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# Nudges derived from Mental Accounting

Will they motivate better  
economic decision making?

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## Table of Contents

Pre-face .....	iii
Abstract .....	iv
Chapter 1: Introduction .....	1
Chapter 2: Literature review.....	3
2.1 Section 1: Theory .....	3
2.2 Section 2: Heuristics and Biases .....	7
2.2.1 Status quo bias.....	8
2.2.2 Flat-rate bias.....	8
2.2.3 Sunk Cost.....	9
2.3 Section 3: Income accounting and coupling .....	10
2.4 Section 4: Mental Accounting in practice.....	12
2.5 Section 5: Debiasing.....	13
2.6 Section 6: Nudging.....	15
Chapter 3: Bridging research and applications .....	16
3.1 Practical implications, nudging and real life applications .....	16
3.2 Background for proposals .....	16
Proposal 1: Monthly credit-debt reconciliation .....	18
Proposal 2: Payment method .....	18
Proposal 3: Hidden savings .....	19
Proposal 4: Account for household expenditures.....	19
Proposal 5: Windfall income account .....	20
Proposal 6: Bonus payment frequency .....	21
Proposal 7: Predetermined Sunk cost plan .....	21
3.3 Survey.....	22
3.4 Data gathering method .....	22
3.5 Feedback.....	23
Chapter 4: Results.....	25
4.1 Discussion and drawbacks of research method.....	27
4.2 Implications in light of theory.....	28
Chapter 5: Conclusion and discussion .....	31
5.1 Limitations of the research and further suggestions.....	33
References .....	35
Appendix .....	40



## Pre-face

In the aftermath of the previous decade's financial turmoil, the fragility of personal wealth has been displayed over and over again in the news and in most communities. Solemnly we learn that economic choices are highly important in every person's pursuit of financial security and stability. As exposed by the present crisis, dramatic and overwhelming societal and economic changes can generate masses of financially strapped households. That is, if they are completely taken off-guard of such economic environmental changes. Therefore, making smarter and sober economic decisions are both of great importance to budget constrained households as it is to anyone with a large mortgage and a scarce saving account. With regards to my native county, Norway, I have recognized the possible fragile financial situation many young adults might be facing. The Central Bank of Norway acknowledged in 2012 that the households sector is highly vulnerable to shocks and a real estate bubble. The Norwegian cultural and societal norm favors home ownership rather than leasing, which is indicated by a very high rate of home-owners. Norway's Financial Supervisory Authority (FSA) raises concern about the optimistic view of rising house prices, the financial means of highly-leveraged homes, interest-only borrowing, and the high debt-income ratio. Consequently, many indicators suggest cautiousness when making decisions of personal economic concern. I have found a great pleasure of conducting research on the topics of improving decisions in order to make smart economic choices. The field of mental accounting has indicated great prospects to pursue strategies of cognitive manipulation in order to enhance people's financial well-being. This thesis covers such attempts and distinguishes what might work in order to pursue these objectives.

## Abstract

This thesis first introduces in what way people make decisions based on different heuristics and biases. Rules of thumbs are helpful and require minimal cognitive exhaustion; however their construction is based upon simplified calculations which may lead to less than optimal outcomes of choices. Financial and economic decisions that affect our utility are fairly easy to measure and evaluate. Research shows how people handle their decisions affecting money in contradicting and suboptimal manners. Such empirical findings are a great source for strategies and policies in private and public sectors, already pioneered by Richard Thaler and Cass R. Sunstein (2008) which proposed a series of actions, so-called *nudges*, in order to promote social architecture to “*Improve decisions about health wealth and happiness*”. With this thesis I have further pursued this mission. I have created proposals whose objectives are to improve economic decision making based on the exploitation of biases and heuristics that lead to sub-optimal economic outcomes. My study has showed that regardless of relevant knowledge of the mental processes behind our economic decisions, people are quite stable in their preferences. Nevertheless, when the proposal is proposed and implemented by a third party, the preferences significantly shifted towards a more optimal economic judgment. Also, demographics such as gender proved to be a significant factor in banking related proposals. Women who were educated in mental accounting processes tended to favor the proposals more than the equally educated men. In sum, learning how such strategies can work and for who they might be most effective can be of relevance for improving social and economic architecture going forward.

# Chapter 1: Introduction

This thesis deals with strategies that allows us to influence decision making, based on theories derived from behavioral economics and decisional theory. The main concept of these strategies is that people are given options to manipulate their own economic and financial behavior in order to make more optimal decisions. The purpose is to maximize personal net wealth, and subsequently deal with biases and heuristics that support contrary behavior on the individual level. The background for the strategies proposed in this thesis is the concept of bounded rationality, which is more frequently incorporated within the economic and behavioral sciences, enhancing the power of prediction in economic models. Thus, the research and theories reported by economists and behavioral researchers are highly important for the main arguments of this thesis. Empirical evidence undoubtedly reveals that people have complex and inconsistent motives for their decisions. In contrast to the economic man assumed by classical economic theories, people do not behave fully rationally or consistently selfish. With this extensive knowledge, economic behavior can be more accurately predicted and thereby handled on different levels. The objective of this thesis is to apply this knowledge and utilize its behavioral implications in order to support more thought-through decision making.

The theoretical background and the comprehensive groundwork are consolidated in the field of behavioral economics in which classical economic models are challenged and refined according to relevant psychological findings. An important development within this field is the value function, which captures how people evaluate different prospects, involving risk, losses and probabilities. Furthermore, this value function can be applied to distinguish how utility is formed, and disclose determinants for economic behavior. Within these main objectives, a subfield called “mental accounting” is established, aiming to further explore how and why people make the economic choices they do. Mental accounting processes are materialized by the decision maker which assigns wealth, income, and purchases into different mental categories and budgets. Such cognitive processes frequently apply heuristics, and are influenced by changing preferences and emotions, which in turn can cause less than optimal economic outcomes.

An important implication for mental accounting is that the fungibility of money is consistently violated. Numerous economic experiments and natural field experiments reveal peoples irregular behavior and inability to choose optimally for net-wealth maximization.

Two prominent behavioral researchers, Thaler and Sunstein (2008), presented work that processed various cognitive biases in order to utilize them to create pragmatic solutions that would “Improve decisions about health, wealth and happiness” (Nudge 2008). They presented proposals that mainly derive from the principles of research in behavioral economics, and more specifically within mental accounting. The majority of the recommended schemes are positioned toward the government and employers, where some proposals already have proved highly successful. A lead example is a pension savings scheme in which people are urged to “save more tomorrow”. The researches exploited cognitive biases in order to increase participation by utilizing temporal postponement and marginalizing the feeling of loss. Another case which proved successful was the employment of the default bias, which imperceptibly skyrocketed organ-donation participation rate due to a small shift in the default option. Similarly is the objective of this thesis namely to induce people to improve economic decision making. Where it deviates is the target audience for the implementations, which is on the individual level. I have developed proposals aiming to utilize biases related to mental accounting, which are meant to be implemented on an individual level. The theoretical and empirical foundations for these proposals will be given as additional persuasion in order for the user to acknowledge its relevance for enhanced economic well-being.

**My research question is whether individuals with more or less mental accounting knowledge will accept a selection of proposals which intend to improve economic decision making.** Furthermore, are there demographical characteristics that influence these decisions?

Richard Thaler (1999) declares that mental accounting matters, because it influences choice. Consequently, this thesis is about improving individual decision making by using mental accounting as a prescriptive device. The research design of this thesis comprises of two surveys that measure peoples’ willingness to accept nudges developed in line with this research. I endeavor debiasing the subjects by introducing them to their own biases that may cloud judgment. Thereby, my main goal is to find whether people are receptive of economic micro-nudges which are designed to improve economic decision making.

# Chapter 2: Literature review

The literature review of this thesis will cover topics of prospect theory and mental accounting, inconsistent behavior and self-control, theories and practice, common biases and heuristics, debiasing and the cradle of inspiration for the research. The first section of this review focus on the theory, which first briefly explains the departure from expected utility theory to prospect theory, and the value functions important implications for mental accounting. Mental accounting is covered in more details, followed by a more general review of inconsistent behavior with regards to time, money and consumption. Self-control strategies that emerge from the employments of mental accounting are also emphasized in this section. In the second section, I will present a selection of three biases I regard as the most relevant for the purpose of this thesis. Section three focuses on topics within income accounting and coupling, which are important determinants of economic anomalies. Thereafter, section number four covers field research that relates to the demographic influences and appliances of mental accounting. In section five, I brief the current status of what debiasing efforts have been executed in research, and some of the barriers it meets. In the sixth and final section, a short review of nudging is presented.

## 2.1 Section 1: Theory

Kahneman and Tversky's (1979) findings of how people judge monetary prospects and their relative losses and gains, empirically destroyed many of the foundations the traditional expected utility theory is built upon. Expected utility theory relies on the assumptions that people make decisions irrespectively of the structure of the prospect in question, and strictly make their decision based on the expected value of the outcome. The discoveries of Kahneman and Tversky (1979) led to the development of prospect theory, which is based upon the value function which gives a more precise prediction of economic decisions than the expected utility theory's capabilities. The value function is concave over gains and convex over losses, and the gains and losses are defined relative to a neutral reference point. A part of Kahneman and Tversky's (1979) results expose how people judge and code prospects relative to a reference point, and loss aversion was one of their outstanding findings. Many elements distinguished by Kahneman and Tversky have been subject for further research and examination. Among these are evaluations of financial and economic decisions that occur in



everyday life. Many of these processes are captured in the sub-field within behavioral economics, called mental accounting.

Thaler (1999) describes mental accounting as “the set of cognitive operations used by individuals and households to organize evaluate and keep track of financial activities” (p. 1). He assumes people perceive outcomes in terms of Kahneman and Tversky’s (1979) value function, where the incremental change from the reference point determines subsequent choices. More generally, Thaler (1999) claims that the role of the value function in mental accounting is to describe how events are perceived and coded when making decisions. Thaler (1999) emphasizes that every part of mental accounting violates the economic principle of fungibility, meaning that people discriminate money according to which mental account money is stored. Consequently, he states that mental accounting influences choice.

An essential element of mental accounting is loss aversion, which is defined in the value function. Loss aversion derives from empirical data which ascertains that individuals experience a higher hedonic loss of utility from losing something, compared to the increase of utility of gaining something of identical value. A more specific example of loss aversion is that it hurts more to lose €100 than it gives pleasure to gain €100 (Thaler, 1999). Loss aversion influences people to organize outcomes such that the experience of loss is marginalized. Thaler (1999) details how individuals evaluates and converts outcomes to decrease the feeling of loss, and thus gain optimal satisfaction. He presents four principles which are derived from the value function. The principles are to segregate gains and integrate losses, and integrate smaller losses with larger gains and segregate small gains from larger losses. The source of these principles is the steepness of the value function at the origin, see appendix 1.1. For example, the principle of segregating small gains from larger losses is explained by the value function as the utility from a small gain exceeds the utility of slightly reducing a large loss. Even though Thaler argues that the hypothesis of such hedonic editing fails in some instances, it is predictive of how people code multiple events (Thaler, 1999). Further, avoiding losses are of great importance when people judge outcomes, and Thaler (1999) argues that “loss aversion is even more important than the prospect theory value function would suggest, because it is difficult to combine losses to diminish their impact” (p.188). Subsequently, he predicts that people will frequently apply measures to decrease their exposition to losses whenever possible.

When studying decisions and to what degree they are synchronized with preferences, it is ideal to understand how people perceive the now and the future, and how they act accordingly. A person's level of consumption and wealth has traditionally been explained by the life cycle theory in classical economic theory. Thaler (1990) summarizes that the essence of the life-cycle theory is to compute "current and future wealth in any year, and thereafter figure out the level annuity you could purchase with that money and then consume the amount you would receive if you in fact owned such an annuity". Unfortunately, "for all its elegance and rationality, the life-cycle model has not tested out very well" (Courant, Gramlich, and Laitner 1986). Thaler (1990) points out an inconsistency of the life-cycle theory in that regular consumption is excessively sensitive to current income. Also, the marginal propensity to consume (MPC) wealth is not equal for the different wealth classes, as assumed by the theory. In a study, Hatsopoulos, Krugman and Poterba (1989) found that the MPC for disposable income was 0.83 while it was only 0.03 for household net worth. Thaler (1999) further assert that people store their wealth in different mental accounts, and behave according to the hierarchical structure of these accounts which gives a foundation for the many observed "savings anomalies". An anomaly is defined by Thaler (1990) as an empirical result that is hard to rationalize, or it requires implausible assumptions to be explained. Another part of the life cycle theory that is contradictory to the empirical evidence is the assumption of impeccable behavioral conduct. Hoch and Loewenstein (1991) identify that in the rational choice theory people are expected to strictly weigh all the costs and benefits upon every decision with efficient, balanced calculations. On the contrary, the authors acknowledge that people are influenced by myopic, emotional factors alongside the rational, long-term concerns, when they are facing decisions. This interaction is further examined by Hoch and Loewenstein (1991), who especially ascertain the situations in which an overwhelming case of impatience overrule the decision maker.

