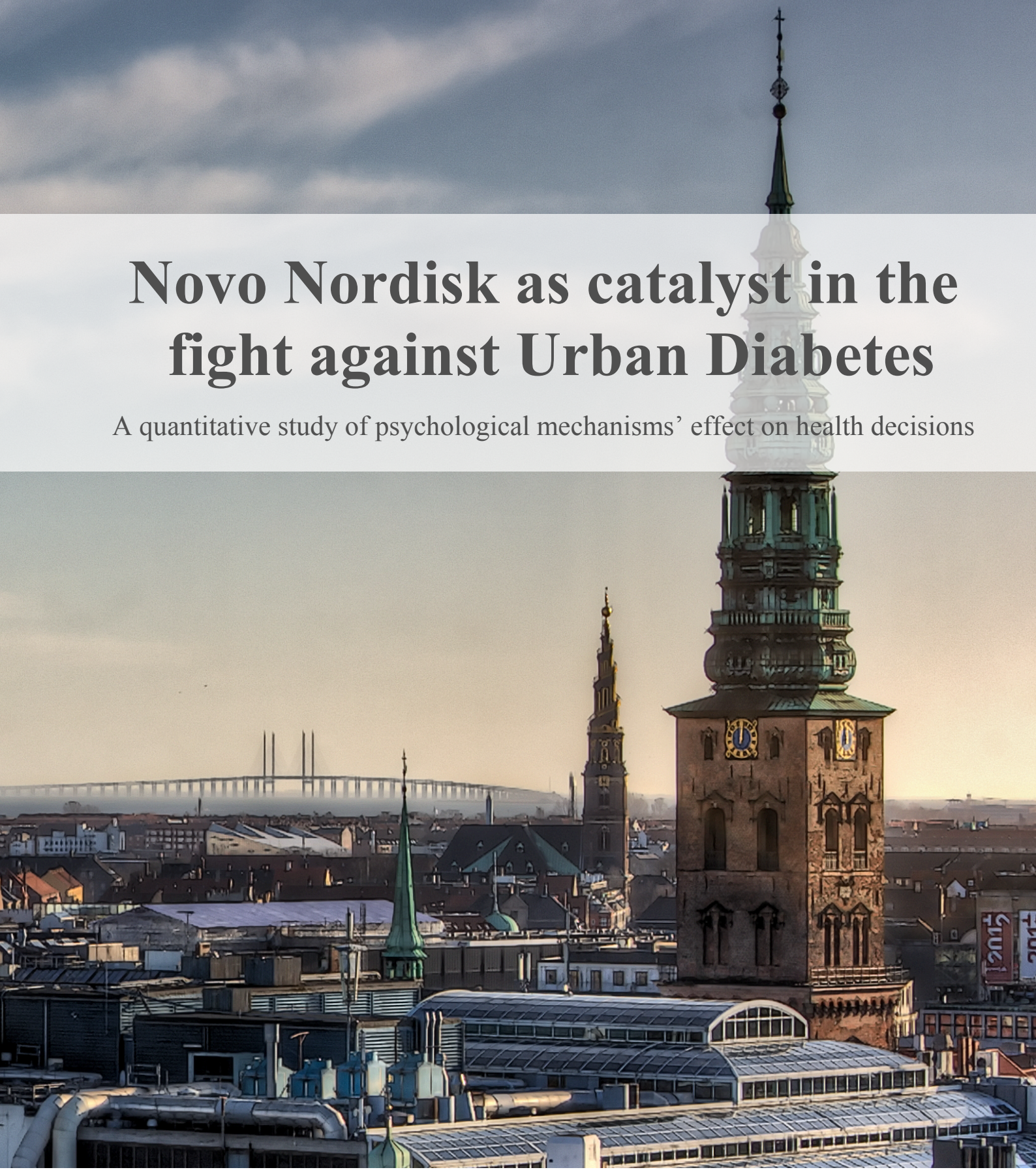
Novo Nordisk as catalyst in the fight against Urban Diabetes

A quantitative study of psychological mechanisms' effect on health decisions



A Master's thesis by:
Tine Enggaard Skovsen

Academic Supervisor:
Tore Kristensen

06 October 2015
Characters: 181,674
M.Sc. International Marketing & Management

Abstract

Purpose: The research objective of the thesis is to determine how Novo Nordisk can ensure that it is recognised as a catalyst for change on the Urban Diabetes Agenda. With a focus on behavioural economics, the research determines which psychological mechanisms that influence everyday decisions regarding psychical activity of Copenhagen dwellers.

Methodology: The research objective is answered by means of an exploratory a multi-method quantitative study on micro level. To be able to construct a realistic context of psychical activity decisions, concrete, everyday decisions are found with the Day Reconstruction method. Based on these insights and psychological mechanisms from existing literature, four hypotheses are developed. A quantitative study determines to what degree the psychological mechanisms affect the decision-making process regarding psychical activity. The findings may guide Novo Nordisk in developing behaviour-changing initiatives to lower the rapid diffusion of urban diabetes.

Findings: The analysis of variance examines the effect of four psychological mechanisms – saliency, framing, reward incentives and audience effects. All four mechanisms are found to significantly influence the everyday decisions of psychical activity. Based on the findings of the ANOVA, an analysis quantitative analysis level of exercising influences the effect of the reward mechanisms, no other variables seems to affect the effect of the psychological mechanisms.

Conclusions: Showing effects on health decisions by means of the four psychological mechanisms for Copenhagen dwellers is the first step in developing behaviour changing initiatives. Habitual behaviour is the crucial aim of the initiatives in order to lower the rapid diffusion of urban diabetes. The characteristics of the decisions indicate that they my hold the potential for habit formation because of the consistency and repetition of the decisions, the low complexity behavioural task and increased intrinsic motivation of the collective mechanisms. The research provides Novo Nordisk with a detailed picture of how influential psychological mechanisms can be in everyday decisions of psychical activity. The insights from the research can be utilised to better understand the value of including psychology into the utilisation of knowledge and design of prevention actions for the CCD project.

Keywords: Choice behaviour, Behavioural Economics, Decisions, Nudging, Psychology.

Table of contents

PART V

List of figures

List of tables

PART I
INTRODUCTION

1. Introduction

Overweight and obesity is a rising and unavoidable problem. In 2014, 39% of adults (aged 18 years and over) were overweight, and 13% were characterised as being obese on a global level (Word Health Organisation, 2015). Most of the world's population live in countries where overweight and obesity kills more people than underweight (Ibid.). If the development of overweight and obesity continues, we are eating ourselves into a diabetes epidemic – an emergency that evolves in slow motion. It is a well-known fact that people, who are overweight or obese, are at greater risk of developing type 2 diabetes (American Diabetes Association, overweight). The number of people with diabetes is growing at an alarming rate: 387 million people in the world have diabetes today – a number predicted to grow to close to 600 million by 2035 equalling more than 10% of the world's adult population (United Nations, 2014).

What is significant about this trend is the link to urbanisation. Urbanisation is fuelling the type 2 diabetes pandemic. For the first time in history, more than half of the world's population live in cities – by 2050 this will grow to two-third of the population globally (Mbanya, Motala, Sobngwi, Assah & Enoru, 2010). People move to cities for opportunities – for security, jobs and education. People are intrigued by social and economic possibilities of urban life. Unfortunately, what most people do not consider is that urban living also poses a health risk to people and increases the risk of type 2 diabetes. As a fact, two-third of people with diabetes live in cities (International Diabetes Federation, 2014). In Sub-Saharan Africa moving from a rural area into a city poses a 2 to 5 times increased risk of developing type 2 diabetes (Novo Nordisk, May 2015). From rising wealth and increasing consumption to more sedentary lifestyles and inequality of access to healthcare, urban living presents a major challenge to health and has become one of the key drivers behind the acceleration of global diabetes.

The way that cities are designed and run influences how people live, and can be either an enabler of or barrier to diabetes prevention. The barriers include modifiable risk factors that span from psychical activity to fast-paced working environment and poor diet. Enablers are related to designs of cities appealing to exercising.

In 2014, the world's largest insulin manufacturer, Novo Nordisk, launched a CSR project called Cities Changing Diabetes – a global effort to fight the alarming rise of type 2 diabetes in the ever-growing big cities of the world (Novo Nordisk, 28 March 2014). The project is a partnership programme to identify and address the root cause of urban diabetes in five major cities around the world. Novo Nordisk works with partners to identify and scale up solutions to tackle diabetes in cities (Cities

Changing Diabetes, booklet). The aim for Novo Nordisk is to play a part in helping to develop action plans in the study cities. Lars Rebien Sørensen, CEO of Novo Nordisk, declares:

"*(…) We're committed to playing our part in the global fight against diabetes. We launched Cities Changing Diabetes because we believe we can use our expertise and knowledge to beat urban diabetes – the rise of type 2 diabetes in cities. We want to stop urban diabetes from ruining millions more lives*."
(Cities Changing Diabetes, Booklet: 8)

With that said, Novo Nordisk promises to go into the fight of urban diabetes by taking action. Such a project may shape the corporate brand in valuable terms. However, this could also result in the reverse of the medal. On the one hand, proving to be a catalyst for change with a legitimate interest in promoting the urban diabetes agenda may strengthen Novo Nordisk as a brand with true intentions. However, an unsuccessful outcome of the promises could increase the scepticism towards the motives of the pharmaceutical company and as a consequence Novo Nordisk's corporate brand could suffer from being accused as solely having financial objectives in mind.

1.1 Research problem and objectives

The importance of changing individuals' consumption and psychical activity behaviour is unquestionable and recognised by the management of Novo Nordisk, but concrete answers regarding what and how has not been considered yet as the project is solely in the mapping phase of the problems. However, Lars Rebien Sørensen, CEO of Novo Nordisk, declares: "*It's a logic and unstoppable trend that people move into the cities. But we'd like to create awareness about the fact that this trend comes with a health issue*" (ComCaseCompetition, 2015: 11).

However, several examples show that you cannot equate awareness with behavioural changes. Huge amounts of information about type 2 diabetes and its causes already exist. Awareness campaigns (e.g. the Danish campaign *6 om dagen*, Michelle Obama's *Let's Move* campaigns) and a general focus on lifestyle provide individuals with information about what is needed to reduce the risk of lifestyle diseases by preventing the modifiable risk factors. But the numbers are speaking for themselves: 39% of adults on global level are overweight, 387 million people have diabetes today and the predicted number for the future is significantly higher.

Such discrepancy between knowledge and behaviour is an important element in designing initiatives against urban diabetes. Individuals are often making decisions with the conviction that they are in control of the situation, because individuals assume that they are aware of their own preferences, and continuously make consistent choices over time, to utilise their own well being (Huang, 2005).

However, deviations from rational behaviour (e.g. making decisions against a better health) indicate that individuals have self-control problem.

Obtaining new information on root causes of urban diabetes is absolute valuable, however, new information does not necessary equal behaviour change. It could be questioned if existing knowledge hold a significant potential of behaviour changes in the way the information is applied and delivered to the decision maker. Decisions about psychical activity in everyday life are (most often) made by the individual itself, why the decision-making process of individual decision is of relevance. Psychologists have long studied the ways that psychological mechanisms influence the decision-making process. On this basis, behavioural economics have recognised the need of including psychology in decision-making processes in order to be able to understand and predict actual decision-making – and not unrealistic, ideal decision-making.

Ineffective utilisation of informative campaigns emphasises the relevance for Novo Nordisk to consider human behaviour and decision-making within more realistic models of decision-making in order to potentially to optimise the utilisation of existing (and future) knowledge in more behaviour changing manners and thus strengthen the corporate brand.

The research objective of the present thesis is:

To determine how Novo Nordisk can ensure that it is recognised as a catalyst for change on the Urban Diabetes Agenda.

1.2 Defining key terms

To be able to avoid ambiguousness of key terms, selected terms will be defined below.

The aim of the research objective is to make Novo Nordisk a *catalyst* for change on the Urban Diabetes Agenda. A catalyst is defined as a person, organisation or thing that precipitates an event (Oxford Dictionary). Being a catalyst of change means to help lowering the rapid diffusion of urban diabetes. This does not mean aiming for Novo Nordisk to solve the problem alone, but rather that Novo Nordisk should be a part of a project that are associated with actual changes in urban diabetes. The most durable way of ensuring to be a part of such a project is to contribute with valid initiatives to fight urban diabetes together with the global partners of CCD.

Other central term is *psychical activity*. The understanding of psychical activity is based on Caspersen, Powell and Christenson's (1985) definition of physical activity in terms of the following three elements: 1) Movement of the body produced by the skeletal muscles, 2) Resulting energy expenditure which varies from low to high and 3) a positive correlation with physical fitness. This definition covers as a wide range of levels of psychical activity, ranging from minor activities as standing up, to more demanding activities as running a marathon (Caspersen, Powell and Christenson, 1985). As far as health outcomes are concerned, the energy expenditure is usually required to be well above resting levels (Bouchard and Shephard 1994). For example, while one could be classified as being physically active while writing a thesis (fingers are moving fairly rapidly across the keyboard), this type of physical activity is largely irrelevant for health. The present thesis will primarily focus on the kind of psychical activity that is considered to be in the lower end of the psychical activity but still affects health, i.e. resulting energy expenditure varying (relatively) from low to high, but not planned, unstructured and without repetitive bodily movement like running, playing football etc. Lower (expenditure) level of psychical activity counts taking the stairs, standing up while being on the phone etc. Such psychical activity is recognised as low-involvement decisions. Involvement is defined as a person's perceived relevance of the object based on inherent needs, values and interest (Zaichkowsky, 1985).

1.3 Structure of the thesis

The thesis is structured into five parts with a total of 12 chapters. The reader is introduced to the problem field in Part I. Part I consists of Chapter 1, 2, and 3. Chapter 1 sets the frame of the thesis by introducing the research background, research problem, structure, and delimitations. In Chapter 2, information about the Novo Nordisk, the Cities Changing Diabetes project and the data foundation stressing the problem are introduced. Chapter 3 concentrates on the tactical methodological reflections of the research – meaning the overall planning of the research methodology in terms of research philosophy and approach. Finer details on research design and data collection will be presented in chapter 6.

Part II consists of chapter 4 and 5 – primarily focusing on the contribution of existing literature with regards to the research problem. In chapter 4, a literature review is conducted, which outlines the theoretical foundation. Based on chapter 4, chapter 5 presents research questions to be answer further in the study to provide Novo Nordisk with realistic predictions in preventing urban diabetes.

Part III consists solely of chapter 6 and contributes with a conceptual framework of this thesis. Chapter 6 establishes a concrete, realistic context of the present thesis to be able to develop four testable hypotheses. These are developed on the basis of psychological elements presented in the

literature review. Overall part III serves the purpose of defining how it is able to attempt research questions.

Part IV consists the execution method of the research. Chapter 7 presents the concrete design and collecting plan of how the thesis will go about answering the research questions. Chapter 8 serves the purpose of presenting the quantitative data analysis method and the analysis of the data collected. Further to this, the results of the data will be discussed in chapter 9.

Part V consists of chapter 10, 11 and 12. Chapter 10 serves the purpose of reflecting on the findings in broader perspectives for Novo Nordisk to be recognised as catalyst for change on the urban diabetes agenda. This is followed by chapter 11, which concludes the research and sums up the answer for the research question and the objectives. In continuation of the concluding remarks, considerations of further research are presented.

1.4 Delimitations

The scope of the thesis is limited to Copenhagen as city of focus. This decision is made due to accessibility and the quality of the study. By narrowing the focus to Copenhagen dwellers, the influence of other, unintended variables is lowered in the study. These variables could be of cultural character.

The literature review will present a number of psychological mechanisms. This list of mechanisms solely contains mechanisms considered relevant within the context of this thesis. Also, the accessibility of measuring effects within the frame of resources available for this study is considered. Selection criteria will further be presented in the literature review (see chapter 4) and in the conceptual framework more specifically for each mechanism (see chapter 6). Psychological mechanisms will be defined later.

As defined in the clarification of key terms, the psychical activity of interest is only psychical activity in everyday life. The purpose of this study is to increase the health level on a broad basis, and not to increase health level of a selection of the Copenhagen dwellers (e.g. by focusing increasing usages of fitness centres). The reason for this should be found in the long-term perspective of possible behaviour changes: Being able to change behaviour in everyday activities hold the potential of developing habitual behaviour due to the frequencies of the activities.

