Future			0.011							
Sex	−0.201	** *	−0.227	** *	0.235		0.613	**	0.133	
Age	−0.004		−0.006	**	0.040	** *	0.006		0.019	** *
School	−0.004		−0.008		−0.049		0.070		−0.030	
Income	0.073	**	0.050		0.180	**	0.591	***	0.233	** *
WithChildren	−0.122		−0.074		−0.014		−0.115		−0.063	
LivesAlone	−0.030		−0.013		−0.071		0.497		0.195	
LivesOthers	−0.174	**	−0.172	**	−0.253		0.746	**	0.125	
Main_source_	0.106		0.152	**	0.021		−0.462		−0.016	

OwnResidence	−0.032		−0.017		0.325	**	−0.414		0.067			
SinglePare nt	−0.191	**	−0.202	**	−0.483	**	−0.952	**	−0.444	*		
FinSupport	−0.075		−0.041		0.009		−0.713	**	−0.170	*		
Parents_tau ght	0.074		0.068		0.208		0.492	*	0.138			
AnySchem e			−0.133		−0.234		−1.071	**	−0.296	*		
INSS			0.065		0.188		−0.114		0.040			
PublicServ antS			0.063		0.631	** *	−0.278		0.125			
PrivatePrev			−0.052		−0.098		0.543		0.059			
PrivateInve st			0.092		0.373	**	1.773	***	0.568	** *		
R2	0.478		0.552		0.262		0.394		0.436			
		**		**		**				**		
Fc	24.205	*	21.783	*	7.750	*	14.173	***	16.904	*		

Source: Prepared by the authors.

Note. HC: Heteroscedasticity Correction. Model 1 describes the association between behavior, knowledge, psyfactor1, psyfactor2, and the socio-economic variables. Model 2 includes additionally grit, resilience to the future, and retirement contribution as explanatory variables to behavior. Model 3 describes the association between preparedness, behavior, socio-economic, and retirement contribution variables. Model 4 is similar to the previous one, but resilience is the explained variable, and in Model 5 FWB. $p < 0.01$, $p < 0.05$, and $p < 0.1$.

Table 3.4 Less than 37 years old (n = 138)

	Model 6		Model 7		Model 8		Model 9		Model 10	
Depend Model	Behav HC		Behav HC		Prepare dness HC		Resilienc e HC		FWB HC	
Const	2.673	***	2.705	***	1.097		1.325		−2.491	***
Knowledge	0.155	***	0.169	***						
Behavior					0.297	*	0.615	**	0.224	**
PsyFactor1	0.186	***	0.185	***						
PsyFactor2	0.113	**	0.123	**						
Grit			−0.008							
ResilienceFu ture			0.011							
Sex	−0.272	**	−0.328	***	0.086		1.222	***	0.120	
Age	0.014		0.005		0.012		−0.096		0.009	
School	−0.039		−0.018		−0.075		−0.056		−0.053	
Income	0.058		0.069		0.097		0.837	***	0.243	***
WithChildre n	−0.255	**	−0.277	**	−0.262		0.171		0.012	
LivesAlone	−0.198		−0.209		0.015		1.214	*	0.336	*
LivesOthers	−0.395	***	−0.374	***	−0.012		1.171	*	0.303	*
MainSourceI ncome	0.154		0.196	*	−0.064		−0.620		0.149	
OwnResiden ce	0.045		0.102		−0.007		−0.932	**	0.185	
SingleParent	−0.216		−0.083		0.532		−2.220	***	−0.560	**
FinSupport	−0.211	**	−0.217	**	−0.037		−0.862	**	−0.052	
ParentsTaug htSave	0.084		0.100		−0.076		−0.137		−0.143	
AnyScheme			−0.096		−0.704		−0.091		0.010	
INSS			0.002		−0.412		0.981		0.094	

PublicServScheme			−0.054		0.531		1.463		0.495	*
PrivatePrev			−0.131		−0.028		0.430		−0.140	
						**				
PrivateInvest			−0.054		1.073	*	2.576	***	0.910	***
R2	0.650		0.680		0.403		0.559		0.617	
						**				
Fc	15.085	***	11.120	***	4.471	*	8.370	***	10.639	***

Source: Prepared by the authors.

Table 3.5 Aged between 37 and 51 years (n = 133)

	Model 11		Model 12		Model 13		Model 14		Model 15	
Depend Model	Behav HC		Behav HC		Preparedness HC		Resilience HC		FWB HC	
Const	2.893	** *	3.345	***	−1.902		3.472		−2.462	***
Knowledge	0.152	**	0.164	**						
Behavior					0.004		−0.153		−0.005	
PsyFactor1	0.198	** *	0.149	***						
PsyFactor2	0.027		0.069							
Grit			−0.062							
ResilienceFuture			−0.016							
Sex	−0.193		−0.185		0.008		−0.766	*	−0.152	
Age	−0.009		−0.012		0.062	**	−0.057		0.032	*
School	−0.023		−0.053		−0.025		0.150		−0.002	
Income	0.142	**	0.137	*	0.180		0.666	***	0.151	*
WithChildren	−0.126		−0.088		−0.131		−0.024		−0.075	
LivesAlone	0.236		0.167		0.111		0.000		−0.206	
LivesOthers	0.099		−0.022		−0.197		0.628		−0.313	*
MainSource	−0.061		−0.249	*	0.017		−0.429		−0.190	
OwnResidence	−0.214		−0.209	*	0.800	***	−0.538		0.167	
SingleParent	−0.136		−0.256	*	−0.951	**	−1.508	**	−0.841	***
FinSupport	−0.052		−0.071		0.175		−0.377		0.124	
ParentsTaugh	0.162		0.093		0.097		0.357		0.265	*

AnyScheme			−0.062		−0.357		−0.215		−0.120		
INSS			0.286	*	0.679	*	0.195		0.333		
PublicServ			0.441	**	1.315	***	0.430		0.780	***	
PrivatePrev			0.068		−0.631	**	0.883	**	−0.020		
PrivateInvest			0.226	*	0.662	**	2.295	***	0.456	***	
R2	0.493		0.572		0.372		0.468		0.517		
Fc	7.584	** *	6.694	***	3.758	***	5.574	***	6.781	***	

Source: Prepared by the authors.

Table 3.6 Older than 51 years old (n = 141)

	Model 16		Model 17		Model 18		Model 19		Model 20	
Depend Model	Behav HC		Behav HC		Prepared ness HC		Resilienc e HC		FWB HC	
Const	1.502	**	1.342	**	−1.814		−6.855	***	−3.457	***
Knowledge Behavior	0.294	**	0.293	*	0.104		1.524	***	0.418	***
PsyFactor1	0.177	*	0.077	***						
PsyFactor2	0.117	**	0.159	***						
Grit			0.198	**						
ResilienceFut ure			0.064	***						
Sex	−0.349	**	−0.139	*	−0.084		1.286	***	0.330	*
Age	0.011		−0.003		0.025		0.065	*	0.017	
School	0.021		0.025		0.062		0.165		−0.017	
Income	0.041		0.026		0.573	***	0.594	***	0.349	***
WithChildren	0.072		0.072		0.722	**	0.118		0.023	
LivesAlone	−0.076		−0.089		0.972	*	1.872	***	0.646	**
LivesOthers	−0.088		−0.093		−0.027		0.036		−0.139	
MainSourceI ncome	0.269	**	0.189	*	−0.167		−1.305	***	−0.234	
OwnResiden ce	−0.160		−0.297	*	−0.105		0.710		0.227	
SingleParent	−0.256	*	−0.125		0.073		0.897		0.050	
FinSupport	0.017		0.089		−0.368		−0.795	*	−0.331	*
ParentsTaugh tSave	−0.084		−0.051		0.871	***	1.002	***	0.353	**

AnyScheme			0.105		−0.144		−3.667	***	−0.673	**
INSS			0.117		0.847	**	−1.036	*	0.040	
PublicServSc										
heme			0.069		0.308		−2.166	***	−0.183	
PrivatePrev			−0.086		−0.152		0.573		0.072	
PrivateInvest			0.024		−0.613	*	0.336		0.049	
R2	0.612	**	0.800		0.388		0.629		0.455	
Fc	13.153	*	21.406	***	4.299	***	11.510	***	5.651	***

Source: Prepared by the authors.

Table 3.7 Principal Components Analysis for Psychological Factors

Component	**PsyFactor 1**	**PsyFactor2**
Locus of Control	0,383	0,173
Financial confidence	**0,405**	0,074
Action orientation	0,269	**-0,526**
Saving/Spending/Borrowing	0,371	0,241
Long-term thinking	0,378	0,320
Self-control	**0,402**	-0,104
impulsivity control	0,377	0,021
Lack of concern social status	0,182	**-0,719**

Source: Prepared by the authors.

Appendix B: Online questionnaire

Dear participant,

You are being invited to participate in a survey for the final work of a doctoral thesis developed in the Graduate Program in Accounting at the University of Brasilia (PPGCont-UnB).

The approximate response time is 10 minutes. The data from this research are confidential and will be jointly analyzed without the possibility of identifying any of the participants.

In case of doubts or suggestions, please contact the researcher by the e-mail eduarda.augusta.sales@gmail.com.

We thank you in advance for your participation.

Eduarda Augusta

PPGCont/UnB

Do you agree to participate in this survey?

( ) Yes

( ) No

Part I

1. New ideas and projects sometimes distract me from previous ones.
2. Setbacks don't discourage me. I don't give up easily.
3. I often set a goal but later choose to pursue another one.
4. I am a hard worker.
5. I have a difficulty maintaining my focus on projects that take more than a few months to complete.
6. I finish whatever I begin.
7. My interests change from year to year.
8. I am diligent. I never give up.

9. I have been obsessed with a certain idea or project for a short time but later lost interest.
10. I have overcome setbacks to conquer an important challenge.

[*Grit: Five-point scale items ("nothing to do with me" to "totally me"). In analysis, statements 1, 3, 5, 7, and 9 are reversely coded]*.

Part II

1. How much of an unexpected expense equivalent to one month's income could you cover with money you have readily available?

2. What is your financial reserve volume in terms of number of months of income? (Short-term financial resources that you can readily count on)

3. How long could you cover a one-third drop in your income without having to borrow?

[*Resilience for the future: Question 1 - Three-point scale items ("nothing," "something,"* and *"all") Questions 2 and 3 - Five-point scale items ("0−1 month," "1–3 months," "3−6 months," "6−12 months,"* and *"more than 12 months")]*.

Part III

1. I will have adequate retirement income without working

2. Degree of reliance on INSS for retirement income

[*Preparedness for retirement*: *Question 1 - Five-point scale items ("it doesn't really fit" to "fits very well"). Question 2 - Four-point scale items ("total," "at least ⅔," "at least ⅓,"* and *"less than ⅓"]*.

Part IV

Financial well-being is not completely determined by income. Behaviors, attitudes, and knowledge can change financial well-being outcomes. This section focuses on your self-perception; therefore, there are no right or wrong answers. WATCH OUT FOR CHANGES IN THE SCALES!

1. I can very well determine what will happen to me.
[Five-point scale item ("it doesn't really fit" to "fits very well"]

2. My financial situation is largely out of my control.
[Five-point scale item ("fits very well" to "it doesn't really fit")]

3. When I make plans, I do everything I can to succeed.
[Five-point scale item ("it doesn't really fit" to "fits very well"]

4. Level of confidence to manage money on a daily basis
*[Five-point scale item ("*very unconfident*" to "*very confident*")]*

5. Level of confidence in planning for the financial future
*[Five-point scale item ("*very unconfident*" to "*very confident*")]*

6. Level of confidence to decide on financial products and services
*[Five-point scale item ("*very unconfident*" to "*very confident*")]*

7. When I have a difficult decision to make, I tend to put it off for another day.
[Five-point scale item ("fits very well" to "it doesn't really fit")]

8. When I have to do something important that I don't like, I do it immediately.
[Five-point scale item ("it doesn't really fit" to "fits very well")]

9. When I have to choose between many options, I find it difficult to make up my mind.
[Five-point scale item ("fits very well" to "it doesn't really fit")]

10. I'd rather cut back on spending than use a credit card for what I can't pay for every month.
[Five-point scale item ("I strongly disagree" to "I strongly agree")]

11. I prefer to spend rather than save for contingencies
[Five-point scale item ("I strongly agree" to "I strongly disagree")]

12. I find it more satisfying to spend than to save.
[Five-point scale item ("fits very well" to "it doesn't really fit")]

13. My focus is on the long-term.
[Five-point scale item ("it doesn't really fit" to "fits very well")]

14. I live more for today than tomorrow.
[Five-point scale item ("fits very well" to "it doesn't really fit")]

15. The future will take care of itself.
[Five-point scale item ("fits very well" to "it doesn't really fit")]

16. I am good at resisting temptation.
[Five-point scale item ("it doesn't really fit" to "fits very well")]

17. I think it's hard to break unwanted habits.
[Five-point scale item ("fits very well" to "it doesn't really fit")]

18. I do things without giving them much importance.
[Five-point scale item ("fits very well" to "it doesn't really fit")]

19. I am impulsive.
[Five-point scale item ("fits very well" to "it doesn't really fit")]

20. I say things without thinking about them.
[Five-point scale item ("fits very well" to "it doesn't really fit")]

21. I care about how other people see me.
[Five-point scale item ("fits very well" to "it doesn't really fit")]

22. I am concerned about social status among the people I meet.
[Five-point scale item ("fits very well" to "it doesn't really fit")]

23. I want other people to respect me.
[Five-point scale item ("fits very well" to "it doesn't really fit")]

Part V

Gender:
( ) Female
( ) Male
( ) I prefer not to say

2. Age
Answer: _____

3. State of residence:
( ) AC, AL, AP, AM, BA, CE, DF, ES, GO, MA, MT, MS, MG, PA, PB, PR, PE, PI, RJ, RN, RS, RO, RR, SC, SP, SE, TO, Abroad.

4. How would you describe your current professional status?
( ) Retired
( ) Unemployed and looking for work
( ) Homeowner
( ) Student
( ) No work due to long-term illness, disability, or other reason
( ) Partially Retired
( ) Public Servant
( ) Working as a freelancer or entrepreneur

( ) Work with a signed contract in the private sector or the third sector

5. Your education

( ) Incomplete Primary Education

( ) Complete Primary Education

( ) Incomplete High School

( ) Complete High School

( ) Incomplete College Education

( ) Complete College Education

( ) Post-graduation (lato sensu)

( ) Incomplete Master's Degree

( ) Complete Master's Degree

( ) Incomplete PhD

( ) Complete PhD

6. According to the latest Pnad Contínua (Continuous National Household Sample Survey), the average income of workers in Brazil was R$ 2,489. Considering this figure, would you say that your salary, compared with that of the average Brazilian, is,

( ) Far below average

( ) Below average

( ) Average

( ) Above average

( ) Way above average

7. Regarding your financial behaviors and attitudes

i. You play an active role in household financial decision making

ii. You take an active role in planning the management of your household finances

iii. You do not borrow for day-to-day expenses

iv. You use credit with caution

v. You are informed to make decisions and choose financial products

[Five-point scale items ("it doesn't really fit" to "fits very well")].

8. Regarding your financial knowledge and experience

i. You have knowledge about financial management

ii. You compare financial products

iii. You have experience with financial management

iv. You feel included in financial matters

v. You understand what financial risk is

[Five-point scale items ("it doesn't really fit" to "fits very well")]

9. Regarding your family type

i. Couple with children or dependents

ii. You live alone

iii. You live with parents or other relatives/friends

iv. You are the main source of your family income

v. You live in your own residence

vi. You are a single parent

vii. You have access to financial support from friends and family

viii. Your parents talked about managing money or saving when you were a child

[Yes/No items]

10. Regarding your retirement contribution. If necessary, choose more than one option.

I don't contribute to any scheme

I contribute to the general social security system (INSS)

I contribute to the public servant's pension plan (private system)

I contribute to a supplementary pension plan

I have investments (e.g., real estate, fixed income, government bonds) to secure my old age

Chapter 4: Study 2 (unpublished)

Next, Study 2 aims to analyze how the issue of time relates to measures of financial well-being (*personal time proxies* vs. *FWB measures)*. I address the question of whether individual differences in *self-control, future time perspective*, *procrastination, grit,* and *psychological resilience* are related to people's ability to make and follow through decisions that will be favorable in the long term and achieve FWB. Three hypotheses based on the existing literature were formulated and tested in a sample of 235 students: i) *self-control*, *future time perspective,* and *procrastination* are related to *FWB measures*; ii) *grit* and *psychological resilience* are related to *FWB measures*; iii) *personal time proxies* are related to *preparedness for retirement,* r*esilience for the future* and *perceived FWB*.

