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**I'm willing to save for my retirement but I don't want to get "old"**  
**Analysis of the effects of ageism stereotypes and age anxiety**

**12<sup>th</sup> International Research Meeting in Business & Management – Nice, 6-7 July, 2023**

## **I'm willing to save for my retirement but I don't want to get "old"**

### **Analysis of the effects of ageism stereotypes and age anxiety**

**Abstract:** Unlike other forms of discrimination, there is little scientific research on ageism. Its scope is limited to health and the workplace, and results show that negative stereotypes most often result in decreased performance. The purpose of this research is to understand the effects of negative age stereotypes and age anxiety on the willingness to save for retirement in an increasingly aging society. A quantitative study was administered online on a sample based on an access panel (Crowdpanel). A structural equation modeling approach was conducted using the LAVAAN R package. It was completed by the analysis of mediations with the Process package. The results show that negative age stereotypes increase aging anxiety and risk tolerance, which reduces willingness to save for retirement. Negative age stereotypes and age anxiety have no indirect effect. In contrast, age anxiety increases risk aversion, which increases willingness to save. The study provides recommendations for bank managers, government, and associations for the elderly, to implement appropriate marketing actions to combat ageism and encourage saving for retirement.

**Keywords:** Savings behavior, retirement savings, risk tolerance, risk aversion, negative age stereotypes, aging anxiety.

## **Introduction**

There are many stereotypes about aging, often negative and discriminatory. For example, older people are described as dependent and sick (stereotypes associated with an image of the elderly person in a wheelchair or in a retirement home), are inactive (they spend their time doing nothing), and are disconnected from reality because of their digital incompetence (Boudjemad & Gana, 2009; Levy et al., 2004). Yet, many older people are healthy and independent, continue to work, engage in volunteer or associative activities, and use new technologies. This form of discrimination is often mistakenly considered normal and acceptable, a paradox in an aging society ((D'hondt & Degryse, 2023).

Saving for retirement is a crucial issue in an aging population. Indeed, with the aging of the population, retirement-related expenses are increasing. Thus, mandatory pension schemes (such as the general social security scheme) are no longer sufficient to ensure a decent standard of living for retirees. Therefore, for instance in France PERs (Plans d'Epargne Retraite) have been created to allow individuals to supplement their retirement with private savings. Saving for retirement seems to be an obvious decision. However, in many countries, the savings rate appears insufficient to ensure a comfortable standard of living for future retirees (Montford & Goldsmith, 2016). In France, the rate of participation in savings plans dedicated to retirement is relatively low, especially among the self-employed and the liberal professions. Yet these professions are required to work longer than employees and must save a significant portion of their income. This will impact their economic and financial situation, but also their health and well-being (Bastos & Brucks, 2017; Brügggen et al., 2017). A growing body of literature is focusing on the mechanisms that are likely to explain this unsettling situation.

The purpose of this research is to understand how negative stereotypes associated with ageism influence retirement saving behaviors. Previous work on ageism, and specifically on negative age stereotypes, is sparse. Their scopes are limited to health and the workplace (Bae & Choi, 2022; Lagacé et al., 2022; Lau, 2023) and results show that negative stereotypes most often lead to unhappiness and decreased performance for those being concerned by such stereotypes. Here we focus on individual factors.

To our knowledge, this research is the first to analyze the effects of negative stereotypes on the willingness to save for retirement. Beyond the factors initially identified by the life-cycle theory

(LCH): income and age, the literature on the determinants of saving for retirement has four main approaches. (i) The cognitive approach, which focuses on perceived risk, relies on Kahneman and Tversky's (1979) prospect theory to show that risk aversion (tolerance) is positively (negatively) associated with the willingness to save for retirement (ii) The social approach focuses on the study of social influences and the identity of the aged self, i.e., the inclusion of the present self to the future self, known as continuity of self, a concept strongly popularized by Hershfield (2011), without considering the role of negative stereotypes of ageism. (iii) The emotional approach focuses on anxiety and fear and shows that concerns about aging drive positive savings outcomes (Berriche et al., 2017). (iiii) The intertemporal choice-centered approach. In this theoretical framework, saving intentions and behaviors are influenced by self-control, the ability to postpone rewards, planning ability, and temporal orientation (Carvalho et al., 2016; Croy et al., 2010). It can be linked to research focused on financial literacy and skills (Rooij et al., 2011). This theoretical framework will not be retained in this scientific work.

Here we develop the idea that negative stereotypes associated with ageism may be an individual antecedent of retirement savings intentions, with paradoxical effects. Since these stereotypes are deeply rooted in each of us, mitigating or reversing them may be complex in the short run. Can ageism influence retirement savings intentions? Therefore, the research question is: To what extent do negative stereotypes associated with ageism, and anxiety about aging affect perceived risk and willingness to save for retirement?