2. Case introduction

The purpose of this chapter is to introduce Novo Nordisk by presenting the organisation's values, markets, and products. Furthermore, the foundation for the thesis is introduced in terms of the Cities Changing Diabetes project, the global development of diabetes, urban diabetes and diabetes in Copenhagen.

2.1 Novo Nordisk

The global pharmaceutical company, Novo Nordisk, manufactures and markets pharmaceutical products and services. Key products include diabetes care medications and devices. Novo Nordisk has been at the forefront in the treatment of diabetes since the company was founded in 1923. Today, the company is the global market-leading provider of pharmaceuticals for treating diabetes, and supplies around half of all the insulin used globally (Novo Nordisk, Company brochure). 23 million diabetics rely on the company's products to keep them alive and help them avoid the serious complications diabetes can lead to (Novo Nordisk, Company brochure: 2).

Headquartered in Denmark, Novo Nordisk employs approximately 39,700 employees and markets its products in more than 180 countries (Novo Nordisk, about Novo Nordisk). As world leader in diabetes care, Novo Nordisk now holds a global value market share of 27% (Novo Nordisk, 2014). In 2014, the sales were 88.8 billion DKK[1].

2.1.1 Triple Bottom Line

A central value in the way Novo Nordisk drives business is the Novo Nordisk Way (Novo Nordisk, Company Brochure). A part of the Novo Nordisk way is stating that the business needs to grow based on the idea of the Triple Bottom Line business principle – believing in a balance between economy, environment and society as the foundation to long-term business success. This way of conducting business aims at pursuing business solutions that maximise value to shareholders as well as stakeholders.

2.1.2 The Cities Changing Diabetes project

A project supporting the Triple Bottom Line principle is the Cities Changing Diabetes (CCD) project. The CCD project is a response to the dramatic rise in urban diabetes across the world. The project is being developed and initiated by Novo Nordisk in partnership with University College London and supported by Steno Diabetes Center, as well as a range of local partners (Cities Changing Diabetes, Booklet).

[1] 6% growth from 2013

CCD is a commitment to push for urgent action against urban diabetes on a global scale. The aim is to map its extent, share solutions and tackle the growing challenge of diabetes in some of the world's largest cities. It is believed that when businesses, city leaders and planners, healthcare professionals, academics, and community leaders pull together, it is possible to transform cities into healthier places to live, work and play – and bring down the risk of urban diabetes.

CCD was first launched in Mexico City, one of the largest metropolitan areas in the world. Other focus cities are Houston, Copenhagen[2], Tianjin, and Shanghai. The initiative aims to comprise three phases in each city: mapping the challenge, sharing solutions and taking action. During 2014 and 2015, the partners are working together to better understand the dynamics of urban diabetes. By the end of this phase, key barriers and future priorities will be identified. In the last phase, the project will lay its part in helping to develop action plans focusing on health preservation.

2.2 Diabetes – An emergency in slow motion

Diabetes is a chronic disease that occurs when the body cannot produce insulin at all (type 1 diabetes) or do not produce enough insulin (type 2 diabetes) to keep blood glucose under control (NHS Choices, Diabetes introduction). The disease befalls a relatively large part of the global population: one out of 12 people in the world have diabetes (International Diabetes Federation, Diabetes Atlas, 2014). The number of people with diabetes and especially people with type 2 diabetes is growing at an alarming rate. The rise of diabetes is one of the world's most serious health challenges with statistics getting worse every year: 387 million people in the world have diabetes today – a number predicted to grow to close to 600 million by 2035 or more than 10% of the world's adult population (International Diabetes Federation, 2014). In 2014, diabetes caused 4.9 million deaths. In order words, every seven-second a person dies from diabetes (Ibid.).

Having diabetes is not only costly for the individual, also for the whole society: it is estimated that diabetes carried a price tag of 682 billion US dollars in direct health expenditures worldwide (International Diabetes Federation, Diabetes Atlas, 2014). On top of that is loss in productivity and other associated indirect costs.

2.2.1 Types of diabetes

There are three main types of diabetes. However, it is solely the type 2 diabetes that is of interest in this thesis, as it is the only type of diabetes susceptible to prevention and changes in lifestyle. Type 2

[2] Even though Copenhagen is not recognised as a metropolis, Copenhagen is included in the project as Novo Nordisk is headquartered in Denmark and the city faces a increased number in people diagnosed with Type 2 diabetes.

diabetes is the most common type of diabetes and accounts for 85–95% of people with diabetes (International Diabetes Federation, Diabetes Atlas, 2014).

Blood glucose starts to rise as the number of insulin-producing cells in the pancreas gradually declines over time due to ageing, and/or when it cannot keep up with the additional demands introduced by lack of exercise and increasing amounts of abdominal fat. In contrast to people with type 1 diabetes, the majority of those with type 2 diabetes usually do not require daily doses of insulin to survive. Many people are able to manage their condition through a healthy diet and increased physical activity. If they are unable to regulate their blood glucose levels, they may be prescribed insulin.

The rise in type 2 diabetics is associated with economic development, dietary changes, increasing urbanisation, reduced psychical activity and changes in other lifestyle patterns (Hunt & Schuller, 2007). 80% of the development of type 2 diabetes can be prevented with a healthy diet and regular exercise (International Diabetes Federation, World Diabetes Day Toolkit, 2013). Obesity is known to be a major risk factor in developing type 2 diabetes. According to the World Health Organisation (WHO), obesity has reached pandemic proportions, with up to 1.9 billion adults[3] being overweight (Novo Nordisk, Annual Report, 2014). Of these 1.9 billion adults, approximately 260 million men and 340 million women are clinically obese (BMI $\geq$30) (WHO, January 2015).

2.2.2 Urban diabetes

In today's increasingly global world, more people live in urban areas than in rural areas: 54% of the world's population resided in urban areas in 2014. Cities are home to 3.9 billion people worldwide (UN, World Urbanisation Prospects, 2014).The most urbanised regions today include Northern America (82% living in urban areas in 2014), Latin America and the Caribbean (80%), and Europe (73%) (UN, World Urbanisation Prospects, 2014).

The urban population is expected to continue to grow, so that by 2050, the world will be one-third rural (34%) and two-thirds urban (66%), roughly the reverse of the global rural-urban population distribution of the mid-twentieth century (United Nations, 2014). The urban population of the world is expected to increase to reach 6.3 billion in 2050 (Ibid.).

Such development in urbanisation is fuelling the type 2 diabetes pandemic, as a reason of the social and economic possibilities of urban life. Today, nearly two-thirds of the 382 million people with diabetes live in cities (Cities Changing Diabetes, About). If this trend continues by 2035 as many as half a billion

[3] 18 years and older

people will have diabetes – nearly all of them in cities (International Diabetes Federation, Diabetes Atlas, 2014).

2.2.3 Diabetes in Copenhagen

Having outlined the diabetes situation on a global level and in urban areas, it is relevant to understand the situation of diabetes in Copenhagen, as Copenhagen is the topic of interest in the present thesis.

Copenhagen was recently named the most liveable city in the world by the highly respected magazine Monocle (Monocle, 2014). However, reality contributes with another aspect of this liveable city; in Copenhagen, type 2 diabetes continues to rise, and there is no doubt that diabetes is a major challenge for Denmark's capital (ComCaseCompetition, 2015). The prevalence of overweight and obesity combined is 34% (i.e. BMI $\geq$ 25), while 9% of the Copenhagen population is obese (i.e. BMI $\geq$ 30). Diabetes prevalence in Copenhagen is now 4% of the population (diagnosed with diabetes) and has increased in the period since 2001.

Further to obesity and diabetes, the area of Copenhagen seems to grow rapidly in the future; the population is 570,000 and this is projected to grow to 720,000 in 2030 (ComCaseCompetition, 2015).

This increase in size, prevalence of diabetes and obesity stress the need of ensuring behaviour changing actions to affect the development of prevalence diabetes as a result of a growing population.

3. Methodology

The purpose of this chapter is to describe the methodology used for answering the research objective. This chapter concentrates on research philosophy and research approach. An explicit description of the methodology supports the reader in understanding the underlying assumption of the research. This will constitute the approach applied to the research and the composition of the present thesis. In the following, the research philosophy, research approach and level of analysis are presented. More detailed plans on execution of research and data collection methods are presented in chapter 7.

3.1 Research philosophy

As a basis of the research methodology, this section will present the research philosophy. The research philosophy adopted contains important assumptions of what constitutes acceptable knowledge (the nature of knowledge) and the process by which this is developed (development of knowledge). These assumptions will underpin the methodology of this research (see chapter 7). The present thesis relies on the ideas of the critical realism paradigm, which is developed based on the scientific discussions between the positivistic and the interpretivistic paradigms that reigned in 1970s. In 1975, philosopher Roy Bhaskar developed the position of transcendental realism in his paper *A Realist Theory of Science*. Later on, in 1979, he presented the position Critical Realism in his paper *The Possibility of Naturalism*. It was in on basis of these two principal works the term critical realism arises and became acknowledged as a scientific approach[4]. To Bhaskar, the development of critical realism was not a clash with realism, but rather a variation of realism.

In terms of ontological stance, critical realism is inspired by the ontology of the positivistic philosophy. While positivism concerns a single, concrete reality and interpretivism of multiple realities, critical realism concerns multiple perceptions about a single, mind-independent reality (Healy & Perry, 2000). The ontology of empirical research is based on three assumptions. Firstly, essentialism is basis for the ontology (i.e. the reality exists independently of our perception of it, independent of our sociocultural dispositions as well as individual judgements and cognitive capacity). Rather than being supposedly value-free, as in positivistic research, or value-laden as in interpretive research (Lincoln & Guba, 1985), realism is instead value cognizant (i.e. conscious of the values of human systems and of researchers). Secondly, a perception for realists is a window on to reality through which a picture of reality can be triangulated with other perceptions. That is, the world can be distinguished as having the three domains of reality of mechanisms, events and experiences (Bhaskar, 1978). In more detail, the three domains are the real domain, consisting of the processes that generate events, in which generative

[4] The later development of critical realism was with contributions from among others Rom Harré (1986) and Andrew Sayer (1992; 2000).

mechanisms or causal powers exist independently with a tendency to produce patterns of observable events under contingent conditions; the actual domain in which patterns of events occur, whether they are observed or not; and the empirical domain, in which experiences may be obtained by direct observation (Tsoukas, 1989; Bhaskar 1978). The discovery of these observable structures and mechanisms that underlie events and experiences is the goal of realism research. The last ontological assumption of critical realism claims that reality consists of an open system of interacting objects and structures with related mechanisms and tendency, which exists in reality independently of agents.

The epistemological stances, critical realism is inspired of the interpretivism understanding of human perception. However, critical realism recognises that perceptions have certain plasticity (Churchland, 1979) and that there are differences between reality and people's perceptions of reality (Bisman, 2002).

The underlying assumptions of critical realism may be understood as a paradox between the reality's permanent nature in ontological stance and the perception's variable nature in epistemological stances. The critical realism draws a picture of reality as additional to observable events also contains unobservable domains. Thus, it is important to separate epistemology (knowledge, systems, thoughts, ideas, theories, language etc.) from ontology (being, things, existents, reality, objects of investigation). This distinction between what critical realism calls the transitive (the changing knowledge of things) and the intransitive (the relatively unchanging things which we attempt to know) is a defining distinction.

By applying critical realism to the present thesis, the aim is to clarify the underlying mechanisms affecting the decision making process related to psychical activity in everyday life. Looking into cause and effect relationships, these mechanisms will be studied.

3.2 Research approach

The research approach serves to give en idea of the role and importance of theory for the research (Saunders, Lewis & Thornhill, 2008). A deductive approach is applied in the present thesis as the emphasis is on causal healthy everyday decisions and psychological mechanisms.

The present thesis follows Robson's (2002) five stages through which deductive research will progress:

1. Deducing hypotheses from the theory. Based on the literature review and situations with decisions regarding physical activity, four hypotheses are developed (See chapter 4 for existing literature and chapter 6 for hypotheses development).

2. Expressing the hypotheses in operations terms, which propose a relationship between specific variables (See chapter 6).
3. Testing these operational hypotheses (See chapter 8).
4. Examining the specific outcome of the inquiry (See chapter 8).
5. (If necessary, modifying the theory in the light of the findings)

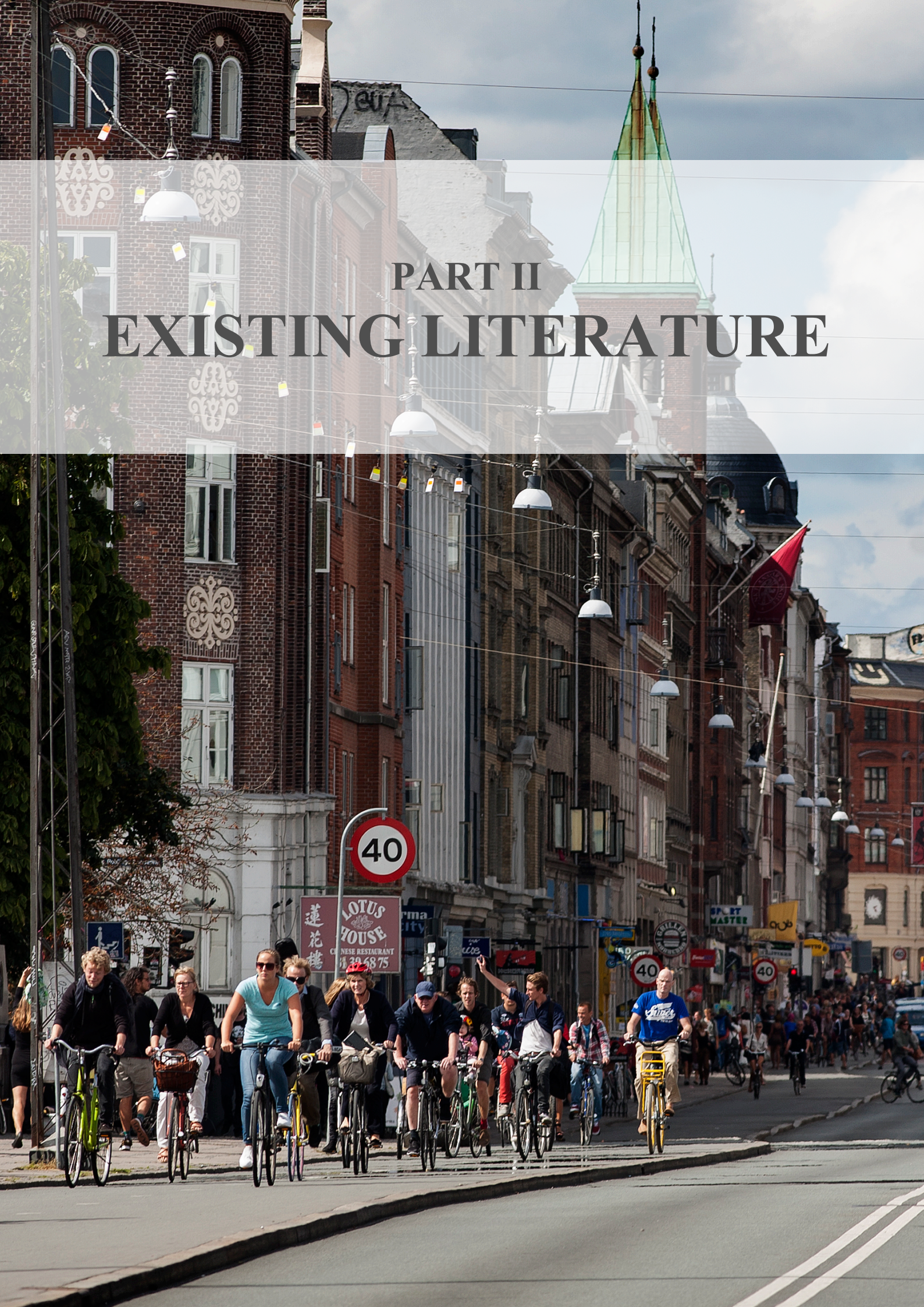
3.3 Level of analysis

The present thesis focuses on the micro-level of analysis, which is the smallest unit of analysis in the social sciences, meaning an individual is studied in their social settings (Palmer, 1999).

