Researching FIRE: exploring positive effects on the willingness to start planning for future retirement

Master Thesis Marketing (FEM11069)

Erasmus University Rotterdam
Erasmus School of Economics

April 18th, 2022

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Specialization:	Marketing
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The views stated in this thesis are those of the author and not necessarily those of the supervisor, second assessor, Erasmus School of Economics or Erasmus University Rotterdam.

Table of Contents

Abstract 4

Acknowledgements 5

1. Introduction 6

1.1. Problem statement 6

1.2. Managerial and academic relevance 7

1.3. Research questions 8

2. Theory 10

2.1. Literature review 10

2.2. Hypotheses 16

2.3 Conceptual model 18

3. Method 20

3.1. Research approach 20

3.2. Variables and measurements 20

3.3. Model equation 22

3.4. Data collection 23

3.5. Sample 24

3.6. Reliability and validity 25

3.7. Data analysis 26

4. Results 27

4.1. Differences in valuing financial independence 27

4.2. Differences in financial literacy 28

4.3. Loss and gain framing 28

4.4. Uncertainty and certainty framing 31

4.5. Loss and uncertainty framing 33

4.6. Moderation effect of financial independence 35

4.7. Moderation effect of financial literacy 37

4.8. Summary of hypotheses 39

5. Discussion 41

5.1. Answering research questions 41

5.2. Managerial and academic implications 43

5.3. Limitations and further research 44

References 47

Appendix 51

Appendix I – Survey questions 51

Appendix II – Descriptive statistics 53

Appendix III – Reliability statistics 54

Appendix IV – Independent Sample T-Tests 54

Appendix V – Linear regression analyses 56

Appendix VI – Two-Way ANOVAs 59

Abstract

With aging populations, economic uncertainty, and negative perspectives for millennials' future retirement, it is important to start planning for future retirement. From a marketing perspective, message framing methods have been studied and proven to be an effective tool in motivation people to start planning for future retirement. On the other side of the equation, FIRE-followers follow a movement that revolves around saving as much money as possible to retire as early as possible. The objective of this study was therefore to understand what the effects of message framing are, how FIRE-followers respond differently to message framing and what demographic insights can be extracted for future targeting, segmentation, and activation by pension funds.

Previous research has shown that loss frames are effective within a wide range of situations. However, not every study backs this claim. Therefore, other message framing methods are to be tested among both FIRE-followers and non-FIRE-followers. Furthermore, FIRE-followers are known to have higher than average education (financial literacy) and motivation (financial independence) levels. To test these different variables, a survey was designed and distributed online among 404 respondents. The distribution between FIRE-followers (N=202) and non-FIRE-followers (N=202) was equal.

The study found significant differences between FIRE-followers and non-FIRE-followers for education and motivation levels. FIRE-followers were found to be more financially literate and motivated to become financially independent. Furthermore, there was no significant difference in message framing effects on FIRE-followers compared to non-FIRE-followers. On top of that, message framing in general did not have significant effects on retirement planning intention, while the assumptions that education and motivation levels would be moderating effects on this relationship was rejected.

Although this study was not able to prove the significant effect of message framing on retirement planning intention, or different responses from FIRE-followers, the results of this study are still relevant to academics, managers, and marketers worldwide. FIRE-followers were identified as having higher education and motivation levels, information that is useful for segmentation, targeting and activation of (possible) pension plan participants. Furthermore, the sample's skewness in terms of gender, age, and higher education levels proves that there is room for further research. Academics have been overlooking the FIRE-movement, so there are still a lot of opportunities left to test different framing conditions while controlling for demographics.

Keywords: FIRE; pension; retirement planning; financial literacy; financial independence; framing

Acknowledgements

Before you lies the dissertation 'Researching FIRE: exploring positive effects on the willingness to start planning for future retirement'. This dissertation revolves around investigating the effects of different framing applications on FIRE-followers and their willingness to start planning for future retirement. The research was conducted in the context of completing my master's thesis for the marketing specialization of the Master of Science in Economics and Business at Erasmus School of Economics, Erasmus University Rotterdam. The thesis writing process took place from November 2020 until April 2022.

During the research conduction and writing this thesis, I faced several challenges to successfully complete the process. For example, the literature review turned out to be more complicated than expected due to the complicated relationships between different relevant topics. However, while writing this thesis, supervisor Yadi Yang always provided me with detailed and helpful feedback to continue my research. Thanks to her and the other lecturers of the Marketing Department of Erasmus School of Economics, I have been able to develop my general research skills as well as my marketing-related professional knowledge.

That is why I would like to thank all those involved – supervisor Yadi Yang and all other lecturers of courses I have been enrolled in – for their contribution and support, not only during the thesis writing process but during the full 2020-2021 and 2021-2022 academic years. Without their expertise and cooperation, this thorough investigation into the FIRE-movement would never have come about. I would also like to thank my friends, family and especially my wife, who has been a great support and motivation in successfully completing this master's thesis. All in all, I hope you will enjoy reading this dissertation as much as I did writing it.

1. Introduction

1.1. Problem statement

Retirement planning matters to everyone, aging is inevitable after all. However, most people seem to start realizing the importance of this subject too late in their lives (Lusardi & Mitchell, 2010). Most pension plan participants are inactive, while not taking the time to examine their retirement savings situation. Furthermore, with a continuously increasing population of people aged 65 years and older, financial pressure on old-age support systems will keep increasing as well (United Nations, 2019).

With this increasing population of people aged 65 years and older, it is important to start motivating and persuading the younger generation as soon as possible to think ahead about their retirement plans. Economic uncertainty is namely not only caused by a continuous increase in global population, the COVID-19 pandemic has resulted in many people feeling the negative economic effects of COVID-19 related local guidelines (e.g., social distancing). These guidelines have especially affected small-business owners all over the world. Data on bankruptcy in EU countries by the Central Bureau for Statistics (2021) shows that bankruptcy numbers have been increasing in a lot of EU countries. Surprisingly, The Netherlands has seen a decrease in bankruptcy numbers since the pandemic has started, largely caused by the financial support packages the Dutch government has been offering (CBS, 2021). What the post-pandemic effects of these support packages will be is an interesting topic for further research.

However – economic uncertainty or no economic uncertainty – some people don't need motivation and persuasion to start thinking about their future financial situation, following a movement called FIRE (Financial Independence, Retire Early). Taylor and Davies (2021) describe FIRE as a community of individuals that aim to reduce consumption while simultaneously accumulating enough savings to achieve financial freedom. The movement comes in many different types and forms, but the fact is that FIRE does motivate mostly millennials to pursue an extreme lifestyle focused on saving as much money as possible, investing those savings effectively, and thus retiring as early as possible (Kurutz, 2018).

As millennials such as the FIRE-followers are in fact the future of our global economy, it would be interesting to see what motivates these people to turn their lives around in such a rigorous manner, and how these insights can be applied to motivate and persuade the rest of the younger generation to think about their future financial situation. Now the younger generation is severely lacking in this department. A study among U.S. citizens namely shows that two-thirds (66.2%) of working millennials have saved nothing for future retirement. And while pension plan participation differs greatly between countries, millennials are characterized as having worse spending habits compared to previous generations (Brown, 2018). FIRE-followers are in this case the exception that

prove the rule. Gaining measurable insights on what drives these FIRE-followers to be financially independent and care deeply for their financial situation in both short-term and long-term, could prove useful to give solid recommendations for future strategies by pension funds, aimed at motivating a younger audience to start planning for future retirement.

Motivating this younger audience brings the marketing perspective into the topic. It would namely be interesting to figure out how influencing people's willingness to start planning for future retirement can be achieved. In the past this has been done using framing (the way information is formulated) to activate both pension plan participants and a younger audience in general to start gathering and reading retirement related information, no matter what educational level they have acquired in the past (Keren, 2012). Especially loss and gain framing as traditional framing methods have been proven multiple times to be effective in influencing consumer behaviour in a financial context (Brown, Kapteyn & Mitchell, 2016).

Not only message framing has been proven to be an influencing factor in motivating people to start planning for future retirement. Education and motivation levels also play a role. Van Rooij, Lusardi and Alessie (2011) have for example directly tied successfully saving and investing for future retirement to one's level of financial literacy. Moreover, financial literacy has been proven to be largely correlated with financial independence. Mandell and Klein (2007) state that the motivation to become financial independence has a causal effect on students' financial literacy levels. However, it is also suggested that the other way around – higher levels of financial literacy influencing the motivation to become financially independent – is true as well (Xiao & Chatterjee, 2014).

Trying to add to existing research, it would be useful to figure out whether these FIRE-followers respond differently to different framing methods compared to non-FIRE-followers and what influence education (financial literacy) and motivation (financial independence) have on this equation. To investigate these effects, research questions are composed (§1.3).

1.2. Managerial and academic relevance

This thesis contributes to the field of Dutch pension funds, by providing relevant research into the activation of a younger audience to start planning for retirement from a different perspective than what research has so far been providing; looking backwards at the relationship between framing, financial literacy, motivation (financial independence), and willingness to start planning for future retirement by looking at FIRE-followers as a benchmark for what must be achieved by Dutch pension funds. Dutch pension funds will therefore have new information available about their target audience, knowing more specifically which people to target their campaigns to (demographics) and how to activate them to actively start searching for information and / or become an active pension fund participant. Everyone involving in this process, CMOs, marketing managers, brand managers,

marketing activation managers, campaign managers and performance / growth / digital marketers will therefore benefit and be able to make more informed decisions.

Furthermore, this thesis also contributes to academic literature. Over the years, academics have been focusing largely on message framing to activate pension plan participants using different types of message framing. The positive effect of different types of message framing on pension plan participant activation has since been studied and proven by – among other people – Keren (2012), Brown, Kapteyn and Mitchell (2016), Eberhardt et al. (2017), Bockweg et al. (2017), and Braun (2018). Although contributing heavily to the field of message framing in the context of pension planning, recently some developments have appeared that are yet to be researched. These developments are all closely related to current economic uncertainty. COVID-19 has indirectly caused small-businesses to lose large amounts of revenue and even go bankrupt (CBS, 2021). Furthermore, instead of becoming more conservative in times of economic uncertainty, millennials are showing worse spending habits than previous generations (Brown, 2018), while pension planning has never been a strong suit of any generation (Lusardi & Mitchell, 2010). Projected retirement prospects are not looking positive for millennials, especially compared to their now retired counterparts, even though millennials earn more in their 20s and 30s and have obtained higher education levels (Johnson et al., 2017).

All these developments have been a large influencing factor in the increasing popularity of the FIRE movement (Robin, Dominguez & Mustache, 2008). Unfortunately – while research in the past has been focusing on financial independence and retirement planning – the FIRE movement has been largely overlooked by academic worldwide so far. The FIRE acronym has been used in only two studies in the past by Olen (2019) and Taylor and Davies (2021), where Olen does identify the movement more as a hype than as a concept to be taken seriously. What cannot be denied however, is the fact that the FIRE movement has been becoming increasingly popular in the past five years. Looking at Google Trends, the search term 'FIRE movement' has seen an 1000% popularity increase since 2017 (Google, 2022). The related Reddit communities r/financialindependence (international) and r/DutchFIRE (Dutch) are currently containing 1.000.000 and 49,000 members (Reddit, 2011; Reddit, 2015). It would therefore be a great addition to academic literature to investigate the FIRE movement in relation to message framing, motivation (financial independence), and education (financial literacy) when it's clearly a real-life development here to stay that influences the way people live their lives and plan for future retirement.

1.3. Research questions

<u>Main research question:</u>

What influence does framing have on people's willingness to start planning for future retirement?

Sub research questions:

1. *Does message framing have a negative or positive influence on people's willingness to start planning for future retirement?*

2. *Comparing non-FIRE-followers to FIRE-followers, will FIRE-followers be more negatively or positively influenced by message framing in their willingness to start planning for future retirement?*

3. *Looking at education and motivation levels, will the relationship between message framing and willingness to start planning for future retirement be negatively or positively influenced?*

2. Theory

2.1. Literature review

2.1.1. Financial Independence, Retire Early (FIRE)

The ideology around FIRE (Financial Independence, Retire Early) is originally born from the book *Your Money or Your Life* (Robin, Dominguez & Mustache, 2008) which was published in 1992 and revised in both 2008 and 2018. This book describes the core principle around the acronym FIRE as to evaluate every expense in comparison to the number of hours it took to pay for the expense. This core principle coincides with the broader goal of FIRE to retire earlier than normally possible with traditional retirement planning.