To answer this question, a quantitative study was conducted on a sample based on an access panel (Crowdpanel). A structural equation modeling approach was performed with the LAVAAN package of R. On the theoretical level, this research contributes on the one hand to the literature on the determinants of saving for retirement by studying the negative stereotypes associated with ageism, and on the other hand, to the cognitive models of behavior that consider the evaluation of overall perceived risk without distinguishing between its two forms of risk tolerance and aversion. From a managerial point of view, this research proposes a decision-making aid to bank and insurance companies' managers, the government, and associations for the elderly on the implementation of a communication strategy to fight against negative stereotypes of ageing and ageism, to promote the inclusion and equality of the elderly. We also advocate for vigilance in the use of a prevention communication strategy about saving for retirement based on mental imagery of the future-aged self and anxiety about aging. We also

highlight the dual nature of the relationship to the risk associated with savings behaviors (aversion and tolerance).

The first part of our work develops a synthesis of the literature review on the determinants of savings for retirement. In the second part, we present the methodology adopted by explaining the construction and administration of our questionnaire and the structural equation modeling associated with the mediation analysis based on the Process method. In the third part, we present our results. The fourth part will focus on theoretical and managerial recommendations as well as limitations and future research directions.

### **Determinants of saving for retirement**

The literature identifies several approaches to explain the individual's willingness to save for retirement: the cognitive approach (perceived risk and coping strategies), the social approach (stereotypes, identity, and social representations), the emotional approach (anxiety about aging), and the temporal approach (temporal distance and immediate or deferred gratification). The temporal approach will not be developed in this research, which considers the direct and indirect effects of perceived risks, stereotypes, and anxiety about aging.

#### ***1. The cognitive approach: The role of perceived risk and coping strategies***

The study of perceived risk is of primary importance in understanding what constrains or motivates individuals to adopt behaviors (Menon et al., 2008). The literature on saving for retirement most often distinguishes between risk tolerance (risk-seeking) and risk aversion (Eberhardt et al., 2022; Harahap et al., 2022; Nguyen et al., 2022). Risk tolerance is defined as "the maximum amount of uncertainty an individual is willing to accept when making a financial decision" (Grable, 2000). Risk aversion measures the preference for savings products with lower returns with known risks over choosing savings products that offer higher returns associated with unknown risks (The Economic Times). The authors rely on the prospect theory of Kahneman and Tversky (1979). This theory explains that when a person considers the gains resulting from his decisions, he develops risk aversion, whereas when he focuses on the losses, he has a risk tolerance. The distinction between these two forms of risk has helped to explain why individuals with a high level of financial literacy have a low motivation to save for

retirement. This is because when individuals lack adequate knowledge - for example, have low financial literacy - or cannot assess the predictable outcome of a particular financial decision, they are inclined to evaluate their choice from the perspective of maintaining earnings and profits. As a result, they exhibit a bias towards the status quo and become more risk-averse. On the other hand, risk-averse individuals tend to think it is risky not to save for retirement. This result confirms the negative relationship between financial literacy and willingness to save for retirement, i.e. the less (respectively more) financially literate the individual is, the more (less) risk averse (tolerant) they will be and therefore the more (less) likely they will be to save for retirement.

Following on from this work, Eberhardt et al (2022) developed a new Retirement Engagement Model (REM) based on the cognitive model of health work, specifically Rosenstock's (1974) Health Belief Model (HBM). According to the authors, the model makes it possible to move away from a utilitarian approach to retirement and saving for retirement by integrating not only cognitive but also emotional, hedonic, and behavioral factors. The theory of reasoned action and the theory of planned behavior (Ajzen, 1985, 2002; Fishbein, 1979), and the Health Belief Model (Glanz & Rimer, 1997; Janz & Becker, 1984) constitute the theoretical foundations of the REM. For volitional behaviors, the Theory of Planned Behavior (TPB) explains behavioral intentions through attitudes, social norms, and perceived behavioral control, or self-efficacy. HBM is frequently used in health behavior research. Its purpose is to explain health engagement behaviors. It explains health behaviors through the influence of several cognitive beliefs, including attitudes and social norms. The authors explain the choice of adapting the HBM to savings for retirement (REM model) by the similarities in the long-term decision contexts between health prevention behaviors and those relating to retirement planning and its financing through savings. In particular, Eberhardt et al (2022) mention several elements. The long-term nature of these decisions, and the immediate costs associated with distant benefits (Gubler & Pierce, 2014). Both families of behaviors present similar barriers: they are time-consuming, costly, and burdensome. Both domains elicit feelings of not knowing where to start (Lusardi et al., 2009). Finally, emotions, such as anxiety, play a significant role in both domains. These different factors can dampen people's intentions to save for retirement, making savings for retirement insufficient. Eberhardt et al. (2022) show that cognitive beliefs such as perceived vulnerability (the belief of not saving enough for retirement), severity (the severity of not having enough information about saving for retirement), perceived benefits (limiting or containing one's money problems at retirement age), costs (the cognitive and financial effort of

accessing financial advice) and self-efficacy (ability to understand information and make the right decisions), as well as confidence and anxiety about retirement, are the main determinants of commitment to saving for retirement.