In marketing research, a common way of investigating consumer behaviour is collective aggregated research, meaning a top-down approach. However, despite that this method often provides great results, it also lacks consideration of individual variation. This means that the findings are not as useful as at first sight as they do not include and predict behaviour of multiple people.

The present thesis will take a bottom-up approach to the micro-level of analysis. Specifically, this research is based on "bottom-up" processing, which: *" (…) refers to processes that take a "lower-level" representation as input and create or modify a "higher-level" representation as output"* (Palmer, 1999, pp. 84–85). The methodology mirrors a consideration of individual variation, as the research will focus on not force to make aggregated conclusions in order to create good-looking results without having a valid foundation defined on individual level.

The level of analysis is mirrored in the selection of theoretical foundation, but especially in the research design (See situations catalogue in chapter 6 and research design in chapter 7).



PART II
EXISTING LITERATURE

4. Literature review

In this chapter, the reader will be introduced to a review of existing literature of individual decision-making theory. The purpose is to achieve the necessary understanding and background information of existing literature as an important step in answering the research objective.

The chapter starts by introducing neoclassic decision-making models and the limitations of these. This is followed by an examination of how and why more descriptive decision-making models are mirroring real human behaviour. Subsequently, existing literature are reviewed to identify psychological mechanisms that are influential fin the individual decision-making process.

4.1 Normative decision-making models

Explanations and predictions of individuals' choices in everyday life are often founded on the assumption of human rationality. The traditional conceptualisation of an individual in economic theory, whom is known as *Homo economicus*, is based on several assumptions that are relatively unproblematic in a market setting, but have potentially misleading implications when applied outside this sphere (Gintis; 2000). These assumptions are that *Homo economicus* 1) comes to a choice situation with exogenously given and determinate preferences, 2) is self-interested; i.e. caring only about personal bundle of commodities, work, and leisure acquired, 3) is outcome-oriented; i.e. caring about social interactions only insofar as they affect his final consumption and wealth, and 4) has a rate of time preference that allows him to allocate consumption over time in a consistent manner (Persky, 1995; Ginits, 2000).

Although economists often formally assume that humans are hyper-rational agents, most recognise that individuals commonly fail to live up to the standards of *Homo economicus* (Persky, 1995). Rational choice theory is conceived as a normative model of an idealised decision maker – not as a description of actual human behaviour. Relying on theories that are normative do not offer a useful foundation for behaviour-changing initiatives, as the theories work with ideals rather than actual behaviour. In order words, working with ideal behaviour rather than actual behaviour is not efficient in real life cases such as urban diabetes.

4.2 Descriptive decision-making models

Everyday observations attest to the fact that individuals sometimes fail to conform to the normative decision-making models: Individuals succumb to harmful temptations, behave charitably and/or vengefully, and have a concern for fairness (Simon, 1955). This point may be more clear when having

the following examples in mind: Drug addiction may seem a perfect example of people making choices that are not in their self-interest and generous acts towards neighbours, co-workers, and friends may be forms of self-interested reciprocity.

In order to develop more realistic behavioural models related to decision-making, Simon (1955, 1956, 1957, 1982) strongly criticised this view of perfect rationality; instead, he claimed that humans have a *bounded rationality*. Simon (1955) points out that it should not be neglected that humans, when making decisions, are subject to psychological and physiological restrictions. For instance, individuals may exhibit forgetfulness (i.e. limited memory), may fail to pay attention (i.e. inattention), and may make decisions without collecting all the relevant information available (i.e. imperfect information). He suggests that the complexity of the environment and limited cognitive system of humans make maximisation all but impossible in real decision-making situations.

Simon's thoughts (1982) are rooted in Commons' ideas (1934) on human behaviour as being goal-oriented and purposive, but also heavily influenced by *stupidity, ignorance*, and *passion* (Kaufman, 1999). Simon (1982) locates the source of bounded rationality in the limited processing capability of the human brain (*stupidity*) and lack of knowledge of alternatives in the choice set (*ignorance*). He stated that trationality of individuals in decision-making is limited by the information they have, the cognitive limitations of their minds, and the finite amount of time they have to make a decision. Thus, Simon (1982) explains deviations by the lack understanding the role of stupidity and ignorance as influencers on the degree of rationality.

Simon's rejection of neoclassic decision-making models (1982) has inspired researchers in psychology to develop research programs to study decision-making empirically. Among others of these endeavours were Tversky and Kahneman's approach investigating the "biased rationality" (1974). Kahneman and Tversky developed their own perspective on bounded rationality. Although acknowledging the role of task complexity and limited processing capacity in erroneous judgement, Kahneman and Tversky were convinced that the processes of intuitive judgement were not merely simpler than rational models demanded, but were categorically different in kind. Clarifying explanations on processing of bounded rationality will follow in the next section.

4.2.1 Dual-process models

To understand the deviations from the rational choice theory, a deeper understanding of the workings of the human brain is beneficial. This may help in understanding how information is processed and

serves as an important insight of how the decision maker may be affected in decision-making processes of everyday decisions relevant for this thesis.

Damasio (1994) presents, with a real-life example, a rejection of the traditional view on the nature of rationality. Specifically, he refers to the traditional view in the brain context by feelings[5] and reason not being mixed; i.e. the mechanisms of reason exist in a separate province of the mind, where feelings should not be allowed to intrude (Damasio, 1994). Damasio's rejection relies on a story from 1848 about Phineas P. Gage – an intelligent human being, one might imagine. Gage worked with railroad's expansion, and had just put powder and fuses in a hole, and told the man who was helping him to cover it with sand. Someone called from behind, and Gage looked away, over his shoulder. Distracted, and before the other man had poured the sand in, Gage began tamping the powder directly with the iron bar. In no time he stroked fire in the rock, and the charge blows upward in his face. The iron entered Gage's left cheek, pierced the base of the skull, traversed the front of this brain, and exited at high speed through the top of the head. This accident caused a neurological disease. He had had an entirely healthy mind until this neurological disease destroyed a specific part of his brain, and from one day to the next, caused a profound defect in decision-making. The instruments usually considered necessary and sufficient for rational behaviour were intact in him. He had the necessary knowledge, attention, and memory; his language was flawless; he could perform calculations; he could tackle the logic of an abstract problem. There was only one significant accompaniment to his decision-making failure: a noticeable alteration of the ability to experience and express feelings. Flawed reason and reduced feelings stood out together as the consequences of a specific brain lesion, and this correlation suggested to Damasio (1994) that feelings were an integrated component of reason. Thus, reason may not be as pure as most of us think it is; feelings may not be intruders in the bastion of reason at all; they may be involved in it networks, for worse and for better.

This understanding of the relationship of feelings and reason is basis for what is known as *dual-process theory* (Chaiken & Trope, 1999; Evans and Over, 1996). In psychological terms, *a dual-process theory* provides an account of how one phenomenon can occur in two different ways, or as a result of two different processes. Often, the two processes consist of a distinction between two cognitive processes: an implicit, unconscious process and a controlled, conscious process (Pettinelli, 2015). Stanovich and West (2000) labelled the two types of cognitive processes *System 1* and *System 2*. This understanding was developed further by Kahneman and Tversky (1974) by differentiating the two

[5] Feelings is referred to interchangeable with emotions in this context, even though the relationship is more complex than that

styles of processing with more explanatory details[6]. Tversky and Kahneman (1974) use the dual-system theoretical framework to explain why human judgements and decisions often do not confirm to formal notions of rationality.

System 1 is rapid and instinctive, and it does not involve what is colloquially associated with the word "thinking". System 2 is more deliberate and self-conscious (Tversky & Kahneman, 1974). Most people are likely to use System 2 when deciding whether to go to law school or business school. However, it is especially the relationship between System 1 and System 2 that is the topic of interest in the dual-process theory. System 1 and System 2 are both active whenever we are awake. System 1 runs automatically, while System 2 is normally in a comfortable low-effort mode. System 1 continuously generates suggestions for System 2; suggestions like impressions, intuitions, intentions, and feelings. If endorsed by System 2, impressions and intuitions turn into beliefs, and impulses turn into voluntary actions. When all goes smoothly, which is most of the time, System 2 adopts the suggestions of System 1 with little or no modification, and that is usually fine. When System 1 runs into difficulties, it calls on System 2 to support more detailed and specific processing that may solve the problem of the moment. System 2 is mobilised when a question arises for which System 1 does not offer an answer, as it has probably happened to you, when you have encountered the multiplication problem 17 x 24. The division of labour between System 1 and System 2 is highly efficient: it minimises effort and optimises performance. The arrangement works well most of the time because System 1 is generally very good at what it does: its models of similar situations are accurate and its short-term predictions are usually accurate as well. These models are known as heuristics, and will be introduced in next section. However, System 1 has biases – systematic errors that it is prone to make in specified circumstances (Kahneman, 2003). There are several examples of conflicts between the two systems. Most of us are all familiar with the experience of what it is like to force our attention on a boring book, when we constantly find ourselves returning to the point at which the reading lost its meaning. This is an example of an automatic reaction and an intention to control.

Having clarified the workings of the human brain serve as an overall understanding of what elements to target for changes in behaviour and as a springboard for answering the research objective. Everyday decisions with regards to psychical activity is primarily characterised as being of low-involvement, which stresses the need of approaching system 1 in the decision making process. Based on this, System 1 will the system, which is aimed to affect in order to change behaviour of such decisions. This does

[6] Tversky and Kahneman refer to system 1 as the Automatic System and system 2 as the Reflective System

not mean that System 2 not will be approached, but focussing on activating System 1 will support the suggestions given to System 2 by System 1. The next section will go further into why makes systematic error of System 1 arise.

4.2.1.1 Heuristics and systematic biases

We humans make decisions and judgements every day – if we can trust someone, if we buy the skimmed milk, if we should do something (or not), which route to take. If we carefully considered and analysed every possible outcome of these decisions and judgements, we would never do anything else. When making judgements, individuals rely on a number of *heuristic principles*, which reduce the complex task of assessing probabilities and predicting values to simpler judgemental operations (Tversky & Kahneman, 1974). A heuristic is a mental shortcut used to solve a particular problem; it is a quick, informal, and intuitive algorithm the brain uses to generate an approximate answer to a reasoning question (Tversky & Kahneman, 1974). Skitmore, Stradling, & Tuohy (1989) mentioned that cognitive heuristics or principles are systematic rules that operate instead of a detailed analysis of the available information thus conserving mental effort. They are used to simplify decision-making. In other words, simple rules of thumb to ease the judgement. Tversky and Kahneman (1974) use heuristics to assert that System 1 thinking involves associating new information with existing patterns or thoughts, rather than creating new patterns for each experience. The logic behind the use of heuristics is that using them should lead to adequate decisions more often than inadequate ones. So to say, on average the resulting loss in decision quality would be compensated by saved time or resources (Bazerman, 2006).

The *availability* heuristic is one of these principles, and is relevant within the context of everyday decisions. This heuristic is of relevance as everyday decisions are characterised by being of low-involvement (e.g. to take the stairs or the escalator). In such low-involvement decisions, the availability heuristic may be one of the heuristics guiding the decision-making process to a large extent because spontaneously and effortless thoughts are a central element of the heuristic (meaning often activated by System 1 processing). The availability heuristic is a useful clue for assessing frequency, because instances of frequent (or outstanding) events are usually recalled better and faster than instances of less frequent (or ourstanding) events (Tversky & Kahneman, 1974). Thus, the availability heuristic is a mental shortcut that relies on immediate examples that come to an individual's mind when evaluating a specific topic, concept, method and/or decision. The availability heuristic operates on the notion that if something can be recalled, it must be important, or at least more important than alternative solutions, which are not as readily recalled (Esgate & Groome, 2005).

This availability of an option is based on an assessment of accessibility. A core property of several intuitive thoughts is that under appropriate circumstances, they come to mind spontaneously and effortless. To understand intuition, one must understand why some thoughts come to mind more easily than others, why some ideas arise effortlessly, and others demand work. This understanding has a long history in psychology. Indeed, this was the central question that the British empiricists sought to answer with the law of association (Kahneman, 2003). The measurement of reaction time became widely used as a general-purpose measure of response strength and major advances were made in the study of why thoughts become accessible - notably the distinctions between automatic and controlled processes. Nevertheless, no general concept was adopted (Kahneman, 2003). However, Kahneman (2003) stated that a common concept is required in order to study intuition. He introduced the term *accessibility,* which was proposed in the context of memory research (Tulving & Pearlstone, 1966) and of social cognition (Higgins, 1996). The different elements of a situation, the different objects in a scene, and the different attributes of an object - all can be more or less accessible. Moreover, the determinants of accessibility subsume the notion of salience of stimulus, selective attention, specific training, associative activation, and priming[7].

What becomes accessible in any particular situation is mainly determined by the actual properties of the object of judgement. For instance, physical salience determines accessibility: If a large green letter and a small blue letter are shown at the same time, the green will come to mind first (Kahneman, 2003). However, salience can be overcome by deliberate attention: An instruction to look for the smaller letter will enhance the accessibility of all its features, including its colour (Kahneman, 2003). Some attributes, named natural assessments (Tversky & Kahneman, 1983), are automatically registered by System 1 without intention. In addition to physical properties such as size, distance and loudness, the list includes more attract properties such as surprisingness (Kahneman & Miller, 1986), similarity, and mood (Schwarz & Clore, 1983). Accessibility itself is a natural assessment (e.g. Tversky & Kahneman, 1973; Schwartz & Vaughn, 2002). The evaluation of stimuli as good or bad is a particular important natural assessment. The evidence, behavioural (Bargh, 1997; Zajoc, 1998) and neurophysiological (e.g. LeDoux, 2000), is consistent with the idea that the assessment of whether objects are good and should be approached, or bad and should be avoided (e.g. a dangerous situation) is carried out quickly and efficiently by specialised neural circuitry.

[7] Priming is an implicit memory effect in which exposure to one stimulus influences the response to another stimulus (Schvaneveldt & Meyer, 1973).

Another group of heuristics relevant when talking about everyday decisions is *social* heuristics. These are guiding behaviour and decisions made in a social environment. The social environment is relevant to consider because most of the decisions individuals make in everyday life do not take place in the vacuum of the laboratory. But also because social heuristics are believed to be automatic and unconsciously applied (Chaiken & Trope, 1999), which is relevant for the characteristics of the decision type of this study. Especially, the social heuristic explains how *the presences of others* (named the audience effects later) may be influential in individual decision-making, because decisions in everyday life are rarely made without being surrounded by other (known and unknown) people who may affect decisions. Several studies have shown that the presences of others improve the performance of an individual's ability (e.g. Triplett, 1898; Allport 1920; Aiello & Douthitt, 2001). The *audience effect(s)* and psychological mechanisms of it will be introduced further later in this chapter.

For the most part, heuristics are helpful, because they allow us to quickly make sense of a complex environment, but there are times when they fail at making a correct assessment of the world. When the heuristics fail to produce an accurate judgement, it can result in a cognitive, systematic bias, which is the tendency to draw an incorrect conclusion in a certain circumstance based on cognitive mechanisms. Biases have high potential for coming into play when a decision task has a high degree of complexity, high degree of procedural uncertainty and when it is performed under circumstances involving a high degree of stress and time pressure. Frederick (Personal Communication, 2003) studied cognitive self-monitoring in the *Bat & Ball* experiment, which shows such systematic biases. The experiment is as follow: A bat and a ball cost $1.10 in total. The bat cost $1 more than the ball. How much does the ball cost? Almost everyone reports an initial tendency to answer: "10 cent" even though the right answer is 5 cent (Frederick, 2003). This study showed that individuals are not accustomed to think hard and are often content to trust a plausible judgement that quickly comes to mind. In this example, intuition was associated with poor performance, but System 1 thinking can also be powerful and accurate. Klein (2003) has argued that skilled decision makers often do better when they trust their intuitions than they engage in detailed analysis.

Even though the different decision-making biases may mislead the human mind in multiple different ways, the judgemental effects of the decision-making biases tend to fall in three different categories: incorrect assessment of event outcomes or probabilities, ignoring relevant alternatives and overly optimistic or pessimistic assessment. This thesis will primarily focus on mechanisms underlying ignorance of (relevant) alternative. In the context of this thesis' purpose, the idea is not to lead the

decision maker into biases, but instead to activate the underlying mechanisms to affect decisions to ignore sub-optimal alternatives in regards to psychical activity.