Unfortunately, not many researchers have taken the step since 1992 to dig deep into the movement, resulting in a limited number of studies to be found on the subject. When researching these studies, the following distinction can be made; studies that explicitly use the acronym FIRE and papers that don't. Logically, the number of papers using the FIRE acronym is even more limited than the papers that don't. Only Olen (2019) and Taylor and Davies (2021) do use the FIRE acronym in their studies. While Olen (2019) doesn't really dive deep into the movement itself, the study explains the FIRE movement as being "…mostly populated by well-compensated technology workers or influencers who earn good money blogging putting FIRE out of reach for most Millennials.", before moving on to other topics that are more relevant – according to Olen – in solving economic uncertainty (Olen, 2019). Taylor and Davies (2021) on the other hand, describe FIRE as an international community of likeminded individuals that aim to reduce consumption while simultaneously accumulating enough savings to ultimately achieve financial freedom. Their study also names the three economics components FIRE revolves around: frugality, passive investments, and the value of time.

Followers of this ideology of retiring as soon as possible are largely millennials (Kurutz, 2018). One of the reasons the FIRE ideology is so popular among millennials is the fact that future retirement perspectives seem to be quite negative, especially for the younger generations. In a study regarding future retirement prospects among US citizens, it was found that men's employment rate before the age of 55 keeps declining and that a large share of Gen-Xers and millennials will not be able to replace at least 75% of their pre-retirement income when retiring. This will result in (projected) declining living standards, even though female Gen-Xers and millennials are now earning more (adjusted for inflation) in their 20s and 30s than their now retired counterparts did when they were in their 20s and 30s. Gen-Xers and millennials are also better educated than now retired men and women (Johnson et al., 2017). Combining these elements – higher average levels of education

and more negative retirement prospects – has been one of the core reasons why the FIRE ideology has become increasingly popular in recent years, especially among (highly educated) millennials.

FIRE has since the publishing of *Your Money or Your Life* evolved into multiple variations of the movement: Fat FIRE, Lean FIRE, and Barista FIRE. Fat FIRE is aimed at being able to retire without having to change current living standards. This of course requires the largest amount of savings and thus the most aggressive saving and investment strategy. Lean FIRE on the other hand, is aimed at retirement with $25,000 to spend annually. This requires a minimalist lifestyle that is most likely already applied pre-retirement. Last, Barista FIRE, which is a combination of Fat FIRE and Lean FIRE. This variation of the movement focuses on maintaining a decent lifestyle during retirement through a combination of savings and parttime jobs (Smith, 2021). When looking at FIRE for this dissertation, no distinctions between the different variations of FIRE will be made, because making the distinction will only distract from what is most important when looking at FIRE-followers: demographics (Johnson et al., 2017), background (Ntalianis & Wise, 2011), and motivation (Mandell & Klein, 2007).

While FIRE-followers are trying to save as much money as possible, these savings are also supposed to be allocated appropriately. The investment portfolio and investing in general is therefore a very important part of following the FIRE ideology (Robin, Dominquez & Mustache, 2008). In a study on optimal consumption and portfolio choice, it was found that specifically investing for early retirement reduces relative risk aversion while simultaneously increasing stock market exposure (Farhi & Panageas, 2007). Thus, while investing for early retirement it is important to counter inflation rates for example, investing in general for early retirement is not necessarily a recipe for success for FIRE-followers.

2.1.2 Financial literacy

However, while successfully investing with the idea of early retirement in mind is not a certainty, a study on retirement planning in The Netherlands has shown that dealing with investment portfolios with retirement planning in mind is largely correlated with financial literacy (Van Rooij, Lusardi & Alessie, 2011). Unfortunately, financial literacy as a concept is quite broad and therefore hard to define directly in the context of it being a major influencing factor of successfully managing investment portfolios. Schuchardt et al. (2009) have therefore called for a consistent definition of financial literacy in scientific research. The study states that terms like financial literacy, financial education, and financial knowledge are often undifferentiable in their implied definitions, and that further research is necessary to clearly define where the definition of financial literacy ends, where financial education, and financial knowledge begin and where they overlap (Schuchardt et al., 2009)

One definition that has often been used in previous research is financial literacy being knowledge of financial concepts (Hilgert, Hogarth & Beverley, 2003). Hilgert, Hogarth and Beverley

also state that there is a statistic link between financial knowledge and financial best practices. An important differentiation to be made here is that financial knowledge is not the same as general knowledge. It has namely been proven that financial knowledge has more of an effect on performing basic investment tasks than general knowledge does (Parker et al., 2008).

Another definition that has been used in research is financial literacy being the ability to manage personal finances. Emmons (2005) is most specific in explaining this definition by attributing measurable attributes related to managing one's personal finances to financial literacy. Remund (2010) is less specific but simultaneously more inclusive in defining financial literacy, stating that financial literacy is one's ability to perform money related tasks for spending, earning, and protecting that same money. Last in this defining category, financial literacy is explained as being the measurement of one's understanding and use of finance-related information in a day-to-day context (Huston, 2010).

The third definition of financial literacy that has been used in previous research is financial literacy being skilled in making financial decisions. The most flexible version of this definition stems from Noctor et al. (1992), explaining financial literacy as being able to carefully use and manage money because of informed judgments and effective decisions. This version of the definition of financial literacy was so flexible that it has been used by Schagen and Lines (1996), Beal and Delpachitra (2003) and Worthington (2004) since. Remund (2010) calls financial literacy in similar fashion "successful financial decision making", while simultaneously supporting the previous definition elsewhere in his article. Lusardi and Mitchell (2007) also try to combine definitions of financial literacy (knowledge and skill), explaining financial literacy as being familiar with the economic concepts needed to make good decisions regarding saving and investing.

The last definition of financial literacy that has been used previously is financial literacy being confident in future financial (retirement) planning. Koenig (2007) calls financial literacy "understanding about investing and financial planning", thus directly relating financial planning to financial literacy. However, it is important to note that every researcher has considered this relation between financial planning and financial literacy. But most of the time, when it happens, the other definitions are also taken into consideration to create a combination of multiple definitions. Johnson and Sherraden (2006) for example, combine both ability and knowledge in relation to financial planning by explaining financial literacy to be participating in economic traffic while maximizing chances and living a fulfilling life, thus requiring both ability and knowledge to create useful opportunities. The importance of combining both ability and knowledge is once more endorsed in another study (Huston, 2010).

For this dissertation, the first definition of financial literacy – knowledge of financial concepts – will be regarded as most appropriate, as this definition of the concept has been used in recent

studies to measure the effect of financial literacy on financial (retirement) planning. This study by Van Rooij, Lusardi and Alessie (2011) concludes – among other things – that the causal relationship goes from financial literacy to retirement planning rather than the other way around. Furthermore, financial literacy in general increases one's chances of successfully managing an investment portfolio with early retirement planning in mind, a study among the French population shows (Arrondel, Debbich & Savignac, 2015). This is mostly because higher financial literacy increases the chances of stock market participation, successful or not (Van Rooij, Lusardi & Alessie, 2009).

So, the conclusion can be drawn that financial literacy is a major cause for successful retirement planning. It increases one's willingness to start planning for future retirement, and it increases the chances of successfully participating in the stock market for the management of the investment portfolio. This higher-than-average level of financial literacy is largely correlated with financial education. A study among the Italian population investigates the relationship between financial education and retirement planning, while also proving that financial education increases financial literacy levels and thus improving successful retirement planning. However, the study also found that younger population are less likely to use educational information to their benefit and are therefore less likely to accumulate enough funds for retirement (Ntalianis & Wise, 2011). So, while younger people are less likely to use educational information about finance to their benefit, their general education levels are higher than their older counterparts. The negative forecasts for their future retirement are a nudge to start planning as well (Johnson et al., 2017).

Lusardi (2019) adds to this proven relationship between financial education and retirement planning by investigating the evidence and implications of needing financial education for the improvement of financial literacy. This study emphasizes the fact that financial literacy is associated with higher returns on investments, as well as investments in more complex assets. Furthermore, the study concludes that more financial literate people have a higher chance of planning for future retirement. This effect is the strongest in The Netherlands, where one additional question answered correctly means 10% higher probability of planning for future retirement. The highest need for better financial education lies with the younger generations (Gen-Zers, Gen-Xers and millennials), who have shown to have very low financial literacy levels. Using large, scalable initiatives, especially by schools and colleges, should target these vulnerable generations and prepare them for their financial future (Lusardi, 2019).

However, improving financial literacy with financial education is easier said than done. Motivational variables have shown to be very important in learning from financial education to improve personal financial literacy (Mandell & Klein, 2007). This study by Mandell and Klein (2007) shows that increasing the number of financial classes in either school and / or college does not equal to an increase in financial literacy levels for the people who take these classes. Questions regarding

motivation were for a large part explanatory for these financial literacy scores, which does suggest a future approach more targeted towards teaching the necessity of financial literacy rather than just teaching financial fundamentals.

2.1.3 Financial independence

Financial independence (FI in the FIRE acronym) has been defined in various ways in the past. For example, Xiao and Chatterjee (2014) define financial independence as the ability to pay for your own expenses, while other researchers like Perrone et al. (2015) define financial independence as not having the necessity to do paid work. Financial independence as a core concept is also defined as "a state in which an individual or household has sufficient wealth to live on without having to depend on income from some form of employment" (TD Ameritrade, 2018). On the other hand, Webster's Dictionary defines financial independence in two parts: financial as "pertaining to the science of managing money" and independence as "freedom from assistance by others". Combined this makes the definition of financial independence "pertaining to the science of managing money" without "…assistance by others" (Merriam-Webster, 2021). There are also researchers that define financial independence even more broad – claiming it gives people the ability to do whatever they want, whenever they want to (Rubin & Spaht, 2021). While being broad, this definition is probably what most FIRE-followers feel like best defines their life goals. However, to achieve these goals, money and work are very important components.

Perrone et al. (2015) therefore tie financial independence directly to financial freedom. Unfortunately, definitions of financial freedom are all over the place as well when comparing the views of different academics. Brüggen et al. (2017) basically use financial freedom as a synonym for financial independence, referring to financial freedom as a state in which a person does not have to include finance into the daily decision-making process. This does however, not mean that financial freedom is the same as being wealthy. It means living an independent life without having to deal with an employer, pension fund or the government regarding your financial situation (Youngling, 2019). For this dissertation, the definition from TD Ameritrade (2018) will be upheld, because it is directly tied to studying the FIRE ideology and thus most relevant.

While financial independence is often found in studies tying the term in a relationship with financial literacy, financial independence (and early retirement) as goal of the FIRE ideology is also directly related to the willingness of people to start planning for this future (early) retirement (Robin, Dominquez & Mustache, 2008). Lusardi and Mitchell (2007) give an additional perspective on the matter, namely that most people do not think about their future retirement situation (Lusardi & Mitchell, 2007), thus not having the motivation to start planning for it.

Mandell and Klein (2007) use financial independence as a motivational variable in their study. They conclude that teaching young students the possible results of their future actions will most likely make them more motivated to become financially literate. A study by TD Ameritrade (2018) shows that dealing with investment portfolios with retirement planning in mind is largely correlated with how much people value financial independence, because financial independence is valued more by FIRE-followers than non-FIRE-followers (TD Ameritrade, 2018). FIRE-followers value financial independence more and are thus more motivated to become financially literate, use financial education to their benefit and start planning for future retirement. Alternatively, the reversed relationship (financial literacy having an influence on how much people value financial independence) has also shown to be applicable. Xiao and Chatterjee (2014) have studied the factors associated with financial independence of young adults. One of these factors has been proven to be financial literacy (Xiao & Chatterjee, 2014).