While the savings literature tends to view risk attitudes as moderators of the antecedents of savings intentions and behaviors, their influence may be more direct. Therefore, as a complement to the work of Eberhardt et al (2022), this research mobilizes Rogers' (1975) theory of protection motivation to understand the effect of coping strategies on saving for retirement. Lazarus and Folkman (1984) define coping as "the set of cognitive and behavioral efforts designed to control, reduce, or tolerate internal or external demands that threaten or exceed an individual's resources. The authors distinguish two types of coping strategies in the face of risk: (a) A first strategy consists of making efforts focused on the problem. These efforts are made when the situation is perceived as controllable. (b) A second strategy is based on efforts focused on the emotions felt. This strategy is implemented when difficulties are perceived concerning the alteration of the situation (uncontrollable situation). Problem-focused efforts correspond to an overestimation of the risk of running out of money in retirement and the need to preserve the status quo, i.e. the same standard of living. In this case, according to prospect theory (Kahnemann & Tversky, 1979), risk aversion arises, which leads to a greater willingness to save for retirement. Conversely, emotion-focused efforts correspond to an overvaluation of the fear of making bad financial choices. This leads to a higher risk tolerance and a lower willingness to save for retirement. In addition, independently of framing, risk aversion negatively impacts risk tolerance. Therefore, the first research hypothesis is formulated as follows:

H1 : (a) Risk aversion (risk of running out of money in retirement) increases willingness to save, while (b) risk tolerance (risk of making bad choices) reduces willingness to save. (c) risk aversion limits risk tolerance.

## ***2. The social approach: stereotypes, identity, and social representations***

Ageism refers to stereotypes, prejudices, and discrimination based on age and can be implicit or explicit (Plan et al., 2022). These authors distinguish three levels of ageism manifestation. (i) Institutional ageism refers to laws, rules, social norms, policies, and practices of institutions; in the health sector, for example, age may be a criterion for determining access to care. (ii) Interpersonal ageism, which occurs between two or more people. For example, when one automatically speaks louder and with a simplified mode of expression to an older person,

assuming that he or she would necessarily be deaf (also known as "baby talk" or "elder speak").  
(iii) Self-aggrandizement, when ageism is internalized and directed against oneself.

This research focuses on interpersonal ageism and more specifically ageism towards older adults defined as: "stereotyping, prejudice, and/or discrimination - negative or positive towards older people based on their chronological age or on the perception that they are old" (Iversen et al., 2009). This form of discrimination is often mistakenly considered normal and permissible, a paradox in an aging society (Lagacé, 2008; D'hondt & Degryse, 2023). McGuire (2022) studies interpersonal ageism in young children. She emphasizes the importance of combating ageism and promoting the right concepts about aging to young children. The author explains that people who have non-ageist interpersonal attitudes live longer, healthier, and more fulfilling lives than others. The effect of negative ageist stereotypes has not yet been studied on a person's motivation to save for retirement. It has been exclusively studied in health behaviors and workplace psychology (Bae & Choi, 2022; Lagacé et al., 2022; Lau, 2023). In health, research shows that perceived negative stereotypes can negatively impact the psychological well-being of older adults, which can lead to lowered self-esteem and poorer mental health. In the workplace, this can lead to unfair treatment of older adults. Therefore:

H2: Negative stereotypes associated with ageism increase anxiety about aging.

Recently in the United States, the work of Hershfield et al (2011) and Hershfield et al (2009) mobilized the concept of self-continuity to understand the savings effort for retirement. To our knowledge, this work has not yet been replicated in France. Self-continuity is the degree to which the individual considers himself or herself to be connected to his or her future self, i.e. the feeling that the future self is an extension of the present self in terms of values, ideals, preferences, and interests, etc. Hershfield et al. (2011) identify three antecedents of continuity of the future self: (1) similarity (cognitive confusion of representations of characteristics similar to the self and association with the self), (2) vividness (perception of the future self as real and authentic), and (3) positivity (it is easier to feel connected to someone we evaluate positively, and this positivity is often measured by the degree of respect for the older self). This positivity increases the willingness to save for retirement. Negative stereotypes associated with ageism can be considered to significantly reduce the positivity of future self-continuity, limit perceived similarity, and limit the vividness of future-self perception. As a result, we propose that the lack of respect for the elderly, which is a consequence of the negative stereotypes associated with

ageism, weakens both the desire to care for one's elderly future self and the concomitant willingness to save for retirement. Therefore:

H3: Negative stereotypes associated with ageism reduce intentions to save for retirement.

Swift et al. (2021) mobilize the risk model of ageism and explain that ageism and negative attitudes toward age can negatively affect three aspects of active aging: (1) autonomy, freedom of choice, and the ability to control and cope to make good personal decisions; (2) the ability to perform daily living tasks with little or no help from others; and (3) quality of life. Also, von Hippel et al. (2013) show that, in the workplace, the threat of negative stereotypes associated with ageism is associated with decreased job satisfaction and organizational commitment. This causes an increase in intentions to quit and, consequently, leads to a higher risk tolerance of employees. The authors add that the experienced threat of negative stereotypes associated with ageism leads to underperformance of the affected employees in stereotypical domains and to lower performance-based outcomes. If we translate these results to retirement savings decisions, we can propose that negative stereotypes associated with ageism lead to suboptimal or misguided financial decisions and a potential loss of confidence in one's financial decisions. Therefore, the effect of these stereotypes is to lead to poor financial choices, which impacts financial risk aversion and tolerance. Thus, the fourth hypothesis can be formulated as follows:

H4: Negative stereotypes associated with ageism reduce risk aversion (risk of running out of money in retirement) and increase (b) risk tolerance (risk of making poor choices).