Table 4.1 - The role of *personal time proxies* on *FWB measures*

Personal time proxies	**FWB**	**Time**
Self-control	*Current money management stress*	Present
Future time perspective	*Expected future financial security*	Future
Procrastination	*Preparedness for retirement, Resilience for the future,* and *perceived* FWB	Intertwined
Grit and *Psychological resilience*		

Source: Prepared by the author.

The Cost-Benefit of Aging: The Role of Personal Time on Financial Well-Being Measures

Abstract

Achieving Financial Well-Being (FWB) in retirement requires trade-offs long before retirement age. Beyond the objective measure of age, we account for *future time perspective* and acknowledge that people's preferences are due not to age, per se, but to perceived limitations on time. This study analyzes how the issue of time relates to measures of financial well-being. We address whether individual differences in *self-control, future time perspective*, *procrastination, grit,* and *psychological resilience* are related to people's ability to make and follow through decisions that will be favorable in the long-term and achieve FWB. Data were derived from a survey to empirically validate the proposed relationships between *personal time proxies* on the one hand and among c*urrent money management stress*, *expected future financial security*, *preparedness for retirement, resilience for the future,* and *perceived* FWB

on the other hand. The sample comprises 235 undergraduate students from the University of Brasilia (Brazil). The results demonstrated that: (1) *future time perspective* was a forward-looking variable related to e*xpected future financial security*; (2) *self-control* was strongly related to less *current money management stress* and higher *expected future financial security*; (3) *grit* was related to *preparedness for retirement,* and *future time perspective,* income, and education level for *resilience for the future*; (4) *self-control*, male gender, and *psychological resilience* were related to *perceived* FWB measure. We highlight the relationship between forward-looking *psychological factors* with favorable long-term decisions and *FWB* measures.

4.1 Introduction

Individuals have difficulty making personal financial decisions that will be most beneficial in the long run. Regardless of age, many still need to plan, save, or invest to secure their Financial Well-Being (FWB). These have implications for present and future individual well-being (Howlett et al, 2008; Frydman & Camerer, 2016; Lusardi, 2019; Riitsalu, et al., 2023). Interestingly, a two-component view of FWB as *current money management stress* and *expected future financial security* (*perceived* FWB) is consistent with academic research on the topic, and both variables share the outcome of well-being (Su et al., 2014; Netemeyer et al., 2018). Notably, *expected future financial security* and overall well-being have "forward-looking" aspects — *expected future financial security* as securing one's financial future and well-being as optimism about future emotional/psychological health (Diener, 2013; Su et al., 2014).

Relevant literature indicates that one's perception of future time is related to their psychological well-being, particularly for older adults (Brothers et al., 2016; Hytman et al, 2023). Interestingly, proximity to death often shifts the perception of time horizons and is associated with individuals' motivations, goals, and psychological well-being (Kotter-Grühn & Smith, 2011). The individual's experience of future time is poised to play a significant role in shaping the goals, plans, and self-regulatory activities that govern action and outcomes concerning achievement, adjustment, and well-being (Carstensen, 2006; Coudin & Lima, 2011). In this sense, goal-based theories have highlighted the role of one's anticipated future as a fundamental determinant of action (Bandura & Cervone, 1986). Notably, these "anticipated endings" have been included in the theory, *future time perspective* being now defined as the perception of time left to live, whether for the elderly or individuals of all ages (Fredrickson & Carstensen, 1990).

The current study analyzes how the issue of time relates to measures of financial well-being. Our research examines potential relationships between forward-looking

psychological factors and favorable long-term decisions to achieve *FWB*. One potential relationship is *self-control,* as this measure serves the long-term best interests of a person in several domains, such as health, school, job, career, social relationships, and finance (Tangney et al., 2004). Notably, *self-control* significantly affects a broad range of financial behaviors, such as feeling more secure in current and future financial situations (Strömbäck et al, 2017). Riitsalu and Raaij (2020) found *self-control* and *future time perspective* are highly correlated with *perceived FWB*. Nevertheless, although Kempson and Poppe (2018) found that *self-control* and time orientation influence spending and saving attitudes, they did not find that any of these forward-looking *psychological factors* directly affect FWB.

Furthermore, the literature sheds light on the psychological and behavioral implications of delaying gratification to pursue long-term goals (e.g., Mischel, 1974; Bembenutty & Karabenick, 2004). Therefore, an intriguing possibility is that the increase in *grit* later in life is due to early individual differences in the ability to forgo immediate pleasure in exchange for more meaningful and deferred benefits. For instance, Urminsky & Zauberman (2017) reviewed the extensive literature on time discounting and demonstrated consistent relationships between future-oriented thinking and preventative health behaviors; Brown et al., (2015) found that individuals are more willing to defer payment from the government if they have a longer time horizon, in addition to other stronger motives; and Keidel et al. (2021) found that temporal discounting is associated with higher levels of self-reported impulsivity and correlates negatively with future-oriented. Ponchio et al. (2019) collected data from 1,027 adult Brazilians. They found that the *future time perspective* undermines *current money management stress* and positively affects *expected future financial security.*

The relationships established in the literature reviewed indicate an evolution in understanding the FWB issue. This study goes beyond *self-control* and *future time perspective* analysis; we also account for *procrastination* according to the delivery deadline of online activities by students. Our sample comprises 235 undergraduate students from the University of Brasilia (Brazil). We cross responses between online activities performed by students in eight curricular disciplines and responses to the survey questionnaire. The survey questionnaire measured the association between *self-control* and *future time perspective*, with *current money management stress*, *expected future financial security, preparedness for retirement, resilience for the future*, and *perceived FWB*, besides *socioeconomic* data. Additionally, to further the relationship between forward-looking *psychological factors* and

FWB measures, we include students' *grit* (Duckworth & Quinn, 2009) and *psychological resilience* (Connor & Davidson, 2003) in our analysis.

In sum, three hypotheses based on the existing literature were formulated and tested: i) *self-control* (Tangney et al., 2004; Strömbäck et al., 2017), *future time perspective* (Lang & Carstensen, 2002), and *procrastination* (Börsch-Supan et al., 2023) are related to *FWB measures*; ii) *grit* (Duckworth & Quinn, 2009) and *psychological resilience* (Connor & Davidson, 2003) are related to *FWB measures*; iii) *personal time proxies*, *grit* and *psychological resilience* are related to *preparedness for retirement,* r*esilience for the future* (Kempson & Poppe, 2018) and *perceived FWB* (Netemeyer et al., 2018).

Procrastination, often studied in the context of behavioral psychology, can have significant implications for accounting and personal financial management. Accounting also involves making informed decisions by analyzing financial data. However, procrastinatory behavior can hinder this ability to make efficient decisions.

In addition, a lack of financial education can exacerbate the procrastination problem in accounting. Lusardi et al. (2017) argue that financial knowledge helps individuals make informed investment decisions and better allocate financial resources. A lack of financial literacy, as highlighted by Lusardi & Mitchell (2011, 2014), can lead to inadequate financial planning in both the short and long term. Therefore, improving financial education can help mitigate the adverse effects of procrastination by empowering individuals to manage their finances more effectively.

4.2 Materials and methods

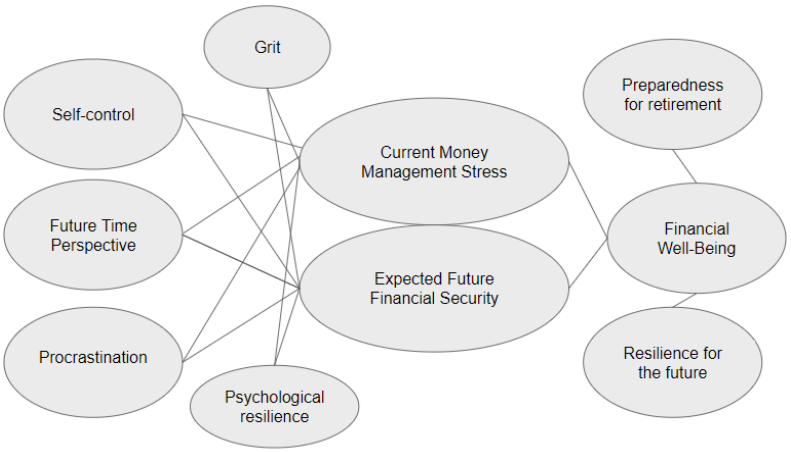
Procedures

This study uses the *perceived FWB* based on Netemeyer et al. (2018) - *current money management stress* and *expected future financial security*; *self-control* based on Tangney et al. (2004) and Strömbäck et al. (2017); and *future time perspective* from Lang & Carstensen (2002). These different views, taken together, were inspired by the study of Riitsalu and Raaij (2020). van Raaij et al. (2023) found *self-control* as the main determinant of *current money management stress*, and *future time perspective* as the main determinant of *expected future financial security.* Nevertheless, as an innovative approach to their model, we studied the relationships between future-oriented psychological factors and two components of *FWB* (*current money management stress* and *expected future financial security*).

We emphasize that *FWB* should not be treated as a one-dimensional construct. Instead, the interventions for improving *FWB* should target either its present and future components and also consider psychological characteristics in their design. Our model accounts for *procrastination, grit,* and *psychological resilience*, and also establishes *preparedness for retirement* and *resilience for the future* as the outcomes of *FWB*. Our intention is to further analyze key psychological factors relevant to time processing of long term thinking. *Procrastination* here is the tendency to put off decisions or actions that are difficult to perform, may be due to a lack of self-control, short-sightedness, or difficulties navigating the complex intertemporal decisions of saving for retirement (Börsch-Supan et al., 2023).

We used data collected from the survey questionnaire (in the Appendix) and conducted ordinary least squares regression analysis to explore how the issue of time relates to measures of financial well-being. Besides *socioeconomic* data, the model's independent variables are *self-control*, *future time perspective*, and *procrastination*. The dependent variables are *current money management stress, expected future financial security*, *preparedness for retirement*, *resilience for the future*, and *perceived FWB*, as shown below in Figure 4.1.

Figure 4.1- research model



Source: Prepared by the authors.

The sample consisted of 235 undergraduate students from curricular subjects in the University of Brasília. This student's sample aimed to measure *procrastination*. We had the help of university professors who allowed us to survey their students. Each professor

conducted online activities within a date and time for the students to start and finish. It is worth noting that the students had the discretion to choose when it suited them to accomplish the task within that period. The students participated in the activities via SIGAA (online academic learning support system), and it was possible to record the dates. We classify those who did the task in advance and those who left it to the last minute. Additional analysis also considers those who did not answer the online activities as maximum procrastinators.

The professors were also responsible for making the link of the survey questionnaire available to their class, and it was up to them to set a grade to incentivize students to answer the questionnaire. In order to improve effectiveness, a few days elapsed between our first contact with the professors and second contact, with the time needed for a rigorous analysis to determine if the professors understood the steps to be taken. The survey questionnaire was appropriate to our research objective and available sample. It was easy to complete (self-explanatory), of short duration (approximately 10 minutes) and measured the areas related to *perceived FWB*.

Subsequently, the analysis consisted of putting together in a single spreadsheet all the answers from the survey questionnaire and the *procrastination* information about the online activities performed by the students. For each class, eight in total, the students were placed in percentile order of activity delivery. We used the percentile because each class had a different deadline to complete the task and probably different incentives from each professor. From the institutional email addresses of students, it was possible to cross-reference those who had answered the survey questionnaire with their *procrastination*. The surveys were thorough and conducted from November 2022 to February 2023 during the school term. Furthermore, the *socioeconomic* overview of the students, with their age, gender, level of income, current education, and occupation, was also obtained.

Data analyses

We start the analysis with the most critical variables in the study (*self-control, future time perspective*, *procrastination*). In the second model, we add the *socioeconomic* characteristics of the students to see if it changes the result. The third model incorporated *grit* and *psychological resilience* to complete the analysis. Subsequently, we checked whether the *personal time proxies* and *socioeconomic* were related to *current money management stress*, *expected future financial security, preparedness for retirement*, *resilience for the future,* and *perceived FWB*.

It is worth noting that, for the online activities performed by the students, we created the *procrastination* variable - an index ranging from 0 (no procrastination) to 1 (maximum procrastination), and we realized two types of analysis. First, we consider only those students who answered the online activities proposed by the professors, and after analyzing the sample as a whole. In the sample as a whole, we considered those students who did not answer the online activities to be maximum procrastinators. For analysis purposes, we simplified the consideration of those students who did not respond to the online activities as maximum procrastinators. See tables 4.2 and 4.3 (Appendix) attached for a detailed analysis.

Apart from the main analysis described above, we also conducted an additional analysis using principal component analysis (PCA) to all survey variables, including the *perceived FWB measure*. We decided to use PCA in a further regression analysis because it was possible to reduce the number of issues into single components. Thus, each variable of *self-control, future time perspective, current money management stress*, *expected future financial security*, and *perceived FWB* were reduced into one component, namely, SC, FTP, CMMS, EFFS, and *perceived FWB*. Furthermore, we reduced *socioeconomic* data into four components (CSE1 to 4), *grit* into two components, and *psychological resilience* into nine components. As criteria for selecting components, we used eigenvalues >1. See Table 4.4 for a PCA detailed analysis. Tables 4.5 to 4.8 contain the PCA components loads.

Next, we analyzed descriptive results of the main variables of our study. Later, we studied both the magnitude and the significance of association between the dependent and independent variables. Finally, in order to identify independent risk factors, ordinary least squares regression analysis was performed. The research instruments used are attached.

4.3 Results

Descriptive analysis

In the descriptive results of the *socioeconomic* variables, we found that the percentage of men (56%) in the sample is slightly higher than that of women. In terms of age, all of them are between 18 and 63, the average age being 22. The economic level of the participants' families is medium-high - compared to the Brazilian national average. As for their professional status, 75% are only students, and 80% have completed high school as their highest level of education to date.

