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# The Influence of Personality and Preferences on Mental Budgeting

## Preface

The presented Master thesis contains the final assignment to succeed in the Master program Business Administration Marketing at Radboud University Nijmegen. To fulfil the assignment, I combined theoretical knowledge with experiences from practice I gained from the past years. It was a challenge to execute the research and it made this assignment a worthwhile process.

During this process, I received great support and help. Therefore, I would like to take the opportunity to thank Prof.dr. Gerrit Antonides for helping me all the way through it, because he was of great value for my thesis. Additionally, I want to thank my friends and family for supporting me during this process and also during the Bachelor and Master program. Lastly, I would like to thank everyone who took the time to fill out the survey.

I wish you pleasant reading!

Bregje van Rosmalen

*'s-Hertogenbosch, June 2020*

## Abstract

This research aimed to find out how personality traits, economic preferences and locus of control affect mental budgeting. The Big Five personality traits, the economic preferences time orientation and risk aversion, and locus of control were expected to be determinants of mental budgeting. It has been studied by quantitative research in the form of an online survey. The survey was distributed via snowball sampling and social media. In total, 149 respondents completed the survey without missing data.

Multiple regression was conducted to analyze the data. Besides testing the hypotheses, a mediation analysis was conducted for analyzing the indirect effects of personality traits on mental budgeting, mediated by economic preferences. Also, ordinal regression was used to analyze the effect of mental budgeting on making ends meet.

The results showed that risk aversion, time orientation and neuroticism had (small) significant direct effects on mental budgeting. Also, extraversion had an indirect significant effect on mental budgeting, mediated by risk aversion. Furthermore, the results showed that extraversion, conscientiousness and neuroticism were significant predictors of risk aversion and that conscientiousness was a significant predictor of time orientation as well. The other expectations derived from theory were not met. The thesis concludes with several explanations for the significant and non-significant results regarding the hypotheses, and some future research suggestions are discussed.

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## 1 Introduction

How come that we are less willing to spend money on a night out when we just bought some expensive tickets for the theatre? Why do we spend less money on clothing when we just spontaneously bought a new dress? Why do people keep their budget for food expenditures separated from their entertainment budget (Heath & Soll, 1996)?

All questions mentioned above can be explained by mental accounting. “Mental accounting is the set of cognitive operations used by individuals and households to organize, evaluate and keep track of financial activities” (Thaler, 1999, p. 183).

To be more precise, it can be concluded that the questions above are related to mental budgeting, which is a part of mental accounting. Mental budgeting describes the phenomenon that “people budget portions of their total resources to separate mental accounts (for instance food or clothing expenses) and then track expenses against the budget they took into account” (Heath & Soll, 1996, p. 40).

Several studies investigating mental accounting have focused on decisions regarding gains and losses. Early research by Kahneman and Tversky (1984, p. 347) explained the concept of mental accounting through developing scenarios, for instance by the following example: when someone is going to a play which costs 10 dollars, this person is less likely to rebuy a ticket when he or she already bought a ticket on the forehand and lost it, than when this person lost 10 dollars but did not already buy a ticket.

The study of Kahneman and Tversky (1984), but also other studies regarding mental accounting (Heath & Soll, 1996; Henderson & Peterson, 1992; Thaler, 1999) showed that the way people use their finances depends on how those resources are categorized or labelled. Mental accounting and mental budgeting are mostly analyzed in (laboratory) experiments through scenarios, but they are usually not measured directly (Antonides et al., 2011; Antonides & de Groot, 2020). Earlier studies mainly focused on *what* mental budgeting is and *how* and *why* it is used. However, research regarding *who* (i.e. what kinds of people regarding characteristics and preferences) make use of it, is lacking. Are conscientious people more likely to control their finances with mental budgeting? Differ risk-avoiders from risk-takers in their use of mental budgeting? Are people who attribute the cause of life events to themselves more likely to budget parts of their total resources in separate mental accounts than people who attribute the cause of life events to luck or fate? These questions are not answered in scientific literature yet.



Nevertheless, earlier research mentioned there is evidence that personal characteristics can have a significant effect on financial behaviour (Barbić, Lučić, & Chen, 2019). For instance, Guven (2012) showed that happier people are more likely to save money, prefer the future, like to have control over expenditures, and take more time before making decisions.

Furthermore, personal preferences are also related to mental budgeting. For example, Antonides et al. (2011) showed that mental budgeting is negatively related to short-term time orientation and positively related to long-term time orientation. Therefore, patient consumers will practice mental budgeting more than impatient consumers.

In addition, locus of control could influence mental budgeting, since it is evidenced that saving behaviour, which is also a financial behaviour and is related to mental budgeting, is influenced by locus of control (Cobb-Clark, Kassenboehmer & Sinning, 2016).

Those examples indicate that personality, economic preferences and locus of control can have an impact on the use of mental budgeting. Therefore, this research focuses on personality, economic preferences and locus of control as determinants of mental budgeting. This research aims to find out how personality traits, economic preferences and locus of control affect mental budgeting. This leads to the following research question:

*“How do personality traits, economic preferences and locus of control affect mental budgeting?”*

The concept of mental budgeting related to personality traits, preferences and locus of control has received little attention in academic literature so far. By researching the relation between these concepts, this study aims to contribute to existing scientific knowledge. Besides the scientific contribution, knowledge about the financial behaviour of consumers and personal drivers of this behaviour is of vital importance for both consumers themselves as for organizations. For example, people who are less conscientious show more impulsive buying behaviour and less saving behaviour than more conscientious people (Mowen, 2000). These people will probably use mental budgeting less than conscientious people since the use of mental budgeting will create more controlled behaviour. It could be expected that impulsive buying behaviour and less saving behaviour will result more easily in financial problems than controlled behaviour and saving behaviour. When organizations, for instance banks, have insight into these different kinds of personalities of clients and thereby know more about their financial behaviour, they can help people who need it. For instance, by giving them insights into how much money they spend in what kind of category. By doing this, they can make people

more aware of their spending behaviour. In that way, they can encourage these people to use mental budgeting more, which will lead to less impulsive buying behaviour and more saving behaviour. This will have a positive effect on people's financial situation, which is preferable for both banks and people themselves. Thus, when people and organizations have more insight in financial behaviour and its personal determinants, they have more knowledge to influence or change it. Therefore, this research both adds to scientific knowledge and has practical implications.

To answer the research question, it is important to elaborate on the important concepts of this study: mental budgeting and personality traits, economic preferences and locus of control, which will be done in the next Chapter. Also, hypotheses and a conceptual model will be presented in Chapter 2. The research methodology of this study will be discussed comprehensively in Chapter 3: Methodology. In Chapter 4, the findings are reported. Finally, the research will end with Chapter 5: Discussion and Conclusion, which will include theoretical implications, practical implications, limitations and future research suggestions.



## 2 Theoretical Framework

### 2.1. Mental Accounting and Mental Budgeting

Kahneman and Tversky (1984) introduced the concept of mental accounting and subsequently, more research has been done into this concept (Heath and Soll, 1996; Henderson and Peterson, 1992; Kahneman & Tversky, 1984; Thaler 1980, 1985, 1999). “Mental accounting is the psychological separation of events, objects or transactions, based on categorization, with consequent effects on choices or behaviour” (Antonides, 2015, p. 260). Mental accounts are utilized to coordinate, assess and keep up with financial actions (Thaler, 1999). Tversky and Kahneman described a narrower definition of a mental account: “an outcome frame which specifies (i) the set of elementary outcomes that are evaluated jointly and the manner in which they are combined and (ii) a reference outcome that is considered neutral or normal.” (1981, p. 456).

Studies mentioned earlier, for instance Thaler (1999), showed that mental accounting matters because it affects resource use, and thereby provided evidence for the violation of the fungibility of money. The economic principle of fungibility of money suggests that money has no labels and money should be conveyable across different budgets (Arkes et al., 1994; Thaler, 1999). For example, a 300-euro bonus one earned should be the same as a 300-euro increase in the value of shares one owns. However, the phenomenon of mental accounting showed this is generally not the case. Not only different sources of income may affect spending, but also the existence of mental budgets allocated for different kinds of expenses. When the allocated budget for a mental account is reached, people will not buy more within this account, even though there is still money available in other budgets or mental accounts. In other words, people set budgets for different mental accounts and they consider those budgets as binding (Heath & Soll, 1996). For example, money that is allocated to the food account will not be used for buying a new mobile phone. Hence, mental accounting is violating the fungibility of money.

Mental accounting consists of different aspects, where mental budgeting is one of them. The concept of mental budgeting was introduced by Heath and Soll (1996), and they theorized how mental budgeting alters consumer choice. Mental budgeting is the separation of resources into different mental accounts. Within every mental account, budget limits are set on the consumption, to constrain spending behaviour. In other words, people use mental budgeting to stay financially stable, so to make sure that they do not expend more money than they possess.

Heath and Soll (1996) described that mental budgeting includes two different processes: budget-setting and expense tracking. Budget setting describes the phenomenon of people

labelling money as relevant for a particular expense account, like entertainment or food. Expense tracking refers to the assignment of expenses to appropriate accounts and to occasionally recalculating the remaining amount of money in the concerned account. Expense tracking consists of two parts: first, the expense must be noticed, and second, expenses need to be assigned to the appropriate mental accounts. For example, the spending on theatre tickets can be assigned to the entertainment account and the spending on vegetables can be assigned to the food account.