In the field of health communication, many research studies have used Rosenstock's HBM model (1974) to show the direct effect between perceived risk and behavioral intentions. Indeed, low levels of perceived risk among individuals result in less engagement in health protection behavioral intentions. The same is true for financial security in retirement (Heydari et al., 2021; Schmäzle et al., 2017; Choi and Park, 2015). On the other hand, communication has a direct effect on risk perception. Therefore, it can be considered that communicated information about risks can change perceptions of those risks, and then change the impacts of perceptions of those risks on behaviors. Previous studies confirm the effects of risk communication modalities on behavior change and the relationship between risk communication and behavior adopted (Heydari et al., 2021; Schmäzle et al., 2017). Therefore, we propose that negative stereotypes associated with ageism and information conveying disrespect toward older people negatively affect risk aversion, i.e. the assessment of the risk of

running out of money in retirement. In contrast, these stereotypes and information positively influence risk tolerance, here understood as the assessment of the risk of making bad financial choices. Through risk tolerance and risk aversion, the negative stereotypes associated with ageism act on the willingness (intentions) to save for retirement. Therefore:

H5: Negative stereotypes associated with ageism indirectly affect saving intentions for retirement through (a) risk aversion (risk of running out of money in retirement) and (b) risk tolerance (risk of making bad choices).

### ***3. The emotional approach: the role of age anxiety***

Building on Stereotype Activation Theory, Rittenour and Cohen (2016) use age progression and remodeling interventions aimed at behavior change. Their research is based on the premise that making people aware of their future appearance will motivate them to change their behavior to avoid the undesirable consequences of aging. Using three groups of participants (presentation of the Older Self, an Older Other, and the Current Self for the control group), these authors show that respondents' exposure to their self at increasingly older ages causes negative affect and increases anxiety about aging. Contrary to other experiments (Hershfield et al., 2011), the level of negative affect (worrying, frightening, shocking) is significantly higher for the Older Self group than for the control group, which is not presented with its face affected by an age progression. The image of the Virtual Future Self (Aged) elicits negative affect and anxiety about aging in participants of age progression simulations (Rittenour & Cohen, 2016). The authors consider concerns about aging to be the cause of positive health or savings outcomes. This article retains a definition of anxiety as a negative emotional state caused by the vividness of one's self-image at retirement age. It is different from anxiety about aging defined as the concern and anticipation of undesirable physical, mental, and personal losses during the aging process (Lasher & Faulkender, 1993). Therefore:

H6: Emotional anxiety about aging increases saving intentions for retirement.

Loewenstein et al (2001) show that accidental anxiety can influence risk-taking. Anxiety leads to feelings of apprehension and tension and activation of the autonomic nervous system (Spielberger, 1966). Anxiety-provoking events are events over which individuals feel they have little control (Lazarus, 1991; Smith & Ellsworth, 1985). For example, a person who finds themselves imagining themselves at retirement age will become anxious in response to the

uncertainty of their retirement situation and the lack of control over the income they may have. When individuals are anxious, they pay close attention to potential threats in the environment and are very vigilant in preserving their resources (Eysenck, 1997; Pacheco-Unguetti et al., 2010). This attention to potential threats and vigilance leads anxious individuals to avoid risk (Loewenstein et al., 2001). The literature shows that anxiety elicited by reading stories about a person's death influences risk perception in the context of the story and in a variety of other contexts (e.g., health, fire, and crime) (Johnson & Tversky, 1983). In another study, accidental anxiety and sadness were elicited by asking participants to imagine experiencing the events described in a hypothetical scenario they read, such as being in a precarious situation at retirement age. Results show that accidental anxiety leads to a greater preference for low-risk investments and risk aversion (Raghunathan & Pham, 1999; Yip & Côté, 2013). We propose that anxiety about getting older leads the individual to preserve resources and thus to consider more the risk of running out of money in retirement and, instead, to focus less on the fear of making poor financial choices. Therefore, we can formulate the following hypothesis:

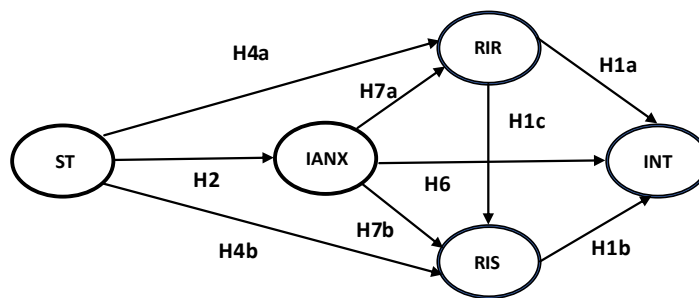
H7: Age anxiety increases both (a) risk aversion (risk of running out of money in retirement) and (b) risk tolerance (risk of making poor financial choices).