2.1.4 Message framing

Influencing people's willingness to start planning for future retirement can be done through different types of framing, which has been proven to be an effective method (Keren, 2012). Framing has also been proven to be effective in motivating pension plan participants to actively search for retirement related information online (Eberhardt et al., 2017). This study shows the effectiveness of different types of framing in relation to motivating pension plan participants to actively search for retirement related information online: gain, loss, investment, and assurance frames. In this study, the investment and assurance frames were basically small iterations of the gain and loss frames. Therefore, the study tests both the regular gain and loss frames and alterative variations on regular gain and loss frames. The study eventually concludes that all types of framing are effective in activation pension plan participants to search for information online. However, loss framing does result in more negative emotions and evaluations in comparison to gain, investment and assurance framing.

These negative feelings after loss framing are also proven by a study on exploring the effects of framing on acquiring pension related information (Braun, 2018). This study shows no differences in the effects of gain and loss framing. These results are somewhat surprising, because a previous study in a financial context – although not on exploring effects of framing on acquiring pension related information – had shown that loss framing was most effective compared to gain framing (Brown, Kapteyn & Mitchell, 2016). The effectiveness of these loss and gain frames to activate pension plan participants is also supported by a study from a Dutch pension fund (Bockweg et al., 2017).

Other types of framing which have not been used in studies regarding retirement planning, are certainty and uncertainty framing. These types of framing have been proven to be effective to change people's perceptions of themes (Blair et al., 2015). One of the themes that are currently trending worldwide is of course the COVID-19 pandemic. To further investigate this theme and its implications, Gozgor and Lau (2021) have studied the economic effects of COVID-19. This study concludes that COVID-19 related economic uncertainty has caused household consumption to drop worldwide. This is another reason for retirement planning to become more and more important for younger generations (Gen-Zers, Gen-Xers, millennials).

2.2. Hypotheses

H1: First, it is important to investigate fundamental differences between FIRE and non-FIRE-followers. An important factor in identifying FIRE-followers is the amount of which FIRE-followers value financial independence, according to a survey by TD Ameritrade. In this survey, conducted among 1,503 U.S. adults aged 45 and older, financial independence is defined as "a state in which an individual or household has sufficient wealth to live on without having to depend on income from some form of employment" (TD Ameritrade, 2018).

This is therefore a good variable to consider when assessing the differences between FIRE and non-FIRE-followers, assuming FIRE-followers in The Netherlands will value financial independence just as much as their U.S. counterparts. Thus, the first hypothesis is formulated as followed: *FIRE-followers value financial independence more than non-FIRE-followers.*

H2: The backgrounds of FIRE-followers are also most likely to contain a certain amount of financial literacy (van Rooij, Lusardi & Alessie, 2011); because of a relatively high interest in finance, a higher sense of financial community or simply by being more educated in the form of a bachelor's or master's degree in finance (Ntalianis & Wise, 2011).

Financial literacy can be divided into multiple elements. For example, a causal relationship between financial education and financial literacy has been researched and proven in Italy (Stella, et al., 2020). In addition to the first hypothesis, it is therefore important to assess whether FIRE and non-FIRE-followers differ from each other looking at financial literacy as a variable. Thus, the second hypothesis is as followed: *FIRE followers are more financially literate than non-FIRE-followers.*

H3: Following two hypotheses to determine the differences between FIRE and non-FIRE-followers regarding financial independence and financial literacy, it is important to start looking at the causal relationship between the independent variable and dependent variable of the conceptual model.

The traditional framing methods are so-called gain and loss frames. These frames have been used in the past in a financial context, where especially loss frames have been proven effective (Brown, Kapteyn & Mitchell, 2016). However, this is not always the case since loss frames could also result in more negative feelings towards possible pension planning issues (Braun, 2018). To test whether loss frames are also more effective for FIRE-followers and non-FIRE-followers, hypothesis 3a is formulated as followed: *loss framing has a more positive effect on people's willingness to start planning for future retirement compared to gain framing.*

When this hypothesis (3a) is accepted or rejected, it is interesting to test whether loss framing has a more positive effect on FIRE-followers' willingness to start planning for future retirement compared to non-FIRE-followers' willingness to start planning for future retirement. Therefore, hypothesis 3b is as followed: *loss framing has a more positive effect on FIRE-followers' willingness to start planning for future retirement in comparison to non-FIRE-followers.*

H4: Furthermore, because of Covid-19, people must consider more uncertainties in their lives. This also affects framing methods and their effectivity. Taking this into account, important information could be framed using both certainty and uncertainty frames which highlight the benefits and risks of highlighted information. In the past, presenting both risks and benefits of certain themes have been proven to be an effective method to shape people's perceptions towards themes (Blair et al., 2015). Thus, to properly answer the main research question, certainty and uncertainty frames must be tested as well, while comparing FIRE-followers' responses to non-FIRE-followers' responses. To test whether uncertainty frames are more effective for FIRE-followers and non-FIRE-followers, hypothesis 4a is formulated as followed: *uncertainty framing has a more positive effect on people's willingness to start planning for future retirement compared to certainty framing.*

When the previous hypothesis (4a) is accepted or rejected, it is interesting to test whether uncertainty frames are more effective for FIRE-followers than non-FIRE-followers. Therefore, hypothesis 4b is as followed: *uncertainty framing has a more positive effect on FIRE-followers' willingness to start planning for future retirement in comparison to non-FIRE-followers.*

H5: Assuming, based on the third and fourth hypothesis, that loss and uncertainty framing are most effective in influencing both FIRE-followers' and non-FIRE-followers' willingness to start planning for future retirement, it is interesting to test whether combining these framing methods – therefore focusing on the interaction effect – will result in the most positive response on people's willingness to start planning for future retirement.

Therefore, the fifth hypothesis is formulated as followed: *combining loss and uncertainty framing has the most positive effect on both FIRE-followers' and non-FIRE-followers' willingness to start planning for future retirement.*

H6: As described for the first hypothesis, the amount of which FIRE-followers value financial independence is the highest motivator to start their so-called FIRE journey (TD Ameritrade, 2018). However, it is yet unknown what relationship this variable has in combination with the causal relationship between different types of framing and willingness to start planning for future retirement.

To determine in what way the amount of which FIRE-followers value financial independence is of influence on this causal relationship – the main topic of this thesis – financial independence as a moderating variable will be researched in relationship to the relationship between framing and willingness to start planning for future retirement. Therefore, the sixth hypothesis is as followed: *financial independence has a moderating effect on the relationship between framing and planning for future retirement, when financial independence is valued more the relationship between framing and planning for future retirement becomes stronger.*

H7: As described for the second hypothesis, FIRE-followers are likely to contain a certain amount of financial literacy (van Rooij, Lusardi & Alessie, 2011). However, for financial literacy it is unknown what relationship financial literacy in combination with the causal relationship between different types of framing and willingness to start planning for future retirement, at least when researching FIRE-followers.

To investigate how financial literacy influences the causal relationship between framing and willingness to start planning for future retirement, the seventh hypothesis can be formulated as followed: *financial literacy has a moderating effect on the relationship between framing and planning for future retirement, higher financial literacy means a stronger relationship between framing and planning for future retirement.*

2.3 Conceptual model

A conceptual model (Figure 1) was composed to give a clear overview of relevant variables (based on the literature review) and the corresponding to be tested relationships: all hypotheses.

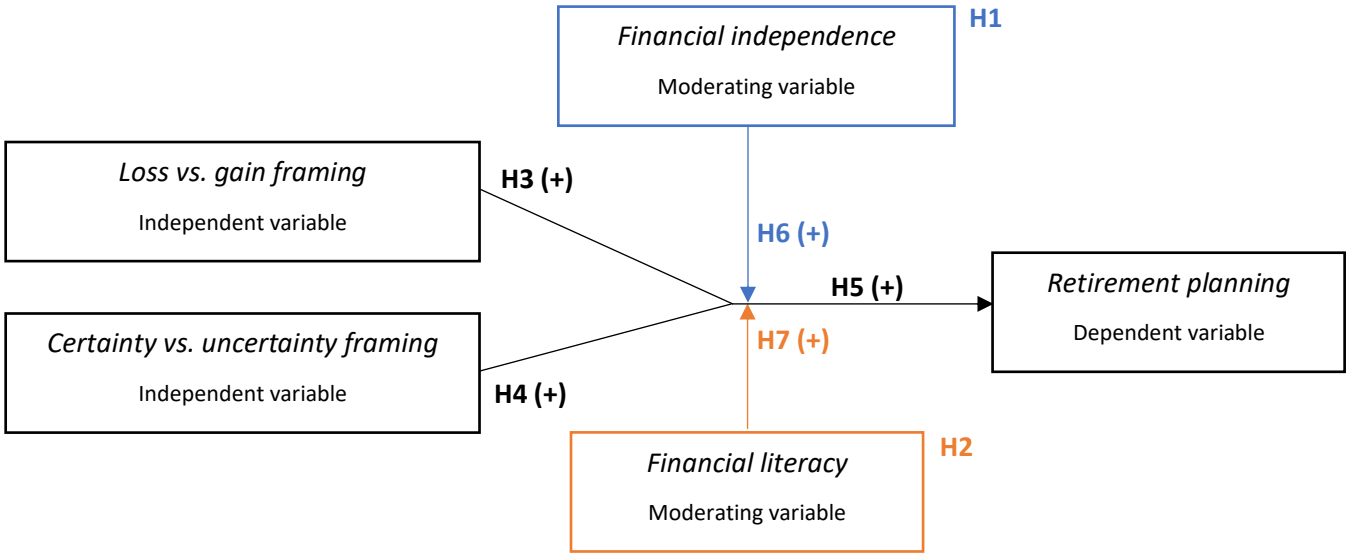

Figure 1: conceptual model

3. Method

3.1. Research approach

The main research question that is investigated in this thesis is:

> *"What influence does framing have on people's willingness to start planning for future retirement?"*

The aim to which this research question is investigated, is to prove the causal relationship between framing and the willingness to start planning for future retirement, by looking at FIRE-followers as a benchmark for what is to be achieved in an ideal situation.

Collecting data for the assessment of individual hypotheses is done through a conducted survey among both FIRE-followers and non-FIRE-followers with mostly the same demographics to account for people's possible demographic differences when comparing the two different groups (Mahajan, 2015). To make sure the control group matches the FIRE-followers' demography, the survey was conducted first among FIRE-followers. That way, data collection methods for the control group with non-FIRE-followers could be changed in such a way that the demographics of control group were still able to match the demographics of the treatment group.

Analysing the data was done first by testing the different hypothesis with statistical methods to assess their significancy assuming an α of 5%. When all these tests were conducted, linear regression analysis was used to measure the causal effect of the independent variables on the dependent variable.

3.2. Variables and measurements

In the conceptual model (visualized in previous chapter), the following variables are present: willingness to start planning for future retirement (dependent variable), loss vs. gain framing (independent variable), uncertainty vs. certainty framing (independent variable), financial independence (moderating variable), and financial literacy (moderating variable).

Willingness to start planning for future retirement: the dependent variable of the conceptual model. Willingness to start planning for future retirement is measured using a score from 1-7, answering a statement about being willingness to search for retirement related information online (none at all – a great deal) and was previously used in a study conducted in Germany to assess willingness to accept early retirement among online respondents (Schreiber & Weber, 2014). This scoring method is also often referred to as a Likert scale. This Likert scale to measure the willingness to start planning for future retirement is considered an ordinal variable, as this is widely considered to be the preferred method in defining a 5- or 7- point Likert scale, especially when the differences

between scores cannot be definitively defined as equal (Sullivan & Artino, 2013). This is also the case on this occasion when textual statements such as “a great deal” are translated into numerical scores for data analysis. While being an ordinal variable, this variable can also be described as continuous, as this is often the preferred method to analyse Likert scale data.

Loss vs. gain framing: one of the independent variables of the conceptual model. This variable explains whether a person was subjected in the survey to either loss or gain framing and was previously used in a survey-based experiment among 3,000 Dutch pension plan participants (Bockweg et al., 2017). As this variable can only take on two values, *loss vs. gain framing* is considered a binary variable, as well as nominal variable, because the values (0=loss framing, 1=gain framing) cannot be ranked or measured. Using these two possible values also means that the variable can be transformed into a dummy variable.