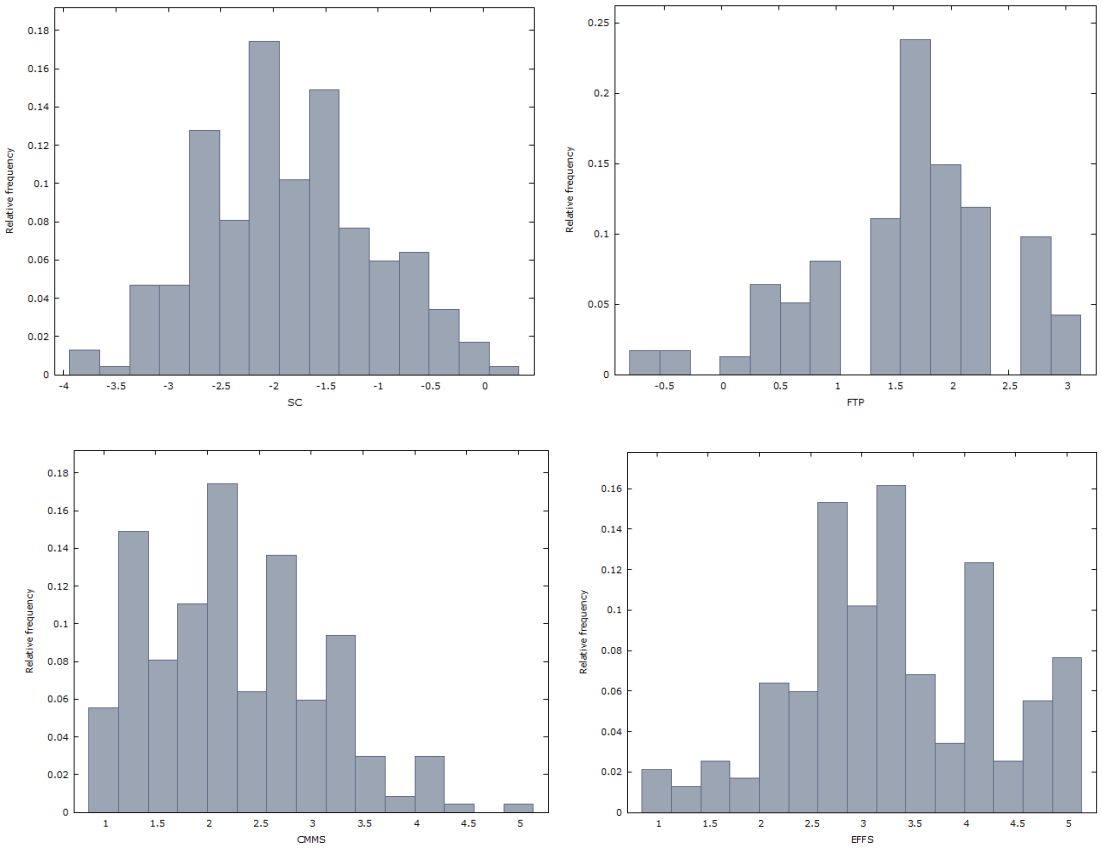
Regarding *self-control*, most of the sample reports finding it hard to break bad habits (30.1%), being easily distracted (30.1%), doing things that make them feel good at the

moment but regret it later (28.8%), not acting without thinking of all the alternatives (29.6%), and neutrality towards resisting temptation (34.7%). For the *future time perspective*, a large part reported that they generally plan for the future (37.7%), like planning and preparing for the future (38.56%), and neutrality on taking each day as it comes (31.4%).

Concerning the *perceived FWB measure* of *current money management stress*, the majority of the sample do not believe that they are unable to enjoy life because they obsess too much about money (58.5%), a significant portion report that they are behind with their finances (40.7%), and a large part are neutral about "finances control my life" (28.0%). Also, the phrases "whenever I feel in control of my finances, something happens that sets me back" (30.1%) and "I will never have the things I want in life because of my money situation" (33.9%) describe a significant part of the sample. On *expected future financial security*, most reports have saved (or will be able to save) enough money to last to the end of their life (28.8%), and will be financially secure until the end of their life (27.1%). However, they are neutral about becoming financially secure (33.9%), securing their financial future (28.8%) and achieving the financial goals that they have set for themselves (30.1%).

Figure 4.2 below shows the frequency distribution of responses to the main variables in the survey questionnaire; *self-control*, *future time perspective*, *current money management stress,* and *expected future financial security* (in this order). For *self-control* and *expected future financial security* variables, the sample's average response resembles the shape of a normal curve. It means a tendency for neutral *self-control* and *expected future financial security*. For the *future time perspective*, there is a slight asymmetry on the right and for *current money management stress* on the left. It means a tendency towards less *current money management stress* and a greater perspective on the future, with a higher frequency of answers generally preparing for the future.

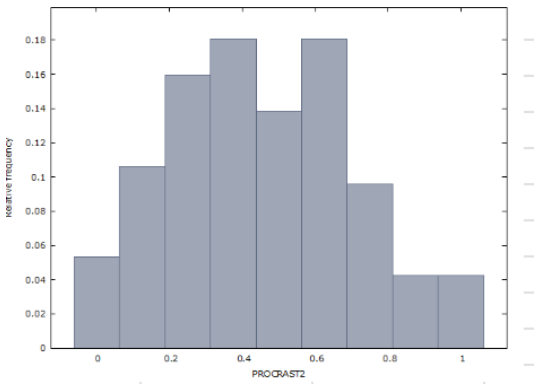
Figure 4.2 - Frequency distribution of responses for *self-control*, *future time perspective*, *expected future financial security*, and *current money management stress*



Source: Prepared by the authors.

As for the *procrastination* variable, Figure 4.3 below shows the frequency distribution of responses for those who answered the online activity (39.83% of the sample). Remembering that we transformed *procrastination* into an index ranging from 0 (no procrastination) to 1 (maximum procrastination). This variable had an average answer of 0.45 - i.e., just below the midpoint between maximum and minimum *procrastination* - with a median of 0.43 and a standard deviation of 0.26.

Figure 4.3 - Frequency distribution of responses for *procrastination*



Source: Prepared by the authors.

Regarding *preparedness for retirement*, the most frequent answer was not to believe they will have adequate retirement income without working (36.9%), and also that the Brazilian public pension - INSS (Instituto Nacional do Seguro Social) will make up less than 1/3 of their retirement income (33.5%). Nonetheless, the results also illustrated that 56.4% of the sample intend to keep private investments to guarantee their future retirement income, among other retirement savings options. For *resilience for the future*, a large part of respondents report that their family has less than a month's income savings (40.7%) and that they would only last three months without borrowing if their family income decreased by one-third (53%).

Furthermore, regarding the relationship between the variables, notably, we highlight the negative correlation between *self-control* and *current money management stress* (-0.34), as well as the positive correlation between *self-control* and *expected future financial security* (0.28) and *self-control* and *resilience for the future* (0.18), for a two-tailed critical value of 0.000. However, we found no correlation between *self-control* and *preparedness for retirement*. The *future time perspective* demonstrated no significance with *current money management stress*, *preparedness for retirement*, and *resilience for the future* (0.14). However, a correlation exists between *future time perspective* and *expected future financial security* (0.36).

Regression analyses

Table 4.2 in the Appendix presents the main regression analyses for those students who answered the survey questionnaire and the online activity requested by the professors. All the models presented in the appendix met the requirements for OLS. We built three models for each dependent variable. Model 1a includes *self-control*, *future time perspective*, and *procrastination* as independent variables related to *current money management stress*. In Model 1b, we included *socioeconomic* data, and in Model 1c, *grit* and *psychological resilience*. The results demonstrated that *self-control* was negatively and strongly related to *current money management stress.* Besides we found a better explanatory power in Models 1b and 1c, *self-control* remained the only significant variable. Models 2a to 2c are similar to the previous, but *expected future financial security* was the dependent variable analyzed. The results revealed a positive relationship between *expected future financial security,*

self-control, and *future time perspective,* at 10% two-tailed (Model 2a). Nevertheless, when we added *socioeconomic* data, *self-control* was not significantly related, *future time perspective* remained positively related, and male gender was an independent variable related to *expected future financial security* (Model 2b). Additionally, when adding *grit* and *psychological resilience,* male gender remains the only significant related variable (Model 2c).

Models 3a to 3c analyzed *preparedness for retirement* as the dependent variable. Regarding Model 3a, we did not find any significant *personal time proxies*. In Model 3b, which includes *socioeconomic* variables, *future time perspective*, income, and education level were related to *preparedness for retirement*. Notably, in Model 3c, the *future time perspective* was negatively related to *preparedness for retirement*, and *grit* appeared as positively related. As for *resilience for the future*, Model 4a demonstrated non-significance when only *personal time proxies* were added. Nevertheless, with the inclusion of *socioeconomic* data in Model 4b, *future time perspective*, income, and education level were significantly related. Furthermore, in Model 4c, which includes *resilience* measures, the variable of self-employed also appeared to be significantly related. Finally, regarding the *perceived FWB*, *personal time proxies* were insignificant in Model 5a, male gender was the only variable significantly related in Model 5b, and *self-control*, male gender, and *psychological resilience* in Model 5c.

Table 4.3 in the Appendix presents the main regression analyses for the sample as a whole[5]. In these models, we used a dichotomous variable, maximum procrastinator, instead of the *procrastination* variable. The maximum procrastinator variable was negatively related in Model 1a (*current money management stress*) and Model 5a (*perceived FWB*) but was insignificant in the other models. Additionally, *grit* appeared as relevant in Models 2c (*expected future financial security*) and 5c (*perceived* FWB) - in addition to Model 3c analyzed above - and *psychological resilience* in Models 2c (*expected future financial security*) and 3c (*preparedness for retirement*) - in addition to Model 5c analyzed above. On *socioeconomic* variables, age appeared as significantly related in Models 1b and 1c (*current*

[5] In the models presented above, the sample was made up only of those who answered the survey questionnaire and also did the online activities. This means that the sample size was 93. As several students answered the survey questionnaire but didn't do the requested online activities, they were disregarded at first. But it is possible to imagine that these respondents are maximum procrastinators, while the others, despite often leaving it until the last moment to do the proposed tasks, did. With this in mind, we think that there are two groups of students: those who didn't do what was asked (maximum procrastination) (N= 235) and those who did. (N = 93). What we mean is that the second group of students was analyzed earlier, with the results shown in Table 4.2. Then, an interesting analysis was to compare the two groups using a binary regression. In this sense, all the previous analysis was carried out again, now comparing the two groups. The results obtained are shown in Table 4.3 in the appendix and analyzed below.

money management stress) and 2c (*expected future financial security*), professional status in Models 4b and 4c (*resilience for the future*), and male gender in Models 2b and 2c (*expected future financial security*), 4b and 4c (*resilience for the future*), and 5b and 5c (*perceived* FWB). In sum, these results in Tables 4.2 and 4.3 did not differ substantially. Nevertheless, we would like to highlight the new relationships that appeared when we used the maximum procrastination variable. We will discuss these findings in the next section.

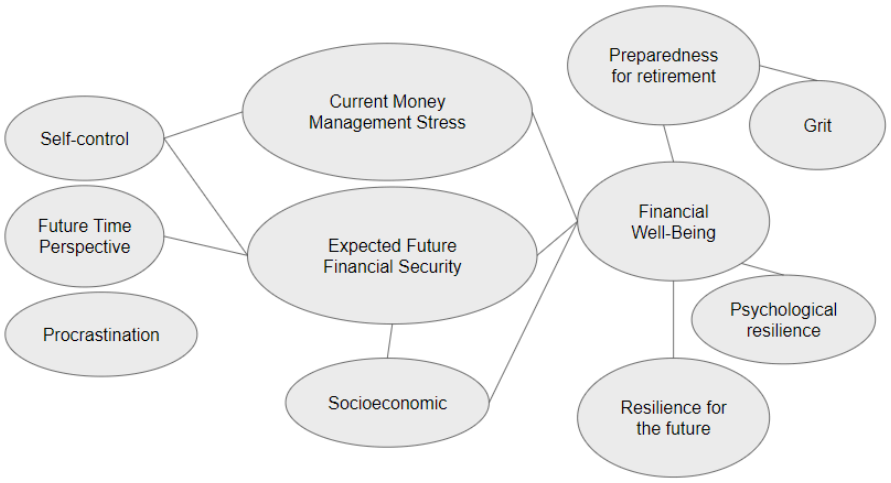
Finally, Table 4.4 in the Appendix presents the additional (PCA) regression analyses. The improvement in the explanatory power of almost all the models is noteworthy. Also, one variable that stands out is *procrastination*, which appears as negatively related to *expected future financial security.* We would also like to point out that the two components of the *grit* variable, one with loadings more significantly related to the perseverance construct (GRIT1) and the other to passion (GRIT2), were significantly related to *expected future financial security* and *preparedness for retirement*. Finally, the *psychological resilience* construct (RES8) was negatively related to *preparedness for retirement* and *perceived FWB*.

4.4 Discussion

This study analyzed how the issue of time relates to measures of financial well-being, per Figure 4.1, our research model. The results demonstrated that *self-control* was strongly related to less *current money management stress*. Nonetheless, *future time perspective* and *procrastination* were unrelated to the present construct of *perceived FWB.* The analyses with the *expected future financial security* additionally provided the *future time perspective* as a forward-looking variable related to the future construct of *perceived FWB*. Interestingly, from the *socioeconomic* variables analyzed in this study, the male gender was the only significantly related to *expected future financial security.*

We also established *grit* and *psychological resilience* as potential variables related to *FWBs* present and future constructs. Our regression analysis results revealed no relationship between the independent variables of *grit* and *psychological resilience* with the dependent variables of *current money management stress* and *expected future financial security.* Nevertheless, *grit* was strongly related to *preparedness for retirement* and *psychological resilience* was related to *perceived FWB measure*. In addition, the male gender also appeared as the only *socioeconomic* variable significantly related to *perceived FWB*.

Figure 4.4- Research findings



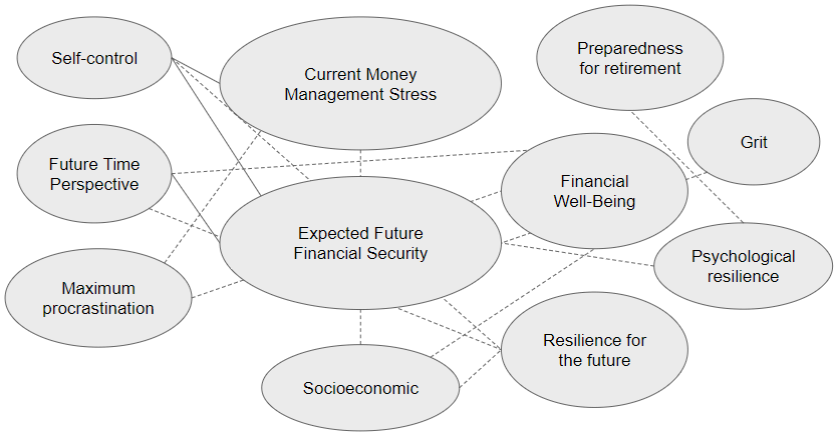
Source: Prepared by the authors.

Although we found no relationship between *procrastination* and the other predicted variables in the first analysis, relevant literature suggests that procrastination determines saving decisions over the lifecycle (e.g Börsch-Supan et al., 2023). For instance, Lucci (2013) argues that a potential essential component of discounting is time perception, which is fundamental to understanding the mechanisms underlying time processing in different situations. Brown and Previtero (2014) showed that procrastinators take longer to sign up for company-sponsored retirement plans, contribute less, and are more likely to stick with default portfolio allocations. Wang (2017) claimed public awareness about how procrastination may limit the degree of financial wellness, and Gamst-Klaussen et al. (2019) also confirmed that procrastination was a significant predictor of personal finances in terms of unhealthy financial behaviors.

Other key findings appeared with the maximum procrastinator variable, which was negatively related to *current money management stress,* as well as to *perceived* FWB. Notably, in the maximum procrastinator models, *grit* was relevant for *expected future financial security* and *perceived FWB,* and *psychological resilience* was relevant for *preparedness for retirement.* Additionally, *future time perspective* was significantly related to *perceived FWB* when we considered the maximum procrastinator. This result means that individuals with a greater perspective on the future also tend to perceive better *FWB*. On *socioeconomic* variables, age was significantly related to *current money management stress* and *expected future financial security*, professional status to *resilience for the future*, and male gender to *expected future financial security*, *resilience for the future*, and *perceived FWB*. Regarding PCA analyses (not presented in the image below), we highlight that

procrastination was negatively related to *expected future financial security,* and the two components of the *grit* variable, perseverance and passion, were significantly related to *preparedness for retirement* and the future construct of *perceived FWB*.

Figure 4.5 - Research findings with the maximum procrastinator



Source: Prepared by the authors.

The dashed lines indicate the new relationships that appeared using the maximum procrastination measure. Our results are similar to those of McGuire and Kable (2013), which provided empirical evidence to test the hypothesis that when timing is uncertain, the value of persistence depends crucially on the nature of a decision maker's prior temporal beliefs; and Lukinova and Erlich (2021), whose empirical evidence provided some individual differences in "internal clock speed" and the variance between choices across time-horizons.

On *resilience* measures, the growing experimental literature on strategies that regulate attention, emotion, and behavior in the presence of immediate temptations, points to *grit* and its cultivation. *Grit*, however, is distinguished from the general tendency to be self-controlled, emphasizing on long-term rather than short-term intensity. *Self-control* and *grit* operate on different time scales. Similar to the literature, it means that some people with high levels of *self-control* capably handle temptations but do not consistently pursue a dominant goal

(Duckworth & Gross, 2014). That is why we decided to look at our sample's level of *grit* in addition to the *self-control* measure.