Combining both processes of mental budgeting, Heath and Soll (1996) showed that typical goods will affect spending within budgets much more than less typical goods since typical goods are more likely to be posted to their expense account. They showed that underconsumption is more common in a certain account when people just bought an item that is highly typical for that account. Additionally, if the budget for the account is stated too high (low), people will spend too much (little) within the account (Heath and Soll, 1996). This is an example of evidence against the principle of fungibility of money explained earlier. Abeler and Marklein (2008) also showed that money is not fungible, by combining a quasi-field-experiment with a laboratory experiment.

Whereas Heath and Soll (1996) stated that mental accounts are inflexible, Cheema and Soman (2006) later discovered that this is not always the case. They showed that the mental accounting process is malleable when an expense can be assigned to multiple accounts, so when the expense is ambiguous. To support this finding, they mentioned the following example:

“Participants who wanted to go out with a friend to a restaurant classified the restaurant visit as a food expense when they had some surplus money in their food account but as entertainment when they had a surplus in their entertainment account. Therefore, they were willing to spend money on the restaurant visit in both conditions. In contrast, participants were unable to allocate a food delivery or a music concert expense to different accounts, and so they were willing to spend money for these opportunities only if they had a surplus in the particular account to which the expense pertained.” (Cheema & Soman, 2006, p. 38).

Thus, it can sometimes be hard to assign expenses to an appropriate account because they are unclear (Zhang & Sussman, 2018) Therefore, mental budgets may not always be strictly maintained but sometimes adapted (Cheema & Soman, 2006).

More recently, Antonides et al. (2011) found significant determinants of mental budgeting. Thereby, they are the first in this field who focused on looking at “who” is using mental accounting. Higher educated people tend to use mental budgeting less than lower



educated people. Secondly, less wealthy people will use mental budgeting more than people who are in a better financial situation. They also showed that females are using mental budgeting significantly more than males. Having saving goals is also positively related to mental budgeting. In addition, long-term time oriented people tend to use mental budgeting more than short-term time oriented people, which suggests “that patient consumers practice mental budgeting if they can see the long-term advantages of it” (Antonides et al., 2011, p. 552). Antonides et al. (2011) further stated that mental budgeting increases the oversight of the current account and expenses, and this improves the financial management of households. Besides these findings, they have generated a scale for measuring mental budgeting.

Even though Antonides et al. (2011) found significant results regarding what type of people use mental budgeting, literature concerning personality traits as determinants of this concept is lacking. However, as mentioned earlier, it could be expected from earlier findings that there will be a relation between these concepts. “Irrational people” (this means people who deviate from decision making as predicted by the standard economic model) are likely to use mental accounting the most (Antonides et al., 2011). Also, mental budgeting is used as a self-control device (Cheema & Soman, 2006; Thaler & Shefrin, 1981; Wertenbroch, 2003). Therefore, we could expect that mental budgeting will be used less by people who are not conscientious and less by those with low self-control, resulting in impulsiveness (Ranyard & Antonides, 2017).

Because of the reasons mentioned above, important literature regarding personality traits will be discussed in the next Section.

## **2.2. Personality**

### **2.2.1. Personality Traits**

The domain of psychology that is concerned about personality traits is personality psychology, and it studies the ways in which persons are unique (Almlund, Duckworth, Heckman, & Kautz, 2011). Roberts (2009) discussed a large number of definitions of personality in current literature. Based on that, he came up with the following definition: “Personality traits are relatively enduring patterns of thoughts, feelings, and behaviours that reflect the tendency to respond in certain ways under certain circumstances” (Roberts, 2009, p. 140). Because this definition is used mostly throughout literature regarding this topic, it will also be used in this research. Personality declares how people respond to real-life situations, and it “is the system of relationships that map traits and other determinants of behaviour into measured actions”

(Almlund et al., 2011, p. 8). Many behavioural economists hold the view that personality traits can only partly explain behaviour and assume that limits and stimuli in life situations further regulate behaviour (Mischel, 2004; Thaler, 2008; Ross & Nisbett, 1991). However, an increasing amount of evidence now explains that personality is an important determinant of behaviour, and it is not situation-specific. Nowadays, most psychologists agree with the phenomenon of “a stable personality” (Almlund et al., 2011). The definition of Roberts (2009) mentioned earlier is consistent with this stability of patterns of behaviour. Nevertheless, it is relevant to note that personality characteristics are not fixed forever since Almlund et al. (2011) showed that these can evolve over a lifetime.

According to Roberts (2009), personality originates from interactions among different components of it, like traits, motives and values, abilities and identity. He developed a model of personality, which is presented in Appendix A, Model 1. Personality traits are not the same as the concept of personality as a whole since personality traits are not the only key factors of personality. The components presented in Model 1 interact with each other, which will ultimately lead to a combination of thoughts, feelings and behaviour that can be called personality.

Over the past century, personality has been analyzed a lot. Discrepancies and consistencies within and between individuals were measured and personality traits were studied in relationship with motives, interests and motives. Psychologists started using words like “proud” and “irritable” to characterize and describe those differences between people. Ultimately, decades of research led to a widely shared classification of personality traits, known as The Big Five (Almlund et al., 2011). “The Big Five posits a hierarchical organization for personality traits, with five factors at the highest level and progressively more narrowly defined traits (or facets) at the lower level” (Almlund et al., 2011, p. 11).

The Big Five consists of the following personality traits: openness to experience, conscientiousness, extraversion, agreeableness and neuroticism (emotional stability). An overview of these traits along with their definitions is represented in Appendix B, Table 1. The Big Five include and summarize a major number of distinct and more specific personality aspects. An overview of the facets of The Big Five is represented in Appendix B, Table 2.

In the academic literature, alternatives to the Big Five are used to determine the traits. For instance, a model consisting of fewer factors, namely neuroticism, extraversion and psychoticism, was developed (Eysenck, 1991). Almlund et al. (2011) suggested there are models that better represent the personality domain than the Big Five, for instance, the Big Six (Ashton et al., 2004). However, they invalidate this observation by saying that these alternatives

are not very different from the Big Five. Additionally, according to Costa and McCrae, (1992), Goldberg (1993) and John (1990), most of the factors used by alternatives can be accommodated into the Big Five. Therefore, this concept will be used in this study to measure the personality of the respondents.

### **2.2.2. Personality and Financial Behaviour**

As mentioned before, research regarding the relationship between mental budgeting and personality traits is lacking. However, the relationship between personality traits and people's financial behaviour has been studied before. Since mental budgeting is a form of financial behaviour, it could be expected that personality traits can affect mental budgeting behaviour.

First of all, spending behaviour can tell a lot about people's personality (Sirgy, 1985), and classifications of spending have congruent associations with someone's character (Matz, Gladstone & Stillwell, 2016).

Also, research regarding saving behaviour revealed that personality traits influence saving behaviour (Asebedo et al., 2018). Saving behaviour is related to mental budgeting in such a way that people who want to save money need to have a good overview of their resources and expenditures. Moreover, they need to limit their expenditures to be able to save money.

Besides, there can be expected that more introvert people will use mental budgeting more than more extrovert people, given the characteristics of these concepts. Extrovert people are more concerned about the future in contrast to introvert people, who live in the present. Also, introverts spend more time planning and analyzing than extroverts (Shoarinejad, in Zafarghandi, Saleh & Khalil Sabet, 2016). The characteristics of introverts fit well with mental budgeting, which explains the expected relationship.

According to Mowen (2000), the personality traits of the Big Five are connected to financial behaviour. For instance, less conscientious people and people with a high degree of agreeableness show impulsive buying behaviour. On the other hand, emotionally stable people (the opposite of neuroticism) are showing less compulsive buying behaviour. So more neurotic people will show more compulsive buying behaviour, which counteracts saving behaviour (Mowen & Spears, 1999). Because of this, it could be expected that conscientious people, people with a lower degree of agreeableness, and emotionally stable people, will use mental budgeting relatively often, since mental budgeting is the opposite of compulsive buying behaviour: it is a way of having control over resources.

Regarding what is discussed in Sections 1 and 2 of this Chapter, the following hypotheses are formulated:

1. *Personality traits affect mental budgeting as follows:*
  - a. *A person who is more introvert, will use mental budgeting more than a person who is more extravert.*
  - b. *A person who is more conscientious will use mental budgeting more than a person who is less conscientious.*
  - c. *A person with a lower degree of agreeableness will use mental budgeting more than a person with a higher degree of agreeableness.*
  - d. *A person who is more emotionally stable will use mental budgeting more than a person who is more neurotic.*

(N.B. No hypothesis is formulated regarding the personality trait “openness to experience” since an expected relationship between this trait and mental budgeting cannot be substantiated.)

## **2.3. Economic Preferences and Locus of Control**

### **2.3.1. Preferences**

Preferences that received the most attention in literature are time preferences and risk aversion, which will both be discussed. “The key difference between time and risk preference is that time preference describes the devaluation of rewards as a function of their delay, whereas risk preference describes the devaluation of rewards as a function of their uncertainty” (Borghans, Duckworth, Heckman, & Weel, 2008, p. 1002). Psychologists used experiments to investigate those preferences. For example, the Balloon Analogue Risk Task (BART) (Lejuez et al., 2002) was one of them. This experiment was a game in which people had to make certain monetary choices to track their risk-taking behaviour.

“Time preference is the preference over consumption in different time periods” and is related to conscientiousness and self-control (Almlund et al., 2011, p. 66). An example of an experiment which measures time preference is the “marshmallow test” (Mischel et al., 2010). This experiment measures “how long a child can resist settling for a small, immediately available reward (e.g. one mini-marshmallow) in order to get a larger reward later (e.g. two mini-marshmallows)” (Mischel et al., 2010, p. 252).