Actions to control impulse behavior are described as individual efforts "to avoid or resist behaving in such an inconsistent manner" (Hoch and Loewenstein, 1991, p 493). Moreover, Thaler (1990) says that "in real life, people realize that self-control is difficult, and so they take steps to constrain future behavior". In plain words, Loch and Loewenstein (1991) describe self-control as an ongoing struggle between the psychological forces of willpower and desire. The impulse control is easy to hypothetically constrain in a future plan, however if it is let free at the point of actual decision, the outcome easily fall prey of a shortsighted goal of immediate pleasure. Marshall (1890) denoted that such time-inconsistent behavior emerge

as a result of volatile alterations in emotional disposition and tastes. Hoch and Loewenstein (1991) appoint time-inconsistent behavior to the aforementioned occurrence of impatience and explain it as a momentary and involuntary departure from the person's dominant, long-term preference. In addition, they note that the behavior caused by sudden impatience is also regarded as distorted at the point of execution by the person himself. Hoch and Loewenstein (1991) also mention that rationalizing expenditures can support the distortion of cost-benefit analysis of choices. For example by consuming excessively because of an euphoric state of mind, or on the other hand, as grieving consolation. The emotional distraction from rational consideration means that feelings such as happiness, sadness, heartbreak, and so on can be used as excuses to splurge. Thus, the timing of decisions can also induce inconsistent behavior, even though people in general might be oblivious to such impostors of judgment.

Furthermore, Thaler and Shefrin (1981) assume the individual at a point in time to be both a farsighted planner and a myopic doer, where a constant agency-conflict is maintained. They outline an ongoing conflict between a persons' "short-run and long-term preferences, where the long-term 'planner'-self is concerned with the lifetime utility, while the short-term 'doer'-self exists only for one period and is completely selfish, or myopic" (Thaler and Shefrin, 1981). The authors construct a model of the two-selves, where the planner must impose constraints and incentives in order to modify the doer's behavior. Subsequently, "rules can limit the range of doer discretion, usually through self-imposed rules of thumb. One can ban borrowing, or prohibit borrowing except for specific purchases" (Thaler and Shefrin, 1981). Shefrin and Thaler note that their model of the two selves is based on a theory of rational behavior, meaning that the economic agent acknowledge his own shortcomings and deal with them accordingly.

In order to facilitate more consistent decision making, Hoch and Loewenstein (1991) propose several methods to effectively implement self-control, among these are avoidance and postponement and distraction. Avoidance is the first and most obvious best tactic, which induces the individual to distance herself from situations that encourage impulsiveness. Secondly, they propose a strategy to postpone and distract, in which the person deliberately postpone a decision while keeping distracted by a minor reward. Studies also support the effectiveness of such tactics, especially that of distraction which have shown an increase in willingness to wait (Hoch and Loewenstein, 1991). Hoch and Loewenstein (1991) suggest that precommitment can also have a positive effect in order to decrease the desire for something, and explain that "Precommitment involves any device though which consumers

impose constraints on, or alter incentives for, future behavior” (p. 501). The authors propose that acknowledging such restrictions can effectively reduce the longing for consumption within these categories in the future.

Brendl, Markman and Higgins (1998) suggest that mental accounting is a manifestation of an important self-regulatory strategy. They claim that discrete mental accounts are organized around active goals that can be specific goals or abstract and constant goals. Furthermore, Thaler (1999) illustrates the self-control mechanisms of mental accounts, and he describes that dividing spending into budget categories facilitates rational tradeoffs. He labels money into accounts at three levels. Expenditures are grouped into budgets for food and housing, wealth is allocated into accounts of savings, pension, and “rainy days”, and income is divided into categories such as regular or windfall. The process in which expenses are tracked against budgets is more technically described by Heath and Soll (1996) “First the expenses must be noticed. Then, they are assigned to their proper accounts. Whenever budgets are not fungible their existence can influence consumption in various ways. One budget may have been spent up to its limit, while other accounts have unspent funds remaining” (p. 194).

The household practice of mental accounting to control spending violates fungibility on many levels, which in turn can lead to peculiar economic behavior. Telyukova (2009) found that 27 percent of Americans held credit card debt in addition to owning liquid asset. Similar findings were discovered by Gross and Souleles (2002). In a large study of US credit card accounts, they reported that the households in the study typically held more than \$ 2.000 in credit debt, while having about \$ 5.000 in positive balances on other cards. Thaler and Sunstein (2008) point out the obvious arbitrage opportunity that arises in such situations, in that households would be better off by buying out their expensive debt with low-interest bearing liquid assets.

## 2.2 Section 2: Heuristics and Biases

More specifically, the general theoretical and empirical groundwork has been further investigated by researches that have found consistent behavioral anomalies and systemized these into an abundant collection of biases and heuristics. In this section, the relevant biases for this thesis will be covered, namely the status quo bias, the flat-rate bias and the sunk cost bias.

### 2.2.1 Status quo bias

In the pursuit of methods to motivate decisional changes there are several cognitive, subconscious powers that may work against these efforts. One powerful force that complicates attempts to change behavior is the incidence of passiveness. Kahneman et al. (1991) state that “one implication of loss aversion is that individuals have a stronger tendency to stay at status quo, because the disadvantages of leaving it loom larger than its advantages” (p.197) Thaler and Sunstein (2008) also identifies loss aversion as a natural cognitive nudge that influence people not to make changes even when those changes are for the better. Samuelson and Zeckhauser (1988) invented the term *status quo bias* which refers to an inflated preference for the current status to prevail and the persistent tendency to stick with the option one is given in the first place. The bias is found in several experiments and field observations, within topics such as in insurance, savings and donations. A large study by Doane et. al (1987) found that the prevailing option was the most important factor for which electricity service was chosen. Reluctance of giving up the current plan for a cheaper option testifies the status quo bias further. In cases where there is no status quo, people tend to have a strong preference for the default option when they are to make a decision. This tendency was observed by Johnson, Hershey, Meszaros and Kunreuther (1993) in an experiment and a study of insurance purchases. Camerer (2000) claims that these phenomena “are consistent with aversion to losses relative to a reference point”, and explains further that “making an option the status quo or default [...] seems to establish a reference point people move away from only reluctantly, or if they are paid a large sum” (p.155).

### 2.2.2 Flat-rate bias

Contrary to the traditional economic prediction that consumers should prefer to pay at the margin, Prelec and Loewenstein (1998) expect that people will find it less painful with flat-rate pricing schemes. Consequently the consumption is decoupled from payment. With a flat-rate price for consumption, the usage-cost relationship is less salient and not as tightly linked as an at-the-margin pricing scheme. Research has revealed consistent preferences of flat rate bias, specifically in health clubs, cruise trips, public transportation (Loewenstein and Prelec, 1998) and in telecommunications (Train 1991). Prelec and Loewenstein (1998) explain that flat rate arrangements shift the cost imputations away from actual consumption, because the

marginal cost of consumption is zero. They argue that consumers prefer to conduct payment before rather than after, as their research revealed debt aversion in the majority of consumer cases (Loewenstein and Prelec, 1993). These findings were also consistent with their earlier work. Thus, they argue, people prefer to pay before consumption and work before they are paid.

### 2.2.3 Sunk Cost

Whenever a payment is conducted, it is typically linked with subsequent consumption. Therefore, if the consumption part fails to be carried out, the cognitive account of that purchase is negative. If the payment is significant, a person can be trapped by the sunk cost bias. It is well established that decision makers are often influenced by historical or sunk costs (Arkes and Blumer 1985; Staw 1981; Thaler 1980). This bias is powerful and can disturb the decision maker to undertake emotionally charged decisions which seems inadequate to the objective eye. An study conducted by Arkes and Blumer (1985) provoked the sunk cost bias in a situation where subjects were asked to choose one out of two pre-paid ski-trips. The subjects were put in a hypothetical situation in where they had to choose which one of two non-refundable ski-trips they had mistakenly booked for the same date. It was clearly stated in the text that the subjects would find the \$50 trip more enjoyable than the more expensive \$100 trip. Although the hypothesis was that all subjects would choose the trip they would find more enjoyable, the results revealed that 46 % of the subjects chose the trip they wanted the least. Thereby, Arkes and Blumer (1985) found that a strong sunk cost bias prevailed and intervened with subjects' choices, leading to about half of the subjects going for the less enjoyable trip, due to its initial higher, already sunk, cost. Although sunk costs influence subsequent decisions, they do not linger indefinitely. Another experiment conducted by Arkes and Blumer (1985) also revealed evidence of the sunk costs effect and how it persists. In a field experiment, the researchers made use of a campus theater ticket office to introduce three different season tickets prices. The aim was to see whether the different price-schemes influenced the attendance rate of the ticket purchasers. They segregated people (unknowingly) who were purchasing season tickets for the campus theatre. One group paid the full price, the second group received a small discount and the third group got a large discount. The tickets had different colors, so it was easy for the researchers to keep track of the frequency rate of the three different ticket-holders. In the first half of the season, the group who paid full price attended significantly more plays than those who received discounts

However, in the second half of the season there were no significant difference in the attendance rates. Arkes and Blumer (1985) thus concluded that decision making is influenced based on how much is invested in an activity. Nevertheless, they urge that sunken costs does not linger eternally and are eventually ignored, a process called ‘payment depreciation’.

### 2.3 Section 3: Income accounting and coupling

Hoch and Loewenstein (1991) point out the challenges people face whenever they are supposed to conceptualize future economic consequences of their decisions. They emphasize how easy it is to lose the overview in the constant stream of income and consumption. As discussed above, there are plenty of cognitive short-cuts that support insufficient decision making which in turn can greatly affect wealth and social welfare. The empirical findings of economic behavior reveal a great amount of deviations with regards to the way people account for money streams. Further, this section will cover current findings and theories relating to income accounting and budgeting.

Current income is more relevant for consumption than future income, (Shefrin and Thaler, 1988). Unwillingness to spend future income is emphasized in the findings of Huffman and Barenstein (2005) which show declining consumption in-between pay-days, falling by 18 % between the first and the last week of the monthly pay period. Consumption returned to its initial level at the next payday. The research was conducted on large sample of UK working households, measuring the pattern of monthly consumption. They also found that the households treated their current and future income accounts (available through credit cards) very differently, indicating usage of self-imposed rules for their financial behavior.

In addition to mental budgeting of disposable assets, the category and origin of income also influences the decision maker. Although regular income is usually subject to predetermined accounts for consumption, unforeseen income is likely to be treated otherwise. Thaler (1990) states that the size of a windfall, i.e. an unexpected or large monetary gain, influences consumption. He identified that relatively small gains was coded as current income, and spent, while larger gains entered asset accounts, where the MPC is lower. The source of the windfall can also matter. O’Curry (1997) investigated the violations of the fungibility of money relatively to the source of income. She found that people have a tendency to match the seriousness of the source of some windfall with the use to which it is put. Kooreman (1997)

studied the spending behavior of families that receive child allowance payments from the Dutch Government. He found that spending on children clothing was much more sensitive to changes in the designated child allowance than to other income sources. Landsberger (1966) found similar results, in an examination of Israeli recipients of German restitution payments after the World War Two. The group who received the largest windfalls (66 % of annual income) had a MPC from the windfall of only 23 percent, while the group who received the smallest windfalls (about 7 % of income) has MPC's from the windfall in excess of 200 %.

Thaler and Shefrin (1981) identifies the shape of the income stream as the determinant of an individuals' saving behavior, and the empirical research of windfalls and disposable income yields a prediction their two-self model. They consider two identical individuals, with different salary schemes. Person A receives \$12,000 per year in 12 monthly installments, and person B receives of \$10,000 per year paid in monthly installments plus a guaranteed bonus of \$2,000 paid once every year. Their model predicts that on average, B will save more. They characterize saving behavior as primarily a set of self-imposed rules of thumb and externally enforced saving plans. Thaler and Shefrin (1981) believe that for the typical individual, much of the bonus will end up being saved. The reason for this is that person B will adjust his spending according to the monthly income flow, and not spend the bonus money in advance of payout. When the bonus eventually arrives, the size of it will indicate if it should be put in a wealth account. The bonus scheme will therefore uphold as an external self-control device for the recipient.