Uncertainty vs. certainty framing: one of the independent variables of the conceptual model. This variable explains whether a person was subjected in the survey to either uncertainty or certainty framing and was previously used in a study assessing the effects of using certainty and uncertainty framing in Colorado News Media (Blair et al., 2015). As this variable can only take on two values, *uncertainty vs. certainty framing* is considered a binary variable, as well as nominal variable, because the values (0=uncertainty framing, 1=certainty framing) cannot be ranked or measured. Using these two possible values also means that the variable can be transformed into a dummy variable.

Financial independence: one of the moderating variables of the conceptual model. This variable explains how much a person values the concept of financial independence. The variable is measured using a score from 1-5, answering a statement about valuing financial independence (none at all – a great deal) and was previously used in a study weighing the pros and cons regarding achieving financial independence (Langenderfer, 2012). This scoring method is also often referred to as a Likert scale. This Likert scale to measure the willingness to start planning for future retirement is considered an ordinal variable, as this is widely considered to be the preferred method in defining a 5- or 7- point Likert scale, especially when the differences between scores cannot be definitively defined as equal (Sullivan & Artino, 2013). This is also the case on this occasion when textual statements such as “a great deal” are translated into numerical scores for data analysis. Being an ordinal variable, this Likert scale variable is used as continuous variable, as this is often the preferred method of using Likert scale data.

Financial literacy: one of the moderating variables of the conceptual model. This variable explains how financially literate a person is on a score from 1-10 (higher score means more financially literate) based on survey answers and was previously used in a study to distinguish different levels of financial knowledge (Van Rooij, Lusardi & Alessi 2011). The scores are basically percentages of questions answered correctly, to be later transformed into a score from 1-10. Because the scores can be ordered based on its numerical value and the differences between the scores are meaningful, financial literacy is considered an interval variable. While being an interval variable, this variable can also be described and used as a continuous variable.

3.3. Model equation

In this research, the T-Test and moderation analyses (through Two-Way ANOVA) are used to test the different hypotheses regarding the effect of different types of framing on the willingness to start planning for future retirement. The choice for T-Test was made because the dependent variable is ordinal (but will be used as a continuous variable), while the independent variables are nominal as well. Furthermore, moderation analyses through Two-Way ANOVA are necessary to assess the moderating effect of financial independence and financial literacy on the relationship between framing methods and willingness to start planning for future retirement.

To further assess the extent of the causal effect of the different independent variables on the dependent variable, linear regression was used. Linear regression is the appropriate statistical method on this occasion because both the dependent and independent variables are continuous. Hence, the following model equation is formulated (Figure 2), assuming an α of 5%. Parts of this model equation will be used to calculate causal effects using linear regression for individual hypotheses.

Retirement planning intention = $\beta 0 + \beta 1 * LossFraming_{dummy} + \beta 2 * UncertaintyFraming_{dummy} + \beta 3 * (LossFraming_{dummy} * UncertaintyFraming_{dummy}) + \beta 4 * Framing + \beta 5 * FinancialIndependence + \beta 6 * (Framing * FinancialIndependence) + \beta 4 * Framing + \beta 7 * FinancialLiteracy + \beta 8 * (Framing * FinancialLiteracy) + \varepsilon$

Figure 2: model equation

Looking at individual hypotheses, different regression models can be formulated for the more complicated hypotheses (5, 6, and 7). These individual regression model equations are as followed.

Interaction effect between loss and uncertainty frames = $\beta 0 + \beta 3 * (LossFraming_{dummy} * UncertaintyFraming_{dummy}) + \varepsilon$

Figure 3: model equation – hypothesis 5

Moderating effect of financial independence on framing = $\beta 0 + \beta 4 * Framing + \beta 5 * FinancialIndependence + \beta 6 * (Framing * FinancialIndependence) + \varepsilon$

Figure 4: model equation – hypothesis 6

Moderating effect of financial literacy on framing = $\beta 0 + \beta 4 * Framing + \beta 7 * FinancialLiteracy + \beta 8 * (Framing * FinancialLiteracy) + \varepsilon$

Figure 5: model equation – hypothesis 7

3.4. Data collection

For answering the individual hypotheses, a survey was designed in Qualtrics and conducted between the 17th of November 2021 and 1st of December 2021 among two different groups, FIRE-followers, and non-FIRE-followers. The two different group are Dutch FIRE-followers and a (if possible) demographically comparable group of people to control for possible demographic differences.

The survey contains demographics related questions (descriptive statistics), questions regarding financial literacy to determine a person's score on this subject, a question about how much financial independence is valued, information that is framed through either a loss or gain frame, information that is framed through either an uncertainty or a certainty frame, and a question about willingness to start planning for future retirement. All survey questions (including message framing) can be found in Appendix I.

To gather the right respondents for the FIRE-followers' sample, the survey was posted and explained in a Reddit post in the r/DutchFIRE subreddit. This forum contains only Dutch people looking to further educate themselves on the topic of FIRE in the Netherlands. It is also worth mentioning that it contains over 49,000 members, which means that this forum is by far the biggest place on the internet where Dutch FIRE-followers gather, talk, and educate themselves and each other (Reddit, 2015).

The collection of respondents for the non-FIRE-followers' sample was done with control for the FIRE-followers' sample motivations and demographics in mind. Therefore, this group of respondents was also found on Reddit, in the general "The Netherlands" subreddit: r/thenetherlands. This subreddit is the biggest collection of Dutch Reddit users (over 400,000).

3.5. Sample

It is hard to estimate how much FIRE-followers exist worldwide, but the most well-known community in The Netherlands (r/DutchFIRE subreddit on Reddit) contains over 49,000 members (Reddit, 2015), while the biggest international community (r/financialindependence subreddit on Reddit) contains over 1,000,000 members (Reddit, 2011). After data collection was completed, a total sample size of 404 respondents was mainly collected through Reddit, to represent the Dutch FIRE-followers and non-FIRE followers as a control group. The sample size for FIRE-followers are 202 respondents and the sample size of non-FIRE-followers is also 202 respondents.

Looking at the research sample, 60.6% is male and 39.4% is female. Furthermore, the most well represented age groups are 25-34 (41.4%), 35-44 (19.7%), and 18-24 (18.2%). When looking at FIRE-followers and non-FIRE-followers individually however, differences in gender and age are noticeable. The FIRE-followers sample is 78.2% male and 20.8% female (1% prefers not to disclose their gender). The non-FIRE-followers sample is 44% male and 54% female (2% prefers not to disclose their gender / identifies as non-binary). Furthermore, the FIRE-followers sample contains mostly respondents aged 25-34 (64.4%). On the contrary, the non-FIRE-followers sample is more equally distributed among different age groups. 22.8% is aged 18-24, 20.8% is aged 35-44, 18.8% is aged 25-34, 15.8% is aged >65, and 13.8% is aged 45-54.

Moreover, when looking at the descriptive statistics for qualification and income; 73.9% has obtained a bachelor's degree (HBO / university) or higher (master's degree and / or doctoral degree), while income is more equally distributed. Looking at yearly gross income, 16.7% earns less than €20,000, 17.7% earns €20,000 – €35,000, 25.6% earns €35,000 - €50,000, and 18.7% earns €50,000 - €65,000. However, for non-FIRE-followers the majority (59%) earns less than €35,000, when most FIRE-followers (85.2%) earn more than €35,000. Qualification levels are not completely equal either. 54.5% of on-FIRE-followers have obtained a bachelor's degree or higher, while 94.1% of FIRE-followers have done the same. The overview of the above-mentioned descriptive statistics can be found in Table 1 (detailed descriptive statistics for the demographics of the samples for both FIRE-followers and non-FIRE-followers can be found in Appendix II).

Table 1: descriptive statistics – demographics

		Male	**Female**	**Age**	**Qualification**	**Income**
		%	%	Mean	Bachelor's degree + (%)	Mean
Group	**FIRE-followers**	78.2	20.8	36	94.1	€47,000
	Non-FIRE-followers	44	54	35	54.5	€26,000

3.6. Reliability and validity

To make sure the data that was collected is both reliable and valid, the following has been considered. First, the sample size of both FIRE-followers and non-FIRE-followers. The target sample size for both data samples representing larger groups of people was 200 respondents (400 in total). In the end this required sample size of 400 respondents in total was achieved by a total sample size of 406 respondents. Between-subjects research design was used to randomly distribute different framing methods among both these groups (FIRE and non-FIRE), which is why a larger than usual sample size was necessary to ensure reliability of the survey results. The software used (Qualtrics) has not managed an absolute random treatment distribution, which is why N=124 for loss framing, N=70 for gain framing, N=104 for uncertainty framing, and N=106 for certainty framing. Another reason for less reliability is the fact that the sample participants are significantly skewed to male population and high education levels. This applies to the FIRE-followers even more so compared to non-FIRE-followers. Both issues – randomization and skewness – will be discussed further in the limitations and further research paragraph of chapter 5.

Furthermore, the validity of the survey results has been ensured by making sure the questions used were appropriate for representing the different variables. Meaning that, when possible, previous research was conducted for survey questions to represent the different variables appropriately. Demographics related questions (Van Dijl, 2019), questions to determine financial literacy (Van Rooij, Lusardi & Alessie, 2011), financial independence (Langenderfer, 2012), and different framing methods such as loss vs. gain (Eberhardt et al., 2017), uncertainty vs. certainty (Blair et al., 2015) have been used in previous research before. This is also the case for questions determining the willingness to start planning for future retirement (Schreiber & Weber, 2014).

Last, to make sure internal consistency and therefore reliability is ensured for the collected data, Cronbach's alpha (Cronbach, 1951) was used to validate the reliability of the survey results. The limit for an acceptable amount of internal consistency when using Cronbach's alpha is >.7. To measure financial literacy as a moderating variable, multiple survey questions were used to come up with a score from 1-10. Other variables only have one related question, which is why Cronbach's alpha is only relevant to measure internal consistency for the financial literacy related questions. The statistics for Cronbach's alpha regarding the moderating variable (financial literacy) can be found in Table 2. Table 2 shows that for FIRE-followers internal consistency between financial literacy related questions is unacceptable, and for non-FIRE-followers that internal consistency for financial literacy related questions is questionable. This can be explained by the fact that inter-item correlation between financial literacy related questions for FIRE-followers is not in the acceptable range of 0.15-0.50 (Briggs & Cheek, 1986). These values of inter-item correlation can be explained by the fact that the financial literacy related question data is expressed in binary (0=wrong answer, 1=right answer).

The highly educated FIRE-followers have not given many wrong answers, which is explained by the very high average mean of .944, meaning that when a question is answered wrongly, it is very unlikely another mistake will be made in a financial literacy related question. This is less so the case with non-FIRE-followers with an average mean of .663, who are therefore also achieving an acceptable range of inter-item correlation. The detailed reliability statistics regarding both Cronbach's alpha and inter-item correlation can be found in Appendix III.

Table 2: reliability statistics – financial literacy

Variable	**Cronbach's alpha**	**N of items**
Financial literacy – FIRE	.174	4
Financial literacy – non-FIRE	.623	4

3.7. Data analysis

Data analysis of the survey results started by calculating the mean and standard deviation for all survey questions. Internal consistency was computed using Cronbach's alpha. Statistical differences between FIRE-followers and non-FIRE-followers in this regard have been calculated using the Independent Sample T-Test for both financial independence and financial literacy related variables. Furthermore, the Independent Sample T-Test was used to calculate a statistical difference (significance) between framing methods on its effect on willingness to start planning for future retirement. To further assess the extent of the causal effect of the different independent variables on the dependent variable, linear regression was used. Linear regression is the appropriate statistical method on this occasion because the dependent variable is continuous. Last, the interaction and moderation analyses were conducted using Two-Way ANOVA, because the independent variable(s) – framing methods – are categorical. All the statistical methods have been conducted assuming an α of 5%, unless otherwise is described.

4. Results

4.1. Differences in valuing financial independence

The first hypothesis that is tested revolves around the differences between FIRE-followers and non-FIRE-followers in how much they value financial independence as a concept. The hypothesis states that FIRE-followers value financial independence more than non-FIRE-followers do, which is tested using an Independent Sample T-Test in SPSS (one-tailed). This test has been conducted assuming an α of 5%. The results are displayed in Table 3.