Risk aversion is related to the personality traits openness to experience, regarding to Almlund et al. (2011). Besides, openness to experience and agreeableness are also related to risk aversion (Dohmen, Falk, Huffman & Sunde, 2010). Risk aversion can, for instance, be measured by letting people choose between a safe sum of cash and a lottery (e.g., Dohmen et al., 2011).

As mentioned above, a small number of studies evidenced the relation between personality traits and preferences, but are preferences also related to mental budgeting? Regarding time preferences, Huffman and Barenstein (2005) found that declining spending between paydays can be explained by the fact that people are unwilling to spend money from the future income account, thus unwilling to borrow (even for consumers owning a credit card). This suggests a relationship between future time orientation and mental budgeting. Antonides et al. (2011) analyzed this relationship and found that long-term time orientation has a positive effect on mental budgeting.

The relationship between risk aversion and mental budgeting has not been analyzed yet. However, a positive relationship can be expected. Since, as mentioned, mental budgeting is used to stay financially stable and to make sure that not more money is expended than one possesses, it could be expected that people who are more risk averse tend to use mental budgeting more.

Based on the above, the following hypotheses are formulated:

2. *A person who is more long-term time oriented will use mental budgeting more than a person who is more short-term time oriented.*
3. *A person who is more risk averse will use mental budgeting more than a person who is more risk-taking.*

### **2.3.2. Locus of Control**

Locus of control is not included in the Big Five, however, it is related to it. Locus of control is defined as “a generalized attitude, belief, or expectancy regarding the nature of the causal relationship between one’s own behaviour and its consequences” (Rotter, 1966, p. 2). “Those with an internal (as opposed to external) locus of control believe that life events are typically caused by their own actions” (Almlund et al., 2011, p. 53). Someone with an external locus of control thinks that events in life are not driven by him or herself. An example of a thought of someone with an external locus of control is: “The reason why I did not pass my exam is due to bad luck.”

As mentioned in Cobb-Clark et al., (2016), the way people perceive self-control is important for the understanding of peoples' ability to avoid temptation and accomplish long-term goals. This relates to the concept of mental budgeting since this is focused on having control over finances (which contrasts impulse buying or temptation) and since long-term time oriented people use mental budgeting more, as is mentioned earlier.

The relationship between locus of control and mental budgeting has not been studied yet, but the relationship between locus of control and financial behaviour has already been researched. For instance, Cobb-Clark et al. (2016) showed that internal locus of control had a significant effect on saving behaviour. In other words, people who think that life situations are induced by themselves, save more money than people who do not believe this.

Derived from the above, it could be expected that someone with a higher degree of internal locus of control will use mental budgeting more than someone with a higher degree of external locus of control. Since this kind of people saves more money, they will probably set certain budgets for different accounts to have money left to make the savings of money possible. Therefore, the following hypothesis is formulated:

*4. A person with a higher degree of internal locus of control will use mental budgeting more than a person with a higher degree of external locus of control.*

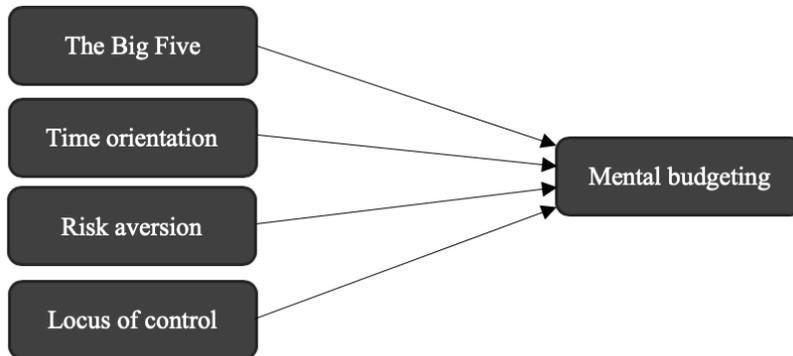
## **2.4. Consequences of Mental Budgeting**

Up to now, antecedents of mental budgeting are discussed since these are the main aspects of this research. Nevertheless, consequences are also important to mention, as they can explain why mental budgeting is probably used by individuals. Managing money falls apart in making ends meet and keeping track of expenses and it is crucial for being financially capable (Atkinson, McKay, Kempson, & Collard, 2006). Therefore, there could be expected that mental budgeting will result in better financial capability.

As stated in Antonides et al.: “mental budgeting has a significant effect on having an overview of expenses and current accounts, because expenses need to be tracked against the set budgets” (2011, p. 552). In addition, they showed that mental budgeting had a significant effect on financial management, which is a part of financial capability (Antonides et al., 2011). Subsequently, there is assumed that financial management will contribute to financial security and financial well-being (Braunstein & Welch, 2002; Hilgert & Hogarth, 2003). Thus, there could be expected that mental budgeting will positively affect “making ends meet.”

## 2.5. Conceptual Model

The following conceptual model is derived from the most important concepts discussed in this Chapter:



*Model 2 - Conceptual model*

Dependent Variable: Mental budgeting

Independent Variables: The Big Five, time orientation, risk aversion, locus of control

As explained earlier, the main goal is to find out how personality traits, economic preferences and locus of control affect mental budgeting.

Important to mention is that personality traits might also be related to economic preferences, but the exact link between these concepts is still unclear. It could be possible that preferences mediate the relationship between personality and mental budgeting. However, there is some discussion in the literature about it and the relationship between personality traits and preferences is largely unexplored (Almlund et al., 2011). Therefore, the economic preferences time orientation and risk aversion as mediating variables in the relationship between personality and mental budgeting are analyzed as well in this research (besides the direct relationship between economic preferences and mental budgeting as shown in Model 2) By doing this, more clarity can be created about the mediating role of economic preferences and about the relationship between personality and preferences.

Also, the effect of mental budgeting on making ends meet is analyzed, because as mentioned earlier, people use mental budgeting to stay financially stable. However, since this research is focused on the antecedents of mental budgeting, this concept is not included in the Model.

## 3 Methodology

### 3.1. Research Strategy

The method of data collection that was used in this study was a survey. This method was used since the concepts of this research were already well defined in the literature. Exploratory research in the form of qualitative research was not necessary since measurements scales were already available. Also, it was the most suitable option given the restricted period to execute this research. Besides, more people could be reached by conducting a survey than by conducting interviews, which was important for the external validity of this study. Therefore, quantitative research in the form of a survey was most suitable.

Qualtrics was used for conducting the survey. Qualtrics is an online survey provider offering software to Radboud University for students who want to distribute surveys. It was useful because it provided a link to the survey which could be easily shared among people.

At the beginning of the survey, respondents were provided with some information about the purpose. Furthermore, an indication of the duration of the survey was given. Besides, some explanation about how to answer the questions was given and it was mentioned that there were no good or wrong answers. Furthermore, the research ethics were discussed in the introduction of the survey, which is elaborated on in the next Section.

### 3.2. Research Ethics

As mentioned, the purpose of the research and the expected duration were discussed prior to the survey questions. The message with which the link was distributed, stated that people could only participate from the age of 18 or older. This was important to mention because minors are unlikely to make (full) decisions about their finances. Participating in the survey was completely voluntary and the respondents were informed beforehand that they would be taking part in a research. Respondents had the right to decline to participate in the research or to withdraw from the questionnaire once they had already started. Also, the participation of respondents was anonymous, and the answers were reviewed carefully. Considering the quantitative nature of the research, no single cases will be reviewed or discussed. This enlarged the privacy of the respondents. Furthermore, the results of the survey were treated confidentially and were not shared with third parties, only with staff members of Radboud University. The e-mail address of the student was provided in the survey, which gave respondents the opportunity to contact when they had questions or comments about the survey or research.



### 3.3. Data Collection, Population and Sample

To collect the data, multiple methods were used. The survey was distributed via social media and e-mail. It was very important to have widely different respondents because this was needed to be able to explain as much as possible of peoples' behaviour regarding mental budgeting. In order to acquire this diversity, the method of snowball sampling was used. The respondents were asked if they could forward the survey to (at least) five other persons within their network. To make sure the respondents differed widely from each other, the starting points in the snowball sampling process were people from a different age, gender, profession and income. As is mentioned, the respondents need to differ as much as possible (regarding gender, age, profession and income) and therefore, the target population of the study is very broad, namely Dutch adults (18 years and older).

The required sample size was determined by conducting a G\*Power 3.1 test. For doing the linear multiple regression, a total sample size of 89 respondents was recommended by this test. To stay on the safe side, it was aimed to have at least 120 participants.

A pretest was conducted before the survey was shared, to see if the questions were clearly defined and to see what time it took to answer the questions of the survey.

### 3.4. Materials

The key concepts of this study were operationalized with measurement scales which were all widely used. As the respondents of the survey had Dutch nationality, the scales were translated into Dutch in advance, to ensure they could comprehend the questions well.

To measure mental accounting, an extended version of the mental budgeting scale of Antonides et al. (2011) was used. It consisted of 16 items and these were rated on a 5-point Likert scale running from *totally disagree* to *totally agree* (Appendix C, Table 3).

Furthermore, to measure the Big Five personality traits, the Big Five Inventory-10 (BFI-10) was used, accompanied by a 5-point Likert scale running from *totally disagree* to *totally agree* (Rammstedt & John, 2007). The BFI-10 scale has been used widely in social-psychological as well as economic research (Donato et al., 2017; Oehler, Wendt, Wedlich, & Horn, 2018). The BFI-10 scale is presented in Appendix C, Table 4.