The relationship between heuristics, biases and the underlying psychological mechanisms of these processes is beneficial to discuss in order to understand which elements should be activated in order to affect human behaviour. Heuristics serves the role as rules of thumb, which humans as described often rely on. However, these rules of thumbs are not constantly active in all situations of decision-making, but arise in some and not in others. Psychological mechanisms are considered as a kind of reminder for the heuristic(s): a sort of trigger of heuristics. This means that a psychological mechanism may (unconsciously) remind the decision maker about the rule of thumb relevant in the given situation. This will be explained in more details later this chapter. Thus, psychological mechanisms are important elements of heuristics' function. As biases arises from heuristics, psychological mechanisms are also involved in the risen of biases – when the heuristic fails to produce an accurate judgement. It is the same psychological mechanism leading to errors as the one activating the heuristic. For instance, when a framed message forces the decision maker to draw an incorrect conclusion – another frame construction may force the decision maker to draw an appropriate conclusion. The psychological mechanisms are of relevance and will be introduced later in this chapter.

The present section has served the aim of defining how the relationship between heuristics, psychological mechanism and biases affect the decision-making process and defined that psychological mechanisms will be of focus in order to affect decision-making process and activate heuristics. Psychological mechanisms will be the central element in the rest of the thesis. The next section will look into how psychological mechanisms could be applied efficiently.

4.3. Libertarian Paternalism

The traditional presumption that individual choices should be free from interference is usually based on the assumption of rational choice theory, explaining how individuals do a good job of making choices, or at least that they do a far better job than third parties could do (Thaler and Sunstein, 2003). However, heuristics and systematic biases indicate that people have self-control problems.

Thaler and Sunstein's (2003) idea of choice architecture is highly helpful for the managing self-control problems. The basic idea is that private and public institutions might nudge people in directions that will make their lives better without eliminating freedom of choice. Their idea of choice architecture is based on what is called *Libertarian Paternalism*. The libertarian aspect lays in the straightforward

insistence that individuals should be free to do what they like — and to opt out of undesirable arrangements if they want to do so. When they use the term *libertarian* to modify the word *paternalism,* they simply mean liberty preserving (Thaler & Sustain, 2003). Libertarian Paternalism strives to make it easy for people to go their own way; it does not want to burden those who want to exercise their freedom. The paternalistic aspect lies in the claim that it is legitimate for choice architects to try to influence individuals' choice architecture in order to make their lives longer, healthier, and better. In other words, Thaler and Sunstein (2003) argue for self-conscious efforts, by institutions, to steer individuals' choices in directions that will improve their lives. A policy is "paternalistic" if it tries to influence choices in a way that will make choosers better off, *as judged by themselves.* Libertarian paternalism is a highly relevant consideration regarding health decisions, as information does not seem to be enough in order to change behaviour. This idea of libertarian paternalisms in choice architecture will be the basis for this thesis. Based on the idea of libertarian paternalism as a solution to self-control problems, the choice architecture in terms of nudging will be of focus further on. A nudge is any aspect of the choice architecture that alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives (Thaler & Sunstein, 2003). Thaler and Sunstein (2003) rely on the idea that small and apparently insignificant details can have major impacts on individuals' behaviour. A good rule of thumb is to assume that "everything matters" (Thaler and Sunstein, 2003).

To be able to develop effective nudges, it is relevant to look further into which psychological mechanisms that are influential in everyday decisions. Without this insight, nudges may be worthless and not support improved health by increasing psychical activity.

4.4 Mechanisms shaping decision-making

In this section, relevant psychological mechanisms possibly influencing individual decision-making processes are examined based on existing literature. The review is structured into two parts: individual mechanisms and collective mechanisms. Behind this division lays the assumption that some mechanisms are triggers in social contexts among other people, while other mechanisms are triggers without largely influence of others.

4.4.1 Individual mechanisms

Individual mechanisms are defined as psychological mechanisms that may be triggered without the presence of others, but may arise without others surrounded.

The selected individual mechanisms have the availability heuristic as the common denominator. As mentioned, this decision is based on the conviction that this study is focused on everyday decisions,

which is characterised by being of low involvement (e.g. to take the stairs or the escalator). In such low-involvement decisions, the availability heuristic may be helpful in reducing the number of (available) options of a decision. Furthermore, the availability heuristic is one of the heuristics most often used by the human brain. A heuristic activated easily will speak for applying mechanisms related to this heuristic in order to influence decisions. The selected individual mechanisms are mechanisms, which may trigger choices to be guided by the availability heuristic.

The presented individual mechanisms are salience effects, reward incentives, framing effect and weakness of will. The last mechanism, weakness of will, is not as such a mechanisms that can be activated or applied alone, as it appear more as an explanation of how suboptimal choices are made. This mechanism serves as an understanding of why people seem to act against their better knowledge and will be applied in order to stress the need for successful effects of the other individual mechanisms.

Further argumentation for selection of the concrete mechanisms will be presented later, when the context of the research is defined more specifically (see chapter 6).

4.4.1.1 Salience effects

In everyday life, we constantly look around and use inputs to guide our behaviour. When searching for particular objects, we may sometimes experience that we attend to things in our environment for which we had no intention to look for.

Due to the surplus of communication channels, consumers are faced with an overabundance of information, and a typical consumer is bombarded with information using all five senses. It is said that we are exposed to 11 million bits of information each second through all our senses. In contrast, we humans are claimed to only be capable of processing around 50 bits of that information (Milosavljevic & Cerf, 2008; Wilson, 2002). In recognition of this cluttered environment, some researchers have declared that we are living in the attention economy, with attention being a limited resource (Davenport & Beck, 2002).

The salience of a given piece of information, or the degree to which that piece of information stands out relative to other information, can affect whether an individual considers (consciously or unconsciously) the specific information in the decision-making process (Davenport & Beck, 2002). Salience effects derive from findings that "*colourful, dynamic, or other distinctive stimuli disproportionately engage attention and accordingly disproportionately affect judgements*" (Taylor, 1982: 192). Theory of saliency builds on the premise that the valuation of a choice option occurs not in isolation but in a

comparative context. Decision makers contrast the features of the option in question with the features of choice alternatives or of "normal" situations that come to the decision maker's mind.
Saliency is highly related to the availability heuristic, because in making a decision, individuals are often biased as they rely too heavily on information that is readily available or prominent, ignoring information that they do not see as readily or that is in the background. Tversky and Kahneman (1974) noted that: "*Availability is affected by factors other than frequency and probability such as salience*" (p: 1127). Thus, saliency is considered as an important factor in establishing availability. This is illustrated by studies on energy savings: Attari et al (2010) found that most participants mentioned curtailment (e.g. turning off lights, driving less) rather than efficiency improvements (e.g. installing more efficient light bulbs and appliances) as the most effective strategies they could think of for saving energy. The energy used by equipment was overestimated where energy use is "invisible", such as space heaters and clothes dryers, was underestimated. This lead to the conclusion that we tend to overestimate the causal role (salience) of information we have available to us. Other effects of salience biases are shown among other contexts within grocery shopping (e.g. Ambler, Stins, Rose & Swithenby, 2004), healthy food choice in everyday life (e.g. van Kleef, Otten & van Trijp, 2012), lotteries (e.g. Bordalo, Gennaioli & Shleifer, 2010), judicial decision (Bordalo, Gennaioli & Shleifer, 2013), and choice in electives (Humphreys & Garry, 2009).

In order to be able to influence the decision-making process, it is crucial to understand the driving forces behind this tendency to focus on salience effects. An important mechanism is *attention* as a mechanism that selects information that gains preferential status over other information (Wilson, 2002). Today, several researchers' understanding of attention is similar to William James' view dating back to 1890: "*Every one knows what attention is. It is the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought.*" (p. 403-404). An exception is the recent work of Pieters and Wedel (2004) who suggest that attention is a more complex phenomenon than currently studied. Pieters and Wedel (2004) introduced two determinants of attention (found in psychology and neuroscience): *bottom-up* and *top-down* attention.

Bottom-up attention is a rapid and automatic form of selective attention. It is also known as saliency-based attention, indicating that the more salient an object, the higher the probability of it being noticed. Bottom-up attention can be the result of events that occur either outside oneself (exteroception[8]) or inside oneself (interception) (Koch 2004). Bottom–up selection[9] is associated with

[8] Exteroception defined as when an individual register characteristics and conditions in the external environment, while interception is conditions inside the body (e.g. hunger).
[9] Selection does not in this context mean consciously

saliency which is computed on the basis of the detection of locations whose local visual attributes significantly differ from the surrounding image attributes, along some dimension or combination of dimensions (Itti & Koch, 2001).

It is likely that before top–down influences can have an effect, the visual system is biased towards salient stimuli that resolve the competition simply on the basis of the bottom–up input (see e.g. van Zoest, Donk, & Theeuwes, 2004). Top-down attention is an example of endogenous[10] (internal) attention, which is a task-dependent, focus-driven process mechanism, which enhances processing of whatever is selected (Pieters & Wedel, 2004). Over the last two decades, a considerable debate emerged regarding the extent to which selection is controlled by individuals in a voluntary, top–down way or by the properties of the stimulus features in the environment in a automatic, bottom–up way (e.g. see reviews Corbetta & Shulman, 2002; Rauschenberger, 2003; Theeuwes & Belopolsky, 2010). More studies have claimed that events, which are salient enough, are selected regardless of the current top–down set (Theeuwes, 1991; Theeuwes, 1995).

A large body of work in visual neuroscience has shown that visual attributes of stimuli that affect their visual saliency, such as brightness or colour, can affect the location and duration of fixations when individuals approach complex displays such as a vending machine or a supermarket shelf (Itti & Koch, 2001). This visual saliency effect has been shown to persist for several fixations (Henderson, Weeks, & Hollingworth, 1999). As a result, more salient items are fixated on longer than less salient stimuli.

A recent series of neuroeconomic studies have also shown that the values assigned to stimuli at the time of choice depend on the amount of attention that they receive during the decision-making process (Krajbich et al., 2010; Armel, Beaumel, & Rangel, 2008). In particular, appetitive items receive higher liking ratings and are more likely to be chosen when attention focuses on them longer. Together, these two classes of findings suggest that everyday choices is subject to visual saliency biases: independent of individuals' preferences, more visually salient options are more likely to be chosen due to the specific way in which the brain processes visual information.

In summary, salient elements affect the decision-making process by achieving bottom-up attention. Evidence shows that more salient items are fixated on longer than less salient stimuli. Also, it is shown

[10] Endogenous orienting occurs when attention is oriented according to an individual's goals or desires, allowing the focus of attention to be manipulated by the demands of a task. In order to have an effect, endogenous cues must be processed by the individual and acted upon purposefully.

that the values assigned to stimuli at the time of choice depend on the amount of attention that they receive during the decision-making process.

4.4.1.2 Reward incentives

The next individual mechanism is related to intertemporal choices and reward incentives of these. Most have probably experienced to fail being on a diet, skipped exercises, etc. Such decisions are defined as intertemporal choices – decisions involving trade-offs among costs and benefits occurring by the decision-maker at different points in time. Many people place a premium on the attribute of self-control. Individuals who have this capacity are able to stay on diets, carry through exercise regimens, show up to work on time, and live within their means (Laibson, 1997). Self-control is so desirable that most complain that they do not have enough of it. Intertemporal choices do not only affect one's health, wealth, and happiness, but may also, as Smith (1937) first recognised, determine the economic prosperity of nations with his term *the invisible hand* (Frederick, Loewenstein & O'Donoghue, 2002).

Inconsistency in intertemporal choices is not unique to exercising or eating healthy (e.g. want to loose wait but skipping workout). It can explain why individuals procrastinate about quitting smoking, or getting a flu shot. Each of these activities features a present cost (e.g. sacrificing something you enjoy, giving up time, incurring physical discomfort) and a delayed benefit (e.g. better health, healthy lungs) and so individuals might constantly wait to incur those costs until a never arriving tomorrow.

In order to understand the psychological motives underlying intertemporal behaviour, it is helpful to understand the historically development and the influential factors. Intertemporal choices became firmly established as a distinct topic in 1834 with John Rae's publication of *The Sociological Theory of Capital.* Like Smith (1937), Rae (1834) sought to determine why wealth differed among nations. Smith (1937) argued that national wealth was determined by the amount of labour allocated to the production of capital, while Rae recognised that this account was incomplete because it failed to explain the determinants of this allocation. In Rae's view (1834), the missing element was *the effective desire of accumulation* – a psychological factor that differed across countries and determined a society's level of saving and investment. Along with inventing the topic of intertemporal choice, Rae also produced the first discussion of the psychological motives underlying intertemporal choice. Rae believed that intertemporal choice behaviour was the joint product of factors that either *promoting* or *limiting* the effective desire of accumulation. The two main factors promoting the effective desire of accumulation were the bequest motive (meaning the prevalence throughout the society of the social and altruistic affections) and the tendency to exercise self-restraint. One limiting factor was the

uncertainty of human life (Rae, 1834). A second and very important factor that limited the effective desire of accumulation was the excitement produced by the prospect of immediate consumption.

Rae's statement about factors limiting the effective desire of accumulation was settling with the traditional economics' understanding of choices over time. Intertemporal choices in traditional economics terms are based on the discounted utility model; the discounted utility model is traditionally modelled in form of exponential discounting, a time-*consistent* model of discounting. The utility is discounted at a constant rate as a function of the delay to the outcome, and the outcome with the highest discounted utility is chosen. Thus preferences held at one point in time do not change with the passage of time (unless new information arrives). A central assumption of the discounted utility model is that all of the disparate motives underlying intertemporal choice can be condensed into a single parameter – the discount rate.

Among the factors that Rae identified as determinants of time preference, William Jevons (1888) and his son, Herbert Jevons (1905), assume that people only care about their immediate utility, and explains far-sighted behaviour by postulating utility from the expectation of future consumption. On this view, delay of satisfaction will occur only if it produces an increase in "anticipate" utility that more than compensates for the decrease in immediate consumption utility. In 1970, Bohm-Bawerk (1970) showed a new motive, arguing that humans suffer from a systematic tendency to underestimate future wants. Whereas the early views of Rae (1934) and Jevons (1888; 1905) explained intertemporal choices in terms of motives that are uniquely associated with time, Bohm-Bawerk began modelling intertemporal choice in the same terms as other economic trade-offs as a *technical* decision about allocating resources (to oneself) over different points in time. Bohm-Bawerk's treatment of intertemporal choice as an allocation of consumption among time periods (1889) was formalised late' by the American economist Irving Fisher (1930).

In line with the above, over the last two decades the discounted utility model has been questioned by some inconsistencies. Several studies have demonstrated that constant discount rates is systematically being violated (Frederick, Loewenstein & O'Donoghue, 2002). Empirical research on intertemporal choice has documented various inadequacies of the discounted utility model as a descriptive model of behaviour. Empirically observed discount rates are not constant over time, but appear to decline. The best-documented and most significantly discounted utility anomaly is "quasi–hyperbolic" discount function to illustrate declining impatience in savings decisions – a time-inconsistent model of

discounting (Laibson, 1997). Quasi-hyperbolic discounting or quasi-hyperbolic time preferences[11] refer to the tendency for people to have a stronger preference for more immediate payoffs relative to later payoffs, where the tendency increases the closer to the present both payoffs are (Frederick, Loewenstein & O'Donoghue, 2002). Empirically, this is shown by Thaler (1981). Thaler (1981) asked subjects to specify the amount of money they would require in (one month/one year/ten years) to make them indifferent to receiving $15 now. The median responses ($20/$50/$100) imply an average annual discount rate of 345% over a one-month horizon, 120% over a one-year horizon, and 19% over a ten-year horizon. Also, Kirby and Herrnstein (1995) found that the majority of subjects systematically reversed their preferences with respect to future monetary rewards or goods as a function of delay. Similar patterns are recognised by several studies (Benzion, Rapoport & Yagil, 1989; Chapman, 1996). O'Donoghue and Rabin (1999) coined the term *present biased preferences* to refer to the broad class of models – including Laibson's (1997) influential model of quasi-hyperbolic discounting model – in which individuals have time-inconsistent preferences that lead them to place a disproportionately greater weight on near-term well-being than more distant well-being.