Cypryńska and Nezlek (2020) point out that very little research has focused on the mediating role of negative emotional reactions, including anxiety, in the relationship between a perceived threat or risk and the adoption of the desired or desirable behavior. To justify this relationship, the authors relied on previous research showing that perceived threat and risk assessment of an infectious disease is positively related to the adoption of desired behaviors. Bavel et al. (2020) state that people are less likely to die from overreaction than from underreaction, i.e., not responding to danger signs until it is too late (p. 462). In other words, although many believe that fear paralyzes people, fear causes them to seriously assess the perceived threat/risk and may motivate them to act. At the same time, research has also shown that anxiety is positively related to the adoption of desired behaviors. For example, individuals who visualize their future aged selves to a greater extent engage in retirement savings behaviors (Hershfield et al., 2011). Cypryńska and Nezlek (2020) argue that the two words emotions and motivation have the same Latin root: *emovere/movere*, meaning "to move." The authors justify the mediating role of anxiety based on the parallel process model (Witte, 1992; 1998) and the stress and coping model (Lazarus & Folkman, 1984), which explain that a stressful event initiates a process of threat and risk assessment (considered dangerous or safe) which then motivates the adoption of the desired behavior specifically the sequence stress-appraisal-coping. Therefore:

H8: Negative stereotypes associated with ageism indirectly affect saving intentions for retirement through age anxiety, which acts through (a) risk aversion (risk of running out of money in retirement) and (b) risk tolerance (risk of making poor financial choices).

All these hypotheses allow us to design a conceptual model (see Figure 1.). Please note that hypotheses for indirect effects are not displayed in Figure 1.

Figure 1. Conceptual model



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## Methodology

A quantitative study was conducted to test the hypotheses of the conceptual model and address the research question specifically: to what extent do negative stereotypes of ageism and anxiety about aging affect perceived risk and willingness to save for retirement?

### *Data collection and sample*

Data for this research were collected through an Internet survey of a sample of French consumers. The sample consisted of 367 individuals. The structure of the sample is presented in Table 1. This sample is not representative of the French population, but it reflects its diversity.

Table 1. Sample description

N = 367		Sample	Population
Gender	Female	50.3%	52.5%

	Male	49.7%	47.5%
Age	Up to 29 years	15.5%	14.8%
	30-39 years	26.7%	15.8%
	40-49 years	30.0%	16.3%
	50-59 years	17.7%	17.2%
	60 years and over	10.1%	35.9%
Monthly income (in EUR)	< 1,000	12.5%	
	1,000-1,999	40.6%	
	2,000-2,999	32.7%	
	3,000-3,999	6.3%	
	4,000-4,999	3.5%	
	5,000 and above	4.4%	

### *Measurement scales*

We chose to use existing scales in the literature, adapting them to our research. The measures of the variables are all made using 7-point Likert scales, and their reliability is presented in Table 2. Negative stereotypes associated with ageism are measured with an adaptation of Levy et al.'s (2004) scale that considers different categories of ageism stereotypes specifically cognitive abilities, physical appearance and performance, autonomy, personality, relational qualities, and enjoyment of life. It is initially composed of 4 items. Analysis of the reliability of this construct led us to remove item ST1: “Many elderly people are stingy and hoard their money and possessions”. Therefore, the scale used has 3 items. Anxiety about aging is measured by the French adaptation (Bruchon-Schweitzer & Paulhan, 1993) of the State-Anxiety Inventory (Spielberger, 1983). This scale measures transient changes in anxiety caused by aversive situations. The risk of running out of money in retirement (aversion) is measured by the Global Risk Scale proposed in the study by Bèzes (2011) because it "is not based on a decomposition of risk using its components or dimensions but on a global apprehension of risk" (Cases 2002, p.284). The risk of making poor financial choices (tolerance) is measured by the scale used in Ayadi's (2010) study to measure financial risk. The advantage of this scale is its ease of adaptation to different savings products, in this case saving for retirement. Willingness (intention) to save for retirement is measured using the Hershey, Henkens, and Van Dalen (2007) Retirement Planning Measurement Scale, because of its good psychometric qualities and ease of adaptation to voluntary supplementary savings for retirement.

The choice of using scales already used in the literature does not prevent us from checking their psychometric qualities. The scales were carefully translated from English to French. To verify

the coherence of the translation, they were retranslated into English. Despite a few wording details, the scales are therefore similar to their original version.

After the administration of the questionnaire, we studied the validity and reliability of the measures. In terms of validity, it appeared that the constructs were valid. According to the usual procedure (Fornell & Larcker, 1981) for each dimension, the item loadings are all significant ( $p < 0.001$ ) and are greater than 0.5. This ensures convergent validity. The wording of all the items can be found in Table 2. Regarding discriminant validity, the AVEs (Average Variance Extracted) associated with each construct are also all greater than 0.5 and the lowest of them is greater than the largest square of the correlations between the factor scores of the constructs (Table 3). Finally, we can observe that all constructs are reliable. The Cronbach's alphas are all greater than 0.7, as are the Jöreskog's Rho coefficients (Table 2).