Regarding the *psychological resilience* measure, we want to point out a "side effect" of our additional PCA analysis results. Our PCA analysis revealed that nine components of the 21 items that make up Connor and Davidson (2003) measure of *psychological resilience* were informative and relevant. Thus, unlike Connor and Davidson (2003), our sample does not allow us to simplify 21 questions into a single measure of resilience. However, our PCA analysis gave strength to the Duckworth et al. (2007) scale, as we also found two components, one with weights more focused on passion and the other on perseverance, representing important data characteristics. Therefore, even though this was not the main analysis of our study, it was possible to verify that, for our study, one resilience metric (*grit*) proved to be better than the other (*psychological resilience*).

It is also worth reflecting on the answers related to *preparedness for retirement* and *resilience for the future* in this study compared to Study 1 of the thesis. Although they are different samples, especially with regard to age, since the sample in this study is younger on average, a large part of both samples reported less than a month's income savings, and also that would only last three months without borrowing if their income decreased by one-third. In Study 1, while many believe they will have adequate retirement income without working, most rely on something other than a state pension. For the present study, the most frequent answer was not to believe they would have adequate retirement income without working and that the Brazilian public pension would make up less than 1/3 of their retirement income. Notably, in the present study, most of the sample intend to keep private investments to guarantee their future retirement income, among other retirement savings options. Nonetheless, the results in Study 1, which had a sample with older average age, illustrated low levels of private retirement savings, even with low reliance on state pensions.

Finally, the male gender variable is also noteworthy for its appearance in several of our results. It appeared as the only *socioeconomic* variable significantly related to *expected future financial security* and *perceived FWB*. Moreover, in our research findings with the maximum procrastinator, male gender was related to *expected future financial security*, *resilience for the future*, and *perceived FWB*.

4.5 Limitations

The study was based on a sample of 235 students and contributed to analyze how the issue of time relates to measures of financial well-being. However, we need to consider a few points when interpreting the results. Our sample was undergraduate students, so we expected a low average age for this sample. Nevertheless, we acknowledge the possibility that people's preferences are due not to age, per se, but to perceived limitations on time (e.g., Fung, Carstensen & Lutz, 1999). Therefore, as this study sought to relate forward-looking *psychological factors* with *FWB measure*s, considering *future time perspectives* beyond the objective aspect of age, we understand that the sample meets the proposed objective. Moreover, we believe that our sample is wealthier and has a higher level of education than the Brazilian population in general, given that achieving higher education at a federal university is not a reality for most Brazilians. It is also worth noting that achieving higher education may represent a more significant *resilience* measure among our sample.

We also would like to highlight our measure of *procrastination* as a limitation of the research. As well as being a complex measure to capture, we had to make some critical decisions to construct this measure in our research. We used the help of professors who had the discretion to demand the online activities. So, there was no standardization of requirements for all classes. Another essential point was that some students participated in more than one subject with the same professor, resulting in different *procrastination* rates in different subjects. We decided to take an average of all the deadlines for the same student in the different subjects he/she attended. Finally, we could not control that some students were absent from class when the professor directed the online activity and the survey questionnaire. Furthermore, the students were free to choose if they would answer the online activities and the survey questionnaire, reducing the probability of cross-referencing between *procrastination* data. For analysis purposes, we also simplified the consideration of those students who did not respond to the online activities as maximum procrastinators.

In addition, although we have captured part of the subjectivity of individual choices to clarify some links better through exploratory research, the reality is more complex. Intertemporal decisions can be affected by a wide range of attitudes, subjective beliefs, cognitive biases, and financial constraints (Brown et al., 2015). Moreover, mood can also influence goal‐directed behavior. The influence of emotional factors proved to increase effort production in incentive motivation tasks (e.g., Schmidt et al., 2009), while aspects of depression were associated with altered reward processing (Culbreth et al., 2018). Thus, future work must account for these often unobserved factors. In future research, it would also

be interesting to compare the objective aspect of age with the subjective aspect of *future time perspective* in FWB studies. One of the few qualitative FWB studies found evidence that FWB meaning and components (or dimensions) change throughout life (Salignac et al., 2020). Future research could seek to *perceive* FWB change over *future time perspective*s rather than the objective measure of age. The self-administered instruments used in our study may be reapplied for this purpose.

4.6 Conclusions

We aimed to analyze how the issue of time relates to measures of financial well-being. The results suggested links between *personal time proxies* and *FWB measures*. *Self-control* was strongly related to less *current money management stress* and *future time perspective* to *expected future financial security*. *Grit* and *psychological resilience* were relevant for *preparedness for retirement* and *perceived* FWB. Despite not being the main focus of our study, the *grit* resilience metric proved to be better than *psychological resilience* in our additional PCA analysis. Additionally, the male gender variable was noteworthy, as it was the only *socioeconomic* variable significantly related to several of our results. Out of the other *socioeconomic* variables included in the study, higher income, greater education level, and self-employed status were related to *perceived* FWB. Besides further *socioeconomic* factors analysis (e.g., gender gap issues), we mainly highlight the importance of forward-looking *psychological factors,* such as *self-control, future time perspective,* and *grit*, to improve present and future *perceived FWB measure*s.

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Tables

Table 4.2 Regression analysis for reduced sample version

	Model 1a	Model 1b	Model 1c
Dependent	CMMS	CMMS	CMMS
const	1.627 ***	1.073	1.055
SC	-0.409 ***	-0.450 ***	-0.430 ***
FTP	-0.020	0.050	0.104
Procrastin	0.061	0.079	0.047
Sex		0.015	0.024
Age		0.017	0.016
Income (10^6)		-0.560	0.162
School		-0.119	-0.009
Student		0.057	0.211
Auton		0.200	0.361
Private		-0.158	0.021
Grit			0.025
Resilience			-0.081 **
N	93	92	92
R2	0.189	0.224	0.279
Fc	7.344 ***	2.485 **	2.243 **

	Model 2a	Model 2b	Model 2c
Dependent	EFFS	EFFS	EFFS
const	3.649 ***	3.400 ***	2.905 ***
SC	0.235 **	0.193	0.147
FTP	0.252	0.306 *	0.230
Procrastin	-0.661 *	-0.492	-0.436
Sex		0.405 **	0.393 **
Age		-0.014	-0.016
Income (10^6)		0.018	0.169
School		0.214	0.152
Student		0.048	-0.060
Auton		0.071	-0.080
Private		-0.051	-0.155
Grit			0.159
Resilience			0.049
N	93	92	92
R2	0.183	0.251	0.272
Fc	6.332 ***	4.135 ***	3.760 ***

	Model 3a	Model 3b	Model 3c
Dependent	Preparedness	Preparedness	Preparedness
const	3.786 ***	3.260	-0.036
SC	0.002	-0.090	-0.344
FTP	-0.535 *	-0.381	-0.809 **
Procrastin	0.096	0.097	0.317
Sex		0.294	0.165
Age		0.026	0.005
Income (10^6)		1.494	1.874
School		-0.415	-0.522
Student		-0.769	-1.171
Auton		-0.354	-0.696
Private		-1.042	-1.228
Grit			1.200 ***
Resilience			0.104 *
N	93	92	92
R2	0.062	0.130	0.290
Fc	1.301	1.141	2.313 **

	Model 4a	Model 4b	Model 4c
Dependent	Resilience	Resilience	Resilience
const	4.355 ***	0.658	3.798
SC	0.421	0.315	0.422
FTP	0.723	0.746 *	0.882 *
Procrastin	-1.600	-0.455	-0.331
Sex		0.123	0.087
Age		-0.007	0.004
Income (10^6)		8.493 **	8.397 *
School		1.350 **	1.346 ***
Student		1.929	1.699
Auton		2.082	2.098 *
Private		2.202 *	1.936
Grit			-0.385
Resilience			-0.031
N	93	92	92
R2	0.093	0.312	0.333
Fc	2.814 **	4.500 ***	5.337 ***

	Model 5a	Model 5b	Model 5c
Dependent	FWBperceived	FWBperceived	FWBperceived
const	5.219 ***	4.473 ***	3.034 **
SC	−0.182	−0.257	−0.292 *
FTP	0.244	0.356	0.314
Procrastin	−0.567	−0.413	−0.525
Sex		0.419 *	0.447 *
Age		0.003	−0.000
Income (10^6)		−0.543	−0.720
School		0.095	0.093
Student		0.105	0.261
Auton		0.271	0.313
Private		−0.208	−0.049
Grit			0.069
Resilience			0.019 *
N	93	92	92
R2	0.049	0.094	0.134
Fc	1.213	1.658	1.770 *

Source: Prepared by the author.

Note: Model 1a describes the association between *current money management stress*, self-control, future time perspective, and procrastination. Model 2a includes additionally the socioeconomic variables as explanatory to *current money management stress*, and Model 3a includes grit and psychological resilience. Models 2, 3, 4 and 5 are similar to the previous, but in Model 2 *expected future financial security* is the explained variable, in Model 3 *preparedness for retirement*, in Model4 *resilience for the future*, and in Model 5 *perceived FWB*. CMMS is *current money management stress, EFFS is expected future financial security.* N = sample size. $p < 0.01$, $p < 0.05$, and $p < 0.1$. Independent variables: SC = self-control; FTP = FTP is future time perspective, Procrastin = procrastination; sex, age, income and school = personal characteristics of the respondent; student, auton and private = dummy. Grit and Resilience, as defined in the thesis.

Table 4.3 Regression analysis for the sample as a whole (maximum procrastinator)

	Model 1a		Model 1b		Model 1c	
Dependent	CMMS		CMMS		CMMS	
const	1.708	***	0.914		0.560	
SC	-0.353	***	-0.375	***	-0.397	***
FTP	0.010		0.027		0.012	
Proc Max	-0.218	**	-0.164		-0.168	
Sex			-0.019		-0.018	
Age			0.023	*	0.023	*
Income (10^6)			-0.666		-0.101	
School			-0.131		-0.125	
Student			0.184		0.200	
Auton			0.207		0.205	
Private			0.403		0.414	
Grit					0.051	
Resilience					0.003	
N	235		226		226	
R2	0.134		0.172		0.175	
Fc	11.387	***	5.674	***	4.970	***

	Model 2a		Model 2b		Model 2c	
Dependent	EFFS		EFFS		EFFS	
const	3.149	***	3.820	***	1.963	**
SC	0.232	***	0.181	**	0.051	
FTP	0.366	***	0.352	***	0.265	***
Proc Max	-0.006		-0.067		-0.078	
Sex			0.367	***	0.370	***
Age			-0.017		-0.022	*
Income (10^6)			0.224		0.129	
School			0.130		0.166	
Student			-0.679		-0.525	
Auton			-0.401		-0.342	
Private			-0.680		-0.543	
Grit					0.362	***
Resilience					0.009	*
N	235		226		226	
R2	0.167		0.225		0.274	
Fc	14.166	***	19.249	***	17.236	***

	Model 3a	Model 3b	Model 3c
Dependent	Preparedness	Preparedness	Preparedness
const	2.947 ***	2.181	0.196
SC	0.009	-0.015	-0.135
FTP	-0.065	-0.092	-0.191
Proc Max	-0.310	-0.289	-0.316
Sex		0.312	0.304
Age		0.033	0.028
Income (10^6)		-0.312	-0.589
School		-0.364 *	-0.348 *
Student		-0.001	-0.051
Auton		0.426	0.357
Private		-0.412	-0.479
Grit			0.220
Resilience			0.022 **
N	213	207	207
R2	0.012	0.079	0.119
Fc	0.841 *	2.434 ***	3.021 ***

	Model 4a	Model 4b	Model 4c
Dependent	Resilience	Resilience	Resilience
const	4.355 ***	-1.375	-0.986
SC	0.564 **	0.497 *	0.563 *
FTP	0.388	0.428 *	0.465 *
Proc Max	0.298	0.171	0.149
Sex		0.996 **	0.998 **
Age		-0.038	-0.035
Income (10^6)		0.374 *	0.353 *
School		1.445 ***	1.421 ***
Student		5.360 ***	5.143 ***
Auton		5.560 ***	5.350 ***
Private		4.935 ***	4.693 ***
Grit			-0.342
Resilience			0.015
N	235	226	226
R2	0.042	0.203	0.207
Fc	3.503 **	6.590 ***	6.415 ***

	Model 5a		Model 5b		Model 5c	
Dependent	FWB perceived		FWB perceived		FWB perceived	
const	4.856	***	4.734	***	2.523	*
SC	-0.121		-0.193	*	-0.345	***
FTP	0.376	***	0.379	***	0.277	**
Proc Max	-0.279	*	-0.231		-0.246	
Sex			0.348	**	0.352	**
Age			0.007		0.000	
Income (10^6)			0.158		0.281	
School			0.000		0.042	
Student			-0.495		-0.325	
Auton			-0.193		-0.138	
Private			-0.278		-0.129	
Grit					0.413	**
Resilience					0.012	
N	235		226		226	
R2	0.077		0.134		0.181	
Fc	4.951	***	6.726	***	6.918	***

Source: Prepared by the author.

Note: Model 1a describes the association between *current money management stress*, self-control, future time perspective, and procrastination. Model 2a includes additionally the socioeconomic variables as explanatory to *current money management stress*, and Model 3a includes grit and psychological resilience. Models 2, 3, 4 and 5 are similar to the previous, but in Model 2 *expected future financial security* is the explained variable, in Model 3 *preparedness for retirement*, in Model4 *resilience for the future*, and in Model 5 *perceived FWB*. CMMS is *current money management stress, EFFS is expected future financial security.* N = sample size. $p < 0.01$, $p < 0.05$, and $p < 0.1$. Independent variables: SC = self-control; FTP = FTP is future time perspective, Procrastin = procrastination; sex, age, income and school = personal characteristics of the respondent; student, auton and private = dummy. Grit and Resilience, as defined in the thesis.