Studies showing these inconsistent preferences are found within several contexts. Among others, results are found in the context of smoking (Bickel, Odum & Madden, 1999), food consumption (Shapiro 2005), drug addiction (see e.g. Logue, 1995) and use of fitness membership (DellaVigna, & Malmendier, 2004).

Although a major development, the quasi-hyperbolic discounting model agrees with the discounted utility model that choices are *alternative-based*: the available options are independently assigned an overall value, these values are compared, and the option with the highest value is chosen (Frederick, Loewenstein & O'Donoghue, 2002).

To sum up, valuations in quasi-hyperbolic discounting fall very rapidly for small delay periods, but then fall slowly for longer delay periods. When individuals are offered the choice between rewards available at different points in time, the relative values of the options are discounted according to their expected delays until delivery (McClure, Laibson, Loewenstein & Cohen, 2004). Outcome of intertemporal choices may be guided by the availability of the cost and benefits of the decision.

[11] Quasi-hyperbolic time preferences are also referred to as "beta-delta" preferences

4.4.1.3 Framing effects

A third mechanism, which is possibly influential in the decision-making process, is that of framing: The same situation, but presented, described or understood differently can lead to different decisions being made. Such observations raise significant challenges to the realism of rational-choice models. The assumption from rational choice models that preferences are not affected by variations of irrelevant features of options is called invariance (Tversky & Kahneman, 1986). However, it is obvious that invariance is violated in demonstration of accessibility and framing as a trigger of accessibility. Highly assessable features influence decisions, whereas features of low accessibility are largely ignored (Kahneman, 2003). Saying that a highly assessable element influences the decision is the same as saying the decision frame is changed. Tversky and Kahneman (1981) use the term *decision frame* to refer to the decision-maker's conception of the acts, outcomes and likelihoods associated with a particular choice.

By using framing effects successfully, the framed option within the decision problem is being more accessible to the decision maker than other options. Because of imperfections of human perception and decision, however, changes of perspective often reverse the relative apparent size of objects and the relative desirability of options. Framing often works because individual's reflective system does not do the work that would be required to check and see whether reframing the questions would produce a different answer. One reason individuals do not do this is that they would not know what to make of the contradiction because of limited time and cognitive capacity.

Framing effects are shown in several context including candidate voting (e.g. Rhee, 1997), news coverage (e.g. McLeod & Detenber, 1999), cancer chemotherapy (O'Conner, 1989), environmental action in the house (Barr & Gilg, 2006) and exercising (Arora, Stoner & Arora, 2006).

Construction of frames

A decision maker can be sensitive to whether a behavioural alternative is framed in terms of its associated costs (loss frame) or benefits (gain frame), even when the two frames describe objectively equivalent situations (Tversky & Kahneman, 1981). To account for this shift in preferences, *prospect theory* will be examined.

The origin of choice theory states that decision makers ought to choose the option that offers the highest expected value (EV) (Fox & Poldrack, 2008). The EV principle assumes that values are defined in objective terms. Consider a prospect (x, p) that offers $\$X$ with probability p (and nothing

otherwise): $EV = px$. Expected value maximisation is problematic because it does not take risk into consideration and allow decision makers to exhibit risk aversion – for instance, it cannot explain, why a person would prefer a sure $49 over a 50–50 chance of receiving $100 or nothing, or why anyone would purchase insurance (Fox & Poldrack, 2008). Bernoulli (1954) advanced a solution to this problem when he declares that agents do not evaluate options by their objective value but rather by their utility. Utility is an abstract measure of how useful something is, or how much happiness it provides. Bernoulli (1954) observed that a particular amount of money is valued more when an agent is poor (wealth level W_1) than when an agent is wealthy (W_2) and therefore marginal utility decreases (from U_1 to U_2) as wealth increases. Based on this, Bernoulli (1954) introduced the term expected utility (EU). In this model, the decision maker chooses the option with highest expected utility: $EU=pu(x)$; where $u(x)$ represents the utility of obtaining outcome x. Expected utility became a central component of economic theory when von Neumann and Morgenstern (1947) articulated a set of axioms that are both necessary and sufficient for representing a decision-maker's choices by maximisation of expected utility (see also Jensen, 1967). The axioms were as follows:

- Completeness: Agents have preferences over all options[12]
- Transitivity: Agents rank options in a consistent manner[13]
- Continuity: For any of the options, some mixture of the best and worst option is preferred to the intermediate option and vice versa[14]
- Substitution (also known as independence): If an agent prefers one option to another, then this preference should not be affected by a mixture of both options with a common third option[15]

The *completeness* and *transitivity* axioms establish that the decision maker can (weakly) order their preferences. The *continuity* axiom is necessary to establish a continuous trade-off between probability and outcomes. The *substitution* axiom is necessary to establish that utilities of outcomes are weighted by their respective probabilities.

However, it was not long before the validity of expected utility theory and its axioms were called into question. Nonetheless, a decision maker is still considered as being rational as long as he or she attempts to maximise expected value. In practice, people are widely assumed to be risk averse. One of the main challenges to expected utility theory has come to be known as *the Allais paradox* (Allais and

[12] Formally, for any two options O_1 and O_2 in O, either $O_1 \geq O_2$, $O_2 \geq O_1$, or both.

[13] Formally, for any three options O_1, O_2, and O_3, if $O_1 \geq O_2$, and $O_2 \geq O_3$, then $O_1 \geq O_3$.

[14] Formally,for any three options $O_1 O_2 O_3$ there exist $\alpha, \beta \in (0,1)$ such that $\alpha O_1 + (1-\alpha) O_3 \geq O_2$, and $O_2 \geq \beta O_1 + (1-\beta) O_3$

[15] Formally, for any three options O_1, O_2, and O_3, and any $\alpha \in (0, 1)$, $O_1 \geq O_2$ if and only if $\alpha O_1 + (1 - \alpha) O_3 \geq \alpha O_2 + (1 - \alpha) O_3$.

Hagen, 1979). The Allais paradox is based on a decision set-up of two decisions with two options in each. They were as follows:

Decision 1: Choose between (a) an 80% change of $4000, and (b) $3000 for sure
Decision 2: Choose between (c) a 20% change of $4000, and (d) a 25% change of $3000.

The results were clear: Respondents chose (b) over (a) in the first decision, and (c) over (d) in the second decision (Allais, 1953). This violates the *substitution axiom* because option (c) equals ¼ change and option (d) equals ¼ change (with a ¾ change of receiving noting in both cases) and according to the *substitution axiom* an agent should prefer option (c) over option (d) if and only if the agent prefers option (a) over option (b) (Allais and Hagen, 1979). This effect resonates with the notion that agents are more sensitive to differences in probability near impossibility and certainty than in the intermediate range of the probability scale (Allais & Hagen, 1979).

In the years since the Allais paradox, numerous studies of decision under risk have shown that agents violate the principle of risk aversion that underlies much economic analysis. A study by Kahneman and Tversky (1992) illustrates a common pattern of risk aversion and risk seeking by participants. The study showed that in the domain of gains, the shape of the value function is *concave,* which means that the satisfaction derived from any increase in potential gains is associated with relatively smaller increases in the perceived value of the positive outcome. The value function in the domain of losses is *convex,* that is, an increase in potential losses has a rapidly decreasing impact on the perceived value of the negative outcome. The Allais paradox and the study of risk attitudes by Kahneman and Tversky (1992) are accommodated neatly by *Prospect Theory* (Kahneman & Tversky, 1979; Tversky & Kahneman, 1992).

According to prospect theory, the value V of a simple prospect that pays $\$x$ with probability p (and nothing otherwise) is given by: $V(x,p) = w(p)v(x)$, where v measures the subjective value of the consequence x, and w measures the impact of probability p on the attractiveness of the prospect. Prospect theory replaces the utility function in explaining actual choice behaviour.

Furthermore, prospect theory describes how the value function demonstrates the psychophysics of diminishing sensitivity. That is, the marginal impact of a change in value diminishes with the distance from a relevant *reference point*. A reference point is that, for instance, for monetary outcomes, the *status quo* generally serves as the reference point distinguishing losses from gains, so that the function is concave for gains and convex for losses. Concavity for gains contributes to risk aversion for gains, as with the standard utility function. Convexity for losses, on the other hand, contributes to risk seeking

for losses. For instance, the disvalue of losing $50 is more than half the disvalue of losing $100, which will contribute to a preference for the gamble over the sure loss.

To sum up: Because of imperfections of human perception, the same situation can lead to different decisions being made, even though it is the same situation, but merely presented differently. By using framing effects successfully, the framed option within the decision problem is being more accessible to the decision maker than other options. The way of constructing a frame can affect the outcome of a decision. Prospect theory proposes that agents (often) are more willing to accept risks when they evaluate options in terms of associated costs but act to avoid risks when the same options are described in terms of associated benefits.

4.4.1.4 Weakness of will

The fourth individual mechanism is weakness of will. This mechanism is difficult to apply due to the vagueness of stand alone, but relevant to include in relation to the role other mechanisms. Suppose a person wants to quit drinking, but finds himself torn between his desire to drink and his desire for all the things that drinking prevents him from doing. In general, when we desire two incompatible things we decide which desire is more important and act on it (Elster, 2000). People act sometimes against their better judgement. Unlike decision-making heuristics, which involve some kind of mental or computational error, weakness of will refers to the state of acting against one's better judgement – a second-order desire (Elster, 2000). Whether weakness of will should properly be regarded as "irrational" is highly debatable. However, weakness of will is an important concept in the context of health prevention as it provides an understanding of components of suboptimal choices. Weakness of will is not a new concept of decision-making, it has been discussed over decades.

Philosophers of action and of mind have attempted to explain the mechanisms by which weakness of will occurs, and what allows a decision maker to be deemed weak-willed. The classical account of weakness of will is akrasia, and an agent is weak-willed on this account when he or she does what he/she does not judge as the best to do. The opposite, enkrateia is, again roughly, a trait of character exhibited in behaviour that conforms one's best or better judgement in the face of temptation to act to the contrary. An akratic person, Aristotle (1915) writes, "(…) *is in such a state as to be defeated even by those (pleasures) which most people master"* (11–13).

The discussion of akrasia as concept goes back to at least as far as Plato. Socrates (in Plato's Protagoras translated by Jowett in 1999) asks how it is possible that if one judges action A to be the best course of action, why would one do anything other than A? Socrates attests that akrasia does not

exist by claiming that: "*No one goes willingly towards the bad*[16]" (p. 358). A decision maker, according to Socrates, never choose to act poorly or against his better judgement; actions that go against what is best are only a product of being ignorant knowledge of what is best or good. Thus, Socrates puts lack and ignorance of knowledge as the reason for akrasia.

Other philosophers like Aristotle (Schrier, 1998) distance themselves from the Socratic position. Philosophical work on akrasia is heavily influenced by the work of Plato and Aristotle (Rowe & Broadie, 2002). Davidson (1969) is accountable for one of the contemporary approaches to akrasia; he expands the concepts of akrasia by criticising some of the former philosophers, who wanted to limit the scope of akrasia to agents who despite having reached a rational decision were somehow swerved off their desired (intentional) tracks. Davidson (1969) defined akrasia[17] to include any judgement that is reached but not fulfilled, whether it be as a result of an opinion, a real or imagined good, or a moral belief. Davidson (1970) draws a distinction between an *all things considered* judgement, and an *all-out* or *unconditional* judgement. *All things considered* judgement means conditional on all the reasons that seem relevant to the agents, e.g. all things considered, it would be better to do A than B. *Unconditional* judgement is a judgement that necessarily results in action, e.g. it would be better to do A and B. He claims that any piece of evidence may tell an agent that action A is better than B. This one-dimensional preference is in no way binding; instead it is only a single way in which A is considered better than B. There are many different ways to compare two actions. For example, smoking may be considered better than not smoking because it helps keep one's weight lower and eases one's anxiety, but not smoking may be considered better than smoking because it is cheaper and better for one's health. If all of the preferences are added up, one can come up with an *all things considered* preference for one action rather than another. All things considered, an agent judges A as preferable to B. This, though, is still not an all-out belief regarding the two actions; it is only in light of all the available evidence collected so far.

In sum, weakness of will – doing A even though B is the 'rational' option - has been discussed over decades especially whether weakness of will should properly be regarded as 'irrational'. Davidson (1969) draws a distinction between an *all things considered* judgement, and an *all-out* or *unconditional* judgement. His argues that there are many different ways to compare two actions, and all of the

[16] Translations of the Protagoras are by Stanley Lombardo and Karen Bell

[17] Davidson uses the word *Incontinence* instead of akrasia. Akrasia is used for simplicity in this thesis.

individual preferences can be added up. This means that option A could be as 'rational' as option B within the context of all considered.

As mentioned in the beginning of this section, weakness of will cannot be applied, but it is related to the other mechanisms. Being able to affect akrasia in decision-making by increase effect(s) of a given option available may include that particular information piece in the all things considered.

4.4.2 Collective mechanisms

Most of the decisions individuals make in everyday life do not take place in the vacuum of the laboratory. Decisions are made in the context of the environmental surroundings, taking into consideration a multitude of factors. Everyday life of Copenhagen dwellers is no exception. Such type of decisions are covered by the social psychology; the scientific study of how individual's thoughts, feelings, and behaviours are influenced by the actual, imagined, or implied presence of others (e.g. Allport, 1935; McGrath, 1970).

In this study, collective mechanisms are referred to as psychological mechanisms that may arise in the presence of others and appears as behaviour guidance in social contexts. These mechanisms cannot arise without the presences of others – or at least the (perceived) feeling of presences of others. This section reviews collective mechanisms relevant for the decision-making of Copenhagen dwellers. The collective mechanisms are highly relevant due to the possible prolonged effects. Such an efficient understanding of heuristics and biases is presented here. Gigerenzer and Todd (Gigerenzer, 2008; Gigerenzer and Selten, 2001; Todd and Gigerenzer, 2012) have put forward the view, drawing closely on Simon's original descriptions of bounded rationality, that our cognitive biases and the heuristics we use are in many cases adaptive—they are not sub-optimal, but actually very well optimised given the time and processing constraints humans face in everyday life contexts. This view of heuristics differs from the view by Tversky and Kahneman (1974), Thaler and Sunstein (2008) and others of human rationality as an understanding of humans as flawed, less-than-rational creatures whose cognitive biases lead us into sub-optimal behaviour, and therefore need to be 'fixed' (via government policy, or from a design point of view, via designed interventions).. These two perspectives are not considered as contrasts, but rather as supplements in terms of explanations and as different attributes of heuristics and biases.

Efficiency of stimulus is the main reason for introducing the social heuristic related to the *presences of others*. The collective mechanisms may be an efficient factor in influencing human behaviour. One reason is that leveraging collective mechanisms may be a significantly cost-efficient way to affect behaviour than monetary incentives (Hollingworth *et al.* 2012). Furthermore, while the literature has

yet to presented many studies with long follow-up periods to test for the effectiveness of social treatments in the long term, there is reason to believe that social forces might build sustaining habits for healthy behaviour (Verplanken & Aarts, 1999; Wood & Neal, 2009). Unlike a monetary incentive, which is either on or off, social incentives might have lasting effects. The following sections will introduce the audience effect and the bandwagon effect.

4.4.2.1 Audience effects

One collective mechanism, which has been empirical proven to affect behaviour, is the audience effect. In this section, the effect(s) of the audience as a mechanism in a decision-making situation will be introduced as first thing. This is followed by the reasoning for the audience effect, in order to end up with an explanation of why and how an audience may shape the decision-making process. The aim of this section is to understand how an audience can shape the decision-making of individuals. To be specific, how the disciplinary role of audience appears. This knowledge may lead to possibility of adjusting elements in the decision-making process leading to more optimal choices in regards to psychical activity.

Social facilitation theory

The audience effect has long been covered in the literature, however, under the term *Social facilitation theory* (see e.g. Triplett, 1898; Allport 1920; Aiello & Douthitt, 2001). Social facilitation theory deals with the impact of social presence on individual performance (Aiello & Douthitt, 2001). Social facilitation theory can be traced to the early observations and experiments of Triplett in the late 1890s. Triplett (1898) noticed that bicycle racers turned in faster times when they were racing with other cyclists that when they raced alone. The experiment highlights the notion that people perform differently when others are present, even though they are not interacting. Triplett (1898) suggested that the sight or sound of another's movement might strengthen the idea of movement and thereby increase energy and motivate greater effort. Allport (1920) named the phenomenon *social facilitation* and attempted to eliminate competition effects. Additionally, Dashiell (1930) proposed different kinds of presence that might have differential effects on individual performance. He provided an early suggestion that physical presence may not be necessary for social facilitation to occur.