Table 3: Independent Sample T-Tests

T-Test	Independent variable	N	Mean	Sig. (two-tailed)
Financial independence - FIRE vs. non-FIRE	*Financial independence (FIRE)*	202	4.000	.000
	Financial independence (non-FIRE)	202	3.320	
Financial literacy - FIRE vs. non-FIRE	*Financial literacy (FIRE)*	202	9.443	.000
	Financial literacy (non-FIRE)	202	6.634	
Loss vs. gain framing	*Loss framing*	124	2.65	.686
	Gain framing	70	2.57	
Loss framing – FIRE vs. non-FIRE	*Loss framing (FIRE)*	50	2.64	.971
	Loss framing (non-FIRE)	74	2.65	
Uncertainty vs. certainty framing	*Uncertainty framing*	104	2.92	.068
	Certainty framing	106	2.62	
Uncertainty framing – FIRE vs. non-FIRE	*Uncertainty framing (FIRE)*	54	3.15	.065
	Uncertainty framing (non-FIRE)	50	2.68	

The mean of how much FIRE-followers value financial independence is compared with the mean of how much non-FIRE-followers value financial independence using an Independent Sample T-Test in SPSS (Table 3). A more detailed table of the Independent Sample T-Test can be found in Appendix IV. Both samples are N=202. Because the Levene's Test indicates a significant result, as p=.000, being lower than p=.050, equal variances can be assumed, and the first table row can be analysed. Furthermore, the statistical difference (significance) between both means should be divided by two as the hypothesis indicates a one-tailed T-Test. Therefore, p=.000, lower than p=.025. This means that assuming an α of 5% the hypothesis that states that FIRE-followers value financial independence more than non-FIRE-followers is to be supported.

4.2. Differences in financial literacy

The second hypothesis that is tested revolves around the differences between FIRE-followers and non-FIRE-followers in how financially literate they are. Based on four different questions regarding basic concepts of finance, a score was formulated for every individual participant. The hypothesis states that FIRE-followers are more financially literate than non-FIRE-followers are, which is tested using an Independent Samples T-Test in SPSS. This test has been conducted assuming an α of 5%. The results are displayed in Table 3.

The mean of how financially literate FIRE-followers are (based on a score from 1-10) is compared with how financially literate non-FIRE-followers are using an Independent Sample T-Test in SPSS (Table 3). A more detailed table of the Independent Sample T-Test can be found in Appendix IV. Both samples are N=202. Because the Levene's Test indicates a significant result, as p=.000, being lower than p=.050, equal variances can be assumed, and the first table row can be analysed. Furthermore, the statistical difference (significance) between both means should be divided by two as the hypothesis indicates a one-tailed T-Test. Therefore, p=.000, lower than p=.025. This means that assuming an α of 5% the hypothesis that states that FIRE-followers are more financially literate than non-FIRE-followers is to be supported.

4.3. Loss and gain framing

The third hypothesis that is tested revolves around the effects of loss and gain framing on people's willingness to start planning for future retirement. The data for this hypothesis was collected by randomly displaying loss / gain framed text before asking a question about willingness to look up retirement related information. The first part (a) of the hypothesis states that loss framing has a more positive effect on retirement planning than gain framing does. To establish a statistical difference between both types of framing, an Independent Sample T-Test was used in SPSS. This test has been conducted assuming an α of 5%. Furthermore, to establish how large the causal effect of the different types of framing are on retirement planning, linear regression was applied in SPSS.

The mean of willingness to start planning for future retirement (based on a score from 1-5) is compared between respondents that have seen loss framing and respondents that have seen gain framing using an Independent Sample T-Test in SPSS (Table 3). A more detailed table of the Independent Sample T-Test can be found in Appendix IV. The samples are N=124 (loss framing) and N=70 (gain framing). Because the Levene's Test indicates a significant result, as p=.038, being lower than p=.050, equal variances can be assumed, and the first table row can be analysed. Furthermore, the statistical difference (significance) between both means should be divided by two as the hypothesis indicates a one-tailed T-Test. Therefore, p=.343, higher than p=.025. This means that assuming an α of 5% the hypothesis that states that loss framing has a more positive effect on

retirement planning than gain framing does is to be rejected. There is no significant difference between the two means.

Table 4: Linear regression analysis – Loss vs. gain framing

Model	**B**	**Std.**	**Sig.**
Constant	2.771	.083	.000
Loss framing	-.126	.137	.356
Gain framing	-.200	.166	.230

The causal effect of loss and gain framing on willingness to start planning for future retirement is modelled through linear regression (Table 4). More detailed tables of the linear regression analysis for this hypothesis can be found in Appendix V. Through the Independent Sample T-Test it was already established that there was no significant difference between loss and gain framing in effect on willingness to start planning for future retirement. Table 4 shows that both framing methods don't have significant effects on willingness to start planning for future retirement either. For loss framing p=.356, which is higher than p=.050. Assuming an α of 5%, this is no significant effect on the dependent variable. For gain framing p=.230, which is higher than p=0.050. Assuming an α of 5%, this is no significant effect on the dependent variable.

Table 4 also shows that both loss framing and gain framing have negative unstandardized effects on the dependent variable. For loss framing β_{Loss}=-.126 and for gain framing β_{Gain}=-.200. There is a small difference between both types of framing, which indicates that loss framing has a less negative impact on the dependent variable compared to gain framing. However, both effects have been proven insignificant with a p-value higher than .050 and the difference between both effects has been proven insignificant as well by the Independent Sample T-Test. This means that assuming an α of 5% the hypothesis that states that loss framing has a more positive effect on retirement planning than gain framing does is to be rejected. Both types of framing do not have a significant effect on the dependent variable.

The second part (b) of the hypothesis states that loss framing has a more positive effect on retirement planning of FIRE-followers in comparison to non-FIRE-followers. To establish a statistical difference between the effect on both groups, an Independent Sample T-Test was used in SPSS. This test has been conducted assuming an α of 5%. Furthermore, to establish how large the causal effect of loss framing was on the different groups, linear regression was applied in SPSS.

The mean of willingness to start planning for future retirement (based on a score from 1-5) is compared between FIRE-followers that have seen loss framing non-FIRE-followers that have seen

loss framing using an Independent Sample T-Test in SPSS (Table 3). A more detailed table of the Independent Sample T-Test can be found in Appendix IV. The samples are N=50 (FIRE-followers) and N=74 (non-FIRE-followers). Because the Levene's Test indicates an insignificant result, as *p*=.731, being higher than *p*=.050, equal variances cannot be assumed, and the second table row must be analysed. Furthermore, the statistical difference (significance) between both means should be divided by two as the hypothesis indicates a one-tailed T-Test. Therefore, *p*=.486, higher than *p*=.025. This means that assuming an α of 5% the hypothesis that states that loss framing has a more positive effect on FIRE-followers' willingness to start planning for future retirement compared to non-FIRE-followers' willingness to start planning for future retirement is to be rejected. There is no significant difference between the two means.

Table 5: Linear regression analysis – FIRE / Non-FIRE and loss framing

Model	**B**	**Std.**	**Sig.**
Constant	2.721	.072	.000
Loss framing (FIRE)	-.081	.185	.661
Loss framing (non-FIRE)	-.073	.158	.645

The causal effect of loss framing on FIRE-followers' and non-FIRE-followers' willingness to start planning for future retirement is modelled through linear regression (Table 5). More detailed tables of the linear regression analysis for this hypothesis can be found in Appendix V. Through the Independent Sample T-Test it was already established that there was no significant difference between the effect of loss framing on FIRE-followers' willingness to start planning for future retirement and non-FIRE-followers' willingness to start planning for future retirement. Table 5 shows that loss framing does not have a significant effect on the willingness to start planning for future retirement either. For FIRE-followers *p*=.661, which is higher than *p*=.050. Assuming an α of 5%, this is no significant effect on the dependent variable. For non-FIRE-followers *p*=.645, which is higher than *p*=0.050. Assuming an α of 5%, this is no significant effect on the dependent variable.

Table 5 also shows that for both groups, loss framing has negative unstandardized effects on the dependent variable. For FIRE-followers β_{Loss}=-.081 and for non-FIRE-followers β_{Loss}=-.073. There is a small difference between both groups, which indicates that loss framing has a less negative impact on non-FIRE-followers' willingness compared to FIRE-followers' willingness. However, both effects have been proven insignificant with a *p*-value higher than .050 and the difference between both effects has been proven insignificant as well by the Independent Sample T-Test. This means that assuming an α of 5% the hypothesis that states that loss framing has a more positive effect on FIRE-

followers' willingness to start planning for future retirement compared to non-FIRE-followers' willingness to start planning for future retirement is to be rejected. Loss framing does not have a significant effect on the dependent variable for both groups.

4.4. Uncertainty and certainty framing

The fourth hypothesis that is tested revolves around the effects of uncertainty and certainty framing on people's willingness to start planning for future retirement. The data for this hypothesis was collected by randomly displaying uncertainty / certainty framed text before asking a question about willingness to look up retirement related information. The first part (a) of the hypothesis states that uncertainty framing has a more positive effect on retirement planning than certainty framing does. To establish a statistical difference between both types of framing, an Independent Sample T-Test was used in SPSS. This test has been conducted assuming an α of 5%. Furthermore, to establish how large the causal effect of the different types of framing are on retirement planning, linear regression was applied in SPSS.

The mean of willingness to start planning for future retirement (based on a score from 1-5) is compared between respondents that have seen uncertainty framing and respondents that have seen certainty framing using an Independent Sample T-Test in SPSS (Table 3). A more detailed table of the Independent Sample T-Test can be found in Appendix IV. The samples are N=104 (uncertainty framing) and N=106 (certainty framing). Because the Levene's Test indicates a significant result, as p=.050, being equal to p=.050, equal variances can be assumed, and the first table row can be analysed. Furthermore, the statistical difference (significance) between both means should be divided by two as the hypothesis indicates a one-tailed T-Test. Therefore, p=.034, higher than p=.025. This means that assuming an α of 5% the hypothesis that states that uncertainty framing has a more positive effect on retirement planning than certainty framing does is to be rejected. There is no significant difference between the two means.

Table 6: Linear regression analysis – Uncertainty vs. certainty framing

Model	**B**	**Std.**	**Sig.**
Constant	2.619	.086	.000
Uncertainty framing	.305	.146	.038
Certainty framing	.004	.145	.978

The causal effect of uncertainty and certainty framing on willingness to start planning for future retirement is modelled through linear regression (Table 6). More detailed tables of the linear

regression analysis for this hypothesis can be found in Appendix V. Through the Independent Sample T-Test it was already established that there was no significant difference between uncertainty and certainty framing in effect on willingness to start planning for future retirement. Table 6 shows that only uncertainty framing has a significant effect on willingness to start planning for future retirement. For uncertainty framing p=.038, which is lower than p=.050. Assuming an α of 5%, this is a significant effect on the dependent variable. For certainty framing p=.978, which is higher than p=0.050. Assuming an α of 5%, this is no significant effect on the dependent variable.

Table 6 also shows that both uncertainty framing and certainty framing have positive unstandardized effects on the dependent variable. For uncertainty framing $\beta_{Uncertainty}$=.305 and for certainty framing $\beta_{Certainty=}$.004. There is a noticeable difference between both types of framing, which indicates that uncertainty framing has a more positive impact on the dependent variable compared to certainty framing. However, while the causal effect of uncertainty framing has been proven to be significant, the difference between both effects has been proven insignificant by the Independent Sample T-Test. This means that assuming an α of 5% the hypothesis that states that uncertainty framing has a more positive effect on retirement planning than certainty framing does is to be rejected. Only uncertainty framing has a significant effect on the dependent, but not a significant difference with the effect of certainty framing.

The second part (b) of the hypothesis states that uncertainty framing has a more positive effect on retirement planning of FIRE-followers in comparison to non-FIRE-followers. To establish a statistical difference between the effect on both groups, an Independent Sample T-Test was used in SPSS. This test has been conducted assuming an α of 5%. Furthermore, to establish how large the causal effect of uncertainty framing was on the different groups, linear regression was applied in SPSS.