Tableau 2. Measurement scales – description and reliability

Variables	Item	Loading (Cronbach 's alpha)	Joreskog's Rho	Références
Negative stereotypes associated with ageism	ST2: Many older people are just living in the past. ST3: Most older people can be annoying because they tell the same stories over and over. ST4: Older people complain more than others.	0.855	0.855	Levy et al. (2004)
Age anxiety	IANX1: It confuses me to imagine myself at retirement age. IANX2: It scares me to think of myself as old. IANX3: It scares me to think of myself as old. IANX4: It makes me worry when I think about what I will be like when I retire.	0.941	0.942	Bruchon-Schweitzer et Paulhan (1993)
Risk of running out of money at retirement (aversion to risk)	RIR1: I am sure that I would be in financial trouble if I did not save for my retirement. RIR2: All things considered, I feel that not preparing for retirement would cause me financial hardship. RIR3: Overall, I am sure I would be making a mistake if I did not contribute to my retirement.	0.894	0.827	Bèzes (2011)
Risk of making poor financial choices (tolerance towards risk)	RIS1: Saving money for my retirement may be a bad use of my money. RIS2: When I save for my retirement, I'm afraid of making a poor investment. RIS3: When I save for retirement, I'm really worried that I won't get my money's worth.	0.852	0.863	Ayadi (2010)
Intentions of saving for retirement	INT1: I want to contribute enough to have a good supplemental retirement pension. INT2: I want to learn about the types of supplemental retirement pensions.	0.924	0.928	Hershey et al. (2007)

INT3: I want to prepare for a comfortable retirement with a supplemental pension.

Table 3. Discriminant validity of the measures

Discriminant validity: $\max(R^2) < \min(\text{Average Variance Extracted})$					
	IANX	RIS	RIR	INT	ST
Anxiety about aging (IANX)	<b>0.895</b>				
Risk of making poor financial choices (tolerance) (RIS)	0.148	<b>0.820</b>			
Risk of running out of money at retirement (aversion) (RIR)	0.092	0.001	<b>0.781</b>		
Intentions of saving for retirement (INT)	0.000	0.115	0.366	<b>0.900</b>	
Negative stereotypes towards aging (ST)	0.130	0.111	0.005	0.006	<b>0.814</b>

We consecutively applied two statistical methods to test our different hypotheses.

The data were first analyzed with the covariance-based structural equation modeling software, Lavaan (Rosseel, 2012). The model was tested using the Satorra and Bentler process in R (1994). LAVAAN has the advantage of automatically limiting biases related to possible non-normality in our sample data. The validation was carried out in three steps. First, the quality of the model was estimated, then its predictive validity, followed by a Bootstrap procedure to estimate the structural coefficients (Hair, 2010). The absolute indices are generally good. The CFI is 0.962 while the TLI stands at 0.951. Both indicators are greater than 0.95. The SRMR is equal to 0.063, the RMSEA is equal to 0.062 (<0.08). below the 0.08 threshold. Although somewhat higher than the maximum limit of 0.05, they are still acceptable (Henseler et al., 2016). The normalized  $\chi^2$  (2.406) has a value below the recommended value of 5 (Valette-Florence & Valette-Florence, 2020). Taken together, these indicators point to a model of satisfactory quality (Hu & Bentler, 1999; Hair et al., 2010).

Structural equation modeling allows us to test hypotheses H1a, H1b, H1c, H2, H4a, H4b, H6, H7a and H7b.

Hypotheses H3, H5a, H5b, H8a, and H8b are tested using a mediation analysis conducted with the PROCESS macro of Hayes (2022). Indeed, our model potentially describes more complex paths than a single-variable mediation relationship. Therefore, we replace the indirect effects analysis with the mediation analysis with PROCESS. PROCESS v4.2 may be more interesting

than a SEM analysis when there are multiple relationships between the variables under study (Borau et al., 2015). This algorithm can identify indirect effects for complex paths, i.e., paths that involve more than 3 variables, and that aggregate several lower-order sub-paths (e.g., paths that involve 3 to 5 variables).