A shorter version of the CFC measurement scale was used to measure time orientation because Petrocelli (2003) showed great support for this shorter variant of the measurement scale (Strathman, Gleicher, Boninger & Edwards, 1994) (Appendix C, Table 5). To measure risk aversion, the Risk Propensity Scale (Meertens & Lion, 2008) was used, which consisted of 7 items (Appendix C, Table 6). Both measurement scales were also rated on a 5-point Likert scale

running from *totally disagree* to 5 *totally agree*. The higher the scores, the more risk averse or more long-term time oriented someone was.

To measure locus of control, the scale of Kovaleva (2012) was used. This scale consisted of 4 items that were also rated on a 5-point Likert scale running from *totally disagree* to *totally agree*. The measurement scale is presented in Appendix C, Table 7. In addition, a one-item scale for making ends meet is added to the survey, which is derived from the EU-SILC questionnaire (Eurostat, 2014). The item reads: “*In an average month, how easy or difficult is it for you to make ends meet and pay all your bills?*” Respondents could rate their ability to make ends meet on a 5-point scale ranging from *very difficult* to *very easy*. This question was valuable to add because, as mentioned before, it could be a consequence of mental accounting.

In addition to the items for measuring the key concepts, the survey contained sociodemographic questions to assess the gender and age of the respondents. The survey is presented in Appendix D.

### 3.5. Data Analysis

The data of the survey was analyzed via SPSS. Since the used measurement scales were all well-known and widely used, the validity of the measurements scales was already proved in earlier researches. This made factor analysis not necessary. To test the reliability of the scales, reliability checks were conducted. To construct the measurement scales, the means of the items of the scales were calculated. Furthermore, to analyze whether the expected relationships were present and whether the hypotheses were correct, multiple regression analysis was conducted. Multiple regression analysis was most suitable because it is used when people want to determine the effect of multiple independent variables on one dependent variable. Age, gender and profession were included as control variables in the analysis to ensure there would be no bias. Furthermore, possible mediation by economic preferences was examined, using “PROCESS” (Hayes, 2017) in SPSS. Also, ordinal regression was conducted to analyze the effect of mental budgeting on making ends meet.

## 4 Results

### 4.1. Sample Statistics

In total, there were 165 respondents. Due to missing values, 16 respondents were removed from the data set (who filled in less than 25% of the survey), leaving 149 respondents for the data set. Before requesting sample statistics in SPSS, the reverse formulated variables were recoded. The sample statistics are presented in Table 8.

The male-to-female ratio was quite equal, slightly more females than males participated in the survey. The highest represented age category was that of younger than 25, followed by the age category of 46-55 years. Remarkably, only three persons fell into the age category of 36-45 years. Since it is less than the minimum of 5, this age category was combined with the age category of 25-35 years in the regression analysis. Besides, most respondents were currently working (59.1%), followed by students (38.3%).

Table 8 - *Sample statistics*

	Frequency	Percent
Gender		
Male	66	44.3
Female	83	55.7
Age		
<25	60	40.3
25-35	26	17.4
36-45	3	2.0
46-55	41	27.5
>55	19	12.8
Profession		
Student	57	38.3
Working	88	59.1
Retired	1	0.7
Other	3	2.0
Total	149	100.0

### 4.2. Scale Reliability

The data were analyzed with the use of SPSS. As mentioned before, the validity of the measurement scales was already proven in earlier researches. Reliability checks were conducted on the measurement scales to test the reliability of the scales. The results of the reliability checks are presented in Table 9. The scales of *mental budgeting*, *extraversion*, *neuroticism*, *time preference* and *risk preference* were all above 0.700, which indicates reliable measurement scales. Cronbach's alpha of *mental budgeting*, *time preference*, and *risk*

*preference* could be slightly higher when one item was deleted. However, these increases were minimal. Therefore, these items were not deleted.

The reliabilities of three out of the five dimensions of the BFI-10 scale were not above 0.600. Nevertheless, no items could be deleted to enlarge Cronbach's alpha. Cronbach's alpha of Agreeableness was -.110 and therefore not reliable at all. Therefore, this trait was excluded from further analysis, which meant that hypothesis 1c could not be accepted or rejected. *Openness to experience* and *conscientiousness* did not meet the required Cronbach's alpha of 0.6. However, no items could be deleted to enlarge reliability, because they both consisted of only two items. Since they both consisted of only two items, it was better to look at the inter-item correlations between the items. This was 0.350 for *openness to experience* and 0.277 for *conscientiousness*, which meant that the items were positively correlated. These values were desirable since the optimal inter-item correlation values range from .200 to .400 (Briggs & Cheek, 1986). Also, Cronbach's alpha of *locus of control* was slightly below 0.6. However, this could not be further improved by removing any of the items.

Despite the lower reliability of some of the measurement scales mentioned above, these were still included in the analysis (except for agreeableness). The lower reliability of the measurement scales mentioned above could give a lot of noise, which was probably random. As a result, these variables were less likely to be significant. However, this was not a reason not to include them in the analysis.

Table 9 - Reliability analysis of the measurement scales mental budgeting, the big five, economic preferences and locus of control

Measurement scale	Cronbach's alpha
Mental Budgeting	0.845
BFI-10	
Openness to Experience	0.498
Conscientiousness	0.411
Extraversion	0.722
Agreeableness	-.110
Neuroticism	0.719
Time Preference	0.702
Risk Preference	0.746
Locus of Control	0.554

### 4.3. Analysis

To test the hypotheses, multiple regression analysis was conducted. The independent variables were *the big five*, *time orientation*, *risk aversion* and *locus of control*. The dependent variable was *mental budgeting* and the control variables were *age*, *gender* and *profession*. *Age* and *gender* were both nominal measurements and *age* was an ordinal categorical measurement. Therefore, these were converted into dummy variables. *Age* was converted into dummy variables  $age1 = \text{younger than 25}$ ,  $age2 = 25-45$ ,  $age3 = 46-55$  and  $age4 = \text{older than 55}$  (with younger than 25 as reference category). *Gender* was converted into male (reference category) and female. *Student* was converted into student (reference category) and others. In this way, it was possible to include the variables in the regression analysis.

All the assumptions of regression were met. Firstly, there was no significant multicollinearity. This was tested by using the Variance Inflation Factor (VIF) values. Besides, the histograms and pp-plot showed that the residuals were normally distributed. Also, the scatterplot of residuals versus predicted values confirmed the assumption of homoscedasticity. Lastly, given the scatterplots, the assumption of linearity was met.

The results of the regression analysis are shown in Table 10. Model 1 (with control variables *age*, *gender* and *profession*) was not significant ( $R^2 = .060$ ;  $F(5,143) = 1.818$ ;  $p > .05$ ). The variable  $age=25-45$  (model 1) had a significant effect on *mental budgeting* ( $B = -.023$ ;  $t(136) = 2.102$ ;  $p < .05$ ), and the effect of variable  $age=46-55$  on *mental budgeting* was marginally significant ( $B = .310$ ;  $t(136) = 1.681$ ;  $p < .10$ ). The other control variables (*student*, *male* and  $age = \text{older dan 55}$ ) were not significant ( $p > .05$ ).

Besides, the results presented in Table 10 showed that multiple regression with *mental budgeting* as dependent variable and *the big five*, *time orientation*, *risk aversion* and *locus of control* as explaining variables (Model 2) was marginally significant ( $R^2 = .133$ ;  $F(12,136) = 1.736$ ;  $p < .10$ ). The (marginally) significant direct effects are presented in Model 3. The effect of the personality trait *neuroticism* on *mental budgeting* was significant ( $B = -.124$ ;  $t(136) = -2.006$ ;  $p < .05$ ). Therefore, hypothesis 1d was not rejected. The personality traits *extraversion*, *conscientiousness* and *openness to experience* did not have significant effects on *mental budgeting* (*extraversion*:  $B = -.024$ ;  $t(136) = -.409$ ;  $p > .05$ ; *conscientiousness*:  $B = -.020$ ;  $t(136) = -.298$ ;  $p > .05$ ; *openness to experience*:  $B = .002$ ;  $t(136) = .028$ ;  $p > .05$ ). Therefore, these results showed no support for hypotheses 1a and 1b. Besides, the economic preferences *time orientation* and *risk aversion* both had marginally significant effects on *mental budgeting* (*time orientation*:  $B = .145$ ;  $t(136) = 1.686$ ;  $p < .10$ ; *risk aversion*:  $B = .195$ ;  $t(136) = 1.977$ ;  $p < .10$ ). Therefore, these results showed little support for hypotheses 2 and 3.

Furthermore, *locus of control* did not have a significant effect on *mental budgeting* ( $B = -.042$ ;  $t(136) = -.431$ ;  $p > .05$ ), which indicated no support for hypothesis 4.