Prelec and Loewenstein (1998) argue that the consumer hedonics, which means whether outcomes are perceived beneficial or painful, make people experience pain of paying for a purchase, which suppress the pleasure of consumption. People prefer to separate and recombine psychological costs and benefits in order to minimize the pain of experienced losses, so they can enjoy the benefits (Linville and Fischer, 1991). Furthermore, Prelec and Loewenstein (1998) introduced the concept "coupling", which refers to the degree of which consumption and payment is associated. By limiting coupling between consumption and payment, utility of consumption will increase, uninterrupted by the thought of payment.

Thaler states that the simple separation of purchase and payment is what makes credit cards appealing (Thaler, 1999). Concurrent with credit card usage, unplanned debt can occur. This is mainly because people underestimate their ability or willingness to pay off the monthly balance, according to Ausubel (1991). Prelec and Loewenstein (1998) further suggests that if



the pain of making interest payments is small relative to the pain of clearing debt, the payment of the full debt will be delayed to somewhere in the future.

Credit cards weaken coupling, while paying with cash produce tight coupling, and Prelec and Loewenstein (1998) claim that the method of payment is one of the most important determinants of coupling. Soman (1997) found that students leaving a campus bookstore were more accurate in remembering the amount of their purchases if they paid with cash rather than by credit card. He claims that “paying by credit card reduces the saliency and vividness of the outflow, making it harder to recall than payments by cash or check which leads a stronger memory trace” (p.9).

Thaler and Shefrin (2008) claim that “self-control issues are more likely to arise when choices and their consequences are separated in time” (p.75). The way credit cards can spoil financial self-control was demonstrated by Prelec and Simester (2001). They found that people were willing to pay twice as much for a pair of basketball tickets when they could pay with credit card rather than cash. Mental budgets, which are fixed amounts allocated to a particular purpose (e.g. entertainment), have traditionally been interpreted as a self-control device, designed to prevent overspending on certain categories of expenses (Shefrin and Thaler, 1988, 1992, Heath and Soll 1998). Furthermore, Prelec and Loewenstein (1998) suggest that the effect of coupling can be enhanced by earmarking accounts to a particular expenditure or category of expenditures. Brendl, Markman and Higgins (1998) suggest that people who set money aside in a ‘vacation’ account might enjoy their vacation more than if they retrieved the money from another account, which in turn would violate the other accounts’ monetary goals.

## **2.4 Section 4: Mental Accounting in practice**

In 2011, Antonides et al. identified that mental accounting had mainly been observed in the lab, and was therefore ripe for investigation in people’s natural habitat. In a study of a large sample from the Dutch population Antonides et al. (2011) found that mental budgeting was common and positively correlated with household financial management. The mental budgeting process and attitude towards money management was self-reported on a mental budgeting scale. The findings show that mental budgeting is mainly practiced by less wealthy, less educated people with a short-term time orientation. Effectively, the practice of

applying mental budgets improves the overview of household expenses and current accounts. Antonides et al. (2011) reasonably expect that the research reports less mental accounting and budgeting with the people who has more academic training and knowledge of finance. Former research (Frederick, 2005) offers reason to presume that men employ less mental budgeting than women, based on findings showing a higher level of cognitive reflection with men. Frederick (2005) conducted research on whether cognitive abilities are causal determinants for decision making, by measuring the cognitive reflection in a three-item test called the Cognitive Reflection Test (CTR). The test is composed by three simple questions, which successfully assess the level of deliberation in decisions with the participants. The questions are constructed as mathematical or logical tests, in which the participant needs to distrust his intuition and take time to contemplate the correct answer. Frederick (1995) maintains the CTR to be predictive in choices described by decision-making theories and prospect theory. Compared to other cognitive measure tests like the Scholastic Assessment Test (SAT), American College Testing (ACT), the Need for Cognition (NFC) and more, which can account to as many 215 items, the CTR proved to be the best or the second best in predicting cognitive reflection on the different domains such as inter-temporal choices and choice under uncertainty. The three responses in the CTR accumulate to a score between 0 to 3, depending on how many answers were reported incorrectly intuitive or with thoughtful reflection. In a large study using the CTR, Frederick distinguished men to be more reflective of their answers than women, resulting in a significantly higher CTR score for men. This result of higher cognitive reflection with men was also found in the study of Antonides et al. (2011).

## 2.5 Section 5: Debiasing

The economic anomalies discussed in the previous paragraphs are inevitable truths about society and human behavior. Most of the biases and the heuristics that guide people through their daily life are mainly subconscious cognitive operations. Furthermore, awareness of own cognitive limitations and the knowledge of when and where people make sub-optimal decisions can be highly advantageous. One of the methods to do this is by trying to debias people. Lilienfeld et al (2009) point out there is a great shortage of research on debiasing, and point out that a search in PsycInfo (June 19, 2008) returned merely 158 references on “debias” or “debiasing”. Nevertheless, debiasing is regarded an important part of the behavioral research. In fact, Lilienfeld et al. (2009) claim “a plausible case can be made that debiasing people

against errors in thinking could be among psychology's most enduring legacies to the promotion of human welfare" (p 391).

Debiasing through education by giving a brief, unpretentious introduction concerning common biases, have proved fairly effective (Lilienfeld et al, 2009). Strategies such as "consider-the-opposite" can be successful in the means of counteracting automatic, heuristic thinking induced by the confirmation bias and related biases (Anderson, 1982; Anderson & Sechler, 1986; Hirt & Markman, 1995; Hoch, 1985; Lord, Lepper, & Preston, 1984). Studies also show that subjects had a decreasing tendency to fall prey of certain cognitive biases when they were briefly educated about them (Evans, Newstead, Allen, & Pollard, 1994; Kurtz & Garfield, 1978; Mynatt, Doherty, & Tweney, 1977; Newstead, Pollard, Evans, & Allen, 1992; Tweney et al., 1980). Parmley (2006) supports their view, and states that psycho-educational methods often tend to be effective. Willingham (2007) disagrees with the support for debiasing and argues that critical thinking is not more than modest in its ability to deal with biases, other than letting participants recall alternative points of view. More disagreeable is Arkes (1981), who claims that psycho-educational methods are "absolutely worthless" (p.326), mostly because people are unaware of how their biases cloud their judgments.

Arkes and Blumer (1985) tried to ascertain whether economically sophisticated subjects were less predisposed to the sunk cost effect. They concluded that general knowledge of economics did not decrease the effect of sunk cost. Furthermore, Fischhoff (1982) underline that many attempts of debiasing people of their judgment errors have not been successful. One explanation is that subjects do not acknowledge that they are biased, and therefore are not receptive of the debiasing methods (Pronin et al., 2004). Also, if the implication of personal welfare is not obvious, the debiasing efforts might lack of results (Lilienfeld et al, 2009). Arkes (1991) and Tetlock and Kim (1987) provides research that suggests that by giving the subjects the opportunity to carefully examine evidence, they will be less automatic in processing of information. Lilienfeld et al, (2009) argues that many techniques are insufficient to generate behavioral changes, where one of the reasons is the lack of methods exposing subjects to real-word situations.

Arkes (1991) stated that "Sub-optimal behaviors occur because the effort or cost of a more diligent judgment performance is greater than the anticipated benefit. The way to improve judgment within this category is to raise the cost of using the suboptimal judgment strategy."

(p. 492). Hilgert and Hogarth (2003) present research that distinguishes a correlated relationship between financial knowledge and behavior. “Compared with those who has less financial knowledge, those with more financial knowledge are also more likely to engage in recommended financial behaviors such as paying all bills on time, reconciling the checkbook every month and having an emergency fund” (p.311). The authors acknowledge that higher educational level does not unisonally indicate a positively causal relationship to appropriate financial behavior, as experience and social impulses can also influence.

## **2.6 Section 6: Nudging**

Thaler and Sunstein wrote the book *Nudge* (2008) in order to promote “self-conscious efforts, by institutions in the private sector and also by governments, to steer people’s choices in directions that will improve their lives” (p. 5). Consequently, Thaler and Sunstein (2008) claim that nudges are needed to conquer inadequate decision-making which is caused by inattention and incomplete information, limited cognitive abilities and incomplete self-control. A nudge, according to Thaler and Sunstein (2008), is characterized as nonintrusive attempt to change behavior without forbidding alternatives, or drastically changing economic incentives. The authors claim that “by properly deploying both incentives and nudges, we can improve our ability to improve people’s lives” (p.8). Economically rational people do not have any problems with their spending and savings. As Thaler and Sunstein affirm, these people will pay their credit card bills on time and keep extra money for rainy days. Nevertheless, such persons are of miniscule proportions in society, and one of the main goals of Thaler and Sunstein (2008) is to explore how people can be nudged to make better economic decisions, so they become wealthier and more financially secure.

# Chapter 3: Bridging research and applications

## 3.1 Practical implications, nudging and real life applications

Mental accounting theory includes several aspects, which are all based on the mental separation of economic categories (Antonides et al., 2011), and those aspects are up for further investigation in this thesis. We can label mental accounting as deviating behavior from what is characterized in economic literature, which relies on the common assumption that money is regarded as fungible (Thaler 1985). Knowing that mental accounting influence people's perceptions, is it possible to apply the theories from this insight to derive useful proposals that can increase people's wellbeing? Thaler (1999) declares that is not possible to say that the system is flawed without knowing how to fix it. He further suggests that those interested in improving individual decision making can do more work on mental accounting as a prescriptive device. He asks "How can mental accounting rules be modified to achieve certain goals?" (Thaler, 1999) Several strategies have already been developed with such objectives. One noticeable approach is the Save More Tomorrow (SMarT) plan where Thaler and Benartzi (Thaler and Susnstein, 2008) developed a pension saving scheme which takes advantage of psychological 'shortcomings' people have, such as loss aversion, time-discounting, money illusion and inertia. These factors were mitigated by the plan which automatically enrolls participants into an exponential savings scheme, which in turn successively increase accumulated pension savings (Thaler and Sunstein, 2008).

## 3.2 Background for proposals

The research that exists on the topics discussed in this literature review give grounds to make more accurate predictions of human behavior, and for promoting strategies to mitigate their cognitive limitations. The next question is what to do about it. Public policy suggestions derived from the research are plentiful, while I find that proposals on individual level are ripe for further initiatives. Therefore, I want to explore how individuals conform to nudges that are designed to improve their personal financial well-being. I have focused on pragmatic solutions which are to be implemented in daily life. I have developed seven propositions, based on current empirical research and theories.

In order to make people understand and acknowledge the purpose, and wish to change behavior, I need a persuasive strategy for the proposals. The pro and con for debiasing indicates that it is possible to induce people to be more considerate in their decision making. Some of the arguments against debiasing pointed out the psycho-educational efforts had little or no effect because of the absence of recognizable real-life implications. In his blog about behavioral economics, Ariely (2013) falls in-between the arguments of the critics and supporters of debiasing strategies. He states that trying to educate and provide information to people has shown poor results in terms of increasing saving rates and such. However, he promotes that re-engineering society so it is easier to save will produce better results in saving schemes. Furthermore, Arkes (1991) proclaimed that in order to improve judgment people must have their costs of suboptimal strategy raised. A related viewpoint is therefore to raise awareness of the costs that incur from the current non-optimal behavior. My objective is to create such engineered options that can be enrolled and activated in daily life. I have gathered advice and suggestions from the authors of the book “Nudge” and from the selection of the cited research papers. Even though Ariely, among others, do not believe in educating people to deal with their biases, I will nevertheless accompany the proposals with relevant educational parts, to ensure that the purpose of the proposal is made obvious.

In the survey, the responder is urged to put herself in a specific situation, and then indicate the likelihood that she will approve or disprove the particular proposal that is suggested. The proposals are purposely set up to be initiated by the individual, thus they require a pre-commitment or change in behavior accordingly. Some proposals are purely indicative, where the subject is to choose a preferred option, while educated with relevant information that more or less discreetly suggests the optimal choice. Other proposals are more pragmatic in their form, and ask the subject to choose one option in a specific scheme; whether or not to get involved. The proposals as they are presented in the survey are found in the appendices. Next, the groundwork of the proposal will be outlined, and the structure of the proposals’ foundation contains two parts. The first part emphasizes the research and theory that supports the relevance of the bias and/or heuristic. Secondly, I introduce the suggested implementation of the proposal which is designed to deal with the cognitive limiting bias or heuristic. The options in which the participants indicated their preferences are identical for both surveys. All proposals are made under the assumption that people wish to make more rational, considerate decisions if it is achievable, and they are instructed how.