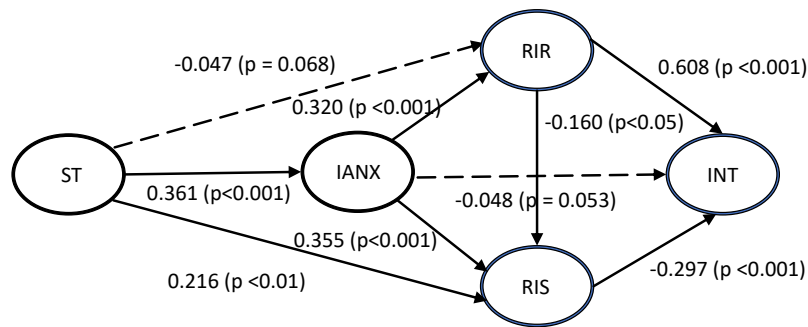
## **Results and discussion**

### *Model testing by covariance-based structural equation modeling*

We first examine the hypotheses tested by structural equation modeling. The results show that risk aversion, in this case, the fear of running out of money in retirement, negatively influences risk tolerance (here the risk of making poor financial decisions) ( $\beta=-0.160$ ,  $p\text{-value}=0.0012<0.05$ ), thus validating H1b. Risk aversion also ( $\beta=0.608$ ,  $p\text{-value}=0.000<0.001$ ) has a positive influence on the willingness to save for retirement while risk tolerance, specifically the risk of making bad financial choices, has a negative influence ( $\beta=-0.297$ ,  $p\text{-value}=0.000<0.001$ ), thus validating H1a and H1b. Negative stereotypes of ageism increase anxiety about aging, validating H2 ( $\beta=0.361$ ,  $p\text{-value}=0.001<0.001$ ). However, stereotypes exclusively have a significant influence on risk tolerance ( $\beta=0.216$ ,  $p\text{-value}=0.003<0.01$ ), validating H4a. Their influence on risk aversion is not significant: H4b is not validated. This result confirms that negative stereotypes most often lead to a decrease in performance. The direct effect of age anxiety on the willingness to save is not significant, which leads us to reject H6. Anxiety about aging increases both risk aversion ( $\beta=0.320$ ,  $p\text{-value}=0.000<0.001$ ) and risk tolerance ( $\beta=0.355$ ,  $p\text{-value}=0.001<0.01$ ), which validates H7, for direct effects. This result is interesting because anxiety and fear are associated in the literature with more serious risk assessment and the adoption of protective and safety behaviors. One possible explanation is the particularity of the financial context where risk tolerance is linked to the choice to invest in products that are certainly risky but have high returns. Furthermore, the influence of risk tolerance on risk aversion is validated ( $\beta=0.160$ ,  $p\text{-value}=0.035<0.05$ ).

The direct influence of stereotypes on the willingness to save is not significant. H3 is therefore rejected. The indirect effects of stereotypes on the willingness to save are not significant, so H5 is rejected. Finally, the indirect effects of age anxiety are not significant and H8 is rejected.

Figure 2. Results



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### *Analysis of the mediations and indirect paths*

To test hypotheses H3, H5a, H5b, H8a, and H8b, we use the mediation analysis offered by PROCESS (Hayes, 2022). We used the PROCESS v4.2 macro with SPSS, which allows for a more refined analysis than structural equation modeling. To validate or refute our hypotheses, we tested 7 indirect paths. Table 4 describes these 7 paths. We perform this analysis on the pathway linking negative stereotypes associated with ageism (ST) to saving intentions for retirement (INT). The longest path includes all 5 variables in the model.

Table 4. Process results

<b>Paths</b>	<b>Beta</b>	<b>Confid. Interval (95%)</b>
ST > RIR > INT	0.0377	NS
ST > RIS > INT	-0.0109	NS
ST > IANX > INT	-0.0545	*
ST > RIR > IANX > INT	-0.0006	NS
ST > RIR > RIS > INT	0.0027	NS
ST > IANX > RIS > INT	-0.0295	*
ST > RIR > IANX > RIS > INT	-0.0017	NS

Of the various paths linking ageism stereotypes to retirement savings intentions that we tested, only the paths through age anxiety or age anxiety and then financial risk tolerance when saving for retirement were significant. Their sign is negative. Therefore, hypothesis H3 is validated. It follows from these results that only hypothesis H5b is validated: stereotypes associated with ageism have an indirect effect on saving intentions for retirement. This effect is negative. On the other hand, the indirect path through risk aversion is not significant: H5a is refuted. The second significant indirect path that is significant according to Process is the one going through anxiety about aging and then risk tolerance: hypothesis H8b is validated. On the other hand, hypothesis H8a is not validated.

### **Managerial and theoretical perspectives**

The objective of this research was to understand the direct and indirect effects of negative stereotypes of ageism and anxiety about aging on the willingness to save for retirement. The analysis of the interactions between these different antecedents confirms the complexity of the mechanisms that influence saving behavior for retirement. So far, it has been established that saving intentions and behaviors for retirement are positively influenced by income, ability to plan and postpone rewards, self-efficacy, and self-continuity. We show that negative stereotypes, in this case, ageism, can impact intentions to save for retirement. This influence is totally indirect and is exerted through anxiety about aging, which is reinforced by ageism. It also mobilizes risk aversion in the choice of savings products. The strength of this indirect influence is, however, significant. This research thus makes three main theoretical contributions.

The first contribution is the analysis of negative stereotypes associated with ageism as a social determinant of the willingness (intention) to save for retirement. This research is the first to our knowledge to analyze the effect of ageism in the financial context and more specifically the motivation of the individual to save for retirement. The scope of ageism has been limited to the domain of health and the workplace (Bae & Choi, 2022; Lagacé et al., 2022). The results show that negative stereotypes associated with ageism, and advancing age lead to decreased performance. This research thus adds to the literature on the determinants of saving for retirement by showing the positive influence of stereotypes on age anxiety, as well as on financial risk tolerance, which in turn reduces the willingness to save for retirement. Therefore, through the analysis of negative stereotypes associated with ageism, the results of this research contribute to the social approach to the determinants of saving for retirement that focuses on

the analysis of the role of social influences and the identity of the aged self. i.e., to the self-continuity approach, a concept strongly popularized by Hershfield (Berriche et al., 2017).