The mean of willingness to start planning for future retirement (based on a score from 1-5) is compared between FIRE-followers that have seen uncertainty framing and non-FIRE-followers that have seen uncertainty framing using an Independent Sample T-Test in SPSS (Table 3). A more detailed table of the Independent Sample T-Test can be found in Appendix IV. The samples are N=54 (FIRE-followers) and N=50 (non-FIRE-followers). Because the Levene's Test indicates an insignificant result, as p=.266, being higher than p=.050, equal variances cannot be assumed, and the second table row must be analysed. Furthermore, the statistical difference (significance) between both means should be divided by two as the hypothesis indicates a one-tailed T-Test. Therefore, p=.033, higher than p=.025. This means that assuming an α of 5% the hypothesis that states that uncertainty framing has a more positive effect on FIRE-followers' willingness to start planning for future retirement compared to non-FIRE-followers' willingness to start planning for future retirement is to be rejected. There is no significant difference between the two means.

Table 7: Linear regression analysis – FIRE / Non-FIRE and uncertainty framing

Model	**B**	**Std.**	**Sig.**
Constant	2.620	.069	.000
Uncertainty framing (FIRE)	.528	.177	.003
Uncertainty framing (non-FIRE)	.060	.182	.742

The causal effect of uncertainty framing on FIRE-followers' and non-FIRE-followers' willingness to start planning for future retirement is modelled through linear regression (Table 7). More detailed tables of the linear regression analysis for this hypothesis can be found in Appendix V. Through the Independent Sample T-Test it was already established that there was no significant difference between the effect of uncertainty framing on FIRE-followers' willingness to start planning for future retirement and non-FIRE-followers' willingness to start planning for future retirement. Table 7 shows that uncertainty framing does have a significant effect on FIRE-followers' willingness to start planning for future retirement, but not on non-FIRE-followers' willingness to start planning for future retirement. For FIRE-followers p=.003, which is lower than p=.050. Assuming an α of 5%, this is a significant effect on the dependent variable. For non-FIRE-followers p=.742, which is higher than p=0.050. Assuming an α of 5%, this is no significant effect on the dependent variable.

Table 7 also shows that for both groups, uncertainty framing has positive unstandardized effects on the dependent variable. For FIRE-followers $\beta_{Uncertainty}$=.528 and for non-FIRE-followers $\beta_{Uncertainty}$=.060. There is a noticeable difference between both groups, which indicates that uncertainty framing has a more positive impact on FIRE-followers' willingness compared to non-FIRE-followers' willingness. However, only the effect of uncertainty on FIRE-followers has been proven significant with a p-value lower than .050, while the difference between both effects has been proven insignificant by the Independent Sample T-Test. This means that assuming an α of 5%, the hypothesis that states that uncertainty framing has a more positive effect on FIRE-followers' willingness to start planning for future retirement compared to non-FIRE-followers' willingness to start planning for future retirement is to be rejected. There is no significant difference in uncertainty framing's effect on the dependent variable for both groups.

4.5. Loss and uncertainty framing

The fifth hypothesis that is tested revolves around maximizing the effects of loss and uncertainty framing on people's willingness to start planning for future retirement, assuming these types of framing do indeed have the most positive effect on retirement planning compared to both gain and

certainty framing. The hypothesis states that combining loss and uncertainty framing – therefore focusing on the interaction effect of loss framing on uncertainty framing (due to its significant effect on the dependent variable) – has the most positive effect on retirement planning. To establish a statistical difference between this combination and other types of framing, Two-Way ANOVA was used in SPSS. This test has been conducted assuming an α of 5%. Furthermore, to establish how large this interaction and causal effect on retirement planning of combining loss and uncertainty framing is, linear regression was applied in SPSS.

Table 8: Two-Way ANOVA – Interaction effect loss and uncertainty framing

Variable	**Mean Square**	**F**	**Sig.**
Loss framing	1.162	.806	.370
Uncertainty framing	6.866	4.764	.030
*Loss framing*uncertainty framing*	3.273	2.271	.133

Using Two-Way ANOVA in SPSS, the effects of loss framing, uncertainty framing and the interaction effect between loss and uncertainty framing on willingness to start planning for future retirement are compared (Table 8). A more detailed table of Two-Way ANOVA can be found in Appendix VI. Because the Levene's Test indicates a significant result, as p=.012, being lower than p=.050, equal variances (homogeneity) can be assumed. Looking at Table 8, loss framing has a p=.370, being higher than p=.050. Assuming an α of 5%, this means that loss framing as a variable has a statistically insignificant effect on the dependent variable. This is not the case for uncertainty framing, which has p=.030 being lower than p=.050, a significant effect on the dependent variable. The interaction effect between loss and uncertainty framing has a p=.133 being higher than p=.050. The interaction effect between loss and uncertainty framing on the dependent variable is therefore not significant when assuming an α of 5%.

Table 9: Linear regression analysis – Interaction effect loss and uncertainty framing

Model	**B**	**Std.**	**Sig.**
Constant	2.559	.211	.000
Loss framing	-.076	.130	.558
Uncertainty framing	.278	.160	.082
*Loss framing*uncertainty framing*	.043	.141	.761

The causal effect of loss framing, uncertainty framing and the combined interaction effect on willingness to start planning for future retirement is modelled through linear regression (Table 9). More detailed tables of the linear regression analysis for this hypothesis can be found in Appendix V. Through the Two-Way ANOVA it was already established that only uncertainty framing had a statistically significant effect on willingness to start planning for future retirement. Table 9 shows that no independent variable has a significant effect on willingness to start planning for future retirement. For loss framing p=.558, which is higher than p=.050. Assuming an α of 5%, this is an insignificant effect on the dependent variable. For uncertainty framing p=.082, which is higher than p=0.050. Assuming an α of 5%, this is no significant effect on the dependent variable. Last, for the interaction (moderation) effect p=.761, which is higher than p=.050. Assuming an α of 5%, this is no significant effect on the dependent variable.

Table 9 also shows that both uncertainty framing and the interaction effect have positive unstandardized effects on the dependent variable, compared to the negative unstandardized effect of loss framing. For loss framing β_{Loss}=-.076, for uncertainty framing $\beta_{Uncertainty}$=.278 and for the interaction effect $\beta_{Loss*Uncertainty}$=.043. This indicates the positive (moderating) effect of financial independence on the effect of framing on the dependent variable. However, while the effect of uncertainty framing has been proven to be significant by Two-Way ANOVA, the interaction effect has been proven insignificant by Two-Way ANOVA and the above linear regression analysis. This means that assuming an α of 5% the hypothesis that states that combining both loss and uncertainty framing for the highest causal (significant) effect on the willingness to start planning for future retirement is to be rejected. Last, the following regression model can be made (including standardized coefficients, see Appendix V):

Interaction effect between loss and uncertainty frames = $2.559 + .018 * (LossFraming_{dummy} * UncertaintyFraming_{dummy}) + \varepsilon$

Equation 1

4.6. Moderation effect of financial independence

The sixth hypothesis that is tested revolves around the moderating effect of how much financial independence is valued on the causal effect of framing on willingness to start planning for future retirement. The hypothesis states that when financial independence is valued more, the relationship between framing and retirement planning becomes stronger. To establish a statistically significant moderating effect on this relationship, Two-Way ANOVA was used in SPSS. This test has been conducted assuming an α of 5%. Furthermore, to establish wat taking this moderating effect into

account means for how large the causal effect of framing is on retirement planning, linear regression was applied in SPSS.

Table 10: Two-Way ANOVA – Moderation effect financial independence

Variable	**Mean Square**	**F**	**Sig.**
Financial independence	14.340	11.018	.000
Framing	.454	.349	.790
*Financial independence * Framing*	1.161	.892	.541

Using Two-Way ANOVA in SPSS, the effects of financial independence, framing and the interaction effect between financial independence and framing on willingness to start planning for future retirement are compared (Table 10). A more detailed table of Two-Way ANOVA can be found in Appendix VI. Because the Levene's Test indicates a significant result, as p=.000, being lower than p=.050, equal variances (homogeneity) can be assumed. Looking at Table 10, financial independence has a p=.000, being lower than p=.050. Assuming an α of 5%, this means that financial independence as a variable has a statistically significant effect on the dependent variable. This is not the case for both framing and the interaction effect between financial independence and framing. Framing has a p=.790 and the interaction effect has a p=.541. Both P-values are higher than p=.050, and therefore not statistically significant when assuming an α of 5%.

Table 11: Linear regression analysis – Moderation effect financial independence

Model	**B**	**Std.**	**Sig.**
Constant	1.737	.455	.000
Financial independence	.258	.122	.036
Framing	-.211	.190	.267
*Financial independence * Framing*	.059	.051	.244

The causal effect of financial independence, framing and the combined interaction effect on willingness to start planning for future retirement is modelled through linear regression (Table 11). More detailed tables of the linear regression analysis for this hypothesis can be found in Appendix V. Through the Two-Way ANOVA it was already established that only financial independence had a statistically significant effect on willingness to start planning for future retirement. Table 11 shows that only financial independence has a significant effect on willingness to start planning for future retirement. For financial independence p=.036, which is lower than p=.050. Assuming an α of 5%, this

is a significant effect on the dependent variable. For framing p=.267, which is higher than p=0.050. Assuming an α of 5%, this is no significant effect on the dependent variable. Last, for the interaction (moderation) effect p=.244, which is higher than p=.050. Assuming an α of 5%, this is no significant effect on the dependent variable.

Table 11 also shows that both financial independence and the interaction effect have positive unstandardized effects on the dependent variable, compared to the negative unstandardized effect of framing. For financial independence $\beta_{FinancialIndependence}$=.258 and for the interaction effect $\beta_{FinancialIndependence*Framing}$=.059. This indicates the positive (moderating) effect of financial independence on the effect of framing on the dependent variable. However, while the causal effect of financial independence has been proven to be significant, the interaction effect has been proven insignificant by Two-Way ANOVA and the above linear regression analysis. This means that assuming an α of 5% the hypothesis that states that financial independence has a positive moderating effect on the relationship between framing and willingness to start planning for future retirement is to be rejected. Last, the following regression model can be made (including standardized coefficients, see Appendix V):

Moderating effect of financial independence on framing = 1.737 + (-.206) * Framing + .215 * FinancialIndependence + .247 * (Framing * FinancialIndependence) + ε

Equation 2

4.7. Moderation effect of financial literacy

The seventh hypothesis that is tested revolves around the moderating effect of financial literacy on the causal effect of framing on willingness to start planning for future retirement. The hypothesis states that when financial literacy is higher, the relationship between framing and retirement planning becomes stronger. To establish a statistically significant moderating effect on this relationship, Two-Way ANOVA was used in SPSS. This test has been conducted assuming an α of 5%. Furthermore, to establish what taking this moderating effect into account means for how large the causal effect of framing is on retirement planning, linear regression was applied in SPSS.

Table 12: Two-Way ANOVA – Moderation effect financial literacy

Variable	**Mean Square**	**F**	**Sig.**
Financial literacy	1.496	1.067	.373
Framing	4.000	.951	.416
*Financial literacy * Framing*	3.472	2.476	.009

Using Two-Way ANOVA in SPSS, the effects of financial literacy, framing and the interaction effect between financial literacy and framing on willingness to start planning for future retirement are compared (Table 12). A more detailed table of Two-Way ANOVA can be found in Appendix VI. Because the Levene's Test indicates a significant result, as *p*=.000, being lower than *p*=.050, equal variances (homogeneity) can be assumed. Looking at Table 12, financial literacy has a *p*=.373, being higher than *p*=.050. Assuming an α of 5%, this means that financial independence as a variable has a statistically insignificant on the dependent variable. This is also the case for framing, which has a *p*=.790 being higher than *p*=.050. However, the interaction effect between financial literacy and framing has a *p*=.009 being lower than *p*=.050. Therefore, when assuming an α of 5%, the moderating effect of financial literacy on the relationship between framing and willingness to start planning for future retirement is significant.