## **Proposal 1: Monthly credit-debt reconciliation**

As discussed in the literature review, people perform mental accounting by locating sums of money in different accounts. Money is subsequently directed by a hierarchical system, which influence how the money is spent. Thereby savings can be saved while the household is simultaneously paying interest costs on short-term debt. By emphasizing the element of fungibility of money and challenging this hierarchical system, it is possible to attain a better financial wellbeing (Hatsopoulos, Krugman and Poterba ,1989 and Thaler, 1990). Measures for financial self-control such as credit limits, rules for borrowing and over-spending, are already found in typical household budgets. Furthermore, a method to solve the debt-paradox which incur in households that do not manage to stay clear out of credit debt could be effective.

Thus, in order to encourage activities that will decrease the costs connected to the use of credit cards, one option is to make it possible to automatically pay the entire credit card bill in one go, proposed by Thaler and Sunstein (2008). In the imagined scenario the subject possesses credit debt and bank savings simultaneously, which leads to an arbitrage opportunity for the user. This proposal is that whenever the user's credit balance is negative, the necessary funds will automatically be transferred from his savings account at the month end. The incentive for such a deal is the concept of never incurring late-payment costs again, and the participant is asked to state how interested he would be to agree with such a proposal.

## **Proposal 2: Payment method**

Ariely (2013) discusses the pain of paying, and the way cash payments enhance this sentiment. He makes a solid example of how it pains much more to pay an expensive dinner with cash rather than with a credit card, because the physicality of cash out of pocket magnifies the negative feeling of spending when the money are directly coupled with consumption. Soman (1997) found that students found it is easier to remember exacts amounts of purchases they paid with cash, rather than with credit cards. Ariely asserts that the saliency to the purchase in addition to the moral tax that is added to consumption enhance the pain of paying. Consequently, Ariely further suggests that by paying with cash one can easier control spending.

By introducing this notion of payment methods self-controlling ability, consumers can impose private directives to strictly pay with cash or debit card in conditions of financial constraint. I ask the participants to put themselves in a situation attempting to keep within a tight budget, and what payment device they will choose for an item-purchase. In survey 2, the subject receives the theory about which payment method that implies as a natural saving-mechanism.

### **Proposal 3: Hidden savings**

Ariely (2013) claims that one of the most difficult things a person can do is to save money for future consumption and states that a saving strategy is highly challenging to pursue. Money spent today is hard to conceptualize into future economic consequences because of the abstract nature of money, and the unrecognized opportunity costs of today's consumption. A way of dealing with financial self-control problems is to place funds in accounts that are off-limit. According to Shefrin and Thaler (1988), households arrange money according to a hierarchy system of how tempting it is to spend the money from each of the locations, or accounts. The theory which actuates off-limit accounts is that the propensity to consume from these accounts is lower than for the current accounts (Shefrin and Thaler, 1988).

The third proposal exploits the hierarchical accounting system people apply in mental budgeting, and suggests a method for increasing savings by placing money in a 'hidden account'. The purpose is to pursue a strategy in line with the saying "out of sight, out of mind" with the objective of what you do not see, you do not spend<sup>1</sup>. The participants are asked whether they are interested in a savings-scheme proposed by the bank, where they are given the opportunity to open a new bank account which is not visible along with other accounts. The hidden account is put forward for the purpose of increased savings, and more specifically, suggested for 'rainy days'.

### **Proposal 4: Account for household expenditures**

Corresponding with the theory of the previous paragraph, the hierarchy of accounts; studies

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<sup>1</sup> "Remember: If you don't see it, you won't spend it! ... If your company offers a 401(k) retirement plan, make sure you sign up for the maximum possible contribution. It will be taken out of your *paycheck* automatically... The whole point is to get the money out of your checking account before you see it and spend it." - T. Savage, *How small cuts become huge savings*, MSN Money website (undated)



also show that consuming from accounts that does not initially fit the purpose of those accounts is found to be difficult (Brendl, Markman and Higgins, 1998). Thaler (1999) and Brendl, Markman and Higgins (1998) proclaim that mental accounting and budgeting influence choice furthermore, by categorizing budgets the household will make rational tradeoffs with spending within the different accounts. By separating a specific amount to a purposeful account, the bias of preference toward flat-rate deals can also be elicited. In contrast to paying numerous large and small bills at separate times, a fixed larger amount delegated to an expense account every month can accommodate this bias.

Furthermore, I want to utilize psychological mental accounts that already exist in households in order to strengthen the objective of mental budgeting. The practical implication I suggest is to apply the theory to real accounts, as a supportive initiative to limit over-consumption and budget defaults. Thus, the subject is given an option to open a bank account which is branded “Household expenses”. This implies that the subject is asked to pre-commit a specific amount every month to this very account. According to theory, the subject will more probably spend this money within its designated purpose. The fixed amount is designated to cover all the individual household bills, which in turn are made less salient and painful to pay. The subject is asked about her level of interest for this the proposal, which can support the household to achieve a more robust financial position.

### **Proposal 5: Windfall income account**

The fourth scenario derives from the theory of windfall accounting. People deviate from rationality of sober financial behavior when they receive unusual earnings such as bonus, gifts or lottery wins, and subsequently spend it more frivolous than with ordinary income (O’Curry, 1997 and Thaler 1990). The fundamental economic principle that says that no matter the source of income, money is fungible, indicates that the source should not influence the way the money is spent. Windfall gains are susceptible to irrational, frivolous use unless it is restricted somehow. Thus, if money-loss is introduced to windfall spending, the effect of loss aversion might trigger deviating, more considerate windfall-spending behaviour.

With that, I made a proposal where the subjects are asked about their interest in special bank account in which income with windfall characteristics are kept. If the money on the windfall-account is used within a month, the subject would lose 10 % of its value to charity. The purpose is clearly stated in the proposal, thus to impose an external constraint on windfall

spending so that the subject will need to spend some time to consider her initial spending decisions.

### **Proposal 6: Bonus payment frequency**

The structure and size of a windfall can influence the subconscious choices of a decision maker. The high correlation between income and consumption, as well as the size of an income can differentiate how two individuals with equal yearly bonus remunerations, choose to save. Thaler and Shefrin's (1981) predict in their two-self model that a bonus payment on an annual frequency is positively correlated with higher saving-rates, compared to more frequent payment schemes. A bonus is declared as windfall, however the size of the windfall influence how it is spent. Thaler and Shefrin (1981) suggest that the amount will more probable be put in equities or in other saving options if it is paid in large, rather than smaller, more regular payments.

I asked the subjects about their personal preferences for a bonus scheme. They were asked how they would choose if they were given a bonus at work, and the payment frequency of the bonus was up to individual selection. They could select one of four payment-options; monthly, quarterly, twice a year or once a year.

### **Proposal 7: Predetermined Sunk cost plan**

Finally, a phenomenon that also falls under the topics within mental accounting is the sunk cost bias. As previously discussed, this is a powerful bias which easily dictates the decision maker en route to sub-optimal outcomes. When a person has devoted money or effort in an activity, he will very likely pursue this activity even if a better option emerges. Arkes and Blumer's (1985) experiments showed the disutility that sunk cost can lead to. The subjects of these studies displayed a tendency to choose options because of their initial investment value, rather than the expected enjoyment they would receive from the activities.

I outlined a scenario and an implication to deal with this bias in order to study whether the sunk cost effect can be somewhat controlled. Under these pretenses, the subject is asked to imagine she is attending a show she paid €50 (NOK 400) for, but after a short while she receives an invitation to a dinner party. The subject is told she will prefer the dinner party more. The dinner starts immediately, and a taxi-ride costs about €30 (NOK 250). In her wallet, she has a separate pocket with money (more than €30) that is designated to support

objective decision making. The subject is asked whether she prefers to leave immediately for the dinner, stay a while, go home or stay throughout the unsatisfactory show.

### 3.3 Survey

I have used two different surveys in my research. Both surveys share the identical base, which consists of seven hypothetical scenarios, followed by a practical proposal. Survey no. 1 contains the scenario and proposal. Survey 2 is identical to survey 1, in addition to a section of relevant theory, empirical results and practical implications. The purpose of the additional part of the survey 2 is to educate subjects about bounded rationality in economic decision making. The responder indicates her preferences in each of the seven scenarios, in which the choices are presented in either four different specific alternatives or on a Likert-7 scale. Responders are anonymous beyond the characteristics of occupation, gender, nationality and age.

My objective is to study behavioral tendencies toward economic nudges. First, I want to learn whether the subjects favor financial self-control proposals, and whether preferences change due to the nature of the different proposals? Secondly, do respondents demonstrate consistent preferences if they are acquainted to the empirical behavioral implications of the topics? Finally, I will study whether demographic characteristics of the respondents matter in their preferences.

My hypothesis is that subjects who also review the second part will show the same preference as the subjects who do not receive additional information. An assumption for the survey is that people want to make optimal decisions when it comes to personal financial well-being, while they might be resistant to implementations that seem to limit their or be regarded as intrusive.

### 3.4 Data gathering method

I distributed about 300 questionnaires through two main sources. I made 49 English hard-copies of the surveys which were placed in students' mail-boxes in TheStudentHotel, Rotterdam. In addition, I created a Norwegian online-survey on SurveyMonkey.com. I distributed the link to one of the two surveys through e-mails and personal messages on Facebook to my Norwegian network. The period for the data collection lasted from May 26<sup>th</sup> to 11<sup>th</sup> of June. Respondents received one of the two surveys interchangeably, therefore

ensuring that the assignment of surveys was completely random. Participants answered the surveys at their own convenience. Every participant was given a brief introduction of subject and purpose, in addition to the practical instructions in the welcome-page of the survey. Anonymity was emphasized, and participants were also strongly urged to answer according to their truthful preferences. The full English edition of the survey is added in the appendices. The alternatives for the seven scenarios are either presented in four brief options, or as a Likert 7-Scale ranging from very likely, to highly unlikely. The survey also includes a final section which obtains demographical characteristics of the participants such as gender, age, nationality and main occupation.

The three scenarios that collect responses on a nominal scale ask the respondent to choose from four options. To illustrate how, is an example where the subject is asked to choose a preferred payment method in a stated scenario, out of; “Cash”, “Debit Card”, “Credit Card” or “Indifferent”. These options represents a range from “not interested in the nudge, and/or do not agree with the intentional premise of proposal”, to “clear interest in nudge, and/or agree with proposal”. In the case above, paying with cash will indicate an agreement with the optimal option according to the theory, which indeed suggests that cash payment enhance the memory trace and cognitive rationality of the purchase.

The four scenarios that collect responses on a Likert-7 scale ask respondents to indicate their level of interest with the proposals. This scale ranges from “very low interest or likeliness, to very high interest or likeliness”. The data is on ordinal scale, and is easier to interpret as each option does not represent a fixed act, as is in the nominal data.

### 3.5 Feedback

During the data-collection period, I received some feedback regarding two proposals. Proposal 2, concerning credit-card debt and automatic transfer, returned a few comments about the difficulty to relate to such a situation; that of actually having a credit debt. The seventh proposal about the sunk cost bias was unclear and hard to grasp for some of the participants. One possible reason can be that the proposal does not indicate an improved financial situation. On the contrary, the purpose was to introduce a decision that would increase net utility, not necessarily net worth, and it might have been confusing. According to the feedback from four subjects, they had a hard time visualizing this scenario, not realizing it

was an urgent matter to choose to accept the dinner-invitation or not and therefore requested the option to join the dinner-party after the show.

## Chapter 4: Results

In total, I gathered 209 answers from the Norwegian online surveys. The hard-copies distributed to the residents of the Student Hotel merely returned seven completed surveys. I decided to discard the international students' survey data, and focus explicitly on the Norwegian online-surveys, which gives a more comparable sample dataset. Out of the 209 surveys, I collected 85 fully completed forms for Survey 1, and 97 fully completed forms of Survey 2. More specifically, 53 females and 32 males completed Survey 1, while 54 females and 43 males completed Survey 2. The main age-group for both survey samples are between the age of twenty to thirty, and most of the respondents are either students or in a full time job. The gender, age and occupation distribution can be found in tables (1) - (3) in the appendix.