The second contribution concerns the study of the emotional determinants of saving for retirement, specifically anxiety about aging. Research in finance is limited to the analysis of the influence of financial anxiety (Hayhoe et al., 2012), trait anxiety (Gambetti & Giusberti, 2012), or even anxiety about one's future aged appearance thanks to new technologies of modeling or simulation of age progression (Rittenour & Cohen, 2016; Berriche et al., 2017). The results of the literature are indeed contradictory, with some research showing that low levels of anxiety favor conservative financial decisions such as saving while other publications show that high levels of anxiety favor saving for retirement. This research shows that a high level of anxiety increases both risk tolerance and risk aversion, because in finance (unlike in health) the individual can choose to invest in products that are certainly risky but have high returns (the financial equivalent of the side effects of pharmaceutical substances).

From a theoretical point of view, the association between ageism and anxiety about getting old needs to be investigated more into detail. We can expect interactions between the negative stereotypes associated with ageism or anxiety about aging and the determinants already mobilized in the literature: self-continuity, self-efficacy, temporal styles, etc. The different components of ageism and age anxiety need to be studied specifically (i.e. fears related to cognitive and social abilities, etc.). Other emotions related to saving for retirement may be involved. Their entry and influence will depend on the messages delivered and the perceived self-efficacy of consumers. Our results highlight the need to develop models that combine the main determinants of the different research avenues on saving intentions for retirement, especially at the decision-making stage (e.g., on the model of Netemeyer et al., 2018).

The third contribution concerns the literature on cognitive models of health behavior such as Rosenstock's health belief model (1974), the parallel process model (Witte, 1992; 1998), and the stress and coping model (Lazarus & Folkman, 1984) which consider the assessment of threat or perceived risk without distinguishing between its two forms, risk tolerance, and risk aversion. Vulnerability and the severity of the threat as determinants of risk assessment remain insufficient. A person can consider that he or she is vulnerable, and that the situation is serious and yet have a high tolerance for risk. These last two contributions underline the need, in terms of financial behavior for retirement, to consider risk tolerance and risk aversion simultaneously.

From a managerial point of view, this research provides insights for bank and insurance company managers, for the government, and for associations for the elderly. It calls for vigilance regarding the use of a prevention communication strategy for retirement savings based on mental imagery of the future elderly self and anxiety about aging. The results show that anxiety about aging does promote risk aversion and the willingness to save for retirement, but also risk tolerance. Consequently, communication actions on these products and for these targets must precisely calibrate the intensity of references to the two forms of reaction to risk to maximize the positive effects in terms of savings. Bank managers could support and advise their clients by directing their choice mainly to low-risk, low-return products (life insurance, retirement saving schemes such as 401k or PER (Plan d'Épargne pour la Retraite), PERCO (Plan d'Épargne pour la Retraite Collectif), PERP (Plan Épargne pour la Retraite Populaire), for example) and, as a complement, to high-risk, high-return products (hedge funds, exchange-traded funds (ETFs), for example). The idea is to make savers aware of the benefits of holding low-risk products before investing in high-risk products. It would also be of interest to encourage savers to accept a significant proportion of riskier savings vehicles. This argues for the creation of "tiered", pre-formatted savings schemes. On the other hand, education on the various savings products must be strongly reinforced and developed.

Our results also underscore the need for retirement savings stakeholders to develop communications, particularly messages, that consider the various, sometimes contradictory, parameters that are involved in the determinants of retirement savings. It is necessary to simultaneously accentuate consumers' anxiety about aging and to moderate the risks of poor choice of savings products, while at the same time flattering their confidence in their financial skills (self-efficacy). Most importantly, it is necessary to simultaneously help individuals picture themselves in the future, feeding their anxiety about aging while combating negative age stereotypes.

In addition, the government and senior citizens' organizations could implement a communication strategy to combat negative stereotypes of aging and ageism to promote the inclusion and equality of older adults. Especially since the results of this research show that negative stereotypes associated with ageism do not have a significant effect on risk aversion and increase risk tolerance, which in turn decreases the willingness to save for retirement. Intergenerational interaction could be considered as a solution to help break down these

stereotypes, by allowing young and old people to interact together. This can be done through mentoring programs or social activities that bring young and old people together. Age stereotypes can be deconstructed by presenting examples of successful, active older people who are involved in their communities. Currently, in France, the role of retired volunteers in the operation and animation of associations is fundamental. The media can also play a significant role in presenting positive portraits of older people. Finally, legislation can intervene in the fight against ageism, with laws that can be put in place to protect older people from discrimination, and perhaps sanctions extreme ageist language and behavior.

In conclusion, future research could measure different savings products at different risk-return levels to analyze the influence of age anxiety on risk aversion vs. risk tolerance, and ultimately the willingness to save for retirement by type of product. Other forms of ageism should also be considered alongside interpersonal ageism. In particular, these include self-aggrandizement (Plan et al., 2022) or stereotype embodiment, that is, the process by which stereotypes are internalized and become relevant to the self (Swift et al., 2017). The construal level theory (Liberman & Trope, 1998) could be mobilized to compare the effects of stereotypes specifically low levels of stereotypes may be associated with abstract thoughts and conversely, high levels of stereotypes may be associated with concrete thoughts. The idea is to analyze the intention to prepare and plan one's retirement in the short term (starting today) vs. in the long term (in a few years) according to the intensity of stereotypes manifested by abstract or lower vs. concrete or higher mental representations. In conclusion, we have shown that the understanding of saving for retirement can be advanced by combining components from different streams of research on the subject.

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