Table 10 - Multiple regression analysis with personality traits, economic preferences and locus of control as independent variables and mental budgeting as dependent variable

#### Model summary

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error
1	.244	.060	.027	.64797
2	.364	.133	.056	.63811

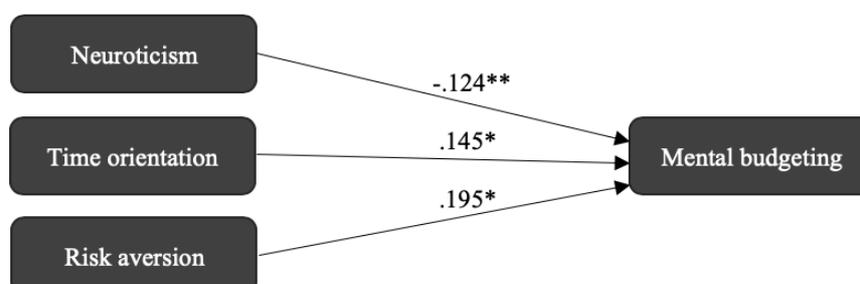
#### ANOVA

Model		df	F	Sig.
1	Regression	5	1.818	.113
	Residual	143		
2	Regression	12	1.736	.066
	Residual	136		

Model		B	SE B	$\beta$	t	Sig.
1	(Constant)	3.148	.168		18.724	.000
	Male	.144	.111	.109	1.293	.198
	Student	-.023	.158	-.017	-.145	.885
	Age= 25-45	.342	.163	.207	2.102	.037**
	Age= 46-55	.310	.184	.211	1.681	.095*
	Age= Older than 55	.102	.212	.052	.483	.630
2	(Constant)	2.618	.653		4.071	.000
	Male	.125	.123	.095	1.014	.313
	Student	.025	.162	.018	.152	.879
	Age= 25-45	.370	.162	.224	2.287	.024**
	Age= 46-55	.265	.187	.181	1.420	.158
	Age= Older than 55	.008	.215	.004	.036	.971
	Extraversion	-.024	.059	-.038	-.409	.683
	Conscientiousness	-.020	.066	-.027	-.298	.766
	Neuroticism	-.124	.062	-.197	-2.006	.047**
	Openness	.002	.061	.002	.028	.977
	Time orientation	.145	.086	.150	1.686	.094*
	Risk aversion	.195	.099	.191	1.977	.050*
	Locus of Control	-.042	.096	-.039	-.431	.667

\*  $p < .10$  \*\*  $p < .05$

- a. Predictors: (constant), age, male, student  
 b. Predictors: (constant), age male, student, time orientation, extraversion, openness, locus of control, conscientiousness, risk aversion, neuroticism  
 c. Dependent variable: mental budgeting



\*  $p < .10$  \*\*  $p < .05$

Model 3 – The direct effects of personality and economic preferences on mental budgeting (standardized values)

## 4.4. Indirect Relationships and Making Ends Meet

### 4.4.1. Indirect Relationships

As mentioned in Section 2.5, it could be possible that economic preferences mediate the relationship between personality traits and mental budgeting. However, this relationship was largely unexplored. Because the personality traits generally had no significant direct effects on mental budgeting, economic preferences as mediating variables in the relationship between personality and mental budgeting were analyzed as well. The possible mediation effects by economic preferences were examined, using “PROCESS” (Hayes, 2017) in SPSS. The independent variables were *extraversion*, *conscientiousness*, *neuroticism* and *openness to experience*. The dependent variable was *mental budgeting*, the mediators were the economic preferences *time orientation* and *risk aversion* and the control variables were *age*, *male* and *student*. As with the previous analysis, all the assumptions mentioned earlier were also met with this analysis. The whole model was tested, including economic preferences as mediators. The test was conducted 4 times, to check all four independent variables.

The direct effects of the personality traits *extraversion*, *conscientiousness*, *neuroticism* and *openness to experience* and the control variables *age*, *male* and *student* on *risk aversion*, *time orientation* and *mental budgeting* are presented in Table 11. The indirect effects of the *personality traits* and *mental budgeting* mediated by the economic preferences *risk aversion* and *time orientation* are presented in Table 12.

To check whether mediation has occurred, the p-value ( $<0.05$ ) was checked as well as the confidence interval, with 95% confidence (bounded by LLCI at the lower end and ULCI at the higher end). If the confidence interval did not include zero, zero could be confidently ruled out as a plausible value for the effect (Hayes, 2017).

The indirect effect of *extraversion* on *mental budgeting* with *risk aversion* as the mediating variable was significant, given the confidence interval with 95% confidence (Model 4). The effect of *extraversion* on *mental budgeting* with *time orientation* as the mediating variable was not significant. Furthermore, the indirect effects of *neuroticism*, *openness* and *conscientiousness* on *mental budgeting* for both mediators *time orientation* and *risk aversion* were not significant given the confidence interval.

Besides, *Risk aversion* had a significant direct effect on *mental budgeting* and *neuroticism* had a marginally significant effect on mental budgeting. Both *extraversion* and *neuroticism* had significant direct effects on *risk aversion*. The direct relationship between

*conscientiousness* and *risk aversion* was marginally significant, and the direct relationship between *conscientiousness* and *time orientation* was significant as well.

Table 11 – The direct effects of the personality traits and the control variables age, male and student on mental budgeting

Dependent variable	Independent variable	Coeff	Se	t	p	LLCI	ULCI
Risk aversion	Constant	3.118	.365	8.546	.000	2.397	3.834
	Age= 25-45	-.018	.141	-.124	.901	-.297	.262
	Age= 46-55	.190	.162	1.180	.240	-.129	.511
	Age=Older than 55	.1178	.187	.631	.529	-.252	.487
	Male	.363	.103	3.519	.001**	.1592	.5676
	Student	-.065	.141	-.463	.645	-.345	.214
	Extraversion	-.166	.049	-3.409	.001**	-.262	-.070
	Conscientiousness	.096	.054	1.790	.076*	-.010	.203
	Neuroticism	.160	.052	3.091	.002**	.058	.262
	Openness	-.044	.052	-.848	.398	-.147	.059
Time orientation	Constant	2.056	.425	4.838	.000	1.216	2.897
	Age= 25-45	-.092	.165	-.560	.576	-.418	.233
	Age= 46-55	-.114	.189	-.604	.547	-.487	.259
	Age=Older than 55	.154	.218	.707	.481	-.277	.584
	Male	.053	.120	.437	.663	-.185	.291
	Student	.023	.165	.141	.888	-.303	.349
	Extraversion	.033	.057	.585	.560	-.079	.145
	Conscientiousness	.262	.063	4.175	.000**	.137	.385
	Neuroticism	-.018	.060	-.306	.760	-.138	.101
	Openness	.046	.061	.752	.454	-.074	.165
Mental budgeting	Constant	2.494	.529	4.718	.000	1.449	3.539
	Age= 25-45	.370	.161	2.295	.023**	.051	.688
	Age= 46-55	.269	.186	1.445	.151	-.099	.356
	Age=Older than 55	.018	.214	.083	.934	-.404	.440
	Male	.123	.123	1.001	.319	-.120	.366
	Student	.022	.161	.136	.892	-.297	.341
	Extraversion	-.028	.058	-.475	.636	-.142	.087
	Conscientiousness	-.023	.065	-.355	.723	-.152	.106
	Neuroticism	-.120	.061	-1.970	.051*	-.241	.001
	Openness	.007	.060	.119	.910	-.111	.125
Time orientation	.138	.084	1.639	.104	-.284	.304	
Risk aversion	.200	.098	2.043	.043**	.006	.393	

\*  $p < .10$  \*\*  $p < .05$

Table 12 – The mediation effects of economic preferences in the relationship between personality traits and mental budgeting

		Effect	BootSE	BootLLCI	BootULCI
<b>Extraversion</b>	Time orientation	.005	.010	-.010	.032
	Risk aversion	-.033	.019	-.075	-.001*
<b>Neuroticism</b>	Time orientation	-.003	.010	-.026	.016
	Risk aversion	.032	.021	-.001	.081
<b>Openness</b>	Time orientation	.006	.011	-.011	.034
	Risk aversion	-.009	.012	-.038	.009
<b>Conscientiousness</b>	Time orientation	.036	.025	-.007	.094
	Risk aversion	.019	.015	-.003	.055

\*  $p < .10$



Model 4 – The indirect effect of extraversion on mental budgeting, mediated by risk aversion

#### 4.4.2. Making Ends Meet

As mentioned in Section 2.5, the effect of *mental budgeting* on *making ends meet* was also analyzed. This was done by ordinal regression analysis in SPSS, since making ends meet consisted of only one item, which might not form a cardinal scale. The dependent variable was *making ends meet* and the independent variable was *mental budgeting*. The control variables *age*, *male* and *student* were also taken into account.

The results of this analysis are shown in Table 13. It can be seen that there was a significant improvement in the fit of the final model over the null model ( $\chi^2 (7) = 17.549$ ;  $p < .05$ ).

The Goodness of Fit Table (in Table 13) suggested good model fit since non-significant test results are indicators that the model fits the data well (Field, 2017). Both the Pearson chi-square test ( $\chi^2 (339) = 314.802$ ;  $p = .823$ ) and the deviance test ( $\chi^2 (339) = 249.680$ ;  $p = 1.000$ ) were non-significant, as desired. The Pseudo  $R^2$  was .125 (Nagelkerke). As can be seen in the Parameter Estimates Table, *mental budgeting* did not have a significant effect on *making ends meet* ( $p > .05$ ).

Table 13 – Ordinal regression with *mental budgeting* as independent variable and *making ends meet* as dependent variable

<b>Model Fitting Information</b>				
Model	-2 Log Likelihood	$\chi^2$	df	Sig.
Intercept Only	291.749			
Final	275.399	16.350	6	.012
<b>Goodness-of-Fit</b>				
	$\chi^2$	df	Sig.	
Pearson	314.802	339	.823	
Deviance	249.680	339	1.000	
<b>Pseudo R<sup>2</sup></b>				
Cox and Snell			.111	
Nagelkerke			.125	
McFadden			.054	
<b>Parameter Estimates</b>				
	Estimate	Std. Error	df	Sig.