Table 13: Linear regression analysis – Moderation effect financial literacy

Model	**B**	**Std.**	**Sig.**
Constant	2.559	.441	.000
Financial literacy	.010	.053	.845
Framing	-.053	.160	.742
*Financial literacy * Framing*	.009	.019	.624

The causal effect of financial literacy, framing and the combined interaction effect on willingness to start planning for future retirement is modelled through linear regression (Table 13). More detailed tables of the linear regression analysis for this hypothesis can be found in Appendix V. Through the Two-Way ANOVA it was already established that only the interaction effect between financial literacy and framing had a statistically significant effect on willingness to start planning for future retirement. Table 13 shows that no independent variable has a significant causal effect on willingness to start planning for future retirement. For financial literacy *p*=.845, which is higher than *p*=.050. Assuming an α of 5%, this is an insignificant effect on the dependent variable. For framing *p*=.742, which is higher than *p*=0.050. Assuming an α of 5%, this is no significant effect on the dependent variable. Last, for the interaction (moderation) effect *p*=.624, which is higher than *p*=.050. Assuming an α of 5%, this is no significant effect on the dependent variable.

Table 13 also shows that both financial literacy and the interaction effect have positive unstandardized effects on the dependent variable, compared to the negative unstandardized effect of framing. For financial literacy $\beta_{FinancialLiteracy}$=.010 and for the interaction effect

$\beta_{FinancialLiteracy*Framing}$=.009. This indicates the positive (moderating) effect of financial independence on the effect of framing on the dependent variable. However, while the interaction effect between financial literacy and framing has been proven to be significant by Two-Way ANOVA, the causal positive effect has been proven insignificant by the above linear regression analysis. This means that assuming an α of 5% the hypothesis that states that financial literacy has a positive moderating effect on the relationship between framing and willingness to start planning for future retirement is to be rejected. Last, the following regression model can be made (including standardized coefficients, see Appendix V):

Moderating effect of financial literacy on framing = 2.559 + (-.052) * Framing + .024 * FinancialLiteracy + .096 * (Framing * FinancialLiteracy) + ε

Equation 3

4.8. Summary of hypotheses

The results (supported / rejected) for all individual hypotheses are combined in Table 14.

Table 14: Summary and results of hypotheses

	Hypotheses	**Result**
1.	*FIRE-followers value financial independence more than non-FIRE-followers.*	Supported
2.	*FIRE followers are more financially literate than non-FIRE-followers.*	Supported
3a.	*Loss framing has a more positive effect on people's willingness to start planning for future retirement compared to gain framing.*	Rejected
3b.	*Loss framing has a more positive effect on FIRE-followers' willingness to start planning for future retirement in comparison to non-FIRE-followers.*	Rejected
4a.	*Uncertainty framing has a more positive effect on people's willingness to start planning for future retirement compared to certainty framing.*	Rejected
4b.	*Uncertainty framing has a more positive effect on FIRE-followers' willingness to start planning for future retirement in comparison to non-FIRE-followers.*	Rejected
5.	*Combining loss and uncertainty framing has the most positive effect on both FIRE-followers' and non-FIRE-followers' willingness to start planning for future retirement.*	Rejected

Table 14 (continued)

6.	*Financial independence has a moderating effect on the relationship between framing and planning for future retirement when financial independence is valued more the relationship between framing and planning for future retirement becomes stronger.*	Rejected
7.	*Financial literacy has a moderating effect on the relationship between framing and planning for future retirement, higher financial literacy means a stronger relationship between framing and planning for future retirement.*	Rejected

5. Discussion

5.1. Answering research questions

The aim of this study was twofold: (1) to test the effects of different types of framing methods and (2) figure out whether FIRE-followers respond differently to these framing methods than non-FIRE-followers do. A survey has since been conducted among both FIRE-followers and non-FIRE-followers to answer the main research question: *"What influence does framing have on people's willingness to start planning for future retirement?".* Based on message framing literature, framing was expected to have a positive and significant impact on retirement planning intention. However, this assumption is not consistent with the results this study has produced.

The first sub-research question "*Does message framing have a negative or positive influence on people's willingness to start planning for future retirement?"* can be answered by reviewing the results of hypotheses 3, 4, and 5. These hypotheses revolve around different types of framing. Based on previous research by Brown, Kapteyn & Mitchell (2016) it was assumed that the so-called "negative frames" (loss and uncertainty framing) would have more positive effects on retirement planning intention than their positive counterparts. That's also why hypothesis 5 revolves around the interaction effect between the two framing methods that are assumed to be most effective. However, based on this study, all these assumptions can be rejected. According to linear regression analyses, uncertainty framing does have a positive effect on retirement planning intention where other framing methods do not. Nevertheless, the difference between the effects of uncertainty framing and gain framing – also loss framing and gain framing – is insignificant. Therefore, it cannot be said that one framing method does have a more positive effect on retirement planning intention than another. Moreover, combining both loss and uncertainty framing did not result in the most positive (or even significant) effect on retirement planning intention. To answer the sub-research question, it cannot be said that message framing has either a positive or negative influence on people's willingness to start planning for future retirement. Only uncertainty framing had a significant positive effect on retirement planning intention, but the effect was not significantly more positive compared to other framing methods.

The second sub-research question "*Comparing non-FIRE-followers to FIRE-followers, will FIRE-followers be more negatively or positively influenced by message framing in their willingness to start planning for future retirement?"* can be answered by reviewing the results of hypotheses 1, 2, 3, and 4. These hypotheses revolve in part around the differences between FIRE-followers and non-FIRE-followers regarding education (financial literacy), motivation (financial independence), and their response to message framing (loss and uncertainty framing). Because research by van Rooij, Lusardi & Alessie (2011) has shown that FIRE-followers are more educated in fields like finance, it was

assumed that FIRE-followers would have higher financial literacy levels than non-FIRE-followers. Furthermore, it was also assumed that FIRE-followers would have more motivation to become financially independent and would be more susceptible to framing methods like loss and uncertainty framing. Hypotheses 1 and 2 have shown that FIRE-followers do indeed have higher levels of financial literacy (education) and value financial independence more (motivation) compared to non-FIRE-followers. Hypotheses 3 and 4 have shown that FIRE-followers are not more susceptible to loss framing and uncertainty framing than non-FIRE-followers are. To answer the sub-research question, it cannot be said that FIRE-followers are either more negatively or positively influenced by message framing than non-FIRE-followers are. The differences of the framing effects on retirement planning intention between the two groups are insignificant.

The third sub-research question "*Looking at education and motivation levels, will the relationship between message framing and willingness to start planning for future retirement be negatively or positively influenced?"* can be answered by reviewing the results of hypotheses 6 and 7. These hypotheses revolve around the assumed moderating effects of both education (financial literacy) and motivation (financial independence) levels on the relationship between framing and willingness to start planning for future retirement. These moderating effects have not been researched before in this context, even though valuing financial independence (TD Ameritrade, 2018) and financial literacy (van Rooij, Lusardi & Alessie, 2011) have been proven to be major factors when differentiating FIRE-followers from non-FIRE-followers. Hypothesis 6 assumed a positive moderating effect from financial independence on the relationship between framing and willingness to start planning for future retirement. Hypothesis 7 assumed a positive moderating effect from financial literacy on the relationship between framing and willingness to start planning for future retirement. Both hypotheses had to be rejected, as no moderating effects were proven to be significant. The interaction effect between framing and financial literacy was significant, but the positive causal effect in the linear regression analysis was not. To answer the sub-research question, it cannot be said that the relationship between message framing and willingness to start planning for future retirement is either negatively of positively influenced by education (financial literacy) or motivation (financial independence) levels. The moderating effects of both variables were insignificant.

To answer the main research question, it cannot be said exactly what influence framing in general does have on people's willingness to start planning for future retirement. Only uncertainty framing has been proven to have significant effect, although not significantly more positive or negative than any other framing method. Moreover, FIRE-followers cannot be called more susceptible to message framing than non-FIRE-followers, even though they have been proven to have higher education and motivation levels. Last, these education and motivation levels do not have moderating effects on the relationship between framing and retirement planning intention.

5.2. Managerial and academic implications

Regarding managerial implications, this study has tried to emphasize how important the usage of message framing is in a financial context. It is namely of utmost importance that a younger audience starts being motivated to start planning for future retirement. Message framing can help do this for the field of Dutch pension funds. This study also provides managers with a different perspective on retirement planning than what academic research so far has been providing. By not only testing the effects of different methods of message framing, but also taking education and motivation levels into account. This has resulted in new information that can be used for further segmentation, targeting and activation while simultaneously being relatively easily accessible for Dutch pension funds. These education and motivation levels are major identifiers of FIRE-followers compared to non-FIRE-followers, as this study has shown. FIRE-followers are therefore sort of a benchmark for what must be achieved by pension funds for a larger part of their pension plan participants. Achieving higher education and motivation levels requires a large part of Dutch pension funds' operations to be aligned in achieving the same goal. Knowing who to target with marketing campaigns in terms of demographics, how to write convincing copy using message framing, but also how to activate pension plan participants to actively start searching for retirement related information and indirectly educate themselves, is important for everyone involved in this process, among which are CMOs, marketing manager, brand managers, marketing activation managers, campaign managers and performance / growth / digital marketers working for pension plan providers. Because of this study, these professionals will be able to make more informed decisions.

Furthermore, this study is also able to contribute to academic literature. Academic literature has studied many different methods of message framing over the years. The positive effects on pension plan activation of these different methods have been studied and proven by Keren (2012), Brown, Kapteyn and Mitchell (2016), Eberhardt et al. (2017), Bockweg et al. (2017), and Braun (2018). Even though these studies have contributed heavily to the field of pension plan participant activation through message framing, the field of pension planning continuous to develop in ways that are yet to be studied. One of the reasons the field of pension planning is changing currently is for instance economic uncertainty. COVID-19 has caused small-businesses worldwide to lose massive amounts of turnover, or worse, go bankrupt (CBS, 2021). Furthermore, as interest rates and inflation continue to rise, millennials are not becoming more financially responsible and relatively conservative in their spending. Millennials are namely showing worse spending habits than previous generations have done (Brown, 2018). Pension planning has never been a strong suit of any young generation (Lusardi & Mitchell, 2010), but projected retirement is currently not looking good for millennials. Their now retired preceding generations had much better odds, even though millennials are earning more in their 20s and 30s and have obtained higher education levels than those

generations ever did (Johnson et al., 2017). All these developments have been influencing factors in the rise of the FIRE-movement (Robin, Dominguez & Mustache, 2008) that is experiencing increasing popularity among millennials. Unfortunately, academics worldwide have not been giving much attention to the FIRE-movement, while a lot of research has been done on message framing in the context of regular pension planning. This study helps remove this enormous lack of academic research, by combining both message framing theory and FIRE, resulting in new insights into the demographics of FIRE-followers and how they respond differently to certain message framing methods. Only two studies have used the FIRE acronym in the recent past. Apart from Taylor and Davis (2021), Olen (2019) identifies the movement more as a hype than a legitimate concept that is to be taken seriously. However, what can't be denied by any academic is that the FIRE-movement has been increasing in popularity, especially in the past five years. Looking at Google Trends, the search term 'FIRE movement' has seen an 1000% popularity increase since 2017 (Google, 2022). The related – international and Dutch – Reddit communities r/financialindependence (international) and r/DutchFIRE (Dutch) are respectively containing over 1.000.000 and 49,000 members (Reddit, 2011; Reddit, 2015). This study has been using these important developments as influencing factor for part of the research questions that have been answered. These research questions were aimed at finding out more regarding the response of FIRE-followers to different methods of message framing, their motivation and education levels and whether these differ significantly from non-FIRE-followers. Answering these research questions, this study found out that FIRE-followers are not more susceptible to message framing methods than non-FIRE-followers are. However, FIRE-followers do differ significantly from non-FIRE-followers when it comes to education (financial literacy) and motivation (financial independence) levels. Academic literature had already proven that FIRE-followers were easily identifiable by high education and motivation levels, but never directly compared FIRE-followers to non-FIRE-followers regarding these variables in the same study.