The observations from the survey data show what tendencies are evident among the subjects. Proposal 2 show that the clear majority prefers to pay with cash or debit card, whereof 151 out of 181 choosing this option. Proposal 7 shows a close to 50/50 division where 92 chose to leave for the dinner and 85 decide to stay throughout the show. Most subjects displayed positive tendencies to use expense accounts in proposal 4, while the majority would not be interested in spending windfall-money tied up in a locked account when it implied losing 10 % of its value, in proposal 5. Proposal 3, regarding the hidden account was more divided, 56 subjects were not at all interested, while 82 showed tendencies to be somewhat, to very interested. Proposal 1 returned a dispersed dataset throughout the scale, with no real tendencies favoring one or the other side of the credit debt reconciliation proposal. Close to the same distribution is found in proposal 6, however here the tendency favoring less frequent bonus payments is much more prominent for subjects in survey 2.

I applied two non-parametric statistical tests for the analysis of the data. The Chi-squared test was used for all sample data, on nominal and ordinal scale. The Mann-Whitney U Test was additionally applied for the ordinal data, which were collected from four of the seven questions. Thus I tested whether the two survey sample groups are collected from the same population, or if they are statistically significantly different, by comparing responses of Survey 1 and Survey 2 in SPSS. The first hypothesis, whether the educational does not impact preferences, was rejected for proposal 6. This question in which subjects were asked what bonus-payment option they preferred, displayed a statistical significant difference between

Survey 1 and Survey 2 in the Chi-squared test, on a five percentage significance level (p-value of 0.07 %). For the six other proposals, the hypothesis of no difference between Survey 1 and Survey 2 was not rejected. Continuing further, I tested whether gender has any influential power on the preferences, if women or men display different tendencies in the surveys. The first hypothesis here is that women in Survey 1 do not differ significantly from women in Survey 2. The bonus-payment frequency scenario reported no significant difference for the female survey groups 1 and 2. However, the chi-squared test produces a statistical significant different result for proposal 3 which concerns hidden savings. The Chi-square value is 15.376, which is higher than the critical chi-square value of 12.592 with 6 degrees of freedom and a significance level of 10 %. However, the results show that 6 (42.3%) cells have expected count less than 5. This violates the 20 % rule of the Chi-Square test. Nonetheless, the Mann-Whitney U test returned a Z-Score of 1.859, and reported a p-value of 6.3%, which gives a significant result on the 10 % level. There were no evident differences within the male samples in the tests. Due to the indicative, however moderate results from the individual female samples, I was encouraged to augment the gender related study. Thus, I wanted to find whether there are any distinguished tendencies by comparing genders of the total sample of 182 observations, (107 females, and 75 male). Independently of which survey the observations were retrieved from, I tested the accumulated data by comparing the general propensity of women and men toward conceding with proposals. The test returned noteworthy results for Proposals 3 and 4. Proposal 3, regarding the hidden-account, exposed a significant difference at a five percent level between men and women, with a Mann-Whitney U Test Z-Score of -2.822 and corresponding p-value of 0.5 %, and a Chi-square value of 12.904, which is above the critical value of 12.592. Consequently, men and women were significantly different in their preferences towards opening a hidden bank account in order to accumulate savings (for rainy days). Women also responded significantly different from men in proposal 4, regarding the household expenses account. The results show that the female observations responded significantly different on a 5 % significance level, with Z-Score of 1.9914 and p-value is 0.0466. The Chi-square test returned a Chi-value of 13.783, again higher than the critical value off 12.592, thus significant on a 5 % level. As for the other characteristics such as age and main occupation; no further notable results were retrieved from the output of the statistical test.

See appendices for tables 5-7 summarizing the most relevant SPSS results.

## 4.1 Discussion and drawbacks of research method

Several method-biases can arise in the light of the specific survey set-up used in this research. Although I intentionally endeavored making the theoretical part in Survey 2 fairly objective, it are still quite suggestive in its form. Indeed, the purpose of the theory section is for the subjects to consider the proposal from a more rational, educated viewpoint. It might be the case that the option represents the intuitive decision of the subject, i.e. preference to pay with cash, in any case. Thus, even though the educational part is provided, the subjects' initial preference is already in agreement with the indication of 'best option', so there will be no proven "effect" of the additional information.

However, subjects might be led to these 'favored' options as a result of biased forces that are difficult to identify. Whether the subjects decided upon options as a result of intuition, learning effect or if it was because they strictly want to comply with the theory is hard to distinguish and can create a challenge. Such potential systematic variance error can pollute the empirical results and lead to misinterpretation of the results (Campbell and Fiske, 1959). On the other hand, the subjects are asked to state their preferences according to the proposal itself, which is consistently equal for Survey 1 and 2. The theory part is merely an addition to the questionnaires, and the purpose of this section is indeed to influence subjects toward better decision making.

Another drawback of the questionnaire design is the potential threat of the hypothetical bias and its interference with results. It is difficult to obtain an accurate indication of how people will behave if the proposals from the survey were to be presented in real life. Ajzen et al. (2004) found that subjects display more pro-social behavior when facing a hypothetical situation in contrast to a real situation. The authors further summarize three main factors that affect behavioral intention. Is the behavior considered favorable or unfavorable, is there a social norm and how is the perceived behavioral control. The reported intention, and actual behavior will be strongly correlated if the behavior is positively acknowledged by the person and by the social environment, and whether there is a strong notion of behavioral control in the situation. The proposals are indeed objects for control by the subject in question. Whether the behavior these proposals suggest is pro-social or not is hard to say. I propose it to be considered positive for society that individuals make considerate purchase decisions, pay their bills on time, and save up spare funds for rainy days. On the other side however, one can be regarded as a tightwad, limited by strict budgeting rules, lacking financial flexibility and



frivolity. It might also be perceived shameful to apply financial self-monitoring and control devices if it implies lack of economic sophistication.

Neill et. al. (1994) found that willingness to pay was significantly higher for a hypothetical economic decision, than for a real one. Even though my survey is not about people's decision to pay for something, the decisions require an economic cost-benefit consideration and therefore they might be influenced by this hypothetical bias. In addition to hypothetical bias, the status quo bias might purposely restrict people to enter new paradigms. Thus, although the survey indicates implementations that can positively influence peoples' wellbeing, the actual movement in behavior may be stickier.

Other drawbacks of this research is insinuating specific settings and situations, hence the outline of the scenarios in the survey. I have assumed such conditions are likely to occur in the subjects' environment. Thus, subjects who cannot comply with the outlined scenario will choose an option he does not agree with, because he does not agree with any of them anyway. If this complication were to happen frequently, it can disrupt my results. Nevertheless, fortunately there are some interesting implications from the results which will be discussed further in the next paragraphs.

## 4.2 Implications in light of theory

As proposed in the literature review, people are less likely to fall victim of their own biases if they are educated about them. Lilienfield et. al (2009) attributed failed attempts to debias people partly to their lack of relevance to real-life situations. My efforts to introduce real situations should also enable the subjects to acknowledge the relevance of the information. In line with Arkes (1991), who claims that behavioral changes require a better anticipated benefit if the change in order to make it attractive, and Hilgert and Hogarths (2003) which point that more financial knowledge implies healthier economic lifestyle, the proposals in the study might positively affect preferences, particularly in Survey 2.

In the statistical tests, I found a significant difference for proposal 6, the bonus frequency payment in the study. The subjects in survey 2 are clearly more interested in the annual payment plan compared to the Survey 1 group. Thus, being educated on the empirical results and implied inclined savings, 73.2 % of Survey 2 subjects prefer either annually or half-yearly payouts. This can suggest that subjects in Survey 2 purposely prefer the option that more

probably will contribute to higher savings. A cause for the significant difference can be found in the design of the proposal. Although subjects need to make a choice, they do not undertake any further action, as it is the manager who activates the decision. This reasoning is in line with the strong influence of inertia in decision making. The implication is that the less the person has to do, the easier it is to accept.

Generally, the results indicate that subjects were far from consistently different in their preferences, regardless of which survey they took. Thus, whether subjects are steered towards the researchers' preferred alternative, as discussed in the limitations part, is not apparent. Rather, subjects showed very similar preferences for the majority of scenarios. The question that asked for the preference to spend an unexpected money-gift showed that 55% in Survey 1 and 51 % in Survey 2 agreed that they would not spend it within the month (scores 6-7), indicating that the subjects of Survey 2 were mainly unaffected by the theoretical implication. The notion of the 10 % loss might trigger the aversion for it, and thus be an explanation for the strong tendency in both surveys to not want to spend the money.

As observed in the field, schemes that demand too much effort will most probably result in no change. Inertia, default bias and status quo bias supports the decision maker to undertake the most convenient choice, preferably no choice at all. A large share of subjects in Survey 1 (37%) and Survey 2 (26 %) were not at all interested in saving money in a hidden account (score 1). Subject might interpret this proposal as effort demanding, and perhaps, unusual. Thus, it seems particularly tedious for the survey 1 group to re-arrange their funds elsewhere, such as a hidden account, whereas the survey 2 group showed some less resistance to the proposal.

As previously identified by Antonides, Groot and Raaij (2011), women tend to apply more mental accounting than men. I could not help but wonder if women are also object for more powerful influence when educated in these matters, and indeed I found a significant difference on a 10 % level in the Chi-squared test for female samples regarding the hidden account proposal. Women also responded significantly different on a 10 % level for the proposal of using a specific account for living expenditures. The initial response rate for Survey 1 is 55 % choosing highly unlikely (6-7), and 40 % choosing the same in survey 2. Thus, by being informed about the positive aspects of out-of-sight savings and rational consumption trade-offs, women display a greater propensity toward the use of such accounts. See figures 2 and 3 in the appendices for illustrative pie-charts.

The former results are indicative, and I further studied whether there were significant gender differences in the total sample. Indeed, the results proved stronger, whereof both proposals regarding hidden savings and expense account were significantly different on the 5 % level in both tests. Accordingly, this suggests that women, with or without the relevant education, are more likely to accept a selection of economic nudges compared to men.

Also noted by Antonides et al. (2011) is that people who most frequently apply mental accounting and budgeting are the less rich people with lower education. In addition, subjects must recognize the relevance to their personal situation. I tested a sub-sample of young people in the age-group of 25-35 but did not find any dissimilar results from the general sample results. The same can be said for young versus the old subjects. The subjects in the two samples are primarily in a full-time job, or in education, which indicate that their level of wealth or education does not comply with the groups Antonides et al. (2011) identified as the more financial restricted ones. Even though the groups from the samples are probably indebted with house mortgages and/or student debt, they do not necessarily regard themselves as financially constrained as long as the interest rates are low, properties are soaring and salaries are high.

## Chapter 5: Conclusion and discussion

This thesis pursues to increase the understanding of economic decision making and self-control, and to find what determinants of economic behavior are exposed to external influences. When dealing with economic decisions people are prone to stay within their choice, which initially are not fully considered by a rational evaluation of all alternatives. Outcomes are therefore likely to be less than optimal. In this thesis, the theory and practical implications of mental accounting have been interchangeably discussed and incorporated to a study of how people's choices are affected by micro-nudges. Limitations of cognitive reasoning are the foundation for the topic of this thesis, by exploring pragmatic approaches which cultivate biases and heuristics in order to support improved economic decision making.

In my survey, subjects were educated with theoretical and empirical research of how predisposed sub-optimal behavior can inflict economic and financial decisions. They are told about the determinants of time-inconsistent behavior induced by biases and heuristics. Thereafter, I presented proposals, small nudges, where these biases and heuristics can be dealt with, and even better, exploited. Subsequently I studied how subjects respond to counter-effective proposals, whether they are educated with the relevant theoretical implications, or not.

The reported data from this thesis' research indicated that subjects mainly have consistent preferences, independent of being educated or not. However, the research reveals some cases of changes in preferences whereof subjects are made aware of how subconscious decision making is easily navigated by system architecture. Subjects seem to comply more easily with proposals that do not directly intervene or indicate a notion of loss, hence the ones that are more gentle, or supplementary, to a current condition. Subjects display a significant inclination to accept an income scheme that indirectly facilitates higher savings. The bonus-payment proposal evidently altered preferences for the better when subjects were educated about the beneficial part of payment infrequency and its correlation with savings. The subjects who were aware of the proposals' implied positive behavioral influence display significantly higher interested to receive their bonus once, or twice a year, in contrast to the subjects who did not receive the educational part. This discreet self-control measure combines the tactics of avoidance and postponement. The proposal indicates that the recipient of the bonus avoids

frequent payments and subsequently avoids premature spending. Thus he postpones the money in order to save a larger proportion when it eventually arrives.

Another finding in the study suggests the existence of gender differences when subjects consider the proposals. As formerly noted in the literature, women apply more mental budgeting than men, and successively my study also produced a significant gender difference. Women tend to be more open to proposals that are designed to influence better economic decision making. Women were found to favor the proposals that imply increased savings through the utilization of heuristics in mental budgeting and mental segregation. Proposal 3 and 4, regarding “hidden account” and the “expense-account”, both showed significant differences in acceptance between men and women, whereof women exhibited a higher inclination towards being nudged.