Table 4.4 Additional regression analysis (PCA)

	Model 1a		Model 1b		Model 1c	
Dependent	CMMS		CMMS		CMMS	
const	1.627	***	1.486	***	1.496	***
SC	-0.409	***	-0.432	***	-0.455	***
FTP	-0.020		0.013		-0.030	
Procrastin	0.061		0.159		0.182	
CSE1			-0.013		-0.036	
CSE2			-0.019		-0.045	
CSE3			-0.057		-0.022	
CSE4			-0.030		0.076	
GRIT1					0.043	
GRIT2					-0.036	
RES1					-0.026	
RES2					0.061	
RES3					0.000	
RES4					-0.058	
RES5					-0.086	
RES6					-0.031	
RES7					0.085	
RES9					-0.044	
R2	0.189		0.205		0.292	
Fc	7.344	***	3.454	***	2.898	***

	Model 2a		Model 2b		Model 2c	
	EFFS		EFFS		EFFS	
const	3.649	***	3.408	***	3.171	***
SC	0.235	**	0.190	*	0.161	
FTP	0.252		0.335	**	0.422	**
Procrastin	-0.661	*	-0.564		-0.368	
CSE1			0.044		0.045	
CSE2			0.011		0.009	
CSE3			-0.153	*	-0.245	**
CSE4			0.157	*	0.212	**
GRIT1					0.100	
GRIT2					0.132	**
RES1					-0.021	
RES2					0.057	
RES3					0.055	
RES4					0.012	
RES5					0.127	
RES6					-0.115	
RES7					-0.005	
RES8					-0.199	
RES9					-0.057	
R2	0.1829		0.233		0.405	
Fc	519,528.000	***	4.987	***	3.833	***

	Model 3a		Model 3b		Model 3c	
Dependent	Preparedness		Preparedness		Preparedness	
const	3.786	***	3.322	***	3.151	***
SC	0.002		-0.087		-0.462	**
FTP	-0.535	*	-0.421		-0.703	**
Procrastin	-0.096		0.201		-0.081	
CSE1			0.075		0.015	
CSE2			-0.059		0.030	
CSE3			-0.206		-0.159	
CSE4			0.079		0.134	
GRIT1					0.332	***
GRIT2					-0.167	
RES1					-0.042	
RES2					-0.049	
RES3					-0.201	
RES4					-0.105	
RES5					-0.034	
RES6					0.257	
RES7					-0.011	
RES8					-0.371	**
RES9					-0.179	
R2	0.062		0.096		0.329	
Fc	1.301		1.098		2.797	***

	Model 4a		Model 4b		Model 4c	
Dependent	Resilience		Resilience		Resilience	
const	4.355	***	3.246	**	3.157	**
SC	0.421		0.294		0.409	
FTP	0.723		0.906	**	1.142	**
Procrastin	-1.600		-0.531		-0.690	
CSE1			0.428	**	0.422	**
CSE2			0.266		0.297	
CSE3			-0.359		-0.474	
CSE4			0.104		-0.029	
GRIT1					-0.267	
GRIT2					0.214	
RES1					0.063	
RES2					0.214	
RES3					0.221	
RES4					0.141	
RES5					0.158	
RES6					0.016	
RES7					-0.025	
RES8					-0.272	
RES9					0.643	
R2	0.093		0.182		0.299	
Fc	2.814	**	3.023	***	2.266	***

	Model 5a		Model 5b		Model 5c	
Dependent	FWB perceived		FWB perceived		FWB perceived	
const	2.090	***	1.922	***	1.675	**
SC	0.654	***	0.621	***	0.616	***
FTP	0.259		0.322		0.452	**
Procrastin	-0.762		-0.722		-0.550	
CSE1			0.056		0.081	
CSE2			0.030		0.054	
CSE3			-0.096		-0.222	
CSE4			0.187		0.287	**
GRIT1					0.057	
GRIT2					0.168	
RES1					0.006	
RES2					-0.004	
RES3					0.054	
RES4					0.070	
RES5					0.213	
RES6					-0.084	
RES7					-0.089	
RES8					-0.377	**
RES9					-0.013	
R2	0.282		0.307		0.441	
Fc	13.140	***	7.503	***	4.611	***

Source: Prepared by the author.
Note: SC is self-control, FTP is future time perspective, CSE are PCA components of socioeconomic variables, and RES the PCA components of psychological resilience variable.

Table 4.5 Principal components analysis for *self-control* and *future time perspective*

SC	SCloads	FTP	FTPloads
I have a hard time breaking bad habits.	0.436	I generally plan for the future.	0.654
I get distracted easily.	0.486	I take each day as it comes	-0.338
I'm good at resisting temptation.	-0.384	I like planning and preparing for the future.	0.677
I do things that feel good in the moment but regret later on.	0.477		
I often act without thinking through all the alternatives	0.445		

Source: Prepared by the author.

Table 4.6 Principal components analysis for *current money management stress, expected future financial security*

CMMS	CMMSloads	EFFS	EFFSloads
Because of my money situation, I feel I will never have the things I want in life.	0.426	I am becoming financially secure.	0.443
I am behind with my finances.	0.408	I am securing my financial future.	0.471
My finances control my life.	0.522	I will achieve the financial goals that I have set for myself.	0.434

Whenever I feel in control of my finances, something happens that sets me back.	0.52	I have saved (or will be able to save) enough money to last me to the end of my life.	0.454
I am unable to enjoy life because I obsess too much about money.	0.331	I will be financially secure until the end of my life.	0.433

Source: Prepared by the author.

Table 4.7 Principal components analysis for *grit*

GRIT	GRITloads1	GRITloads2
New ideas and new projects sometimes distract me from previous ones.	0.136	-0.424
Obstacles don't discourage me. I don't give up easily.	0.399	0.171
Many times I set a goal, but then I prefer to look for another one.	0.208	-0.426
I am a hard worker.	0.418	0.185
I have trouble staying focused on projects that require more than a few months to complete.	0.249	-0.402
I finish everything I start.	0.400	0.042
My interests change from year to year.	0.048	-0.321
I am dedicated. I never give up.	0.467	0.137
I have been obsessed for some time with a certain idea or project, but then I lost interest.	0.125	-0.476
I have overcome obstacles to achieve an important goal.	0.382	0.251

Source: Prepared by the author.

Table 4.8 Principal components analysis for *psychological resilience*

Psychological resilience	RESloads1	RESloads2	RESloads3	RESloads4	RESloads5	RESloads6	RESloads7	RESloads8	RESloads9
Able to adapt to change	-0.180	0.160	0.361	0.233	0.283	0.307	-0.010	-0.033	-0.029
Close and secure relationships	-0.142	0.168	0.160	0.378	0.186	-0.078	0.236	0.034	0.431
Sometimes fate and God can help	-0.126	-0.348	-0.102	0.029	0.435	0.045	-0.181	-0.103	-0.141
Can deal with whatever comes	-0.238	0.267	0.113	-0.088	0.066	-0.252	-0.189	-0.158	-0.091
Past success gives confidence for new challenge	-0.173	-0.121	0.439	-0.015	-0.216	0.027	0.312	-0.026	-0.314
See the humorous side of things	-0.189	0.244	0.226	0.005	0.121	-0.100	-0.012	0.287	-0.016
Coping with stress make stronger	-0.160	0.386	-0.021	-0.205	0.202	0.220	0.080	0.092	-0.227
Tend to bounce back after illness, injury or hardship	-0.149	0.173	-0.109	-0.403	0.338	-0.061	0.278	-0.134	0.086
Things happen for a reason	-0.127	-0.370	-0.075	0.075	0.483	0.029	0.012	-0.064	-0.035

Best effort no matter what	-0.200	-0.099	0.101	-0.325	0.021	0.310	0.175	0.005	-0.074
One can achieve one's goals	-0.183	-0.167	0.114	-0.362	-0.030	-0.146	-0.047	0.324	-0.044
When things look hopeless, I don't give up	-0.253	-0.007	-0.125	-0.180	-0.240	0.037	-0.096	-0.337	-0.010
Know where to get help	-0.146	-0.078	-0.116	0.073	-0.073	-0.247	0.590	-0.076	-0.120
Under pressure, focus and think clearly	-0.176	0.224	-0.289	-0.154	-0.191	0.191	-0.102	0.225	0.041
Prefer to take the lead in problem solving	-0.188	-0.085	-0.199	0.203	-0.084	0.245	-0.023	0.531	-0.153
Not easily discouraged by failure	-0.254	-0.052	-0.307	0.069	-0.061	0.302	0.080	-0.171	0.075
Think of self as strong person	-0.278	0.095	-0.102	0.153	-0.049	0.073	-0.044	0.053	0.193
Make unpopular or difficult decisions	-0.153	0.074	-0.091	0.411	-0.081	-0.111	-0.041	-0.000	-0.563
Can handle unpleasant feelings	-0.194	0.271	-0.201	0.154	0.047	-0.232	-0.097	-0.246	-0.085
Have to act on a hunch, without knowing why	-0.045	-0.053	-0.280	-0.036	0.128	-0.456	0.211	0.376	0.054
Strong sense of purpose in life	-0.246	-0.315	-0.146	0.054	-0.079	0.035	0.023	-0.092	-0.003
In control of my life	-0.281	-0.082	0.117	0.007	-0.285	-0.132	0.081	-0.174	0.136
I like challenge	-0.249	0.028	-0.057	-0.061	0.035	-0.213	-0.374	-0.014	0.050
One works to attain one's goals	-0.222	-0.219	0.327	-0.071	-0.035	-0.225	-0.285	0.099	-0.003
Pride in my achievements	-0.255	-0.120	0.083	0.102	-0.117	0.092	-0.009	0.096	0.434

Source: Prepared by the author.

Appendix C - Online questionnaire

Dear participant,

You are being invited to participate in a survey for the final work of a doctoral thesis developed in the Graduate Program in Accounting at the University of Brasilia (PPGCont-UnB).

The approximate response time is 10 minutes. The data from this research are confidential and will be analyzed jointly, without it being possible to identify any of the participants.

In case of doubts or suggestions, please contact the researcher by the e-mail eduarda.augusta.sales@gmail.com. We thank you in advance for your participation.

Eduarda Augusta
PPGCont/UnB

Do you agree to participate in this survey?

( ) Yes
( ) No

Part I
Read each sentence and, on the right, mark the one that seems most appropriate to you. Don't reflect too much on the sentences. Instead, compare yourself with "people in general" - not just co-workers, friends, or relatives.

1. New ideas and new projects sometimes distract me from previous ones.
2. Obstacles don't discourage me. I don't give up easily.
3. Many times I set a goal, but then I prefer to look for another one.
4. I am a hard worker.
5. I have trouble staying focused on projects that require more than a few months to complete.
6. I finish everything I start.
7. My interests change from year to year.
8. I am dedicated. I never give up.
9. I have been obsessed for some time with a certain idea or project, but then I lost interest.
10. I have overcome obstacles to achieve an important goal.

[*Grit: Five-point scale items ("nothing to do with me" to "totally me"). In analysis, statements 1, 3, 5, 7, and 9 are reversely coded]*.

Part II
Now some questions about unforeseen expenses or drop in income.

1. How much of an unexpected expense equivalent to one month's income could you (or your family) cover with money you (or your family) have readily available?

2. What is your financial reserve volume in terms of number of months of income? (short term financial resources that you can readily count on)

3. How long could you (or your family) cover a one-third drop in your (or your family) income without having to borrow?

[*Resilience for the future: Question 1 - Three-point scale items ("nothing", "something", "all") Questions 2 and 3 - Five-point scale items ("0-1 month", "between 1-3 months", "between 3-6 months", "between 6-12 months", "more than 12 months")]*.

Part III
About work and planning for retirement.

1. Which of the following things do you personally plan to do in the next five years to ensure that you will have enough income for your needs after retirement?

( ) Payment of a pension in your own name (employer pension, private pension, public sector pension).
( ) Paying for other investments that will provide an income in retirement.
( ) Buy a property that will provide a rental income in retirement.
( ) Establish a business that will provide an income in retirement.
( ) Other investments that you will sell to give you an income in retirement.
( ) Buy a property that you will sell to give you an income in retirement.
( ) Establish a business that you will sell to give you an income in retirement.
( ) None of these.
( ) I don't know.

2. I will have adequate retirement income without working.

3. Degree of reliance on INSS for retirement income.

[*Preparedness for retirement*: *Question 1 - More than one option could be selected. Question 2 - Five-point scale items ("it doesn't really fit" to "fits very well"). Question 3 - Four-point scale items ("total", "at least ⅔", "at least ⅓", "less than ⅓"]*.

Part IV
Don't overthink the following sentences. And compare yourself with "people in general".

a. I have a hard time breaking bad habits.
b. I get distracted easily.
c. I'm good at resisting temptation.

d. I do things that feel good in the moment but regret later on.
e. I often act without thinking through all the alternatives.

[Self-control (SC): Five-point scale items ("nothing to do with me" to "totally me"). In analysis, statements a, b, d and e are reversely coded].

Part V
Mark the one that seems most appropriate to you. Don't overthink the phrases and compare yourself with "people in general" - not just co-workers, friends or relatives.

a. I generally plan for the future.
b. I take each day as it comes.
c. I like planning and preparing for the future.

[Future Time Perspective (FTP): Five-point scale items ("nothing to do with me" to "totally me"). In analysis, statement b is reversely coded].

Part VI
Don't overthink the phrases and compare yourself to "people in general".

I am becoming financially secure.
I am securing my financial future.
I will achieve the financial goals that I have set for myself.
I have saved (or will be able to save) enough money to last me to the end of my life.
I will be financially secure until the end of my life.

[Expected future financial security: Five-point scale items ("does not describe me at all" to "describes me completely")].

Because of my money situation, I feel I will never have the things I want in life.
I am behind with my finances.
My finances control my life.
Whenever I feel in control of my finances, something happens that sets me back.
I am unable to enjoy life because I obsess too much about money.

[Current money management stress: Five-point scale items ("does not describe me at all" to "describes me completely")].

Part VII
Then answer according to what most applies to your life today. Don't overthink the statements. Compare yourself with "people in general" - not just with co-workers, friends or relatives.

Able to adapt to change
Close and secure relationships

Sometimes fate and God can help
Can deal with whatever comes
Past success gives confidence for new challenge
See the humorous side of things
Coping with stress make stronger
Tend to bounce back after illness, injury or hardship
Things happen for a reason
Best effort no matter what
One can achieve one's goals
When things look hopeless, I don't give up
Know where to get help
Under pressure, focus and think clearly
Prefer to take the lead in problem solving
Not easily discouraged by failure
Think of self as strong person
Make unpopular or difficult decisions
Can handle unpleasant feelings
Have to act on a hunch, without knowing why
Strong sense of purpose in life
In control of my life
I like challenge
One works to attain one's goals
Pride in my achievements

[Connor-Davidson Resilience Scale: Five-point scale items ("not at all true" to "truth almost all the time")].

Parte VIII
Demographics data

Gender:
( ) Female
( ) Male
( ) I prefer not to say/Other

2. Age (in years and just numbers)
Answer:_____

3. Average monthly family income in Reais
Answer:_____

4. What is your last schooling?
( ) Up to high school complete
( ) Complete College Education
( ) Post-graduation (lato sensu)

( ) Master's Degree Complete
( ) PhD complete

5. How would you describe your current professional status?:
( ) Student

( ) Public Servant
( ) Working as a freelancer or entrepreneur
( ) Work with a signed contract in the private sector or the third sector
( ) Partially Retired or Retired

6. Next, enter your academic registration:
Answer:_____

Chapter 5: Study 3 (unpublished)

Next, Study 3 aimed at identifying if *financial capability and well-being* awareness increases reported *preparedness for retirement*, *resilience for the future,* and *FWB*. Our hypothesis was that respondents made aware of their *financial capability and well-being* would be able to understand the possible consequences of their financial decisions on *FWB*s outcomes. Hence, making *financial capability and well-being* more salient would be expected to draw their attention to their financial decisions and, consequently, would be expected to shape their reported *preparedness for retirement*, *resilience for the future,* and *FWB*. In an experiment, I demonstrated that drawing people's attention to their *FWB expectations* and objectively informing them about the *financial capability* concept increases reported *preparedness for retirement*, *resilience for the future,* and *FWB*. This is an important finding, implying that making these concepts more salient drew people's attention to their financial decisions regarding future financial protection.

The Cost-Benefit of Aging: Financial Capability and Well-Being Awareness

Abstract

Awareness of the importance of financial capability in financial decision making and financial well-being (FWB) is growing. We aimed to identify if *financial capability and well-being* awareness increases reported *preparedness for retirement*, *resilience for the future,* and *FWB*. We randomly assigned participants to a Control group and two Treatment groups, one of which was asked about their *FWB expectations*, while the second also received objective *financial capability* information. Our first key finding was that drawing people's attention to their potential *financial capability and well-being* significantly increased reported *preparedness for retirement, resilience for the future,* and *FWB*. Therefore, making *financial capability and well-being* more salient drew people's attention to their potential financial decisions and shaped their reported *preparedness for retirement*, *resilience for the future,* and *FWB*. These results are important, as it is in line with the literature, and can inform financial institutions, policymakers, and individuals with regard to future financial protection. We also document that many people need to prepare for retirement. Many of the participants expressed disagreement about their expectation, without the public pension (INSS) or working, to have enough income after retirement. The majority reported that they entrust less than a third of their income to the INSS as a source of future retirement income, but 50% also reported the INSS as their main *retirement contribution* today (probably because it is compulsory for workers in Brazil). Researchers, policymakers, and people interested in boosting savings and insurance coverage can learn from our evidence since we show the risk of running out of money at retirement age and tools to strengthen old-age financial resilience.