Threshold [MEM= 2]	-5.649	1.131	1	.000
[MEM= 3]	-3.143	.971	1	.001
[MEM= 4]	-.677	.931	1	.467
Location Male	-.549	.335	1	.076
Age= 25-35	-1.099	.500	1	.028**
Age= 36-45	.174	1.220	1	.887
Age= 46-55	.110	.556	1	.843
Age=Older than 55	-.404	.632	1	.523
Student	-.777	.478	1	.104
Mental budgeting	-.203	.251	1	.420

\*\*  $p < .05$

## 5 Discussion and Conclusion

### 5.1. Discussion

#### 5.1.1. Theoretical Implications

Knowledge about financial behaviour of consumers and its personal drivers is of vital importance for both consumers themselves and organizations. This research aimed to find out how personality traits, economic preferences and locus of control affect mental budgeting.

The results derived in this research deviate from existing literature, regarding some of the determinants of mental budgeting. Specifically, statistical evidence did not support the influence of personality traits on mental budgeting. However, neuroticism was an exception because this personality trait did have a negative significant effect on mental budgeting. This result suggests that the less neurotic someone is, the more likely this person will use mental budgeting, which is in line with hypothesis 1d. This result seems logical because emotionally stable people (the opposite of neuroticism) are showing less compulsive buying behaviour. The fact that the most personality traits did not affect mental budgeting significantly is in contrast to the expectations about the relationship between the personality traits and mental budgeting (hypothesis 1), based on earlier research (Sirgy, 1985; Mowen & Spears, 1999; Mowen 2000; Mahdavi Zafarghandi, Salehi & Khalil Sabet, 2016; Asebedo et al., 2018) that found evidence of the effects of personality traits on financial behaviour. One reason for this deviation could be that other personal factors are more important determinants of mental budgeting than The Big Five.

Some evidence is found for the effects of the economic preferences time orientation and risk aversion on mental budgeting (hypotheses 2 and 3). This is in line with research discussed earlier (Antonides et al., 2011), that also showed the effect of time orientation on mental budgeting. The outcomes of the current study suggest that people who are more long-term time oriented and/or are more risk averse will make more use of mental budgeting. This seems logical since mental budgeting is used to stay financially stable and to make sure not more money is expended than someone possesses. This fits well with someone who is more risk averse. Also, people using mental budgeting are planning *ahead* and thinking about *future* incomes and expenses to make sure to stay financially stable. This fits well with people who are more long-term time oriented as well. This reasoning explains the significant effects of both economic preferences on mental budgeting.

Besides, no evidence was found to support the influence of locus of control on mental budgeting, which is not in line with the expectation (hypothesis 4) based on research discussed

earlier. A reason for this deviation could be that these factors are indirectly related to each other and that another factor (or more factors) needs to be taken into account. Cobb-Clark et al. (2016) discussed that the way people perceive self-control is important for the ability to avoid temptation and accomplish long-term goals. Therefore, it could be possible that avoiding temptation and accomplish long-term goals should be taken into account in the relationship between locus of control and mental budgeting. Another possible explanation for the non-significant result will be discussed in Section 5.1.3.

Besides, the economic preferences did not mediate the relationship between personality traits and mental budgeting, except for extraversion. This significant indirect effect suggests that people who are less extravert will be more risk averse and will, therefore, use mental budgeting more. This effect seems explicable because people who are less extravert are not very adventurous (Appendix B, Table 2). Being not adventurous fits well with risk averse people and as mentioned, risk averse people will use mental budgeting more.

The effect of mental budgeting on making ends meet was not significant as well. Possible reasons for this result are the sample, and the way of measuring mental budgeting. In contrast with Antonides et al. (2011), a convenience sample was used, which was not representative for the Dutch population. Also, a different scale for measuring mental budgeting was used, which was actually more reliable than the one in Antonides et al. (2011). Future research concerning the use of the scale in larger samples should be conducted in order to study the stability of our results.

Furthermore, as mentioned in Section 2.5, the connection between the concepts personality and preferences remained largely unknown and unclear (Almlund et al., 2011). This research shows that extraversion, conscientiousness and neuroticism are significant predictors of risk aversion and that conscientiousness is a significant predictor of time orientation as well. Therefore, this research provides more clarity about the relationship between preferences and personality and it suggests that these personality traits can affect economic preferences.

This research addresses the need for further theory development concerning determinants of mental budgeting. The results suggest that people's economic preferences affect mental budgeting more than personality traits and locus of control do. This finding adds to the literature because personality traits were expected to be an important indicator of mental budgeting based on earlier research. However, the effect of personality traits on mental budgeting are likely to be less significant than previously thought, and economic preferences seem to be more important determinants of mental budgeting. Therefore, investigating more preferences more deeply in relationship with mental budgeting can be an interesting angle in

the light of this research. Future research suggestions will be discussed in more detail in Section 5.1.3.

### **5.1.2. Practical Implications**

The main takeaway from the results for practice is the relevance of economic preferences in relation to mental budgeting. This research suggests that having insight into economic preferences is relevant when people and organizations want to have knowledge about financial behaviour, and more specifically, about mental budgeting. As mentioned before, mental budgeting appears to be a self-control mechanism, which is very helpful to stay financially stable. Organizations like banks can help people with their mental budgeting behaviour when they know about people's economic preferences, since people who are not risk averse and short-time oriented will make less use of mental budgeting. This help can influence people's finances positively, which could be valuable for both people and organizations, or in other words society at large.

Knowing more about consumers' economic preferences could also be valuable to organizations who want to influence how people spend their money. For instance, in this time of the Corona-crisis, people are not able to go on vacation this summer. People who make use of mental budgeting can decide to use the money they reserved for the vacation to spend on something else. When organizations have knowledge about the economic preferences of consumers, they could influence their buying behaviour. They can, for instance, anticipate on it by convincing risk averse and/or long-term time oriented (potential) consumers that they could use the money they reserved for the vacation to spend on a product the organization sells.

### **5.1.3. Limitations and Future Research Suggestions**

The current research was the first attempt to investigate the relationship between personality and mental budgeting. However, the length of the questionnaire and the ease of reaching the respondents were factors that might have limited the findings of this Master thesis research.

Therefore, it may not have been adequate enough in some respects to find significant results. The scale reliabilities were not high enough for three out of the five personality traits. One reason could be only a 10-item measurement scale for measuring The Big Five was used. Also, the scale of locus of control was not very reliable as well. This situation could have limited the significance of the findings. Measurements of The Big Five and locus of control could be more reliable when using scales consisting of more items. This may produce different results than

presented here. Therefore, future research including more extensive measurement scales for The Big Five and locus of control could address this limitation.

Furthermore, despite the use of snowball sampling, the sample of the survey shows an overrepresentation of young respondents (younger than 25 years old), which might have affected the generalizability of the results. The overrepresentation may have occurred because, besides snowball sampling, social media was also used to distribute the survey and mainly young people are very active here. Therefore, I would suggest that future research should pay more attention to the distribution of the sample. Also, it is important to note that the findings may not be generalizable to other countries since this research took place in the Netherlands.

Another future research suggestion would be to look further into the effect of economic preferences on mental budgeting. Given the restricted period to execute this research, only two economic preferences were taken into account. It could be interesting for future research to take other preferences into account as well because the economic preferences of time orientation and risk aversion seem to affect mental budgeting. For instance, other common preferences discussed in the economics literature, like social preferences and preference for leisure, can be researched as well (Almlund et al., 2011).

It would also be interesting to look further into the relationship of personality and preferences because this was not the main focus of this study and it remained largely unexplored. When doing this, I would suggest using scales consisting of more items.

## 5.2. Conclusion

To conclude, hypotheses 1a and 1b were rejected, since the personality traits did not have significant effects on mental budgeting. Except for hypothesis 1d, because neuroticism showed a significant effect on mental budgeting. Besides, hypotheses 2 and 3 were not rejected, since risk aversion and time orientation had some significant effects on mental budgeting. Lastly, no evidence was found to support the influence of locus of control on mental budgeting. Thus, hypothesis 4 was rejected. The indirect effects of personality traits on mental budgeting were also analyzed. These effects were not significant, except for the indirect relationship between extraversion and mental budgeting, mediated by risk aversion. Besides, it can be concluded that mental budgeting did not affect making ends meet significantly.

This research contributes to the existing theory about mental budgeting by analyzing the effects of personality and preferences on mental budgeting. In addition, the results suggest that people's economic preferences affect mental budgeting more than personality traits and locus of control do, which answers the research question presented at the beginning of this study.



This finding adds to the literature because personality traits were expected as important indicators of mental budgeting based on earlier research. However, the effects of personality traits on mental budgeting are likely to be less significant than previously thought. Economic preferences appear to have more influence on mental budgeting. Therefore, investigating more preferences more deeply in relation to mental budgeting can be an interesting and value-adding angle in light of this research. Also, this research provides more clarity about the relationship between preferences and personality and it suggests that these personality traits affect economic preferences. Nevertheless, it could be interesting to look further into this relationship, since it remained largely unexplored.