The seven different proposals in the survey deal with the foundation of the biases people encounter when making economic decisions. Collectively, these biases and heuristics summarize to misconception of fungibility, time and value-discounting, mental budgeting, payment decoupling, self-control issues, income accounting and the debt-paradox. The proposals are developed with regard to one or a few biases each. The seven scenarios and their respective nudge were presented in a two versioned survey, in which I collected a total of 181 valid responses. The strategy of proposals is inspired from the tactics proposed by Hoch and Loewenstein (1991) which propose that avoidance, postponement and distraction are highly functional for measures to deal with self-control and time-inconsistent behavior.

Thaler and Sunstein (2008) suggested that incentives and nudges that are properly deployed into everyday lives can improve it. However, whether people want to accept these nudges is not evident, and is an evaluation that deserves attention. The proposals which more noticeably limit subjects' discretion did not exhibit any significant change in preferences. Namely the two proposals, the windfall account and credit-debt transfer, failed to achieve a change in preferences despite the apparent economic benefit. The windfall account proposal involve time-restricted injunction on spending in cases where people would normally spend frivolously, and the credit-debt proposal reconcile monthly financials and thereby dictate fund allocation. The beneficial aspects of these strategies are apparently not sufficiently persuasive. One explanation is that they are too intrusive and does not give enough room for flexibility. Another reason can be that these proposals require too much effort, and the improved financial control of the proposal apparently does not account for this.

The results of this thesis suggest that it is possible to introduce effective schemes that can improve economic decisions in light of the biases people frequently encounter. However, the results suggest that such schemes must be highly user-friendly, and preferably both proposed and implemented by a third party. When the configuration of the proposal is accepted as comprehensible and effortless, it seems to be possible to improve economic decisions with relevant background information. Meanwhile, proposals that require more than minimal effort did not achieve any significant evidence for change in preferences, even though the theoretical foundation advocates it in order to reach better economic decision making.

I can conclude from my results that people, especially women, indeed can allow themselves to be positively nudged into making better economic choices. However, this does not apply for nudges that requires much effort. The teachings from my study also suggests that the nudge itself should not dictate fund allocations such as moving an amount from savings to cover debt or locking money to an account for a period of time.

### **5.1 Limitations of the research and further suggestions**

A nudge should be nonintrusive and should not forbid alternatives, as stated by Thaler and Sunstein (2008), but it is challenging to assert at what level people find a proposal indiscreet. By using a survey as the research design implies limitations such as non-controllable environmental factors such as to what degree the subject is consciously involved when answering, how the information is interpreted and so forth. I acknowledge that by researching whether practical implications of theories will be effective, the obvious preference for this study should indeed have been by conducting practical experiments. Such experiments can contribute more precise data in which the observed behavior is more natural and real, rather than collecting data of intended behavior based on hypothetical situations. Physical experiments designed to study economic behavior would be favorable, if my time horizon would allow it.

Another limitation, as mentioned earlier, is the drawback of using hypothetical scenarios. The subject does not have to commit to a certain behavior in a hypothetical case, thus the truthfulness or practical implications of the survey must be dealt with great care. Two proposals were not clear to all subjects, and more specifically, Proposal 7 proved challenging to comprehend for a few subjects. Dealing with sunk-cost issues is complicated to resolve. Strategies to do so will likely imply higher utility, however more investing, which might lead

to less wealth. Nevertheless, for the purpose of gaining higher utility it should not be abandoned. For further research I therefore propose to pursue other suggestions that deal with the sunk cost bias. Also, more variables could have been included in the survey, such as level of income, debt, wealth and other financial factors. Mental budgeting is found to be mainly applied by less wealthy, less educated people with a short-term time orientation, and necessarily independent of these characteristics, by women. Further, using mental budgeting is positively correlated with household financial management. Thus, it would be interesting to study whether people who fit the categories of lower level of education and less financial resources would differentiate from subjects in higher wealth classes.

With the risk of being too speculative in the interpretation of the difference in women and men in the survey, and their cognitive abilities, I suggest to rather obtain more direct data on the cognitive reflection level of the subjects. Thus, it would be possible to introduce the Cognitive Reflection Test which is described in the literature review. By including this test in the survey, it helps us to explain whether preferences are dependent on the subjects' level of cognitive reflection.

For further research, my suggestion is to conduct experiments in which subjects are asked to partake in a study that actively engage them in nudged situations. A specific example is to ask subjects to rearrange their financial funds for the time of the experiments, according to a system retrieved from mental budgeting. The financial behavior can be monitored either directly by the researcher if he can gain a "read-only" limited access to the subjects bank statement, or indirectly by collecting self-reported data of financial activity. With precommitment and physical involvement, I believe that the observed behavior can be highly valuable in the further pursuit of creating systems and developing social architecture that facilitates a more consistent and forward-thinking saving behavior and more rational spending.

## References

- Anderson, C.A. (1982) “Inoculation and counter-explanation: Debiasing techniques in the perseverance of social theories”, *Social Cognition*, 1, pp. 126–139
- Anderson, C.A. and Sechler, E.S. (1986), “Effects of explanation and counter-explanation on the development and use of social theories” *Journal of Personality and Social Psychology*, 50, pp. 24–34
- Antonides G., Groot I. M. and Raaij W. F. (2011), “Mental budgeting and the management of household finance”, *Journal of Economic Psychology* 32, pp. 546–555
- Ajzen I., Brown T. C. and Carvajal F. (2004), “Explaining the Discrepancy between Intentions and Actions: The Case of Hypothetical Bias in Contingent Valuation” *Personality and Social Psychology Bulletin* 30, pp. 1108-1121
- Ariely, D., (2013) «Saving money without thinking about it (is the best way to do it)», [www.danariely.com](http://www.danariely.com), 15-04-2013
- «Cash versus credit», [www.danariely.com](http://www.danariely.com), (2013) 21-03-2013
- «Distance from money», [www.danariely.com](http://www.danariely.com), (2013) 20-03-2013
- «The Pain of Paying», [www.danariely.com](http://www.danariely.com), (2013) 05-02-2013
- Arkes, H. (1981), “Impediments to accurate clinical judgment and possible ways to minimize their impact”, *Journal of Consulting and Clinical Psychology*, 49, pp. 323–330
- Arkes, H. (1991), “Costs and benefits of judgment errors: Implications for debiasing”, *Psychological Bulletin*, 110, pp. 486–498
- Arkes, H. and Blumer, C. (1985), “The psychology of sunk cost”, *Organizational Behavior and Human Decision Processes*, 35 (1), pp. 124-140
- Ausubel, L. M. (1991), «The failure of competing in the credit card market», *American Economic Review*, 81, pp. 50-81
- Brendl, Markman and Higgins (1998), “Mental accounting as self-regulation: representativeness to goal-derived categories” (translated) *Zeitschrift für Sozialpsychologie*, 29, pp. 89-104
- Camerer, C.F. (2000), "Prospect Theory in the Wild: Evidence from the Field," in “Choices, Values, and Frames”, D. Kahneman and A. Tversky, eds. Cambridge, UK: Cambridge University Press, pp. 288-300
- Campbell, D. T., and Fiske, D. (1959), “Convergent and discriminant validation by the multitrait–multimethod matrix”, *Psychological Bulletin*, 56, pp. 81–105



Courant, P. Gramlich, E., and Laitner, J. (1986), “A dynamic micro estimate of the Life Cycle Model”, In Aaron, H. J., and Burtless, G., eds., *Retirement and Economic Behavior*, Washington D.C: Brookings Institution

Doane, M. J., Hartman, R. S., and Woo, C. (1988), “Household Preference for Interruptible Rate Options and the Revealed Value of Service Reliability,” *The Energy Journal, Special Electricity Reliability Issue*, pp. 121-134

Evans, J., Newstead, E., Allen, J., and Pollard, P. (1994), “Debiasing by instruction: The case of belief bias”, *European Journal of Cognitive Psychology*, 6, pp. 263–285

Fischhoff, B. (1982), "Debiasing." In “Judgment under Uncertainty: Heuristics and Biases” edited by D. Kahneman, P. Slovic, and A. Tversky. New York: Cambridge University Press

Frederick S. (2005), “Cognitive reflection and decision making”, *The Journal of Economic Perspectives*, 19 (4), pp. 25-42

Gross D. B. and Souleles N. S. (2002), “Do liquidity constraints and interest matter for consumer behavior? Evidence from credit card data”, *Quarterly Journal of Economics* 117, pp. 149-85

Hatsopoulos, G., Krugman P. R. and Poterba, J. M. (1989) “Overconsumption: The Challenge to US Economic Policy”, *American Business Conference*

Heath, C. and Soll J. B. (1996) «Mental budgeting and consumer decisions», *Journal of Consumer Research*, 23 (1), pp. 40-52

Hilgert M A. and Hogarth M. J. (2003), “Household financial management: The connection between knowledge and behavior”, *Federal Reserve Bulletin*, pp. 309-322

Hirt, E., and Markman, K. (1995), “Multiple explanation: A consider-an-alternative strategy for debiasing judgments” *Journal of Personality and Social Psychology*, 69, pp. 1069–1086

Hoch, S.J. (1985), “Counterfactual reasoning and accuracy in predicting personal events”, *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 11, pp. 719–731

Hoch, S. J. and Loewenstein G. F. (1991), “Time-inconsistent preferences and consumer self-control”, *Journal of Consumer Research* vol. 17, pp. 492-504

Huffman, D., and Barenstein, M. (2005), “A monthly struggle for self-control? Hyperbolic discounting, mental accounting, and the fall in consumption between paydays” IZA discussion paper 1430, Bonn

Johnson E., Hershey J., Meszaros J. and Kunreuther H. (1993) “Framing, probability distortions, and insurance-decisions”, *Journal of Risk and Uncertainty*, 7, pp. 35-51

Jurgilas M. and Lansing K, L. (25<sup>th</sup> June 2012), “Housing bubbles and homeownership returns”, *FRBSF Economic Letter*

<http://www.frbsf.org/economic-research/publications/economic-letter/2012/june/housing-bubbles-homeownership-returns/>

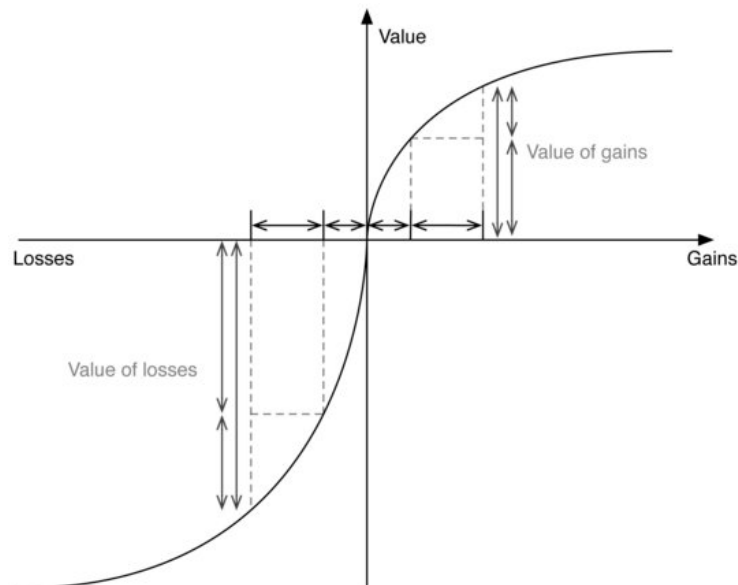
- Kahneman, D. and Tversky, A. (1979), «Prospect theory: an analysis of decision under risk», *Econometrica*, 47, pp. 263-291
- Kahneman, D, Knetsch J. L., and Thaler, R. H. (1991), “Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias”, *The Journal of Economic Perspectives*, 5 (1), pp. 193-206
- Kooreman, P. (1997), «The labeling effect of a child benefit system», unpublished working paper, University of Groningen
- Kurtz, R., and Garfield, S. (1978), “Illusory correlation: A further exploration of Chapman’s paradigm”, *Journal of Consulting and Clinical Psychology*, 46, pp. 1009–1015
- Landsberger, M. (1966) «Windfall Income and Consumption: Comment”, *American Economic Review*, 56, pp. 534-539.
- Lilienfeld S. O., Ammirati R. and Landfield K. (2009), “Giving Debiasing Away: Can Psychological Research on Correcting Cognitive Errors Promote Human Welfare?” *Perspectives on Psychological Science*, 4, pp. 390-395
- Linville, P. W. and Fischer G. W., (1991) “Preferences for separating or combining events”, *Journal of Personality and Social Psychology*, 60 (1), pp. 5-23
- Loewenstein, G. and Prelec, D. (1993), «Preferences over outcome sequences», *Psychological Review*, 100, pp. 91-108
- Lord, C., Lepper, M., and Preston, E. (1984), “Considering the opposite: A corrective strategy for social judgment”, *Journal of Personality and Social Psychology*, 47, pp. 1231–1243.
- Marshall, A. (1890), “Principles of Economics”, 1st ed., London: Macmillan.
- Mynatt, C., Doherty, M., and Tweney, R. (1977), “Confirmation bias in a simulated research environment: An experimental study of scientific inference”, *Quarterly Journal of Experimental Psychology*, 29, pp. 85–95
- Neill H. R., Cummings R. G., Ganderton P. T., Harrison G. W. and McGuckin T. (1994), “Hypothetical Surveys and Real Economic Commitments”, *Land Economics*, 70 (2), pp. 145-154
- Newstead, S., Pollard, P., Evans, J., & Allen, J. (1992), “The source of belief bias in syllogistic reasoning” *Cognition*, 45, pp. 257–284
- O’Curry, S. (1997), «Income source effects», unpublished working paper, DePaul University
- Parmley, M.C. (2006), “Effects of the confirmation bias on diagnostic decision making” *Unpublished doctoral dissertation*, Drexel University, Philadelphia
- Prelec D. and Loewenstein G. (1998), “*The red and the black: Mental accounting of savings and debt*”, *Marketing Science*, 17 (1), pp. 4-28