5.1 Introduction

Financial hardship is not separate from people's wider potential well-being. *Financial capability*[6] services (MSD, 2021) equip people with the tools and strategies to manage their finances effectively to achieve immediate and longer-term financial well-being (*FWB*) goals crucial to older age. One motivation for such service is that addressing hardship and improving *FWB* should help relieve people's pressures in other areas of their lives, such as housing, health, and education. People particularly need help to prevent unmanageable debt and to ensure adequate retirement consumption (Lusardi & Mitchell, 2021). Moreover, services have shifted worldwide from budgeting to building *FWB*, and these new *financial capability* services are based on a strengths-based approach (MSD, 2021).

The effectiveness of traditional financial education like high school courses, seminars, etc., has been challenged, calling for alternative education tools (Goyal & Kumar, 2021). Some researches underline the challenges of a 'one-size-fits-all' financial education and emphasize specific financial situation-based counseling and teaching in groups to motivate the participants (e.g. Peeters et al., 2018). Personal finance blogs help many who need 'just in time' financial education (Hoffmann & Otteby, 2018), while media tools like television prove to be cost-effective alternatives for financial knowledge and attitudes of disadvantaged people (Crawford, Lajbcygier, & Maitra, 2018). Notably, in an experiment to study attitudinal, behavioral, and cognitive constraints that can stymie the link between financial education and financial outcomes, Carpena et al. (2019) show that goal setting and financial counseling complement financial education, by filling the gap between knowledge and behavior.

Goyal & Kumar (2021) detailed systematic review and bibliometric analysis on the financial literacy field found that *financial capability* is developing in the literature and is seen as an emerging theme. Another finding of Goyal & Kumar (2021) was that Xiao, Chen, and Chen (2014, pg. 2) was the first article to explicitly propose the definition of *financial capability* that refers to financial knowledge and behavior: "Financial capability can be demonstrated by a certain level of financial literacy and performance of desirable financial behaviors." The concept of financial capability has this other proposition: (people) "must have not only financial knowledge and skills but also access to appropriate financial products and services" (e.g., Huang et al., 2013, pg. 1). In other words, financial capability is a mix of financial literacy and access to financial services and instruments - financial inclusion (Goyal

[6] As in previous works, we have italicized the variables used in the study.

& Kumar, 2021). To reflect how *financial capability* works in real life, professor Kempson designed a financial capability framework based on interviews and focus groups in several countries (Kempson & Poppe; Kempson & Evans, 2021). This conceptualization[7] is the one used in this study.

Earlier work presented in Study 1 of this thesis has explored how socioeconomic and demographic characteristics, behavior and attitudes, knowledge and experience, and "key" psychological factors affect *preparedness for retirement* and *resilience for the future* (FWB outcomes). In Study 1 we found that different *socioeconomic* aspects, *knowledge* (financial literacy), *behaviors* (financial capability), and "key" *psychological factors* of self-control and confidence helped to explain the variation in FWB outcomes across age groups and that *grit* and *resilience* measures were influential, especially for the older age group (da Silva & Silva, 2023). The present paper considers a different explanation for variation in the FWB outcomes: people may not know *financial capability and well-being* to bridge the gap between poor and better life cycle financial decisions. Hence, this study aimed to identify if *financial capability and well-being* awareness increases reported *preparedness for retirement*, *resilience for the future,* and *FWB*.

To identify if people alerted to *financial capability and well-being* could notice the potential consequences of their financial decisions, we analyzed whether *FWB expectations* and *financial capability* objective concept awareness shape reported financial *preparedness for retirement*, *resilience for the future,* and *FWB*. Using an experimental module we designed and fielded, the first group (the Control group) was not asked or informed about the concept of *financial capability*. Two other groups elicited *FWB expectations*; thereafter Treatment Group 1 received no additional information, while Treatment Group 2 was also informed about *financial capability* objective definition using the Financial Capability and Well-being Model concept (Kempson & Evans, 2021). We then assessed whether our respondents reported *preparedness for retirement*, *resilience for the future*, and *FWB* by asking all of them about their decisions regarding savings, unforeseen expenses or drop in income, and retirement planning.

[7] "Financial capability is the ability to manage money well. In practice, financial capability is a complex set of behaviours, knowledge and attitudes, as wide-ranging as budgeting, understanding financial products, having a long-term perspective, regular saving, doing research, and confidence in one's ability to make good financial decisions. A person may be very good at all of these components, but may also be good at some of them and below average on others." (Kempson & Evans, 2021, pg 2).

Our results revealed that respondents asked about their *FWB expectations* were significantly more likely than the Control group to say they have *preparedness for retirement, resilience for the future,* and *FWB*. The respondents who received the objective information on the *financial capability* concept (T2) were significantly more likely to report *preparedness for retirement* and *FWB*. These are important findings, implying that simply drawing people's attention to their potential *financial capability and well-being* can be a potent method of alerting them to future financial protection. Our overall evidence also indicates that reported *preparedness for retirement*, *resilience for the future*, and *FWB* increase with wage. While formal and self-employment statuses were positively related to *preparedness for retirement*, keeping private investments was related to *resilience for the future* and *FWB*. Another finding which confirms extensive literature (e.g., Landerretche & Martínez, 2013; Kalmi & Ruuskanen, 2018; Koh et al , 2021) was that the majority of respondents did not trust the public pension (INSS) for future income, but 50% of the respondents currently contribute to the INSS (probably because it is compulsory), and only a third reported contributing to a supplementary pension plan (optional) or keeping private investments for old-age.

Prior studies have suggested that skills and noncognitive abilities directly affect financial distress and choices, financial decision-making and perceived financial well-being. For instance, Kumar et al. (2023) found the dominance of financial capability and financial autonomy as mediators in financial decision-making and FWB, while impulsivity fails to mediate financial decision-making. Dare et al. (2023) found that financial self-efficacy (e.g., confidence in one's ability to perform financial tasks) was a robust indicator of positive well-being via positive financial behaviors. Notably, Parise & Peijnenburg (2017) found evidence that individuals with lower noncognitive abilities make financial choices that increase their likelihood of distress, are less likely to plan for retirement and save, and more likely to buy impulsively and to have unsecured debt. Understanding these diversity in financial capabilities of emerging adults has implications for their late life economic well-being. Accordingly, we suggest that grittier people increase their chances of experiencing *FWB* and potentially alter financial choices relevant to old age.

Our results also contribute to the literature examining the relationship between wealth and insurance. Though Gollier (2003) have predicted a negative correlation between wealth and insurance purchase, there is also evidence that wealthier people hold more insurance (Eisenhauer & Halek, 1999; Kumi-Kyereme & Amo-Adjei, 2013; Heo et al., 2013; Gropper & Kuhnen, 2021). The fact that the less wealthy have less coverage, *preparedness for*

retirement, *resilience for the future* and *FWB*, might increase financial health disparities among individuals at older ages. These findings have an important policy implication to protect the poor middle-aged population, as this population enters old age, the high financial burden it faces may exacerbate persistent socioeconomic health disparity.

Accounting plays a crucial role in personal and corporate financial management. Understanding and using this information is essential for accounting professionals and individuals seeking to improve their well-being. In this sense, the issue of financial well-being can be relevant to accounting. We understand that accounting is not just a record of the past but a tool for future planning. Their use is not restricted to entities such as companies or governments, but it can be useful for individuals in using information to plan their financial future. Thus, we understand that this research has accounting implications.

5.2 Materials and methods

Procedures

We conducted ordinary least squares regression analysis to identify if *financial capability and well-being* awareness increases reported *preparedness for retirement, resilience for the future*, and *FWB*. The dependent variables of the models are *preparedness for retirement* and *resilience for the future* as the outcomes of FWB. *Preparedness for retirement* is a separate outcome measure of the overall FWB. This measure alerts us to the respondents' public and private retirement savings. Its results also illustrate the reliance on the governmental retirement income (in Brazil, INSS). *Resilience for the future* is a sub-component of FWB and is measured in terms of the length of time individuals can cover their cost of living if they lose their main source of income and without taking out a loan (Kempson & Evans, 2021). In addition, as a proxy for the *FWB* measure, we added *preparedness for retirement* and *resilience for the future*, a third explanatory measure in our study.

To field the particular purpose of assessing if *financial capability* awareness increases reported *preparedness for retirement*, *resilience for the future,* and *FWB,* we assigned respondents to one of three conditions: for the Control group (C), we only asked about the *preparedness for retirement* and *resilience for the future* questions (we do not ask about *FWB's expectations* or provide information on *financial capability*); for Treatment group 1 (T1) we asked about *FWB expectations* followed by the *preparedness for retirement* and *resilience for the future* questions; and for Treatment group 2 (T2) we asked about *FWB*

expectations, followed by the information about *financial capability*, and thereafter the *preparedness for retirement* and *resilience for the future* questions. The aim of this design was to draw people's attention to assessments of their potential *FW*B and, in the case of the T2 group, also to show them objective information about *financial capability*. We hypothesized that respondents who were alerted to *FWB* and *financial capability* information might notice the potential consequences of their financial decisions. Hence, making these concepts more salient would be expected to draw their attention to their financial decisions and, consequently, would be expected to shape their reported *preparedness for retirement*, *resilience for the future,* and *FWB*. The Appendix contains the questionnaire we used to conduct the experiment. It indicates which questions are exclusive to Treatment Groups 1 (T1) and 2 (T2).

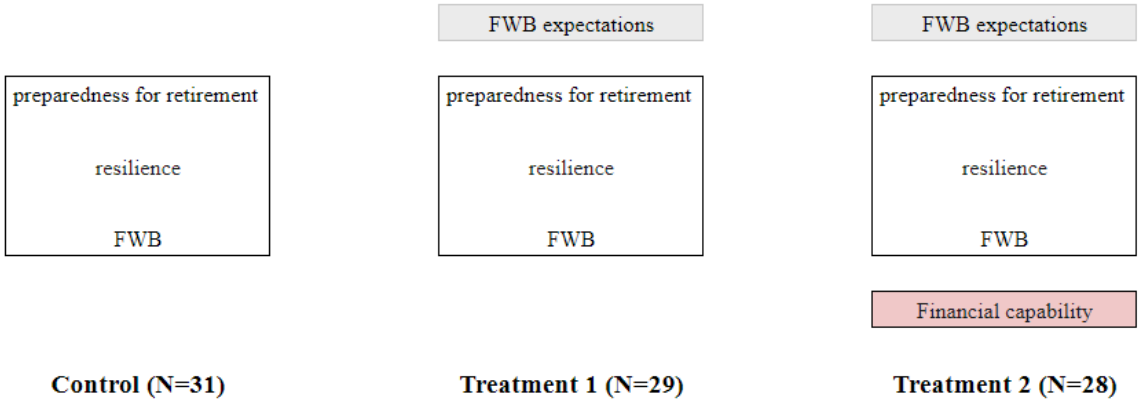

Figure 5.1 - Research Design

Source: Prepared by the authors.

It is important to note that we conducted the experiment using printed questionnaires made available in a gym in an administrative region of Brasília for the second half of 2023. The choice of location to distribute the questionnaire was for convenience and aimed to avoid the respondent being the same as in previous studies, which were applied online (Study 1) or with undergraduate students (Study 2). Due to the choices about where to apply the experiment and the relatively long questionnaire, the number of respondents obtained was not as significant as in previous studies. We did not notice any noteworthy facts to report throughout the application period.

Data analyses

In the current study, we also propose *grit* and *retirement contribution* as variables relevant to explain *preparedness for retirement*, *resilience for the future,* and *FWB*. We used the Brazilian-translated version of Duckworth's book (Duckworth, 2016) to measure the *grit* scale, since the questionnaire was administered in Portuguese. In calculating the total *grit* score, we added all the points from the chosen options together and divided the result by 10. The maximum score on this scale is 5 (with much grit), and the lowest score is 1 (no grit). Also, we constructed the *retirement contribution* items to reflect the Brazilian reality. The public pension in Brazil (INSS) is mandatory for Brazilian workers with signed contracts. However, we also aimed to collect data on making private investments to ensure financial security in old age. In this manner, it is possible to verify whether or not *grit* is a relevant factor, as well as the attitude of making private investments, to secure one's old age.

To explore the FWB outcomes in more depth, we estimated the following multivariate regression model across our sample of *i* individuals for each of the three dependent variables: $FWB\ outcome_i = \alpha_1 + \beta_1 T_1 + \beta_2 T_2 + \gamma_i X'_i + \epsilon_i$. Controls include an indicator for being in Treatment group 1, who were asked only about *FWB expectations* (T_1); or for being in Treatment group 2, who was asked about *FWB expectations* and who additionally was informed about the *financial capability* concept (T_2); the reference group is the Control. We also include X'_i, a vector of controls, including the respondent's age (in years); gender (if respondent female = 1, else 0); indicators of educational levels (high school, some college, college+), professional status (self-employed, formal contract), wage (below average, average, above average), *retirement contribution* (INSS, private investments), and *grit*. The algebraic expression above is the analysis of the complete questionnaire, which included the *FWB expectations* and *financial capability* objective information. It corresponds to the right-hand side of Figure 5.1. For the questionnaire with Treatment 1 only, the central part of Figure 5.1, the formal model is given by: $FWB\ outcome_i = \alpha_1 + \beta_1 T_1 + \gamma_i X'_i + \epsilon_i$. Finally, for the Control group, the left-hand side of Figure 5.1, the model is given by $FWB\ outcome_i = \alpha_1 + \gamma_i X'_i + \epsilon_i$.

The analysis of the results obtained includes two aspects. The first is to check whether the presence of the treatment brings about a change in γ_i, which corresponds to the coefficients of the control variables. The second is to make sure that the presence of treatment

causes a change in the dependent variable through the significance of the angular coefficients of the treatment variables, in this case, β_1 and β_2. Before calculating the regression, we standardize the dependent variables, dividing each observation by the sample standard deviation (N=88). We used a value of 0.05 as the standard for significance. Finally, we also calculated Cronbach's alpha (α) to measure the internal consistency of the survey. The α coefficient is calculated from the variance of the individual items and the variance of the sum of each evaluator's items from all the items in a questionnaire that uses the same measurement scale. Cronbach's alpha ranges from 0 to 1, with higher values indicating that the survey or questionnaire is more reliable.

5.3 Results

Descriptive analyses

In our sample, respondents' average age was 37, 54% were female, 50% had completed higher education, and around 60% rated their wages as medium-high, compared to the Brazilian national average. Slightly more than a third of respondents reported that they live in their own homes, work as self-employed or entrepreneurs, and are the family's main source of income. Regarding pension contribution, 50% reported contributing to the Brazilian public pension system (INSS), 33% reported that they keep private investments to guarantee income in retirement, 31% contribute to a supplementary pension - optional in Brazil, and 17% report not contributing to any scheme. Table 5.1 (in the Appendix) provides summary statistics for the entire sample and each Treatment group.

Interestingly, *resilience for the future* indicates that the percentage of respondents who need to prepare for unexpected expenses or reductions in their income and those who save and can cope with falls in their income without borrowing was practically the same; 40% have less than three months' financial reserve, and 42% reported more than six months of financial resources that they could readily use. Regarding *preparedness for retirement*, many (41%) believe they will not have adequate retirement income without a state pension (INSS) or working, and more than half of the sample (57%) said they trust less than 1/3 of their retirement income to the INSS. Nevertheless, 50% of the sample reported that they currently contribute to INSS, only 33% keep private investments to guarantee retirement, and 31% reported contributing to a supplementary pension scheme.

Furthermore, we found a positive relationship between the main variables in the study. In order, *preparedness for retirement* showed a correlation of 0.30 with *FWB expectations* and 0.34 with *financial capability,* with a two-tailed p-value of 0.0048 and 0.0093; *resilience for the future* demonstrated a correlation of 0.11 with *FWB expectations* and 0.39 with *financial capability*, with a two-tailed p-value of 0.2960 and 0.0024; and, the FWB measure revealed a correlation of 0.25 with *FWB expectations* and 0.49 with *financial capability,* with a two-tailed p-value of 0.0174 and 0.0001. Finally, we calculated Cronbach's alpha of 0.7072, which suggests internal consistency. Generally, if Cronbach's alpha is greater than 0.7 we have evidence that the items in the survey measure the same characteristic.