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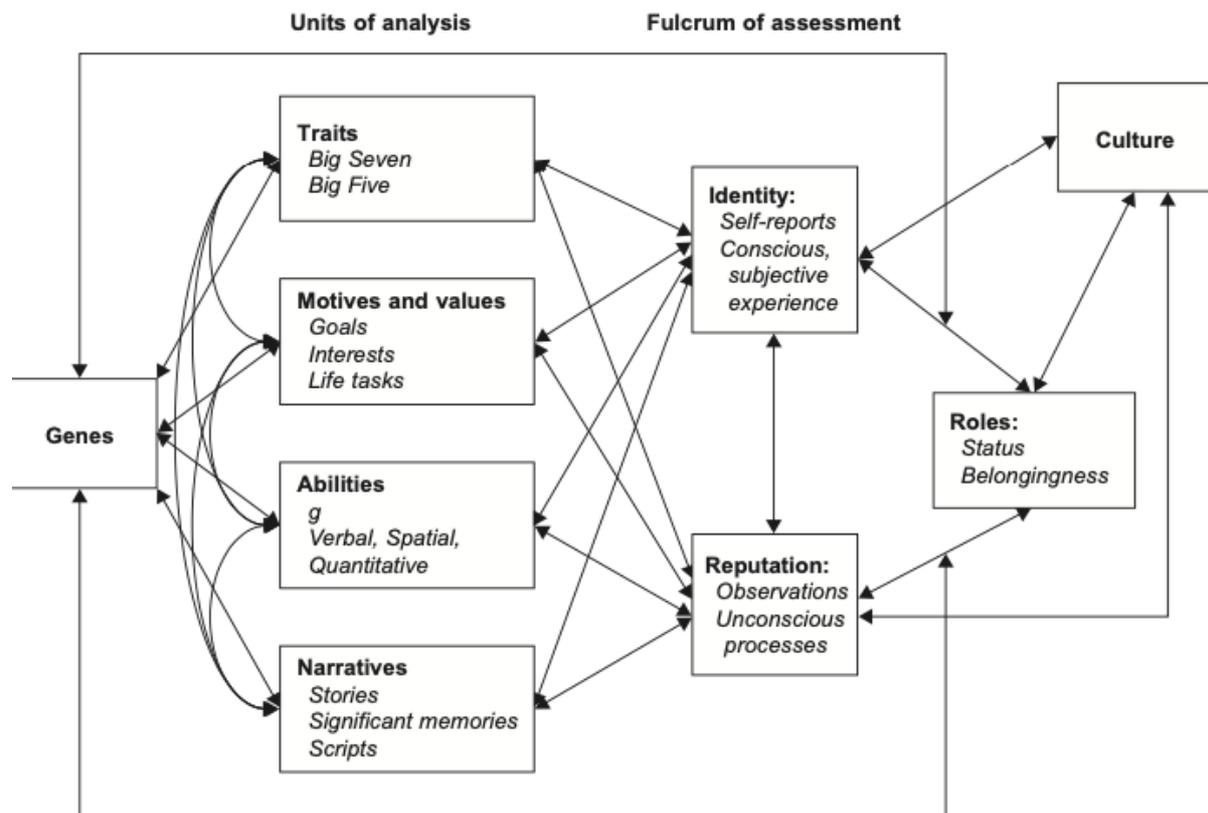
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# Appendix

## Appendix A – Model of Personality

### Model 1

(From Roberts, 2006)



## Appendix B – The Big Five

**Table 1 – The Big Five Traits**

(From the American Psychological Association Dictionary, 2007)

<i>Trait</i>	<i>Definition of trait</i>
<i>I Openness to Experience</i>	The tendency to be open to new aesthetic intellectual experiences.
<i>II Conscientiousness</i>	The tendency to be organized, responsible, and hardworking.
<i>III Extraversion</i>	An orientation of one's interests and energies toward the outer world of people and things rather than the inner world of subjective experience; characterized by positive affect and sociability.
<i>Agreeableness</i>	The tendency to act in a cooperative, unselfish, manner.
<i>Neuroticism (Emotional Stability)</i>	Neuroticism is a chronic level of emotional instability and proneness to psychological distress. Emotional stability is predictability and consistency in emotional reactions, with absence of rapid mood changes.

**Table 2 - Facets of The Big Five**

(From Almlund et al., 2011, p. 44-45)

<i>Trait</i>	<i>Facets</i>
<i>I Openness to Experience</i>	<ul style="list-style-type: none"> <li>Fantasy (imaginative)</li> <li>Aesthetic (Artistic)</li> <li>Feelings (excitable)</li> <li>Actions (wide interests)</li> <li>Ideas (Curious)</li> <li>Values (unconventional)</li> </ul>
<i>II Conscientiousness</i>	<ul style="list-style-type: none"> <li>Competence (efficient)</li> <li>Order (organized)</li> <li>Dutifulness (not careless)</li> <li>Achievement striving (ambitious)</li> </ul>

*III Extraversion*

self-discipline (not lazy)  
 Deliberation (not impulsive)

Warmth (friendly)  
 Gregariousness (sociable)  
 Assertiveness (self-confident)  
 Activity (energetic)  
 excitement seeking (adventurous)  
 Positive emotions (enthusiastic)

*Agreeableness*

Trust (forgiving)  
 straightforwardness (not demanding)  
 altruism (warm)  
 Compliance (not stubborn)  
 Modesty (not show-off)  
 Tendermindedness (sympathetic)

*Neuroticism (Emotional Stability)*

Anxiety (worrying)  
 Hostility (irritable)  
 Depression (not contented)  
 Self-consciousness (shy)  
 Impulsiveness (moody)  
 Vulnerability to stress (not self-confident)

## Appendix C – Measurement Scales

**Table 3 - Mental Budgeting Scale**

(From Antonides, de Groot, & van Raaij, 2011)

Please, indicate to what extent each of the following statements apply to you. (Answers: 1 = totally disagree; 2 = moderately disagree; 3 = neither agree, nor disagree; 4 = moderately agree; 5 = totally agree).

1.	I have reserved money (budget) for different expenses, such as food, clothing, transportation, etc.	Ik heb geld gereserveerd voor verschillende uitgaven, zoals eten, kleding, vervoer, etc.
2.	If I spend more on one thing, I economize on other expenses.	Als ik in een maand meer geld dan normaal uitgeef aan het ene, bespaar ik op andere uitgaven.
3.	I never spend more than a fixed amount on food, clothing, transportation, etc.	Ik geef nooit meer dan een vast bedrag uit aan eten, kleding, vervoer, etc.
4.	When I make a budget, I always take fixed expenses into account.	Als ik een begroting maak, houd ik altijd rekening met vaste lasten.
5.	When I expect a certain cost, I reserve money for it.	Zodra ik een bepaalde uitgave verwacht, reserveer ik daar geld voor.
6.	I always have a money-buffer for emergencies.	Ik heb altijd een geldbuffer voor noodgevallen.
7.	I always leave a certain amount in my account for fixed expenses.	Ik laat altijd een bepaald bedrag op mijn rekening staan voor vaste lasten.
8.	I always leave a certain amount in my account for unexpected costs.	Ik laat altijd een bepaald bedrag op mijn rekening staan voor onverwachte kosten.
9.	When I have more of a certain expense in one period than normal, I spend less on that in the next period.	Als ik in de ene periode meer uitgaven heb binnen een bepaalde categorie dan normaal, dan geef ik daar in de volgende periode minder aan uit.
10.	I accurately plan my expenses beforehand.	Ik plan mijn uitgaven vooraf nauwkeurig.
11.	I have several budgets for different expenses.	Ik heb verschillende budgetten voor verschillende uitgaven.
12.	My expenses are easily divided into recognizable expenditure items.	Mijn uitgaven zijn gemakkelijk te verdelen in herkenbare uitgaveposten.
13.	I usually know from which budget future expenses need to be paid.	Ik weet meestal uit welk budget toekomstige uitgaven moeten worden betaald.
14.	At the beginning of the period I always make budgets for certain expenses.	Aan het begin van de periode maak ik altijd budgetten voor verschillende soorten uitgaven.
15.	If it turns out that way, I often change budgets I made before.	Als het nodig blijkt te zijn, verander ik vaak budgetten die ik eerder heb gemaakt.
16. R	Money I reserved for a certain expense, is sometimes spend on other things.	Geld dat ik voor een bepaalde soort uitgave heb gereserveerd, wordt soms aan andere dingen uitgegeven.

### Table 4 – The BFI-10 Measurement Scale

(From Rammstedt & John, 2007)

Please, indicate to what extent each of the following statements apply to you. (Answers: 1 = totally disagree; 2 = moderately disagree; 3 = neither agree, nor disagree; 4 = moderately agree; 5 = totally agree).

1.	I see myself as a person who is reserved.	Ik zie mezelf als een gereserveerd (terughoudend) persoon.
2.	I see myself as a person who is generally trusting.	Ik zie mezelf als een betrouwbaar persoon.
3.	I see myself as a person who tends to be lazy.	Ik zie mezelf als iemand die de neiging heeft lui te zijn.
4.	I see myself as a person who is relaxed, handles stress well.	Ik zie mezelf als een ontspannen persoon, als iemand die goed met stress kan omgaan.
5.	I see myself as a person who has artistic interests.	Ik zie mezelf als iemand met artistieke interesses.
6.	I see myself as a person who is outgoing, sociable.	Ik zie mezelf als een extravert, sociaal persoon.
7.	I see myself as a person who tends to find fault with others.	Ik zie mezelf als iemand die de neiging heeft fouten bij anderen te zien.
8.	I see myself as a person who does a thorough job.	Ik zie mezelf als iemand die grondig werk verricht.
9.	I see myself as a person who gets nervous easily.	Ik zie mezelf als iemand die snel nerveus wordt.
10.	I see myself as a person who has an active imagination.	Ik zie mezelf als iemand met een actief verbeeldingsvermogen.

#### Scoring the BFI-10 scales:

Extraversion: 1R, 6; Agreeableness: 2, 7R; Conscientiousness: 3R, 8; Neuroticism: 4R, 9; Openness: 5; 10 (R: item is reversed-scored).

### Table 5 – Time Orientation Scale

(From Strathman et al., 1994)

Please, indicate to what extent each of the following statements apply to you. (Answers: 1 = totally disagree; 2 = moderately disagree; 3 = neither agree, nor disagree; 4 = moderately agree; 5 = totally agree).