5.3. Limitations and further research

There are multiple limitations to consider when examining this study. First, the sample that was collected among both FIRE-followers and non-FIRE-followers is skewed in terms of gender, age, and education levels. Looking at all respondents, 60.6% turned out to be male, and 39.4% turned out to be female. This skewness to male respondents is largely caused by the difference between FIRE-followers and non-FIRE-followers. The FIRE-followers sample is 78.2% male, while the non-FIRE-followers sample is only 44% male. These differences are caused mostly by the different demographics in different Reddit communities (r/DutchFIRE vs. r/TheNetherlands). The individual samples most likely represent these communities well, but the communities differ a lot from each other in information that is shared, even though they are both communities on the same social

media platform. The skewness to male respondents this has caused results in less reliable data for the comparisons between FIRE-followers and non-FIRE-followers in terms of responding to different message framing methods.

Furthermore, the sample that was collected is also skewed in terms of age. Although the exact age of respondents is unknown, the respondents were able to select an applicable age group. Here again, primarily the FIRE-followers sample is skewed. 64.4% of FIRE-followers is aged 25-34 in this study, while non-FIRE-followers are much more equally distributed among different age groups. 22.8% is aged 18-24, 20.8% is aged 35-44, 18.8% is aged 25-34, 15.8% is aged >65, and 13.8% is aged 45-54. These differences are also caused by the different demographics in different Reddit communities (r/DutchFIRE vs. r/TheNetherlands). The skewness to younger respondents among FIRE-followers has resulted in less reliable data for the comparisons between FIRE-followers and non-FIRE-followers. It can be assumed that people differently to message framing in different stages of their lives, which means that distribution among age groups should have been more equal to produce reliable results when comparing FIRE-followers to non-FIRE-followers' responses to message framing. This is reason for further research, testing the different responses to message framing methods among both FIRE-followers and non-FIRE followers, while controlling for gender and age. That would also shine additional light on this study because it is currently unknown how the skewness affected study results.

Indirectly, these age differences have also played a role in the skewness to higher education levels, especially among FIRE-followers, the younger group. As was pointed out by Johnson et al. (2017), millennials (people currently in their 20s and 30s) have higher education levels than previous generations. This can be confirmed by this study, where 73.9% has obtained a bachelor's degree (HBO / university) or higher (master's degree and / or doctoral degree). FIRE-followers are extremely skewed to high education levels, because 94.1% claims to have obtained a bachelor's degree or higher. The results of these education levels are noticeable when looking at the financial literacy related questions. The FIRE-followers have hardly made any mistakes (94.4% correct), while the non-FIRE-followers were not able to be as perfect (66.3% correct). This also resulted in unacceptable inter-item correlation – through Cronbach's alpha – between the financial literacy related questions for the FIRE-followers. On the other hand, non-FIRE-followers were able to generate an acceptable range of inter-item correlation for the financial literacy related questions. For further research it would be wiser to use more difficult financial literacy related questions, or at least add more difficult questions to end up with acceptable inter-item correlations between the financial literacy related questions for both FIRE-followers and non-FIRE-followers.

Last, it is important to note that this study should only be the beginning of studying the FIRE-movement in relation to message framing methods. Academics worldwide and pension funds can

learn a whole lot more about this remarkable group when accounting for previously mentioned relevant demographics while testing other message framing methods. The fact that these people are already motivated to start planning for future retirement remains an interesting perspective to work backwards and test how this group - as a benchmark for what is to be achieved – responds to different conditions.

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Appendix

Appendix I – Survey questions

What is your age?

- Under 18
- 18 - 24
- 25 - 34
- 35 - 44
- 45 - 54
- 55 - 64
- 65 or older

Which gender do you identify most with?

- Male
- Female
- Non-binary / third gender
- Prefer not to say

What is your highest qualification?

- Less than secondary education
- Secondary education or equivalent
- Bachelor's degree
- Master's degree
- Doctoral degree

Which income group (gross income) do you fall under on a yearly basis?

- Less than €20,000
- €20,000 - €35,000
- €35,000 - €50,000
- €50,000 - €65,000
- €65,000 - €80,000
- Above €80,000

Suppose you had €100 in a savings account and the interest rate was 2% per year. After 1 year, how much do you think you would have in the account if you left the money to grow?

- More than €102
- Exactly €102
- Less than €102
- Do not know

Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?

- More than today
- Exactly the same
- Less than today
- Do not know

Assume a friend inherits €10,000 today and his sibling inherits €10,000 3 years from now. The interest rate on savings was 2% per year and inflation was 1% per year. Who is richer because of the inheritance?

- The friend
- His sibling
- They are equally rich
- Do not know

Suppose that in the year 2030, your income has doubled and prices of all goods have doubled too. In 2030, how much will you be able to buy with your income?

- More than today
- The same
- Less than today
- Do not know

Financial independence is often defined as "the status of having enough financial power to pay for living expenses for the rest of your life without being employed".

How much do you value financial independence personally?

- None at all
- A little
- A moderate amount
- A lot
- A great deal

Not planning for future retirement could be a problem. Every month, your pension fund receives and manages your contribution for your pension income during retirement. Because of our aging population, changing pension system and economy, this amount of money may not be sufficient for you to keep a decent lifestyle during retirement.

If you don't start planning for future retirement, you might not learn whether you have a savings gap. If you decide not to start planning for future retirement you might not know whether you have saved enough money for retirement.

Not discovering a potential savings gap could mean you won't close it in the future by starting to plan for future retirement right now. What will happen if you don't take this opportunity? Take the first step.

Check your expected retirement income on mijnpensioenoverzicht.nl.

Keeping the previously read statement in mind, how willing are you to check the web for retirement related information right now?

- None at all
- A little
- A moderate amount
- A lot
- A great deal

Appendix II – Descriptive statistics

FIRE-followers

		Age	Gender	Qualification	Income
N	Valid	202	202	202	202
	Missing	0	0	0	0
Mean		3.12	1.24	3.51	3.80
Median		3.00	1.00	4.00	4.00
Std. Deviation		.695	.492	.671	1.353
Range		4	3	3	5
Minimum		2	1	2	1
Maximum		6	4	5	6

Non-FIRE-followers

		Age	Gender	Qualification	Income
N	Valid	202	202	202	202
	Missing	0	2	0	2
Mean		4.03	1.59	2.69	2.40
Median		4.00	2.00	3.00	2.00
Std. Deviation		1.759	.569	.944	1.396
Range		6	3	4	5
Minimum		1	1	1	1
Maximum		7	4	5	6

Appendix III – Reliability statistics

		Cronbach's alpha	Inter-item correlation	Mean
FIRE-followers	Q1	.175	0.094	.98
	Q2		-0.032	1.00
	Q3		.194	.92
	Q4		.069	.88
Non-FIRE-followers	Q1	.623	.413	.81
	Q2		.480	.65
	Q3		.381	.49
	Q4		.351	.70

Appendix IV – Independent Sample T-Tests

Hypothesis 1

	Levene's Test (sig.)	Sig. (two-tailed)	Mean Difference	Std. Error Difference
Equal variances assumed	.000	.000	.683	.094
Equal variances not assumed		.000	.683	.094

Hypothesis 2

	Levene's Test (sig.)	Sig. (two-tailed)	Mean Difference	Std. Error Difference
Equal variances assumed	.000	.000	2.8094	.2369
Equal variances not assumed		.000	2.8094	.2369

Hypothesis 3

	Levene's Test (sig.)	Sig. (two-tailed)	Mean Difference	Std. Error Difference
Equal variances assumed	.038	.686	.074	.182
Equal variances not assumed		.675	.074	.175

	Levene's Test (sig.)	Sig. (two-tailed)	Mean Difference	Std. Error Difference
Equal variances assumed	.731	.971	-.009	.235
Equal variances not assumed		.971	-.009	.235

Hypothesis 4

	Levene's Test (sig.)	Sig. (two-tailed)	Mean Difference	Std. Error Difference
Equal variances assumed	.050	.068	.300	.164
Equal variances not assumed		.068	.300	.164

	Levene's Test (sig.)	Sig. (two-tailed)	Mean Difference	Std. Error Difference
Equal variances assumed	.266	.064	.468	.250
Equal variances not assumed		.065	.468	.251

Appendix V – Linear regression analyses

Hypothesis 3

	Model Summary			
	R	R Square	Adjusted R Square	Std. Error
Gain vs. loss framing	.067	.004	-.001	1.205

	Coefficients				
	B (unstandardized)	Std. Error	Beta (standardized)	t	Sig.
Constant	2.771	.083		33.321	.000
Loss framing	-.126	.137	-.048	-.925	.356
Gain framing	-.200	.166	-.063	-1.202	.230

	Model Summary			
	R	R Square	Adjusted R Square	Std. Error
FIRE vs. Non-FIRE	.029	.001	-.004	1.207

	Coefficients				
	B (unstandardized)	Std. Error	Beta (standardized)	t	Sig.
Constant	2.721	.072		37.714	.000
FIRE	-.081	.185	-.022	-.439	.661
Non-FIRE	-.073	.158	-.023	-.461	.645

Hypothesis 4

	Model Summary			
	R	R Square	Adjusted R Square	Std. Error
Gain vs. loss framing	.110	.012	.007	1.201

	Coefficients				
	B (unstandardized)	Std. Error	Beta (standardized)	t	Sig.
Constant	2.619	.086		30.377	.000
Loss framing	.305	.146	.111	2.087	.038
Gain framing	-.200	.166	.001	.028	.978

	Model Summary			
	R	R Square	Adjusted R Square	Std. Error
FIRE vs. Non-FIRE	.148	.022	.017	1.195

	Coefficients				
	B (unstandardized)	Std. Error	Beta (standardized)	t	Sig.
Constant	2.629	.069		37.983	.000
FIRE	.528	.177	.149	2.990	.003
Non-FIRE	.060	.182	.016	.329	.742

Hypothesis 5

	Model Summary			
	R	R Square	Adjusted R Square	Std. Error
Loss framing*uncertainty framing	.111	.012	.007	1.201

	Coefficients				
	B (unstandardized)	Std. Error	Beta (standardized)	t	Sig.
Constant	2.559	.211		12.149	.000
Loss framing	-.076	.130	-.029	-.586	.558
Uncertainty framing	.278	.160	.101	1.741	.082
Loss framing*uncertainty framing	.043	.141	.018	.305	.761

Hypothesis 6

	Model Summary			
	R	R Square	Adjusted R Square	Std. Error
Financial independence	.325	.106	.099	1.144

	Coefficients				
	B (unstandardized)	Std. Error	Beta (standardized)	t	Sig.
Constant	1.737	.069		37.983	.000
Financial independence	.259	.122	.215	2.109	.036
Framing	-.211	.190	-.206	-1.112	.267
Financial independence * Framing	.059	.051	.247	1.168	.244

Hypothesis 7

	Model Summary			
	R	R Square	Adjusted R Square	Std. Error
Financial literacy	.085	.007	.000	1.205

	Coefficients				
	B (unstandardized)	Std. Error	Beta (standardized)	t	Sig.
Constant	2.559	.441		5.800	.000
Financial literacy	.010	.053	.024	.196	.845
Framing	-.053	.160	-.052	-.330	.742
Financial literacy * Framing	.009	.019	.096	.491	.624

Appendix VI – Two-Way ANOVAs

Hypothesis 5

	Sum of Squares	df	Mean Square	F	Sig.
Corrected model	7.228	2	3.614	2.507	.083
Intercept	2857.549	1	2857.549	1982.724	.000
Loss framing	1.162	1	1.162	.806	.370
Uncertainty framing	6.866	1	6.866	4.764	.030
Loss framing *uncertainty framing	3.273	1	3.273	2.271	.133

Hypothesis 6

	Sum of Squares	df	Mean Square	F	Sig.
Corrected model	82.803	17	4.871	3.743	.000
Intercept	1074.389	1	1074.389	825.539	.000
Financial independence	57.359	4	14.340	11.018	.000
Framing	1.361	3	.454	.349	.790
Financial independence * Framing	11.610	10	1.161	.892	.541

Hypothesis 7

	Sum of Squares	df	Mean Square	F	Sig.
Corrected model	46.718	19	2.459	1.754	.026
Intercept	1115.809	1	1115.809	795.762	.000
Financial literacy	5.982	4	1.496	1.067	.373
Framing	4.000	3	1.333	.951	.416
Financial literacy*Framing	31.248	9	3.472	2.476	.009