In what follows, we first summarize the factors associated with *preparedness for retirement*, *resilience for the future,* and *FWB*. Then, we examine the impact of the two Treatments compared to the Control group, to assess how providing *financial capability and well-being* information shaped people's evaluation of their *FWB* outcomes.

Regression analyses

Table 5.3 summarizes our main findings regarding the financial outcomes of interest, *preparedness for retirement*, *resilience for the future*, and *FWB*. All the models presented in the appendix met the requirements for OLS. Overall, the evidence indicates that *preparedness for retirement*, *resilience for the future*, and *FWB* increases with wage. While formal and self-employment status were positively related to *preparedness for retirement*, keeping private investments was related to *resilience for the future*, and *FWB*. When we restricted the sample to the Control group, the variables of male gender, self-employment, not contributing to INSS, and *grit* appeared relevant in explaining *preparedness for retirement*. In addition, age, keeping private investments, and *grit* were positively related to *resilience for the future*; while formal and self-employment were negatively related. Regarding FWB, age, wage, and *grit* were significantly related.

Table 5.3 also documents whether and how the two information treatments we provided shaped respondents' reported *FWB* outcomes. In Treatment 1 (T1), respondents were asked about their *FWB expectations,* and they were significantly more likely to say they have *preparedness for retirement, resilience for the future,* and *FWB*. The respondents who received the objective information on the *financial capability* concept (T2) were significantly more likely to report *preparedness for retirement* and *FWB*. These findings highlight the potential importance of drawing people's attention to their *FWB expectations* and providing

them with objective *financial capability* information to increase their chances of achieving *FWB* outcomes. This is an important finding and consistent with literature (e.g. Hurwitz & Mitchell, 2022), alerting people could help them protect against running out of money in old age.

To further examine how our two interventions shaped the *FWB* outcomes, we explored their effects for each *FWB* outcome of interest. Regarding p*reparedness for retirement*, with the inclusion of Treatment T1, age and wage were the only two variables related. We highlight here the inverted sign of age (younger, better prepared) compared with the Control group, which was not expected and will be discussed in the next session. Interestingly, with the inclusion of the Treatment T2, only *grit* was significantly related, but also with an inverted sign compared to the Control group (grittier, less prepared). Regarding *resilience for the future*, beyond the *FWB expectations* in the T1 group, age was negatively related (younger, more resilient), and wage was positively related at 10%. In group T2, wage and keeping private investments were relevant for *resilience for the future*. Finally, with regard to *FWB*, in the T1 group, compared to the Control group, age (inverted sign) and wage were significant, beyond *FWB expectations*; and, in the T2 group, keeping private investments and less *grit* were significant, beyond the *financial capability* information.

5.4 Discussion

This study aimed to identify if *financial capability and well-being* awareness increases reported *preparedness for retirement, resilience for the future*, and *FWB*. The experiment results demonstrated that asking people about their *FWB expectations* (T1) increases reported *preparedness for retirement, resilience for the future,* and *FWB*. Additionally, the respondents provided with objective *financial capability* information (T2) were more likely to report *preparedness for retirement* and *FWB*[8]. These results are in line with Mitchell et al. (2022a) and Hurwitz and Mitchell (2022), whose work showed that merely getting people to think about a long-term financial decision can alter their subjective survival probabilities and that informing people about their objective survival probabilities alters how they view these financial decisions. Other studies find that receipt of a message improves consumers' intention to plan for retirement (e.g., Hoffmann, & Plotkina, 2020;

[8] The angular coefficient of this regression is interpreted as follows: if the standardized regressors increase by one standard deviation unit on average, the standardized regressor increases by beta standard deviation units. (...) unlike the usual MQO regression, we measure the impact of a regressor not in terms of the original units in which Y and X are measured but in standard deviation units (Gujarati, 2019).

Eberhardt et al., 2021; Fenton, et al., 2023). Nevertheless, financial information messages are more likely to improve retirement planning intentions when consumers' perceived financial security is low and when such messages are congruent with consumers' construal[9] level (Hoffmann and Plotkina, 2020). For instance, Eberhardt et al., 2021 show that a prevention-oriented assurance frame in technology-facilitated communication is twice as effective as a promotion-oriented investment frame. Therefore, message frame and message appeal seems to influence consumer prevent behavior and preparedness for retirement (Gallagher & Updegraff, 2012; Fenton, et al., 2023).

Moreover, literature indicates that information processing can lead people to arrive at an evaluation of evidence that would support their pre-existing beliefs and/or ignore or distort information compromising themselves (i.e. confirmation bias) (e.g., Peters, 2022). Therefore, future research could use our methodology by advancing the way the message is conveyed and interpreted by different individuals. It's worth remembering that our Treatments were to subtly bring in *financial capability and well-being* expectations and concept in order to be able to compare with the Control, which didn't receive this approach. We emphasize that our experiment did not promote financial education or literacy, but only aimed to draw attention to the topic. Using a randomly-assigned survey providing subjects with either *FWB expectations* and/or *financial capability* objective concept, we show that merely prompting people to think about *financial capability and well-being* changes their perceptions regarding *preparedness for retirement, resilience for the future,* and *FWB*. In the face of a rapidly aging population, our results suggest valuable avenues on saving and pension decisions, as well as behavioral household finance. Our results can also inform financial institutions, insurers, and policymakers on the importance of providing consumers a focus on *financial capability*, so as to help people make better financial decisions essential for old age. And very importantly, *financial capability and well-being* could usefully be embedded into financial education or literacy programs so as to alert consumers to the importance of *preparedness for retirement, resilience for the future,* and *FWB*.

Our analyses, including different *retirement contributions* and *grit* levels, additionally provided nuanced information on factors that influence the outcomes of *FWB*. For example,

[9] Construal level theory describes the relation between psychological distance (e.g., temporal, spatial, social) and the extent to which people's representations of events, situations, or decisions are abstract or concrete (Trope & Liberman, 2010). The general idea is that with high psychological distance people hold a more abstract (high-level construal), while with low psychological distance people hold a concrete (low-level) mind-set.

when comparing the regression models, keeping private investments was related to greater *resilience for the future* and *FWB*. When we restricted the sample to the Control group, *grit* appeared relevant in explaining *preparedness for retirement* and *FWB*. In the Treatment group T2, not contributing to the INSS was relevant for *preparedness for retirement.* This finding can be interpreted to indicate that if people know they can not rely on the INSS, they must prepare financially themselves. Future research could further analyze if relying on something other than the INSS can contribute to a more responsive attitude toward saving for retirement and how *grit* can mediate that. We also want to highlight the key findings of self-employment, not contributing to INSS, and *grit* relevance in explaining *preparedness for retirement*. These findings agree with Gustman and Steinmeier (1999), who found that real estate and business wealth are a larger share of total wealth for those without pensions, reflecting the importance of self-employment in wealth accumulation.

Furthermore, age was significantly related to *preparedness for retirement*, *resilience for the future*, and *FWB*, but with inconsistent signs (younger, better prepared, more resilient). Previous research (da Silva and Silva, 2023; Wang and Bartholomae, 2020) revealed that adults closest to retirement (ages 55 to 64) are more likely to be planning than the other groups, as are adults who were financially confident, risk takers, highly educated, males (both authors), and white (Wang and Bartholomae, 2020). In Study 1 of this thesis, we highlighted the so-called maturity principle (Duckworth, 2016) as a possible explanation for the strong positive association between *grit* and better financial *behavior* for the old group. In the present study, we highlight the inverted sign of the *grit* variable (more *grit,* more *preparedness,* and *FWB* in the control group; less *grit,* more *preparedness,* and *FWB* in Treatment group T2). Thus, these issues remain open for further investigation. From the other socioeconomic variables included in this study, we would like to emphasize the relationship between the male gender and *preparedness for retirement*, as well as higher wages and *preparedness for retirement*, *resilience for the future*, and *FW*B.

Finally, we highlight that many participants disagreed about their expectations of having enough income after retirement without the public pension system (INSS) or working. Only a third reported keeping private investments and contributing to a supplementary pension scheme to guarantee retirement. In addition, the majority of the respondents reported that they entrust less than a third of their income to the INSS as a source of future retirement income. Nevertheless, 50% reported their main *retirement contribution* to the INSS today. Researchers, policymakers, and people interested in boosting savings and insurance coverage

can learn from our evidence since we show the risk of running out of money at retirement.

5.5 Limitations

In order to collect data randomly, we printed and shuffled the three types of questionnaires (Control, T1, and T2), leaving all of them available at the entrance to a gym in the southwest region of Brasilia. This choice considered the large flow of people, and the diversity of respondents in terms of age, profession, educational level, etc. However, this study was based on a convenience and small sample of 88 individuals. This caveat about sample size is intended to alert the reader to statistical fluctuations for small samples (Gelman, Hill & Vehtari, 2020). On the other hand, a smaller sample allows for detailed analysis. In the present study's analysis, we used standardized data to work with the same units of measurement, and we used stepwise methods to decide which variables were relevant.

Furthermore, previous research has shown the necessity of a better understanding of how to measure the level of consumers' financial literacy and abilities to understand and use financial resources related information (e.g., Lusardi and Mitchelli, 2007) and also pointed out that personal characteristics, such as self-control, display a stronger association between intentions and actual behavior (Hoffmann and Plotkina, 2020). In Study 1 of the thesis, we measured the *financial knowledge* of our respondents, and in Study 2, we studied *self-control,* among other personal characteristics in more detail, but we do not cover it in this article. Future research could relate financial literacy (knowledge) and personal characteristics (e.g., self-control and grit) to understanding and using financial information.

5.6 Conclusions

This study aimed to identify if *financial capability and well-being* awareness increases reported *preparedness for retirement*, *resilience for the future,* and *FWB*. In an experiment, we found evidence that respondents alerted to *financial capability and well-being* objective information could notice the potential consequences of their financial decisions. Respondents who were asked about their *FWB expectations* (T1) were significantly more likely than the Control group to say they have *preparedness for retirement, resilience for the future,* and *FWB*. The respondents who received the objective information on the *financial capability* concept (T2) were significantly more likely to report *preparedness for retirement* and *FWB*. These findings highlight the importance of drawing people's attention to their *FWB*

expectations and providing them with objective *financial capability* information. Making these concepts more salient potential drew their attention to their financial decisions and consequently shaped their reported *preparedness for retirement*, *resilience for the future,* and *FWB*. We suggest that information on financial capability and well-being can be a powerful method of warning people to protect themselves against lack of money in old age. Another finding was that the majority of the respondents reported that they entrust less than a third of their income to the INSS as a source of future retirement income. Nevertheless, 50% reported their main *retirement contribution* to the INSS today. Overall, the evidence also indicates that *preparedness for retirement*, *resilience for the future*, and *FWB* increases with wage. And, while formal and self-employment status were positively related to *preparedness for retirement*, keeping private investments was related to *resilience for the future*, and *FWB*.

Tables

Table 5.1 . Descriptive Statistics of FWB variables

	Full sample		**T1**		**T2**		**Control**	
Variable	Mean	Std. Err.	Mean	Std. Err.	Mean	Std. Err.	Mean	Std. Err.
Preparedness for retirement (*)	5.81	2.59	6.10	2.21	6.32	2.67	5.07	2.74
Resilience for the future (*)	8.40	3.19	8.17	3.40	8.11	2.95	8.87	3.25
FWB (*)	11.20	4.47	11.28	4.54	11.43	4.01	10.94	4.91
N			29		28		31	
% Female	54.55%		44.83%		50%		67.74%	
% Auton	42.05%		37.93%		53.57%		35.48%	
$ Private Invest	32.95%		31.03%		28.57%		38.71%	
Age	36.761	9.31	35.83	9.00	37	10.79	37.42	8.33
Income								
Below average	5.68%		3.45%		10.71%		3.23%	
On average	13.64%		17.24%		10.71%		12.90%	
Above average	45.45%		44.83%		42.86%		48.39%	
Way above average	35.23%		34.48%		35.71%		35.48%	
Education								
Until Incomplete College	11.36%		24.14%		10.71%			
Complete College Education	38.64%		24.14%		50.00%		41.94%	

College +	50.00%	51.72%	39.29%	58.06%

(*) Before the standardization. Source: Prepared by the authors.

Note: T1 is the Treatment group 1 and T2 is Treatment group 2. Control is the Control group. Std Err is a standardized error. N is the sample size.

Table 5.2. Current Retirement Contributions

Description	N	%
Any regime	15	17.05%
General social security (INSS)	44	50%
Social security for public servants	9	10.23%
Complementary plan	27	30.68%
Private investments	29	32.95%

Source: Prepared by the authors.

Table 5.3. Regression Models

Dependent	Preparedness (*)						Resilience (*)						FwB (*)					
	Control		T 1		T 2		Control		T 1		T2		Control		T 1		T2	
const	-3.67	***	-0.74		2.45	*	-2.97	**	-2.57		-1.64	***	-5.82	***	-1.39	**	1.41	**
T1 (*)			0.37	*					0.24	***					0.98	***		
T2 (*)					0.42	**											0.41	***
Female	-0.78	**																
Age			-0.03	***			0.05	***	-0.02	*			0.02	*	-0.03	***		
Auton	0.72	**					-0.66	**										
Formal	0.75	**					-0.80	*										
School																		
Wage	0.45	***	0.46	***					0.31	*	0.34	**	0.80	***	0.49	***		
INSS	-0.78	***																
Private							0.76	**			0.71	**					0.85	***
Grit	0.60	***			-0.63	*	0.37	*					0.45	*			-0.45	**
R2 ajust	0.63		0.38		0.22		0.38		0.512		0.28		0.57		0.67		0.38	
Fc	9.41	***	14.16	***	4.25	**	8.15	***	17.64	***	6.98	***	19.05	***	30.44	***	14.02	***

(*) Standard variables. Source: Prepared by the authors.

Note: Stepwise methods were used. $p < 0.01$, $p < 0.05$, and $p < 0.1$.

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Appendix D - Experiment

Dear participant, you are being invited to participate in a survey for the final work of a doctoral thesis developed in the Graduate Program in Accounting at the University of Brasilia (PPGCont- UnB). The approximate response time is 10 minutes. The data from this research are confidential and will be analyzed jointly, without it being possible to identify any of the participants. In case of doubts or suggestions, please contact me. I thank you in advance for your participation.

Eduarda Augusta
PPGCont/UnB

Do you agree to participate in this survey?

( ) Yes
( ) No

Part I
Socioeconomic and demographics data.

1.Gender:
( ) Female.
( ) Male.
( ) I prefer not to say.

2. Age (only numbers):_____

3. How would you describe your current professional status?
( ) Retired.
( ) Unemployed and looking for work.
( ) Student.
( ) No work due to long-term illness, disability or other reason.
( ) Partially Retired.
( ) Public Servant.
( ) Working as a freelancer or entrepreneur.
( ) Work with a signed contract in the private sector or the third sector.

4. Your education:
( ) Incomplete High School.
( ) Complete High School.
( ) Incomplete College Education.
( ) Complete College Education.
( ) College + (post-graduation, master degree, doctoral degree).

5. According to the latest Pnad Contínua (Continuous National Household Sample Survey), the average income of Brazilian workers was R$ 2,489. Considering this figure, would you say that your salary, compared to the average Brazilian, is:
( ) Far below average.
( ) Below average.
( ) On average.
( ) Above average.
( ) Way above average.

6. About your family type:

Couple with children or dependents. ( )Yes ( ) No
Living alone or living with friends. ( )Yes ( ) No
Lives with parents or other relatives. ( )Yes ( ) No
You are the main source of your family income. ( )Yes ( ) No
You live in your own residence. ( )Yes ( ) No
Did your parents talk about managing money or saving when you were a child? ( )Yes ( ) No

7. About your retirement contribution. If necessary, choose more than one option:
( ) I don't contribute to any scheme.
( ) I contribute to the general social security system (INSS).
( ) I contribute to the public servant's pension plan (private system).
( ) I contribute to a supplementary pension plan.
( ) I keep private investments to secure my old age.

Part II
Read each sentence and mark what seems most appropriate to you. Don't reflect too much on the sentences. Instead, compare yourself with "people in general" - not just co-workers, friends, or relatives.