A recent study by Izuma, Saito & Sadato (2010) documents that donation rates increase with the presence of audience. The behaviour is no different from economic behaviours: each person tries to maximise the ratio of rewards to costs (Blau, 1964; Homans, 1961; Thibaut & Kelley, 1959). The important point is that not only materialistic rewards, but also nonmaterial social rewards, such as social approval and a good reputation, play a key role in social decision-making process. Behavioural

studies have also shown that introducing social approval incentives increased the contribution rate among strangers in the public goods game (Rege & Telle, 2004) and that even subtle cues suggestive of being observed by others (e.g. pictures of eyes) were sufficient to enhance prosocial behaviours in both laboratory (Kurzban, DeScioli, & O'Brien, 2007; Haley & Fessler, 2005) and real-life situations (Bateson, Nettle, & Roberts, 2006).

The social facilitation has been studies within several different contexts. Among others sports performance (e.g. see Corbett, Barwood, Ouzounoglou, Thelwell & Dicks, 2012), food consumption (e.g. see De Castro, 1994; De Castro 1990; Clendenen, Herman & Polivy, 1994), efficiency of gym exercise (e.g. see Hausenblas, Brewer & Van Raalte, 2004) and donation rates (e.g. see zuma, Saito & Sadato, 2010).

Guerin (1993) grouped these explanations for social facilitation effects into three categories:

- *Social comparison theories*: In the presence of others, individuals may become concerned about how they look or perform in comparison with others. These concerns include apprehension about possibility of being evaluated by others (Cottrell, 1972), desire to present oneself in a certain way to others (Baumeiter, 1982), or intention to match performance to a socially accepted standard (Carver & Scheier, 1982).
- *Drive theories*: According to Zajonc (1965, 1980), individuals' arousal level increase in the presence of others, which lead to better performance.
- *Cognitive process theories*: This category involves a shift in cognitive processing capacity caused by the distracting presence of others (Baron, 1986).

Due to the focus within the domain of everyday decisions, the primary focus further on will be on the first category – social comparison theories – as the underlying reasons for social comparison may be practical possible to impact by supporting relevant driving forces. An understanding of social comparison theory will be presented in deeper manner below.

Social Comparison theory

Social comparisons – comparisons between the self and others – are a fundamental psychological mechanism influencing individuals' judgements, experiences, and behaviour. Whenever individuals are confronted with information about how others are, what they can and cannot do, or what others have achieved and failed to achieve, they relate this information to themselves (Dunning & Hayes, 1996). Likewise, whenever individuals want to know how they themselves are or what they themselves can and cannot do, they do so by comparing their own characteristics, fortunes, and weaknesses to those

of others (Festinger, 1954). Festinger (1954) is the founder of social comparison theory. As a student of Lewin, who in his field theory (1951) theorised about forces of the environment on the individual, Festinger sets out to answer questions such as why do people interact, to whom do they interact, and what is the result of their interaction (Wheeler, 1970).

Because comparisons with others are such a fundamental human proclivity, it may not be surprising that for over fifty years social comparison has been a highly studied topic in social psychological research. This research has largely been guided by the reason why individuals engage in social comparison. The classic answer to why individuals compare themselves to others is based on motivational considerations (Kruglanski & Mayseless, 1990; Taylor, Wayment & Carrillo, 1996). Social comparison is mostly understood as a process, which is engaged to fulfil fundamental needs, such as *self-evaluation, self-enhancement,* and *self-improvement* (Kruglanski & Mayseless, 1990; Suls, Martin, & Wheeler, 2002; Wood & Taylor, 1991).

One very often-used reason for comparisons used in everyday decision-making is when people try to create and maintain a positive self-image to others. People have an on-going interest in how others perceive and evaluate them. Each year, people all over the world spend billions of dollars on diets, cosmetics, and plastic surgery—all intended to make them more attractive to others (Leary & Kowalski, 1990). People would find it difficult to pursue their social goals (e.g. social approval) without regulating the amount and type of information others have about them. This is also recognised as *self-enhancement* - the need to maintain a positive self-view. Baumeister (1982) proposed that in the presence of others, people are motivated by a desire to please those who are observing them and to construct a certain public presentation of themselves. Such self-enhancement is known as positive self-presentation (Leary & Kowalski, 1990). Self-presentation[18] refers to the process by which individuals attempt to control the impressions others form of them (Goffman, 1959; Leary & Kowalski, 1990). Thus, individuals use their social behaviour to communicate information about them. Because the impressions people make on others have implications for how others perceive, evaluate, and treat them, as well as for their own views of themselves, people sometimes behave in ways that will create certain impressions in others' eyes. Theories of self-presentation often build on work by Goffman (1959). Goffman (1959) deconstructed the components of social interaction and social approval. He explores how the social actor works to create a front that is both believable and elicits the approval of others. The relationship between the performer and its audiences is governed by the performer's need for social approval, as implied by Goffman, but not explicitly named. This need of maintaining the

[18] Also called impression management

approval of others is responsible for the strategic way in which the performer elects to present himself. Goffman states, "(…) *in other words, we must be prepared to see what the impression of reality fostered by performance is a delicate, fragile thing that can be shattered by very minor mishaps*" (1959: 56).

A disciplinary role

Creating and maintaining a positive self-presentation is strongly connected with the disciplinary role of the audience. Festinger (1954) stresses the importance of others in the formation of one's opinions (Festinger, 1950). The idea of how audience influences behaviour has been described thought the role of a novelist and his readers by Budd (1995). Budd (1995) states: "*The role of the artist, properly understood, requires the artist, in the creation of her work, to adopt or bear in mind the role of the spectator*" (p. 11). This means that once the artist has constricted his idea of the reader, he is constrained to write in a way that the reader will find instructive, entertaining, moving, and disturbing. However the reader is constructed; the intended reader of a text serves to discipline the author (Elster, 2000). For the reader to have this disciplining function, the author must believe that the reader's freedom in interpreting the text is less than absolute. The need to ensure freedom for the reader serves as a constraint on the author (Elster, 2000).

This disciplinary role of audience in maintaining a positive self-presentation is relevant for this study, because such a disciplinary role may affect choices; the individual does not know what (and if) others expect, but the individual may act in accordance with its perception of others' expectation(s) to the behaviour. Audience presence in terms of social comparison may be an influential psychological mechanism in the decisions regarding psychical activity in everyday life. Being able to utilise and activate the audience effects in the decision-making process, the individual may choose the psychical active option in order to maintain (and create) a positive self-presentation.

In summary, social comparison is likely to involve a focus on a small subset of all the information that is potentially relevant. Thus, social comparison may be efficient, because the less information people have to consider, the faster they come to a conclusion. When the motive of comparison is to maintain a positive self-presentation, surrounding others play a central role. The decision maker employs (consciously or unconsciously) others to compare oneself with in order to maintain and create a positive self-presentation. Others play a disciplinary role in the creation of a positive self-presentation; the decision maker may be disciplined by the decision maker' audience's *perceived* expectation of behaviour. Concrete how this mechanism may be activated is of relevance and will be studied further (see chapter 6).

4.4.2.2 Bandwagon effect

Besides the role of audience in terms of its presence, it is relevant to understand how the behaviour of others may affect the individual's behaviour. More concrete, how the role of imitation of others may affect the decision-making process. An important imitation effect is known as the bandwagon effect, which is a phenomenon whereby the rate of uptake of beliefs, ideas, fads and trends increases the more that they have already been adopted by others (Colman, 2003). The bandwagon effect arises when demand for a commodity increases due to an increase in the consumption of the commodity by others (Leibenstein, 1950). Research suggests the popularity of a restaurant (Becker, 1991) or perceived high demand of a cookie (Worchel et al., 1975) intensifies the consumer's desire to acquire the item due to an increase in attractiveness.

Thus, individuals will conform to the actions of others under the assumption that those actions are reflective of the "correct" behaviour. Individuals are therefore involved in what economists term *herd behaviour*. These consumers imitate others and follow the crowd as they assume other consumers have the necessary information required to justify their actions (Banerjee, 1992). Individuals may purchase popular products to fit in or identify with a particular reference group (Berger & Heath, 2007; Escalas & Bettman, 2005). Their consumption may assist satisfying their need for conformity, belonging and/or recognition (Tsai, Yang & Liu, 2013; Raafat et al. 2009).

When individuals make rational choices based on the information they receive from others, economists have proposed that information cascades can quickly form in which people decide to ignore their personal information signals and follow the behaviour of others (Bikhchandani, Hirshleifer & Welch, 1992). It could be argued that there is a relationship between the individual and the collective mechanisms: by implementing successful nudges, behaviour of one individual may be affected by another being affected by an individual mechanism. This means that affecting one with an individual mechanism may trigger another individual following the behaviour.

4.5. Conclusion on literature review

From the literature, several psychological mechanisms that may influence the individual decision-making process in everyday life have been reviewed. These mechanisms are separated into individual mechanisms, which triggers choices that are guided by the availability heuristic, and collective mechanisms arise in the presence of others and serve as guidance of behaviour. The list of possible influential individual mechanisms contain: (i) salience effects;(ii) reward incentives; (iii) framing effects; and (iv) weakness of the will. The list of collective mechanisms includes: (i) the audience effects and (ii) the bandwagon effect.

5. Research questions

The literature review serves as the theoretical foundation for determining psychological mechanisms that may influence decision-making process for Copenhagen dwellers regarding psychical activity in everyday life. The literature review presents evidence on the effect(s) of the selected mechanisms. However, to my knowledge, there have been no studies that have demonstrated effect(s) of the selected mechanisms in the context of this case: Copenhagen dwellers' decisions regarding psychical activity in everyday life.

As mentioned in the section of each mechanism, effect(s) are proven in everyday (and other) contexts; however, these are not related to everyday psychical activity. The results of the mechanisms are among others based on studies of exercise, smoking, fitness memberships (reward incentives), gambling (framing), alcohol addiction (weakness of will), goods game (audience effects), donation (audience effects), restaurant choice (bandwagon effects), wanting of cookies (bandwagon effects).

This means that concluding based on results found in other contexts may result in misleading effect(s) and ineffective spend of resources. Being able to study effects of the mechanisms within the relevant context is perceived as highly recommendable, because it may provide Novo Nordisk with mechanisms able to affect the rapid diffusion of urban diabetes.

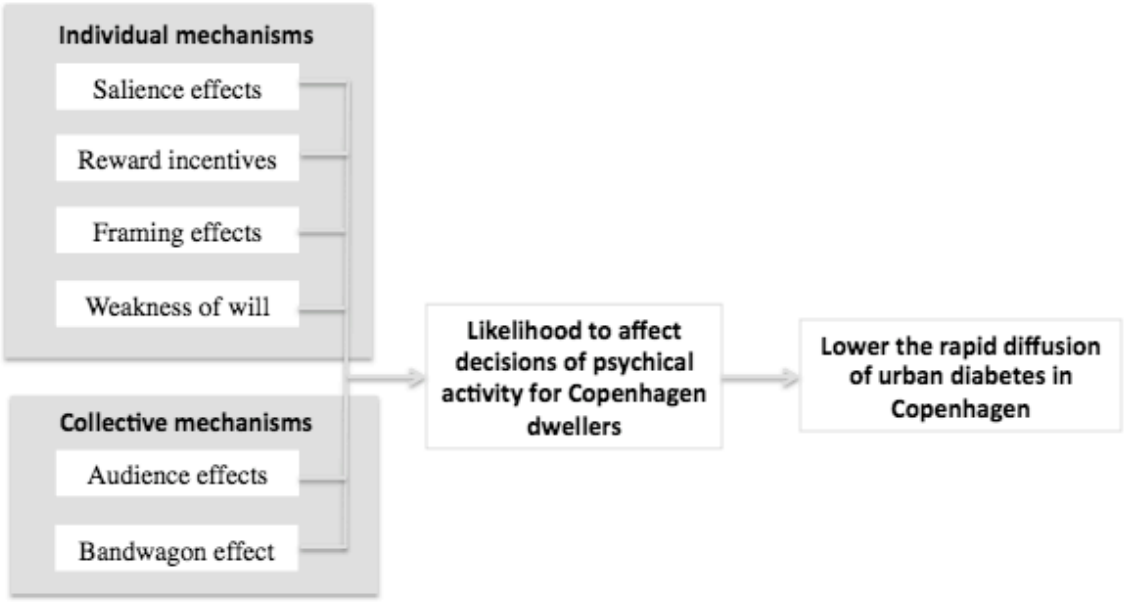
Based on this gap in the literature, to achieve the research objective, the following research questions will be answered:

> **RQ 1.** Which everyday situations are influential to affect in order to increase the overall health level?
>
> **RQ 2.** In influential everyday situations, which psychological mechanisms influence individuals' likelihood to choose the optimal decision option in terms of psychical activity?

The first research question serves the purpose of identifying how everyday life of Copenhagen dwellers are characterised. By identifying everyday life patterns of Copenhagen dwellers, more realistic situations may be object to research. This provides a breeding ground for habitual behaviour rather than base research on situations without realistic foundation.

The second research question serves the purpose of testing the effects of selected psychological mechanisms in terms of significantly influence on Copenhagen citizens' decisions regarding psychical activity. The purpose of the research questions is outlined below in Figure 5.1.

Figure 5.1: **The purpose of the research questions**



PART III

CONCEPTUAL FRAMEWORK

6. Conceptual framework and hypotheses for this study

In this chapter, the intention is to create a well-defined framework to answer the research questions. As a type of a manuscript, a framework synthesises existing theories, related concepts and empirical research in order to develop a foundation for new perspectives (Merriam, 2001). This chapter is structured in two sections; firstly, a situation catalogue is developed with the aim of defining realistic situations in which Copenhagen dwellers' face decisions regarding psychical activity, and secondly, these situations will be compounded with psychological mechanisms from the literature review.
The aim of the present chapter is to develop four testable hypotheses to be able to test the effects of the psychological mechanisms on the decision maker's likelihood to choose the optimal option in terms of psychical activity.

6.1 Situation catalogue

After examining the psychological mechanisms in general decision-making, it is now time to bring the mechanisms further into the context of the present thesis. The aim of this section is to determine everyday decisions that hold the potential of affecting the health level of Copenhagen dwellers. This is important knowledge and cost efficient prior to consider (re)designing of everyday decisions to prevent urban diabetes. The section is structured by first identifying everyday activities and time spends of these activities. Next, situations that are relevant in terms of the possibility of behaviour changes leading to change in health level will be identified.

Individuals are faced with several situations where (conscious and unconscious) decisions about physical activities are made. Such decisions are either one-off or rare situations (e.g. decide to run a marathon) and situations with pronounced higher frequency (e.g. decide to take the stairs instead of the elevator). Especially, decisions of high frequency are considered to be of relevance in preventing urban diabetes, because the more opportunities to affect psychical active behaviour, the higher probability for increased health level over time as the time frequency may lead to habitual behaviour.

6.1.1 Individuality and behaviour patterns

There is some degree of structure in our everyday life that has similarities. Therefore, the focus of the present thesis will be on *adults* (i.e. above 18 years) living in Copenhagen. This age group has autonomy to make decisions by themselves. Adults as group include a sub-group that are not included - the pensioners (not a part of the workforce). The reason for exclusion of this sub-group is the high variety of everyday life. In the next passage, everyday situations of Copenhagen dwellers will be determined.

6.1.2 Everyday situations

Everyday situations are determined by performing Kahneman et al.'s Day Reconstruction Method (2004). The respondents revive memories of the previous day by reconstructing a dairy consisting of a sequence of episodes (Kahneman et al., 2004). The Day Reconstruction method provides with a picture of situations that everyday life tends to include and time spending of the activities. Time spending gives an indication of influence potential of changes in the given activity will be. For instance, a change in the choice architecture related to an activity counting for 0,1 hour per day will not affect the overall health level in the same manner than an activity (with same amount of calories burned) counting for 6,9 hours per day. See the scheme and instructions the respondents were supplied in appendix a.1. Performing the Day Reconstruction method supports the bottom-up approach and therefore takes account of individual variation, because the Day Reconstruction method relies on the assumption that respondents do not have defined scales to rely on. The respondents are free to report their day exactly as it was. This serves the purpose of defining realistic patterns of everyday life.