- Prelec D., and Simester D. (2001), «Always leave home without it: A further investigation of the credit-card effect on willingness to pay», *Marketing letters*, pp. 5-12.
- Pronin, E., Gilovich, T. and Ross, L. (2004), “Objectivity in the eye of the beholder: Divergent perceptions of bias in self versus others”, *Psychological Review*, 111, pp. 781–799
- Samuelson W., and Zeckhauser R. (1988), “Status quo bias in decision making”, *Journal of risk and uncertainty*, 1, Kluwer Academic Publishers, Boston, pp. 7-59
- Shefrin, H. M., and Thaler, R. H. (1988) “The behavioral life-cycle hypothesis” *Economic Inquiry*, 26, pp. 609–643
- Shefrin, H. M. and Thaler, R. (1992), “Mental accounting, saving, and self-control”, in G. Loewenstein and J. Elster (Eds.), *Choice over time* (pp. 287-330), New York: Russel Sage Foundation
- Soman, D. (1997), “Contextual effects of payment mechanism on purchase intention: check or charge?” Unpublished working paper, University of Colorado
- Staw, B. M. (1981), “The escalation of commitment to a course of action”, *Academy of Management Review*, 6, pp. 577-587
- Telyukova, I. A. (2009), “Household need for liquidity and the credit card debt puzzle”, Manuscript, University of California, San Diego
- Thaler, R. H. (1999), “Mental accounting matters”, *Journal of Behavioral Decision Making*, 12, pp. 183-206
- Thaler, R. H. (1990), “Anomalies: Saving, fungibility, and mental accounts”, *The Journal of Economic Perspectives*, 4 (1), pp. 193-205
- Thaler, R. H. and Sunstein C. R. (2008), «Nudge: Improving decisions about health, wealth, and happiness», *Penguin Group*, New York
- Thaler, R. H. and Shefrin, H. M. (1981), “An economic theory of self-control”, *Journal of Political Economy*, 39, pp. 392-406
- Thaler, R. (1980) "Toward a Positive Theory of Consumer Choice," *Journal of Economic Behavior and Organization*, 1, pp. 39-60
- Tetlock, P.E. and Kim, J.I. (1987), “Accountability and judgment processes in a personality prediction task”, *Journal of Personality and Social Psychology*, 52, pp. 700–709
- Train, K. E., «Optimal Regulation: The theory of natural monopoly», Cambridge MA: MIT Press (1991)
- Tweney, R.D., Doherty, M.E., Worner, W.J., Pliske, D.B., Mynatt, C.R., Gross, K.A. and Arkkelin, D.L. (1980), “Strategies of rule discovery in an inference task”, *Quarterly Journal of Experimental Psychology*, 32, pp. 109–123

Willingham, D.T. (2007), "Critical thinking: Why is it so hard to teach?" *American Educator*, 31, pp. 8–19

## Appendix

Figure 1 – The value function



### Survey groups, demographics:

Table 1 - Gender distribution:

Gender	Female	Male	Response Count
Velg en	52	32	84
Answer Options	Female	Male	Response Count
Velg en	54	43	97

Table 2 - Age distribution

Under 20	20-25	26-30	31-35	36-40	41-45	46-50	Over 50	Response Count
0	19	34	7	9	6	3	6	84
Under 20	20-25	26-30	31-35	36-40	41-45	46-50	Over 50	Response Count
2	27	41	4	4	0	2	17	97

Table 3 - Main occupation distribution

Full-time job	Reduced work-hours	Part-time job	Student	Stay-at-home	High school student	Other	Response Count
65	1	1	16	1	0	0	84
Full-time job	Reduced work-hours	Part-time job	Student	Stay-at-home	High school student	Other	Response Count
68	2	4	18	0	1	4	97

Table 4 - Summary all survey-data

<b>Proposal 1 - Monthly credit-debt reconciliation</b>		<b>SURVEY 1</b>		<b>SURVEY 2</b>
<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>	<b>Response Percent</b>	<b>Response Count</b>
1 Highly unlikely	19,0%	16	13,4%	13
2	19,0%	16	10,3%	10
3	10,7%	9	13,4%	13
4	9,5%	8	14,4%	14
5	10,7%	9	14,4%	14
6	10,7%	9	11,3%	11
7 Very likely	20,2%	17	22,7%	22

**Proposal 2 - Payment method**

<b>Answer Options</b>	<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>	<b>Response Percent</b>	<b>Response Count</b>
Cash		22,6%	19	22,7%	22
Debit VISA card		64,3%	54	57,7%	56
Indifferent		7,1%	6	11,3%	11
Credit card		6,0%	5	8,2%	8

**Proposal 3 - Hidden savings**

<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>	<b>Response Percent</b>	<b>Response Count</b>
1 Not interested	36,9%	31	25,8%	25
2	3,6%	3	7,2%	7
3	7,1%	6	5,2%	5
4	10,7%	9	13,4%	13
5	21,4%	18	13,4%	13
6	7,1%	6	20,6%	20
7 Very interested	13,1%	11	14,4%	14

**Proposal 4 - Account for household expenditures**

<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>	<b>Response Percent</b>	<b>Response Count</b>
1 Highly unlikely	11,9%	10	8,2%	8
2	9,5%	8	9,3%	9
3	9,5%	8	6,2%	6
4	6,0%	5	17,5%	17
5	17,9%	15	18,6%	18
6	14,3%	12	14,4%	14
7 Very likely	31,0%	26	25,8%	25

### Proposal 5 - Windfall income account

Answer Options	Response Percent	Response Count	Response Percent	Response Count
1 Very likely	7,1%	6	7,2%	7
2	3,6%	3	8,2%	8
3	6,0%	5	7,2%	7
4	10,7%	9	14,4%	14
5	17,9%	15	12,4%	12
6	32,1%	27	20,6%	20
7 Highly unlikely	22,6%	19	29,9%	29

### Proposal 6 - Bonuspayment

Answer Options	Response Percent	Response Count	Response Percent	Response Count
Bonuspayment/12*12 payments	31,0%	26	11,3%	11
Bonuspayment/4*4 payments	16,7%	14	15,5%	15
Bonuspayment/2*2 payments	23,8%	20	27,8%	27
Bonuspayment/One yearly payment	28,6%	24	45,4%	44

### Proposal 7 - Predetermined sunk cost plan

Answer Options	Response Percent	Response Count	Response Percent	Response Count
Stay at the show	41,7%	35	51,5%	50
Stay for a while, then leave for home	3,6%	3	1,0%	1
Leave to og home	0,0%	0	0,0%	0
Leave the show for the dinner party	54,8%	46	47,4%	46

Table 5: Summary test output (SPSS), Hypothesis: Survey 1 = Survey 2

<b>Hypothesis: Survey 1 = Survey 2</b>						Exp. Count
Summary SPSS Test output						
<b>Proposal 1</b>	Pearson Chi-Square	Chi-square value	<b>5.079</b>	P-value	<b>.534</b>	0*
	Mann-Whitney U Test	Z-score	<b>-1.359</b>	P-value	<b>.174</b>	
<b>Proposal 2</b>	Pearson Chi-Square	Chi-square value	<b>1.493</b>	P-value	<b>.684</b>	0*
<b>Proposal 3</b>	Pearson Chi-Square	Chi-square value	<b>10.888</b>	P-value	<b>.092</b>	1*
	Mann-Whitney U Test	Z-score	<b>-1.621</b>	P-value	<b>.105</b>	
<b>Proposal 4</b>	Pearson Chi-Square	Chi-square value	<b>6.659</b>	P-value	<b>.354</b>	0*
	Mann-Whitney U Test	Z-score	<b>-.277</b>	P-value	<b>.782</b>	
<b>Proposal 5</b>	Pearson Chi-Square	Chi-square value	<b>6.328</b>	P-value	<b>.387</b>	0*
	Mann-Whitney U Test	Z-score	<b>-.282</b>	P-value	<b>.778</b>	
<b>Proposal 6</b>	Pearson Chi-Square	Chi-square value	<b>12.170</b>	P-value	<b>.007</b>	0*
<b>Proposal 7</b>	Pearson Chi-Square	Chi-square value	<b>2.727</b>	P-value	<b>.256</b>	2*

\*Expected count less than 5.

Table 6: Summary test output (SPSS), Hypothesis: Females Survey 1 = Females Survey 2

<b>Hypothesis: Females Survey 1 = Females Survey 2</b>						Exp. Count
Summary SPSS Test output						
<b>Proposal 3</b>	Pearson Chi-Square	Chi-square value	<b>15.376</b>	P-value	<b>.018</b>	6*
	Mann-Whitney U Test	Z-score	<b>-1.859</b>	P-value	<b>.063</b>	
<b>Proposal 4</b>	Pearson Chi-Square	Chi-square value	<b>10.216</b>	P-value	<b>.116</b>	6*
	Mann-Whitney U Test	Z-score	<b>-.866</b>	P-value	<b>.387</b>	

\*Expected count less than 5.



Table 7: Summary test output (SPSS) Hypothesis: Females = Men

Hypothesis: Females = Men						Exp. Count
Summary SPSS Test output						
<b>Proposal 3</b>	Pearson Chi-Square	Chi-square value	12.904	P-value	.045	2*
	Mann-Whitney U Test	Z-score	-2.822	P-value	.005	
<b>Proposal 4</b>	Pearson Chi-Square	Chi-square value	13.783	P-value	.032	0*
	Mann-Whitney U Test	Z-score	-2.029	P-value	.042	

\*Expected count less than 5.