1.What is your percent financial ability to comfortably meet current commitments and needs?
( ) 0% a 30%
( ) 30% a 60%
( ) 60% a 90%
( ) 100%
( ) Don’t Know

2. What is the percent chance that you will have financial resilience to maintain this in the future?
( ) 0% a 30%
( ) 30% a 60%
( ) 60% a 90%
( ) 100%
( ) Don’t Know

3. What is your percent financial ability to have control over day-to-day/month-to-month finances, absorb a financial shock, be on track to meet your financial goals, and financial freedom to make the choices that allow you to enjoy life?
( ) 0% a 30%
( ) 30% a 60%
( ) 60% a 90%
( ) 100%
( ) Don’t Know

[*FWB expectations: exclusive for Treatment Groups 1 (T1) and 2 (T2)*]

Part III
According to international research, “Financial Capability” is the ability to manage money well. In practice, financial capability is a complex set of behaviors, knowledge and attitudes, as wide-ranging as budgeting, understanding financial products, having a long-term perspective, regular saving, doing research, and confidence in one’s ability to make good financial decisions. A person may be very good at all of these components, but may also be good at some of them and below average on others.

Would you say your financial capability is:
( ) good

( ) on average
( ) below average

[*Financial Capability information: exclusive for Treatment Group 2 (T2)*]

Part IV
To what extent do the following statements describe your likely situation about retirement.

1. Which of the following things do you personally [plan to do/are doing/have done] in the [next five years/at present/in the past] to ensure that you [will] have enough income for your needs after retirement?
( ) Payment of a pension in your own name (employer pension, private pension, public pension).
( ) Paying for other investments that [will] provide an income in retirement.
( ) Buy a property that [will] provide a rental income in retirement.
( ) Establish a business that [will] provide an income in retirement.
( ) Other investments that you [will] sell to give you an income in retirement.
( ) Buy a property that you [will] sell to give you an income in retirement.
( ) Establish a business that you [will] sell to give you an income in retirement.
( ) None of these.
( ) I don't know.

2. Even without the INSS or working I (will) have sufficient income after retirement age.
( ) Fits very well.
( ) Fits fairly well.
( ) Fits neither well nor badly.
( ) Does not fit well.
( ) Does not fit at all.

3. Degree of reliance on INSS for retirement income:
( ) total.
( ) at least ⅔.
( ) at least ⅓.
( ) less than ⅓.
( ) I will not be eligible for INSS at all.

Part V
Now some questions about unforeseen expenses or drop in income.

1. How much of an unexpected expense equivalent to one month's income could you cover with money you have readily available?
( ) nothing.
( ) something.
( ) all.

2. What is your financial reserve volume in terms of the number of months of income? (short term financial resources that you can readily count on):
( ) 0-1 month.
( ) between 1-3 months.
( ) between 3-6 months.
( ) between 6-12 months.
( ) more than 12 months.

3. How long could you cover a one-third drop in your income without having to borrow?

( ) 0-1 month.
( ) between 1-3 months.
( ) between 3-6 months.
( ) between 6-12 months.
( ) more than 12 months.

Part VI

Then answer according to what most applies to your life today. Don't overthink the statements. Compare yourself with "people in general" - not just with co-workers, friends or relatives.

	Nothing to do with me	Not much to do with me	A little about me	Very much like me	Totally about me
1. New ideas and new projects sometimes distract me from previous ones.					
2. Obstacles do not discourage me. I don't give up easily.					
3. I often set one goal, but then I prefer to pursue another.					
4. I am a hard worker.					
5. I have trouble staying focused on projects that require more than a few months to complete.					
6. I finish everything I start.					
7. My interests change from year to year.					
8. I am dedicated. I never give up.					
9. I have been obsessed for some time with a certain idea or project, but then lost interest.					
10. I have overcome obstacles to achieve an important goal.					

Chapter 6: Concluding remarks

Aging is already cast in a negative light in regard to both physical and cognitive decline and the potential loss of independence. I highlighted that successful aging is attainable, depending on certain circumstances. The three studies covered different topics about The Cost-Benefit of Aging from the Perspective of Financial Well-Being (FWB). I aimed to analyze "key" factors influencing the *FWB* outcomes: *preparedness for retirement* and *resilience for the future*. To meet this main objective, I conducted three studies with the following purposes: (1) evaluating how well different age groups are financially prepared for retirement in Brazil; (2) analyzing how the issue of time relates to measures of financial well-being; (3) identifying if *financial capability and well-being* awareness increases *preparedness for retirement*, *resilience for the future*, and *FWB*. The following are the conclusions of the three empirical studies taken together.

6.1 Conclusions

Empirical results from Study 1 showed that *preparedness for retirement* was strongly related to older age. However, age was correlated with *resilience for the future* close to zero, which indicates no relationship. Additionally, being female was highly associated with better financial *behavior*, while being male was significantly associated with *resilience for the future*, especially when controlling for age groups. *Knowledge* and the *psychological factors* of self-control and confidence were positively and strongly related to better *financial behavior* for all age groups analyzed. Furthermore, I highlight the so-called maturity principle as a possible explanation for the strong positive association between *grit* and *resilience for the future*, with better financial *behavior* for the older age group. I also attribute the attitude toward *retirement contribution*, seemingly not considered as necessary to the older group compared with their young and mature counterparts, to different *future time perspectives*, analyzed in more detail in Study 2.

In Study 2, I analyzed the relationship between *self-control*, *future time perspective*, *procrastination*, *grit*, and *psychological resilience* (*personal time proxies*) on the one hand, with *FWB* measures on the other hand, besides *socioeconomic* data. *Self-control* was negatively and strongly related to *current money management stress*, while *future time perspective* and male gender were related to *expected future financial security*. When adding

grit and *psychological resilience* to the regression models, male gender remains the only variable significantly related to *expected future financial security. Grit* was positively related to *preparedness for retirement*, while *future time perspective*, income, education level, and self-employed professional status to *resilience for the future*. Furthermore, the *grit* measure proved better than the *psychological resilience* in our additional PCA analysis. Unlike Connor and Davidson (2003), our sample did not allow us to simplify a single measure of *psychological resilience*. However, our PCA analysis strengthened to the Duckworth et al. (2007) scale, as we also found two components representing important data (one more focused on passion and the other on perseverance). Another result that was not expected revealed that besides the *personal time proxies,* male gender was the only *socioeconomic* variable significantly related to *perceived* FWB.

In Study 3, making *financial capability and well-being* concepts more salient drew people's attention to shaping their reported *preparedness for retirement*, *resilience for the future*, and *FWB*. This is an important finding, implying that simply drawing people's attention to their *FWB expectations* and providing them with objective *financial capability* information can be a potent method of alerting people to protect against running out of money in old age. Another finding was that the majority of the respondents reported they entrust less than a third of their income to the Brazilian public pension (INSS) as a source of future retirement income. Nevertheless, 50% reported their main *retirement contribution* to INSS today (probably because it is compulsory). These results are similar with those in the Study 1, which also illustrated low levels of private retirement savings across the sample, even with low reliance on state pensions. A clear finding in Study 1 was that the attitude toward financially securing one's old age should be considered to promote *preparedness for retirement*, *resilience for the future* and *FWB* (da Silva & Silva, 2023). This remains in Study 3, as keeping private investments was related to *resilience for the future*, and *FWB*.

It is also worth comparing *preparedness for retirement* and *resilience for the future* across the three studies. In Studies 1 and 2, a large part of both samples reported less than a month's income savings and would only last three months without borrowing if their income decreased by one-third. In study 3, interestingly, *resilience for the future* indicates that the percentage of respondents who need to prepare for unexpected expenses or reductions in their income and those who save and can cope with falls in their income without borrowing was practically the same: 40% have less than three months' financial reserve, and 42% reported more than six months of financial resources that they could readily rely. Regarding

preparedness for retirement, in Study 3, many (41%) believe they will not have adequate retirement income without a state pension or working, but only a third keep private investments to guarantee retirement and report contributing to a supplementary pension scheme. In Study 2, a low average age sample, the most frequent answer was not to believe they will have adequate retirement income without working, and also that the INSS will make up less than 1/3 of their retirement income. Nonetheless, the results also illustrated that 56% of the sample intend to keep private investments to guarantee their future retirement income, among other retirement savings options. In turn, in Study 1, a sample with a higher average age, the results illustrate low levels of private retirement savings for the sample as a whole.

In sum, the aging population and the lack of systematic financial planning for retirement make the study of the drivers of *FWB* for old age quite timely and relevant. As a limitation of the research, the construct of psychological resilience does not have a single meaning and is difficult to measure. In this case, I used the grit scale to be able to measure it and also to bring out the importance of the long term. As research contributions, from evidence, I emphasize that looking at different age groups seems to be a key factor for *financial behaviors* and *FWB*. In addition to the issue of age, I present evidence about "forward-looking" *psychological factors* that may favor long-term decisions and *FWB* measures. Additionally, a key finding was the importance of drawing people's attention to their potential *financial capability and well-being* in order to increase reported *preparedness for retirement*, *resilience for the future* and the *FWB*. Researchers, policymakers, and people interested in increasing savings and safe coverage can learn from evidence about the risk of running out of money at retirement and tools to strengthen financial resilience for old age.

6.2 Limitations and Future Studies

As an innovation to the Financial Capability and Well-being Model, in this thesis I establish *financial behavior* (of different age groups) as an exploratory variable in a first moment of analysis. In addition, I propose the forward looking *psychological factors* of *grit*, *resilience for the future*, and the attitude of *retirement contribution* as variables relevant in explaining better *financial behavior* of the different age groups. However, future research may further expand analyses by age groups, because, unexpectedly, age was negatively associated with better *financial behavior,* and the association between age and *behavior* did not remain when controlling for the different age groups. Thus, I highlight the importance of focusing on the association between life course and financial *behavior* in other contexts.

A longitudinal study to track whether or not and how financial *behavior* and forward looking *psychological factors* change over the lifetime of an individual would be interesting in future *FWB* research. Also, a better financial *behavior* was not an explanatory variable for *preparedness for retirement*; the variables of *retirement contribution* were seemingly not viewed as important to the older group compared with their young and mature counterparts; and g*rit* and *resilience for the future* were positively related to better *financial behavior* only in the older age group. I attributed these results to different "*future time perspectives*" suggesting that future work should account for more *subjective* and often unobserved factors. The self-administered instruments used in this thesis may be reapplied for this purpose.

The *personal time* frame I adopted was intended to catch some "internal clock speed" and explore further key *psychological factors* relevant to time processing of long term thinking. For instance, literature suggests that a potential essential component of discounting is *time perception* and that *procrastination* determines saving decisions over the lifecycle. A novelty of this thesis was to address the relationship between individual differences in "forward-looking" *psychological factors* and the ability to make decisions that will be favorable in the long term to achieve *FWB*. Nevertheless, I found no relationship between *procrastination* and the other predicted variables in the first analysis. My measure of *procrastination* is a limitation itself, as I had to make some critical decisions to measure it in this research. Future *FWB* research could seek a better understanding of which *procrastination* mechanisms (self-control, short-sightedness, or complex intertemporal decisions of saving for retirement) are the most damaging to long-term decisions.

Finally, based on a convenience and small sample of 88 individuals, I found that drawing people's attention to their *FWB expectations* and objectively informing them about the *financial capability* concept increases reported *preparedness for retirement*, *resilience for the future,* and *FWB*. These are important findings that should be further explored with larger samples, as well as in different contexts and across countries. Besides, future research could search for a better understanding of how to measure the level of consumers' financial literacy and their understanding and capacity to use financial resources related information.

Below are the main results of the hypotheses investigated in this thesis. My expectation is that these various novel propositions will lead to further research in the field of financial well-being. Furthermore, as a future research agenda, I hope that the scientific data collected here and the findings of future financial well-being research will help to support national financial capability strategy services.

Table 6. Research hypothesis conclusions

Hypothesis	Dependent	Independent	Expected Relation	Result	Add results
H1	*Behavior*	Socioeconomic	Positive	Female gender, Income supported	Age inconsistent
		Knowledge	Positive	Supported	Supported (all age groups)
		PsychologicalFactors	Positive	Supported	Selfcontrol and confidence (all age groups)
		Retirement Contribution	Positive	Not found	Supported Young and Mature groups
		Grit, Resilience	Positive	Not found	Supported Older age group
H2a	*Preparedness*	Socioeconomic	Positive	Age, Income supported	Supported Male gender
		Behavior	Positive	Not found	Supported Young age
		Retirement Contribution	Positive	Supported	Supported Young and Mature groups
H2b	*Resilience*	Socioeconomic	Positive	Age not found, Income, Male supported	Female Young age group
		Behavior	Positive	Supported	Supported Young and Older groups
		Retirement Contribution	Positive	Supported	Supported Young and Mature groups
H2c	*FWB*	Socioeconomic	Positive	Age, Income, Male supported	Not being a single parent (Young, Mature)
		Behavior	Positive	Supported	Supported Young and Older groups
		Retirement Contribution	Positive	Supported	Supported Young and Mature groups

Hypothesis	Dependent	Independent	Expected relation	Result	Add results
H3a	*Current Money Management Stress*	Self-Control	Negative	Supported	Supported
		Future Time Perspective	Negative	Not found	Not found
		Procastination	Positive	Not found	Not supported MaxProc
		Socioeconomic	Positive	Not found	Age
		Grit, PsyResilience	Negative	Not found	Not found
H3b	*Expected Future Financial Security*	Self-Control	Positive	Inconsistent	Inconsistent
		Future Time Perspective	Positive	Supported	Supported
		Procastination	Negative	Not found	Supported PCA Procrastination
		Socioeconomic	Positive	Male gender	Age
		Grit, PsyResilience	Positive	Not found	Supported
H3c	*Preparedness*	Self-Control	Positive	Not found	Not supported PCA
		Future Time Perspective	Positive	Inconsistent	Not supported PCA, Not found MaxProc
		Procastination	Negative	Not found	Not found
		Socioeconomic	Positive	Education,Income	Not supported Education
		Grit, PsyResilience	Positive	Grit supported	Supported PCAGrit, Inconsistent PsyRes
H3d	*Resilience*	Self-Control	Positive	Not found	Supported MaxProc, Not found PCA
		Future Time Perspective	Positive	Supported	Supported MaxProc and PCA
		Procastination	Negative	Not found	Not found
		Socioeconomic	Positive	Education, Income,Self-employ	ProfStatus,MaleGender
		Grit, PsyResilience	Positive	Not found	Supported PsyResilience

H3e	*Perceived FWB*	Self-Control	Positive	Supported	Not supported MaxProc, Supported PCA
		Future Time Perspective	Positive	Not found	Supported MaxProc and PCA
		Procastination	Negative	Not found	MaxProcast supported
		Socioeconomic	Positive	Male gender	Male gender
		Grit,PsyResilience	Positive	PsyResilience	Supported Grit MaxProc,NotSupportedPCAPsyRes

Hypothesis	**Dependent**	**Independent**	**ExpectedRelation**	**Result**	**Experiment results**
H4a	*Preparedness*	Socioeconomic	Positive	Wage,ProfStatus	Control(Male),T1(AgeInconsistent)
		Treatment1	Positive	-	Supported
		Treatment2	Positive	-	Supported
		Retirement Contribution	Positive	NotContINSS	NotContINSS (Control)
		Grit	Positive	Not found	Inconsistent
H4b	*Resilience*	Socioeconomic	Positive	Wage, Self-employment	Control, T1(Age inconsistent)
		Treatment1	Positive	-	Supported
		Treatment2	Positive	-	Not Supported
		Retirement Contribution	Positive	PrivInvest	Control and T2(PrivInvest)
		Grit	Positive	Not found	Supported
H4c	*FWB*	Socioeconomic	Positive	Wage	Age inconsistent
		Treatment1	Positive	-	Supported
		Treatment2	Positive	-	Supported
		Retirement Contribution	Positive	INSS and PrivInvest	T2(PrivInvest)
		Grit	Positive	Not found	Inconsistent

Source: Prepared by the author.

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