The following list of situations is selected based on a sample of 11 adults collected in Frederiksberg Centeret. Below is a sorted list solely including situations that where mentioned by the majority of the respondents, because that indicates a pattern, and since the majority mentions these, it may be more pertinent to go further into these than those mentioned by few respondents (e.g. cleaning).
The situations are presented ranging from activities with on average most time spend to situations with the least time spend by the Copenhagen dwellers. See appendix a.2 for each respondent's answer and appendix a.3 for the full result list of situations.

- Working (6 hours 40 min per day)
- Deskwork (2 hours per day)
- In meetings (1 hour 2 min per day)
- Passive leisure activity (55 min per day)
- Transportation for work (43 min per day)
- Dinner (40 min per day)
- Active leisure activity (37 min per day)
- Lunch (28 min per day)
- Breakfast (21 min per day)

It should be noted that there might be some overlap between some of the activities. For instance, between working and deskwork as some respondents were very specific about activities while others

just mentioned work without dividing it.

6.1.3 Physical active situations

In order to spend resources efficiently when (re)designing decision-making situations, it is relevant to determine which situations that contain decisions on psychical activity. Therefore, the argumentation for specific psychical activities is included to understand benefits of being psychical active and the cost of not being psychical active. The psychical activities of focus are grouped into working positions, getting around and transportation.

6.1.3.1 Working position

Several studies conclude that sitting for prolonged periods – even if exercising regularly – could be bad for human health (Cheng, 2010). When considering only healthy people who exercise regularly, those who sit the most during the day have larger waists and worse profiles of blood pressure and blood sugar than those who sit less (Judson, 2010). Compared to sitting, standing in one place is harder work. To stand, you have to tense your leg muscles, and engage the muscles of your back and shoulders; while standing, you often shift from leg to leg. All of this burns energy (Judson, 2010). A study of people who sit for many hours found that those who took frequent small breaks – standing up to stretch or walk down the corridor when talking on the phone – had smaller waists and better profiles for sugar and fat metabolism than those who did their sitting in long, uninterrupted chunks (Judson, 2010).

It looks as though there is a more sinister aspect to sitting, too. Several strands of evidence suggest that there is a "physiology of inactivity": that when you spend long periods sitting, your body actually does things that are bad for you (Judson, 2010). As an example, consider lipoprotein lipase. It is a molecule that plays a central role in how the body processes fats; many tissues including muscles produce it. Low levels of lipoprotein lipase are associated with a variety of health problems, including heart disease. Studies in rats show that leg muscles only produce this molecule when they are actively being flexed (i.e. when the animal is standing up and ambling about) (Judson, 2010). The implication is that when you sit, a crucial part of your metabolism slows down. Nor is lipoprotein lipase the only molecule affected by muscular inactivity. Actively contracting muscles produce a whole suite of substances that have a beneficial effect on how the body uses and store sugars and fats (Judson, 2010).

In sum, the decision related to working positions does affect the health level. Below, there are presented situations from the list of situations in which decisions regarding working position is considered to arise.

- ***Deskwork:*** According to the Day Reconstruction results, adults tend to work a lot by the desk. The respondents' answer showed that they spend on average 2 hours per day by working at the desk. This stresses the need of affecting the working positions at work. In 2013, the Danes sat down on average for 383 minutes a day (La Cour, 2014). This made Danes the second sedentary people in Europe only to the Netherlands. The potential for psychical activity is noticeable. However, being able to maximise the potential of the working position requires a height adjustable desk or the availability of a high table. If one of these is available, there are two choice options in the desk work situation:

  Option 1: Sit down when working at the desk (passive)
  Option 2: Stand up when working at the desk (active)

- ***Eating lunch***: Once a day adult eat lunch at work (Monday to Friday). This leaves room for one more decision regarding psychical activity. According to the Day Reconstruction results, adults spend 28 min per day at lunch breaks. It is not a requirement to sit down to eat lunch. There are two options in this situation:

  Option 1: Sit down and eat lunch (passive)
  Option 2: Eat lunch standing a high table (active)

- ***In meeting:*** The respondents on average spend 1 hour and 2 minutes in meetings per day. The format of a meeting is often with participants sitting around a table. It should be noted that the frequency of this situation depends on job function, job tasks etc. There are three options in this situation:

  Option 1: Sit down (passive)
  Options 2: Stand up (moderate active)
  Option 3: Walk and talk (active)

- ***Coffee break:*** This situation is not explicit described by the respondents; however, breaks during a day are assumed to be necessary. During a working day, most are having coffee breaks. The Danes are not an exception: An average the Danish coffee drinking females drank 3.4 cups of coffee per day, while the Danish coffee drinking men drank 4.5 cups of coffee per day in 2003-2008 (Hermansen et al., 2012). The female coffee drinkers counts for 76% of all Danish women and the coffee drinking males counts for 86% of all Danish males (Hermansen

et al., 2012). The consumption of coffee does not only happen at the workplace, however, some of the consumption is related to working situations. A coffee break offers two options for the decision maker:

Option 1: Pick up the coffee and drink coffee seated at the desk (passive)
Option 2: Pick up the coffee and drink it standing (moderate active)
Option 3: Pick up the coffee and walk when drinking coffee (active)

6.1.3.2 Getting around in buildings

In working places and in locations of leisure time situations, most humans are in the situation of choosing between taking the escalator (or the elevator) or the stairs. This is a decision that affects the health. As the above argumentation shows, standing burns energy. However, the more energy burned, the better health.

Stair climbing provides a useful model for accumulation of physical activity, although it is unlikely that individuals would climb stairs continuously for 10 minutes. But caloric expenditure by stair climbing does not require continuous bouts of 10 minutes (Eves, Webb & Mutrie; 2006). Stair climbing requires 8.6 times more energy expenditure than the resting state showed in laboratory results, and an even higher rate has been reported in the field (Eves, Webb & Mutrie; 2006). Indeed, a 10-year prospective study of middle-aged men estimated that the energy expended in vigorous activity that reduced coronary heart disease incidence by almost two-thirds was equivalent to as little as 7 minutes a day of stair climbing (Eves, Webb & Mutrie; 2006).

There is a second, less publicised benefit of the vigorous nature of stair climbing. An 80-kg man climbing a typical 3-meter flight of stairs in his home 10 times a day would expend 37 kcal/day, equating to 13,443 kcal/year. This energy expenditure would be equivalent to more than 4 ½ days' worth of food over the course of a year (Eves, Webb & Mutrie; 2006). Thus, regular climbing of additional flights of stairs could contribute to weight control. As the energy is expended by raising one's weight against gravity, the speed at which one climbs is of minor importance, and low cardiovascular fitness is not a barrier. Often people excuse the usage of elevator or escalator with timesaving. However, studies in hospitals have disproven this excuse (Sachin, O'Byrne, Wilson & Wilson, 2011)[19].

[19] Taking the stairs rather than the elevator saved about 15 minutes each workday. This, adding the benefit of increased psychical activity, should convince individuals to take the stairs whenever possible (Sachin, O'Byrne, Wilson & Wilson, 2011).

In summary, the decision related to how to get around in buildings does affect the health level. Situations related to this choice are relevant when working on improving the psychical activity level for Copenhagen's citizens.

Following, there are selected situations where this decision is made.

- ***From train platform to street level:*** The respondents were not specific on how they were transported to work. However, the asked Copenhagen dwellers spend on average 43 min per day on transportation to and from work. Based on this, it is assumed that majority of them either were transported by car, train or bike. A large number of Copenhagen dwellers use metro and/or train as means of transportation. Almost all stations in Copenhagen offer different opportunity to get up and down to the platform. This leads to two options:

  Option 1: Taking the escalator (Passive)
  (Option 1: Taking the elevator) (Passive)
  Option 2: Taking the staircases (Active)

- ***At the car park****:* When parking at a car park there are often several levels. Options are:

  Option 1: Taking the elevator (Passive)
  Option 2: Taking the staircases (Active)

6.1.3.3 Transportation

The choice of transportation affects rates of obesity, high blood pressure and diabetes (Gordon-Larsen, Nelson and Beam, 2005). American states with higher rates of bicycling and walking to work also have lower rates of obesity, high blood pressure and diabetes (Gordon-Larsen, Nelson and Beam, 2005). Transportation research from the US shows that over 75% of all trips less than 1 mile (a clearly walkable distance) is made by car. Such numbers are not available for Denmark. However, it is a fact that the number of cars in Denmark is increasing: the number of cars owned by Danes was 2.33 millions at January 2015 (DST, biler, 2014). Forecasts predict that in 2019 the number of cars will be 2.45 millions. This in line with the fact that more Danes are getting more obese, it is assumed that Danes are also using the car increasingly.

Cycling to work has been shown to meet metabolic criteria for achieving health benefits from exercise (Hendriksen, Zuiderveld, Kemper & Bezemer, 2000). Research has even shown that bicycling helps meeting the minimum recommendations for psychical activity (de Hartog, Boogaard, Nijland and Hoek,

2010). In several physical activity studies, metabolic equivalent of task (MET) is used, as an indicator of physical activity, and the minimum goal should be in the range of 500–1,000 MET min/week. Cycling (15 km/hour) has a MET value of 4 and is characterised as a moderate activity (Ainsworth et al. 2000). Hence, a person shifting from car to bicycle for a daily short distance of 7.5 km would meet the minimum recommendation (7.5 km at 15 km/hour = 30 min) for physical activity in 5 days (4 MET×30 min×5 days = 600 MET min/week) (de Hartog, Boogaard, Nijland and Hoek, 2010).

An often-heard excuse for not biking is related to the safety risks. However, research show that the benefits of biking are larger than the safety risks (de Hartog, Boogaard, Nijland and Hoek, 2010).[20]

Following the argumentation above, transportation decisions affect the health level. Below, there are selected situations where transportation decisions are made in everyday life.

- ***Transportation for the workplace:*** Transportation to and from work occurs on daily basis (Monday-Friday). Copenhagen dwellers spend on average 43 min per day on transportation for work. Thus, the effect of increased psychical activity is of high influence. The options are:

  Option 1: Go by train/bus/car (Passive)
  Option 2: Walk/bike/run (Active)

- ***Transportation in leisure time:*** The frequency of this situation is not as often as transportation for work. Copenhagen dwellers spend 17 minutes per day spend on transportation in leisure time. This number is not fully reliable as a few of the respondents go to leisure activities but did not mention transportation time. Decisions related to transportation in leisure time will affect the psychical activity level. The options are the same as transport for work.

[20] For the people who shift from car to bicycle use for short trips, de Hartog, Boogaard, Nijland and Hoek (2010) estimated that the beneficial effect on all-cause mortality rates of the increased physical activity due to cycling is substantially larger than the potential mortality effect of increased inhaled air pollution doses and the effect on traffic accidents. This estimation is based on the following argumentation. The estimated gain in life expectancy per person from an increase in physical activity ranged from 3 to 14 months. The estimated life expectancy lost because of air pollution (0.8–40 days) and traffic accidents (5–9 days) was much smaller. On average, the benefits of cycling were about 9 times larger than the risks of cycling, compared with car driving for the individuals making the shift (de Hartog, Boogaard, Nijland and Hoek (2010). The estimated number of life years gained still exceeded the losses when the lowest estimate for physical activity was compared with the highest estimate for air pollution and traffic accidents (benefits/risks ratio of 2) (de Hartog, Boogaard, Nijland and Hoek, 2010).

Summing up, research question 2 is answered above: it is shown that Copenhagen dwellers in everyday life do face several decisions regarding psychical activity and these are related to working positions, transportation and getting around in buildings. Four of the situations holding decisions on psychical activity will in the next section serve as context in order to determine if and which mechanisms that may be of influence on Copenhagen dwellers' health.

6.2 Everyday situations and psychological mechanisms

Having defined everyday situations of relevance for psychical activity for Copenhagen dwellers, the psychological mechanisms will be compounded with concrete everyday health decisions. This compounding serves to determine if the psychological mechanisms also are influential in the context of everyday decisions regarding psychical activity. Two steps develop this framework: 1) combine four situations with the psychological mechanisms considered most influential in each situation, and 2) four testable hypotheses will be formulated. The intention of the hypotheses development is to be able to test the effect of a mechanism in the given situation in order to provide a realistic estimation of the mechanism's effect.

In table 6.1, the relevant psychological mechanisms are listed in the left-hand column. The psychological mechanisms marked with bold will be the mechanisms of interest for the given situation. In the middle column are the situations in which the mechanisms are expected to influence. The four situations presented are of interest. See the full list of possible psychical active situations and the related mechanisms in appendix a.4.

Selection criteria for situations are based on high frequency (determined in the situation catalogue) and low variation of conditions (e.g. high variety of conditions would be large variation in distances to work). The psychological mechanisms are considered as of high potential influential due attributes of the mechanism (determined in literature review) combined with the characteristics of the situation. For each compound, the argumentation is presented in the right-hand column.

Table 6.1: Compounding of mechanisms and situations

Psychological variables	Situations	Argumentation
Salience effects Bandwagon effects	**Lunch** (working position)	**Lunch** in canteens is often characterised by several of homogeneous furniture and colours. For instance,

Reward incentives		it is rare that a canteen has different chairs and tables. Based on this, it is assumed that saliency has a greater likelihood to have an effect on health decisions in this environment.
Framing effects Reward incentives The audience effects Bandwagon effects	**Deskwork** (working position)	**Deskwork** offers a situation in which the individual actually has time for reading the messages. Framing, as mechanism, to have an effect requires that the targeted individual is exposed to the message. Due to time spend on deskwork and recurrences on daily basis, in case the framing mechanism triggers healthy choices, the influence may be relatively high. This is the reason for looking into the framing mechanism in the deskwork situation.
Framing effects **Reward incentives** Salience effects Social comparison **Audience effects**	**From train platform to street level** (Getting around in buildings)	**From train platform to street level** offer a choice between two options with different health impact – the stairs or the escalator/elevator. Reward incentives, as mechanism, is relevant to consider as the situation offers the opportunity to actually show the relative differences in cost and benefits of a choice option and not just the reward of one choice. Furthermore, the situation bears the potential of making smaller reward immediate more visible due to the relative differences in cost and benefits of each option. **From train platform to street level** offer also a situation where the individual is most likely surrounded by other people, and the audience effect is highly relevant to consider here compared to a situation in which the individual may be alone more often. Also, the frequency speaks a potential effects influence on health.

6.3 Hypotheses development

Based on the compounding, the selected situations and mechanisms (See table 6.1) will be expressed in hypotheses in order to be able to determine the effect of the given mechanism in the given situation. To develop operational hypotheses more theory is added to some of the mechanisms.

6.3.1 Salience effects

The error related to salience is that we tend to overestimate the causal role (salience) of information we have available to us. The salience of a given piece of information, or the degree to which that piece of information stands out relative to other information, can affect whether an individual considers it in the decision-making process.

The first hypothesis deals with the saliency of psychical active options:

H1: A highly salient high table will increase the likelihood to choose to stand up relative to sit down during lunch breaks.

6.3.2 Frame construction

When message frames are integrated into actual health recommendations, operationalising these underlying concepts is considerably more difficult than messages framing of less complex objects. That is because the risk associated with an alternative usually cannot be defined in terms of the actual likelihood of a particular outcome. Rather, risky reflects the subjective perception that to perform behaviour may involve an unpleasant outcome. It is not possible to define a concrete probability for an agent getting diabetes if he or she does not prevent in terms of psychical activity, as it is very individual.

Construction of health recommendations

In a health recommendation, gain- and loss-framed messages are constructed by the presentation of a specific outcome, such that it appears as a benefit or a cost in relation to a specific reference point – just like framing any decision. However, the expected value associated with particular gain- and loss-framed messages cannot be formally determined. Nevertheless, according to Rothman and Salovey (1997), there are a number of ways to construct actual gain- or loss-framed health communications without being able to formally determine the expected value.

First, a health recommendation can focus on either outcomes associated with *health-promoting behaviours* (e.g. the use of condoms during sex) or outcomes associated with *health-damaging behaviours* (e.g. to have unprotected sex). To simplify, they focus primarily on messages that describe the consequences associated with either adopting or not adopting a health-promoting behaviour (e.g. the

use of condoms). Secondly, the consequences depicted in framed messages can differ in both their desirability and their likelihood (Brendl, Higgins, & Lemm, 1995; Petty & Wegener, 1991).