Figure 2: Proposal 3, Female survey 1 versus Female survey 2

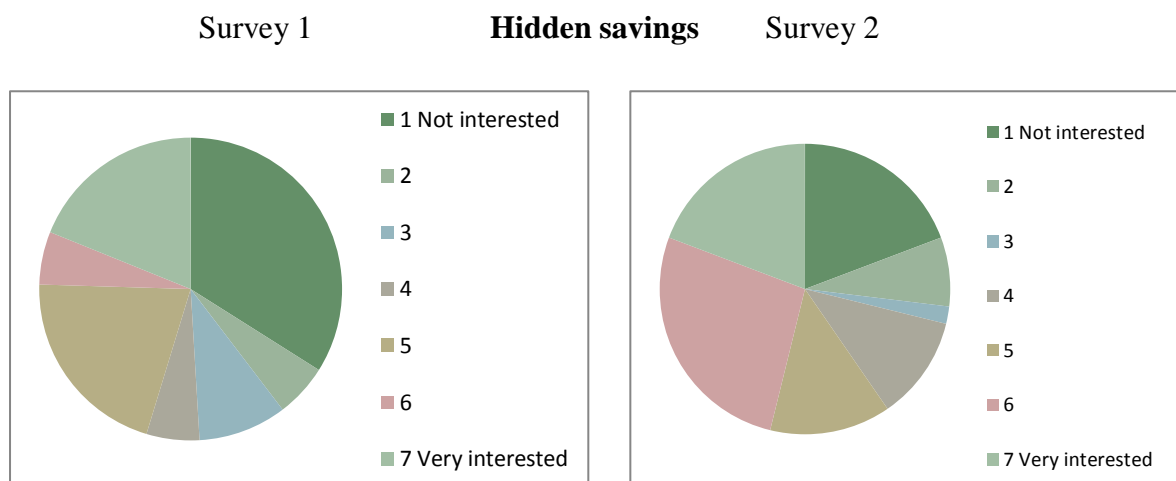
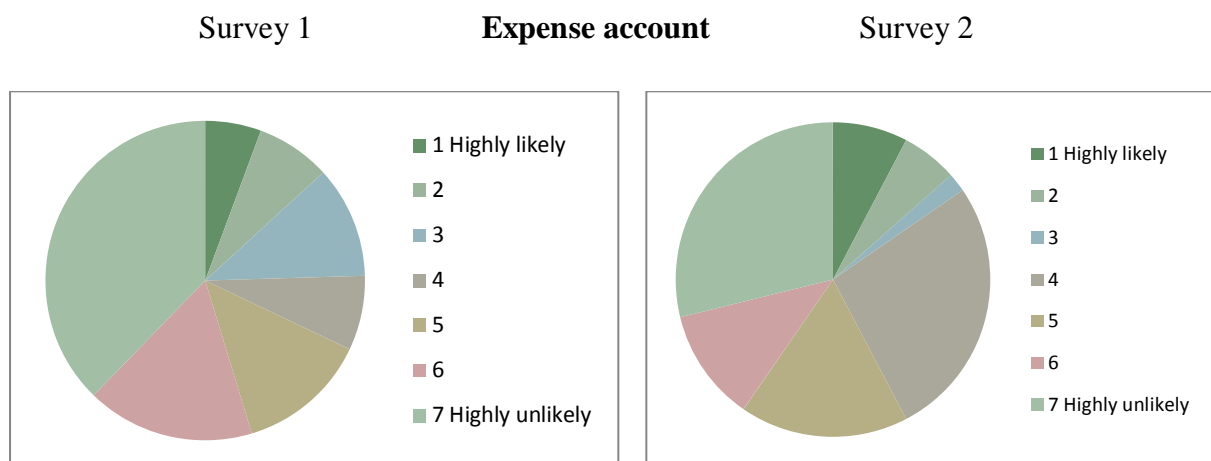


Figure 3: Proposal 4, Female survey 1 versus Female survey 2



**The survey:**

**Dear resident of The Student Hotel.**

In relation with my master thesis, I hereby invite you to partake in a survey which aims to study the preferences of people in different situations. These situations are created based on the research in behavioral economics and economic decision making.

If you decide to participate, please answer the following questions after reading the text, and slip the survey to mailbox **nr. 604**. As an incentive to join, two participants will be randomly drawn to win € 30. Please indicate your StudentHotel mailbox-number on the last page if you wish to be included for the draw.

If you do not want to contribute in the survey, please return the empty forms to mailbox **no. 604**.

This survey is completely anonymous. There is no right or wrong answers. You should choose the option you find most applicable to your preferences. The survey consists of seven hypothetical scenarios where you are asked to put yourself in the situations, and choose what option you will *most likely* prefer.

Please answer honestly, as the purpose of this research is to learn about preferences of real persons.

Thank you

Yours sincerely,

Rita B. Omdal

## Saving and bonus-payment

Imagine you are rewarded a bonus in addition to your ordinary salary at work. The bonus will be a percentage of your salary. Moreover, your boss asks you how you prefer the bonus to be paid out. You can decide if you want monthly payments, quarterly payments, payment each half-year, or one payment a year. Regardless of which distribution you choose; the total value of the bonus is fixed, and the payments are in the end-of-period (e.g. end of month, end of quarter, end of year).

*Hall & Mishkin (1982) and Wilcox (1989) show that consumption is excessively sensitive to income, and that consumption increases when extra benefits arrive. Ishikawa & Veda (1984) found that the propensity to consume is higher for regular income than for bonus income. Moreover, smaller gains are coded as current income, and spent, while larger gains are put into asset accounts where the propensity to consume is lower (Landsberger 1966).*

*A practical implication suggested by professors Thaler and Shefrin predicts that individuals who are paid a portion of their salary as a lump-sum bonus will have higher saving rates than those who receives their bonus in a smooth pattern (i.e. several payments). Savings means here purchases of durable goods, investments, bank-savings, etc.*

*“An economic theory of self-control”, Richard H. Thaler and H. M. Shefrin, Journal of Political Economy, Vol. 89, No. 2 (Apr., 1981), pp. 392-406*

Which alternative would you most likely choose?

- Bonus be paid in monthly installments (Bonus/12\*12 payouts)
- Bonus be paid each quarter of the year (Bonus/4\* 4 payouts)
- Bonus be paid twice a year (Bonus/2\*2 payouts)
- Bonus be paid once a year (Bonus in one payout)

## Saving and credit debt – Net wealth maximization

Imagine that you currently own a savings account which earns 4% interest p.a., and a credit card debt which charges 18 % interest p.a. Your bank contacts you with a proposal to set up an automatic payment feature with your bank and your credit card. The purpose is that you will never pay interest fees or late payment charges on your credit card debt, as your current funds will cover the end-of-period credit balance.

*In the US, 27% of households owned credit card debt while simultaneously holding assets in savings (Telyukova, 2009). The fact that people concurrently borrow money at quite high interest rates, and save money at substantially lower interest rates is called the debt puzzle (cf. Thaler, 1985). Empirical results prove that people do not treat money equally. An economically rational individual will always maximize her current net worth. The combination of expensive short term debt and savings is sub-optimal and decreases net wealth. Money in one account is not regarded a perfect substitute for money in another account, although it really is.*

*“Mental budgeting and the management of household finance”, Gerrit Antonides, I. Manon de Groot, W. Fred van Raaij, Journal of Economic Psychology 32 (2011), pp. 546–555*

*“Mental accounting matters”, Richard H. Thaler, Journal of Behavioral Decision Making, 12 (1999) pp. 183-206*

On a scale from 1 (not interested) to 7 (very interested), please indicate how likely you would accept this proposal from the bank?



## Savings in hidden account

Suppose you use internet banking to manage your current funds. Imagine a situation where the bank provides an option of use a “hidden” savings account. The bank wants its customers to increase their savings rate with this self-control mechanism. The account is named “Rainy days”, and is designated to be a buffer for unanticipated expenses. You can access and use the account by using a specific, self-selected password.

*Karlsson, Gärling, and Selart (1997) found that the motive for saving gives directive to how the money will be spent. Furthermore, Shefrin and Thaler (1988) show that the propensity to consume is greater for the current income account than for current assets or future assets. Thus, more consideration of future consequences is undertaken when savings are spent (Karlsson, 1997).*

*A method to manage personal finances is to place funds in accounts that are “off-limits”. A powerful prediction made by professor Shefrin and Thaler shows that if funds can be transferred to less tempting (mental) accounts, they are more likely to be saved.*

*“Mental budgeting and the management of household finance”, Gerrit Antonides, I. Manon de Groot, W. Fred van Raaij Journal of Economic Psychology 32 (2011) pp. 546–555*

*“Mental accounting matters” Richard H. Thaler , Journal of Behavioral Decision Making, 12 (1999) pp. 183-206*

On a scale from 1 to 7, from not interested, to very interested, will you save money in such a “hidden” account?



## Savings, windfall and self-control

Imagine that you receive an unexpected money-gift from a distant relative. You want to spend the money on an impulsive purchase, like an expensive coat. However, all such “bonus” payments are automatically locked in a specific account that you installed as a self-control mechanism last year. It will cost you 10 % of the amount (which will go to charity) if you spend the money within a month. This will leave time to really consider the purchase and to judge whether it is rational.

*Research conducted by Arkes et al. (1994) shows that windfall (“bonus”) gains are spent more easily than non-windfall gains (regular income). O’Curry (1997) also found a tendency where the seriousness of the source of the windfall is matched with how it is spent. An explanation of this phenomenon states that the unanticipated money is not pre-designated to any account or expenditure. Meanwhile, the money remains uncommitted and therefore available for extravagant, frivolous use. Such behavior violates the fact that money is fungible and should be treated in the same way. Income and windfalls should be given identical attention and be spent on the equal terms (Thaler, 1999).*

*“The psychology of windfall gains”, Arkes et al (1994), Organizational behavior and human decision processes 59, (1994) pp. 331-347*

*“Mental accounting matters” Richard H. Thaler , Journal of Behavioral Decision Making, 12 (1999) pp. 183-206*

On a scale from very likely to highly unlikely, will you spend the money within the month?



## Self-control and spending

Imagine that your bank has added a new account among your other accounts. The account is currently empty, and earmarked “rent and household expenses”. You can set up an automatic (monthly) transfer from your income/checking account to this earmarked account.

*Cheema & Soman (2006) predicts that the use of many accounts and their level of detail can influence the quality of financial management in households. Heath and Soll (1996) analyzed the process of household budgeting, and find that it will be less tempting to take use of accounts that does not fit its purpose. Richard Thaler (1999) states that the budgeting process facilitates making rational trade-offs between competing uses of funds. Also, such a system works as a self-control device.*

*“Mental budgeting and the management of household finance”, Gerrit Antonides, I. Manon de Groot, W. Fred van Raaij, Journal of Economic Psychology 32 (2011) 546–555*

*“Mental accounting matters” Richard H. Thaler, Journal of Behavioral Decision Making, 12 (1999) pp. 183-206*

On a scale, from totally unlikely to highly likely, will you adjust to the intended use of the account “rent and household expenses”?



## Decisions and Sunk Cost

Imagine that you have already paid €30 for an admission ticket for a show. 15 minutes after the show has started you receive an invitation for a spontaneous dinner-party at a good friend's house. You are not enjoying the show, and find the invitation more attractive than the show. If you decide to attend the dinner, you must leave immediately. The taxi ride to your friend will be € 20. In your wallet, you know there is an envelope with some cash that you have designated for yourself to make *unbiased* (neutral) decisions. Going home is a costless option.

*It is well established that decision makers are often influenced by historical or sunk costs (Arkes and Blumer 1985; Straw 1981; Thaler 1980). An experiment conducted by Arkes and Blumer (1985) they set up a scenario where subjects had (mistakenly) paid for two ski-trips on the same weekend, and had to choose which one to go to. The cheapest of the ski-trip was also the most desirable one because of location and facilities. However, results showed that 46 % of subjects chose the ski-trip they wanted *less*, because they had initially paid more for it. Rational decision theory predicts that 100% would decide to go to the more desirable trip. However, sunk costs influence decisions in many ways, even if it leads to making suboptimal choices. One should always ignore sunk costs, because the current choice can only affect future outcomes. Therefore, the decision should only be evaluated in terms of its effect on future outcome, regardless of what happened in the past.*

*"The psychology of sunk cost", Hal R. Arkes and Catherine Blumer, Organizational behavior and human decision processes 35, (1985) pp. 124-140*

Which of the following alternatives are you most likely to choose in this situation?

- I will stay at the show, as I have paid the admission
- I will stay at the show for half an hour, then I'll probably go home
- I will go home
- I will leave the show to join the dinner-party



## **Purchasing and payment decision**

You are about to purchase an item such as a book or a bottle of wine. Imagine that you are currently on a tight budget, and you are trying to keep track of your spending.

*Soman (1997) found that students leaving a campus bookstore were much more accurate in remembering the amount of their purchases if they paid by cash rather than by credit card. Paying an item with cash leaves a stronger memory trace of the purchase, while paying with credit card makes the purchase less prominent. Credit cards are known to facilitate spending whereof it cognitively separates the purchase from the payment. Furthermore, paying with cash makes the purchase more thought-tough.*

*“Mental accounting matters” Richard H. Thaler, Journal of Behavioral Decision Making, 12 (1999) pp. 183-206*

How do you prefer to make your payment when you can choose between credit, debit or cash?

- cash
- debit card
- indifferent
- credit card

**Please answer these additional, demographic questions:**

What is your gender?

- Female
- Male

What is your age? Please circle the suitable age-group:

Under 20   20-25   26-30   31-35   36-40   41-45   46-50   Over 50

What is your main occupation?

- Fulltime job
- Reduced employment
- Part-time job
- Student
- Other

What is your nationality? Please fill inn: \_\_\_\_\_.

If you want to join the draw for two prices of € 30 in cash each, please fill in your TSH mailbox-number: \_\_\_\_\_.

Thank you for your participation!