1.	Often, I engage in a particular behaviour in order to achieve outcomes that may not result for many years.	Vaak gedraag ik mij op een bepaalde manier om uitkomsten te bereiken die pas over vele jaren iets zullen opleveren.
2. (R)	I only act to satisfy immediate concerns, figuring the future will take care of itself.	Ik handel enkel om onmiddellijke belangen te bevredigen, de toekomst zal zichzelf zorgen.
3. (R)	My behaviour is only influenced by the immediate (i.e., a matter of days or weeks) outcomes of my actions.	Mijn gedrag wordt enkel beïnvloed door de directe (=een kwestie van dagen of weken) uitkomsten van mijn acties.
4. (R)	My convenience is a big factor in the decisions I make or the actions I take.	Gemak speelt voor mij een grote rol bij beslissingen die ik maak of acties die ik onderneem.
5. (R)	I generally ignore warnings about possible future problems because I think the problems will be resolved before they reach crisis level.	Over het algemeen negeer ik waarschuwingen over mogelijke toekomstige problemen, omdat ik denk dat de problemen zullen worden opgelost voordat ze het crisisniveau bereiken.
6. (R)	I think that sacrificing now is usually unnecessary since future outcomes can be dealt with at a later time.	Ik denk dat nu dingen opofferen voor een later moment meestal niet nodig is, omdat toekomstige uitkomsten op een later tijdstip kunnen worden aangepakt.
7. (R)	Since my day to day work has specific outcomes, it is more important to me than behaviour that has distant outcomes.	Daar mijn dagelijkse werk specifieke uitkomsten heeft, is dit voor mij belangrijker dan acties waarvan het resultaat nog ver weg is.

### Table 6 – Risk Aversion Scale

(From Meertens & Lion, 2008)

Please, indicate to what extent each of the following statements apply to you. (Answers: 1 = totally disagree; 2 = moderately disagree; 3 = neither agree, nor disagree; 4 = moderately agree; 5 = totally agree).

1.	Safety first.	Veiligheid staat voorop.
2.	I do not take risks with my health.	Ik neem geen risico's met betrekking tot mijn gezondheid.
3.	I prefer to avoid risks.	Ik heb een voorkeur voor het vermijden van risico's.
4. (R)	I take risks regularly.	Ik neem regelmatig risico's.
5.	I really like to know what is going to happen.	Ik wil heel graag weten wat er gaat gebeuren
6. (R)	I usually view risks as a challenge.	Over het algemeen zie ik risico's als een uitdaging.
7. (R)	I view myself as: A risk avoider 1 2 3 4 5 A risk seeker	Ik zie mijzelf als: Een risicomijdend persoon 1 2 3 4 5 een risiconemend persoon

### Table 7 – Locus of Control Scale

(From Kovaleva, 2012).

Please, indicate to what extent each of the following statements apply to you. (Answers: 1 = totally disagree; 2 = moderately disagree; 3 = neither agree, nor disagree; 4 = moderately agree; 5 = totally agree).

	<b>Internal locus of control</b>	<b>Internal locus of control</b>
1.	If I work hard, I will succeed.	Als ik hard werk, zal ik slagen.
2.	I'm my own boss.	Ik maak mijn eigen keuzes.
	<b>External locus of control</b>	<b>External locus of control</b>
3.	Whether at work or in my private life: what I do is mainly determined by others.	Of het nu op het werk is of in mijn privéleven: wat ik doe, wordt voornamelijk bepaald door anderen.
4.	Faith often gets in the way of my plans	Geloof/vertrouwen staan mijn plannen vaak in de weg.

## Appendix D – Survey

Hi, mijn naam is Bregje en ik ben student aan de Radboud Universiteit Nijmegen. Fijn dat u mee wilt doen aan mijn onderzoek. Het doel van het onderzoek is om erachter te komen wat de relatie is tussen uw persoonlijkheid en hoe u met geld omgaat.

Het invullen van de vragenlijst zal ongeveer 5 minuten duren. Deelname aan dit onderzoek is volledig vrijwillig. U zult anoniem blijven en de gegevens zullen vertrouwelijk behandeld worden. De resultaten worden uitsluitend voor dit onderzoek gebruikt en worden niet gedeeld met derden. Door naar de volgende pagina te gaan bevestigt u dat u 18 jaar of ouder bent.

Mocht u vragen en/of opmerkingen hebben, dan kunt u contact opnemen met Bregje van Rosmalen (e-mail: bregjevanrosmalen@outlook.com).

Alvast hartelijk dank voor uw deelname!

De antwoorden op de vragen zijn niet goed of fout, het gaat immers om uzelf! Het is daarom niet nodig om lang na te denken over het antwoord, vink graag aan wat het eerste in u opkomt.

De eerste vragen gaan over hoe u met geld omgaat. Geef voor elke vraag aan in hoeverre u het er mee eens of oneens bent.

1. Ik heb geld gereserveerd voor verschillende uitgaven, zoals eten, kleding, vervoer, etc.
2. Als ik in een maand meer geld dan normaal uitgeef aan het ene, bespaar ik op andere uitgaven.
3. Ik geef nooit meer dan een vast bedrag uit aan eten, kleding, vervoer, etc.
4. Als ik een begroting maak, houd ik altijd rekening met vaste lasten.
5. Zodra ik een bepaalde uitgave verwacht, reserveer ik daar geld voor.
6. Ik heb altijd een geldbuffer voor noodgevallen.
7. Ik laat altijd een bepaald bedrag op mijn rekening staan voor vaste lasten.
8. Ik laat altijd een bepaald bedrag op mijn rekening staan voor onverwachte kosten.
9. Als ik in de ene periode meer uitgaven heb binnen een bepaalde categorie dan normaal, dan geef ik daar in de volgende periode minder aan uit.
10. Ik plan mijn uitgaven vooraf nauwkeurig.
11. Ik heb verschillende budgetten voor verschillende uitgaven.
12. Mijn uitgaven zijn gemakkelijk te verdelen in herkenbare uitgaveposten.
13. Ik weet meestal uit welk budget toekomstige uitgaven moeten worden betaald.
14. Aan het begin van de periode maak ik altijd budgetten voor verschillende soorten uitgaven.
15. Als het nodig blijkt te zijn, verander ik vaak budgetten die ik eerder heb gemaakt.
16. Geld dat ik voor een bepaalde soort uitgave heb gereserveerd, wordt soms aan andere dingen uitgegeven.

De volgende vragen zullen gaan over uw persoonlijkheid. Vink voor elke vraag aan wat voor u van toepassing is.

17. Ik zie mezelf als een gereserveerd (terughoudend) persoon.
18. Ik zie mezelf als een betrouwbaar persoon.
19. Ik zie mezelf als iemand die de neiging heeft lui te zijn.
20. Ik zie mezelf als een ontspannen persoon, als iemand die goed met stress kan omgaan.
21. Ik zie mezelf als iemand met artistieke interesses.
22. Ik zie mezelf als een extravert, sociaal persoon.
23. Ik zie mezelf als iemand die de neiging heeft fouten bij anderen te zien.
24. Ik zie mezelf als iemand die grondig werk verricht.
25. Ik zie mezelf als iemand die snel nerveus wordt.
26. Ik zie mezelf als iemand met een actief verbeeldingsvermogen.

De volgende vragen zullen gaan over het nemen van beslissingen. Vink aan wat voor u van toepassing is.

27. Vaak gedraag ik mij op een bepaalde manier om uitkomsten te bereiken die pas over vele jaren iets zullen opleveren.
28. Ik handel enkel om onmiddellijke belangen te bevredigen, de toekomst zal zichzelf zorgen.
29. Mijn gedrag wordt enkel beïnvloed door de directe (=een kwestie van dagen of weken) uitkomsten van mijn acties.
30. Gemak speelt voor mij een grote rol bij beslissingen die ik maak of acties die ik onderneem.
31. Over het algemeen negeer ik waarschuwingen over mogelijke toekomstige problemen, omdat ik denk dat de problemen zullen worden opgelost voordat ze het crisisniveau bereiken.
32. Ik denk dat nu dingen opofferen voor een later moment meestal niet nodig is, omdat toekomstige uitkomsten op een later tijdstip kunnen worden aangepakt.
33. Daar mijn dagelijkse werk specifieke uitkomsten heeft, is dit voor mij belangrijker dan acties waarvan het resultaat nog ver weg is.

Vink aan wat voor u van toepassing is.

34. Veiligheid staat voorop.
35. Ik neem geen risico's met betrekking tot mijn gezondheid.
36. Ik heb een voorkeur voor het vermijden van risico's.
37. Ik neem regelmatig risico's.
38. Ik wil heel graag weten wat er gaat gebeuren.
39. Over het algemeen zie ik risico's als een uitdaging.
40. Ik zie mijzelf als: een risicomijdend persoon 1 2 3 4 5 een risico nemend persoon.
41. Als ik hard werk, zal ik slagen.
42. Ik maak mijn eigen keuzes.
43. Of het nu op het werk is of in mijn privéleven: wat ik doe, wordt voornamelijk bepaald door anderen.
44. Geloof/vertrouwen staan mijn plannen vaak in de weg.

U bent bijna klaar met de survey. Er volgen nog een paar laatste korte vragen.

45. Hoe gemakkelijk of moeilijk is het voor u om in een gemiddelde maand rond te komen en al uw rekeningen te betalen?
46. Ik ben een: man, vrouw, anders.
47. Mijn leeftijd is: jonger dan 25 jaar, 25-35 jaar, 36-45 jaar, 46-55 jaar, ouder dan 55 jaar.
48. Ik ben (een): student, werkende, gepensioneerd, anders.

Dit is het einde van de survey.

Bedankt voor uw deelname!