Health behaviours can be thought of as to perform one of three functions: 1) A behaviour can *prevent* the onset of a health problem (e.g. condoms can prevent the spread of sexually transmitted diseases), 2) it can *detect* the development of a health problem (e.g. mammography can detect a potentially cancerous tumour) or 3) it can attempt to *cure or treat* an on-going health problem (e.g. chemotherapy can shrink a cancerous growth). Distinguishing between prevention- and detection-oriented health behaviours in particular, have had important implications for predictions about risk assessment, treatment decisions, and the maintenance of behaviour change (Fielding, 1978; Kasl & Cobb, 1966; Kirscht, 1983; Weinstein, 1988). According to Rothman and Salovey (1997), it is possible to formulate precise predictions concerning the relative influence of message frames on health behaviours. The effects of gain- and loss-framing on personal decisions are determined by the definition of the decisions. The decisions are classified as (a) detection behaviours, (b) recuperative behaviours and (c) prevention behaviours.

Detection behaviours are performed to provide information about the presence or absence of a potential undesirable health outcome. Research on messages that promote detection behaviours has shown strong support for the advantage of loss framing: exposure to loss-framed messages increased participants' engagement in treatment (Meyerowitz & Chaiken, 1987; Meyerowitz, Wilson, & Chaiken, 1991).

The category of *recuperative behaviours* includes any intervention undertaken to correct or alleviate an existing health problem. Rothman and Sayovey (1997) expect that the effect of framed information on decisions concerning recuperative behaviours should be similar to that obtained with prevention behaviours. This type of behaviour is relevant to obese people and people already diagnosed with type 2 diabetes. However, since the aim is to increase the health level of Copenhagen dwellers, it is relevant to consider the desired behaviour as a prevention behaviour. *Prevention behaviours* focus on averting the onset or development of a health problem. They provide individuals with the opportunity to maintain their present healthy status (i.e. the safe alternative) and to reduce their risk of future illness (i.e. the risky alternative). In contrast to detection behaviours, the salient function of a prevention behaviour is to provide a relatively certain, desirable outcome. For example, sunscreen can prevent the development of skin cancer. The regular use of sunscreen with a sun protection factor of 15 will maintain one's healthy status. Although there is broad range of important barriers to the use of sunscreen (e.g. inconvenience), the perceived risk associated with the performance of the behaviour is

not one of them. In fact, the choice not to use sunscreen is the risky option; with unprotected exposure to the sun, one risks developing skin cancer. Given that loss-framed information facilitates preferences for risky options, a loss frame might actually undermine sunscreen use and thus not lead to prevention behaviour.

In general, adopting a prevention behaviour can be conceived of as a relatively safe behavioural alternative that maintains one's current healthy status. Because agents prefer less risky or more certain options when they are presented with gain-framed information according to prospect theory, gain-framed information should promote prevention-oriented health behaviours effectively (Rothman et al., 1993). In several studies, researchers have explored the influence of message framing on prevention behaviours, such as exercising, use of infant car seats, and sunscreen application (se e.g Robberson and Rogers, 1988).

The second hypothesis deal with the type of framing of the message:

H2: Positive framed messages about stand-up working positions will increase the likelihood of adults choosing a stand-up working position over a sit-down working position during work hours.

6.3.3 Reward incentives

Motivation in terms of rewards varies with time perspectives. When individuals are offered the choice between rewards available at different points in time, the relative values of the options are discounted according to their expected delays until delivery (McClure, Laibson, Loewenstein & Cohen, 2004).

Being able to design choice architecture in a way that move the reward of an option closer to the decision point may affect the decision. Concrete this means, making the rewards smaller and visible to the decision maker, the immediate reward may be more tempting.

The third hypothesis focuses on visibility of the reward of the psychical active option:

H3: A concrete indication of gain achieved by taking the stairs relative to the escalator increases the likelihood of train passengers choosing the stairs.

6.3.4 Audience effects

From the literature review, effect of audience on the decision maker is shown. The question not answered in the review is how concrete the audience effect can proactively be activated. Before being able to test the effect of audience, more concrete information on how the choice architecture can be affected in order to activate the audience effect will be presented.

A relevant perspective is Bentham's panopticon (1843). The Panopticon is a type of institutional building designed by Bentham in the late 18th century. The structure of the Panopticon is such that the individuals under control are constantly aware of their own visibility; they never know when and if they are actually being watched; and thus they are constantly on the alert (Bentham, 1843). The principle of Panopticon is as follows: at the periphery, an annular building; at the centre, a tower; this tower is pierced with wide windows that open onto the inner side of the ring; the periphery building is divided into cells, each of which extends the whole width of the building; they have two windows, one on the inside, corresponding to the windows of the tower; the other, on the out-side, allows the light to cross the cell from one end to the other. All that is needed, then, is to place a supervisor in a central tower and to lock up in each cell a patient, a condemned man etc. By the effect of backlighting, one can observe from the tower, standing out precisely against the light, the small captive shadows in the cells of the periphery. It is like so many cages, so many small theatres, in which each actor is alone, perfectly individualised and constantly visible. The panoptic mechanism arranges spatial unities that make it possible to see constantly and to recognise immediately. Power has its principle not so much in a person as in a certain concerted distribution of bodies, surfaces, lights, and gazes. The power element is especially of interest to Foucault (1977). In short, it reverses the principle of the dungeon; or rather of its three functions - to enclose, to deprive of light and to hide - it preserves only the first and eliminates the other two. Visibility is a trap (Foucault, 1977).

Hence the major effects of the Panopticon: to induce in the inmate a state of conscious and permanent visibility that assures the automatic functioning of power. So to arrange things that the surveillance is permanent in its effects, even if it is discontinuous in its action; that the perfection of power should tend to render its actual exercise unnecessary; that this architectural apparatus should be a machine for creating and sustaining a power relation independent of the person who exercises it; in short, that the inmates should be caught up in a power situation of which they are themselves the bearers (Foucault, 1977).

The idea is polyvalent in its applications; it serves to reform prisoners, but also to treat patients, to instruct schoolchildren, to confine the insane, to supervise workers, to put beggars and idlers to work (Foucault, 1977). It is a type of location of bodies in space, of distribution of individuals in relation to one another, of hierarchical organisation, of disposition of centres and channels of power, of definition of the instruments and modes of intervention of power, which can be implemented in hospitals, schools etc.

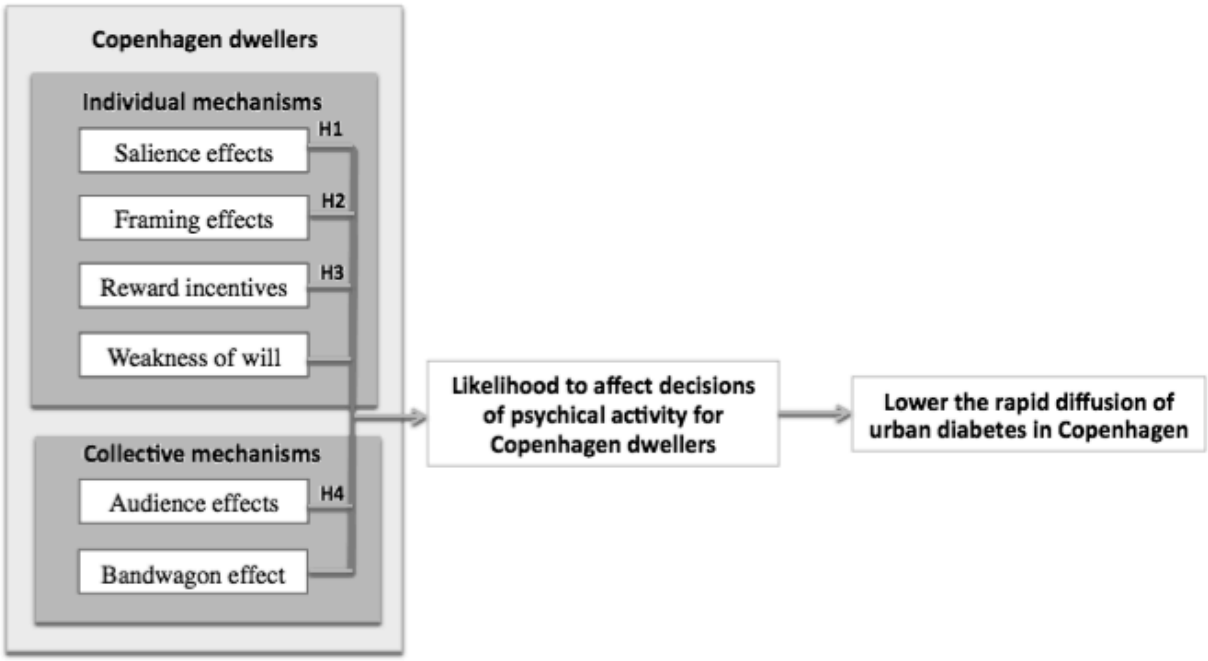
There is no risk that the increase of power created by the panoptic machine may degenerate into tyranny; the disciplinary mechanism will be democratically controlled, since it will be constantly accessible 'to the great tribunal committee of the world'. The Panopticon is subtly arranged so that an observer may observe, at a glance, so many different individuals, also enables everyone to come and observe any of the observers (Foucault, 1977).

Taken together, each choice is affected by the visibility of one's choice to others, leading to the forth hypothesis as follows:

H4: High visibility of the psychical active option to other train passengers increases the likelihood of train passengers choosing the stairs over the escalator.

To sum up, the hypotheses serve the purpose of testing the mechanisms' effect, as shown below.

Figure 6.1: Conceptual framework



PART IV
DATA COLLECTION & ANALYSIS

7. Research design & data collection

To be able to test the hypotheses and thus answering the second research question, the research design will be presented. The research design will be the general plan of how the thesis will go about answering the research question and objective (Saunders, Lewis & Thornhill, 2008). It is important to make a clear distinction between design and tactics. Research design deals with a logical problem and not a logistical problem (Yin, 1989: 29). Design concerns with the plan for the research, while tactics is about finer details of data collection and analysis. Research design is presented in the following two section (section 7.1. and 7.2); the research strategy and the research choice explains how the research questions will turn into a research project. This is followed by decisions about tactics of sampling and data collection procedures (section 7.3 and 7.4).

7.1 Research strategy

The research strategy of the present thesis is defined as an experimental strategy. The reason for this is that the purpose of an experiment is to study causal links (Saunders, Lewis & Thornhill, 2008). That is, studying whether a change in one independent variable produces a change in another dependent variable (Hakim, 2000). The experiment strategy of this thesis relies on the idea of a within-subjects experiment. In a within-subjects design, each participant is in more than one (and usually all) of the levels of an independent variable (Gravetter & Forzano, 2015). A within-subjects design differs from a between-subjects design in that the same subjects perform at all levels of the independent variable. The argumentation rely on the idea that a within-subjects design is more powerful than a between-subjects design; that is, a within-subjects design is more likely to detect a treatment effect than a between-subjects design. One reason is that within-subject experiments rely on the concern related to individual differences. Individual differences can become a confounding variable. If the individuals in one treatment condition are noticeably different from the individuals in another treatment, the individual differences, rather than the treatments, may explain any observed differences. Another reason is that individual differences within each treatment condition can create high variance, which can obscure any differences between treatments. This means that each individual servers as his or her own baseline.

The dependent variables (i.e. choice behaviour) are measured before and after the intervention of the independent variable (i.e. a psychological mechanism). On the basis of this comparison, any difference between the non-treatment option and treatment option for the dependent variable is attributed to the treatment (i.e. a psychological mechanism). The purpose is to try to control (i.e. removing) the

possible effects of an alternative explanation to the planned intervention and eliminate threats to internal validity (Saunders, Lewis & Thornhill, 2011).

7.2 Research choices

This study relies on a multi-method research design to explore and understand psychological mechanisms' influence on everyday decisions related to psychical activity (Creswell, 2014). The term multi-method refers to the combination where more than one data collection technique is used with associated analysis techniques, but this is restricted within either a quantitative or qualitative worldview (Tashakkori & Teddlie 2003). The present thesis applies a multi-method quantitative study as the research is based on two different data collection techniques, but both are analysed in quantitative terms.

The preliminary part collects data based on the Day Reconstruction method (introduced in chapter 6) – a qualitative collecting technique, but the data is understood in quantitative terms by aiming for quantifying the everyday activities of Copenhagen dwellers i.e. to collect a tendency of an everyday time schedule. The Day Reconstruction method is understood as a qualitative collective technique, as the respondents are able to describe their yesterday exactly as it was. The forthcoming part, an experimental study, is based on both quantitative data collecting and analysis techniques. The data analysis technique is characterised by statistical procedures, which will be introduced further in later.

7.3 Sampling procedure

Respondents for the Day Reconstruction study are selected based on a stratified random sampling method. A stratified random sample is obtained by separating the population into exclusive sets, or strata, and then drawing simple random samples from each stratum. The age criterion (of above 18 and not pensioner) is considered as such a stratum within the total group of Copenhagen dwellers.

Respondents for the experimental study is also selected on the basis of stratified random sampling technique. The present study is based on 51 randomly sampled Copenhagen dwellers for the experiment. A stratified random sampling technique is applied relies on randomisation within the age group to control the effects of extraneous variables. Based on this, it is assumed that extraneous factors will affect treatment conditional equally; so any significant differences between conditions can fairly be attributed to the independent variables.

7.4 Data collection method

The research design presented provides a useful take-off for the data collection techniques and data analysis methods. This section will present a clear definition of more finer details of the study: tactics of data collection techniques. These details are relevant to be able to test the hypotheses.

The data is collected by the means of software from Copenhagen Con-joint. Copenhagen Con-joint offers statistical conjoint models. The data collection technique for the experiments take point of departure in the Thurstone scale – a scale developed as a means of measuring attitudes towards region (Thurstone 1927; Thurstone 1934). The central element of this scale is a bipolar continuous scale with two contrary claims or directions. It is based on statements about a particular issue, and each statement has a numerical value indicating how favourable or unfavourable it is judged to be. People check each of the statements to which they agree, and a mean score is computed, indicating their attitude. In psychology and sociology, the Thurstone scale was the first formal technique to measure an attitude.

The empirical data for this study is collected by showing individuals two pictures of two situations (that serve almost the same need) side by side on a computer (or in some situations an iPad) and asking respondents to slide the cursor toward the picture they prefer. Firstly, the respondents are shown four pages with two pictures in each, for which the respondent should state its preferences for one of the pictures. After being presented to the four pages, an information page appears with information about that the forthcoming four pages will contain the same pictures, but this time information about the activity in the picture or a change to the picture will be added. The task is still the identical for the respondent.

As this type of data collection is not as widespread as for instance regular questionnaires for many respondents, guidelines are presented on the first page. The guide page is followed by a training page of how to use the cursor scale by sliding the cursor one way or the other depending on the strength of one's preferences for a choice. If one situation is preferred only a little, then the cursor was moved only slightly toward that pair. Only the instruction photos was equipped with labels at left anchor saying "Prefer much" and the right anchor with "Prefer much" – in the middle of these two photos is an indication telling the placing the cursor here equals being indifferent between the two options. After this, a new comparison appeared for each judgement. The distance from the middle of the scale to the preference was registered electronically in millimetres. The decision of an indicator on a continuous scale with no numbers and only right or left positions without anchors is important to the purpose of

this study. The method eliminates the risk of numeric biases. Such, the paired comparison is a better description of what actually happens when human evaluate objects.

The data is collected in different locations in Copenhagen. The locations span from a central train station in Copenhagen, Nørreport station, to Copenhagen Business School. The train stations are selected due to the variation of individuals coming and going continuously throughout the day. Also, the locations are considered in terms of the opportunity to approach individuals whom actually are willing to take the time needed to answer as individuals often have waiting time for the train or taking a break from the studies. The data was collected over two days. Due to technical issues, one of the mechanisms was tested alone, however, with completely similar data collection technique. This is the reason for a smaller sample size (43 respondents compared to 65 respondents in the test of the three other mechanisms).

In table 7.1 and 7.2, an overview of the pages shown to the respondents is shown. The appearance of each page is available in appendix b.1. and b.2.

Table 7.1: Pages shown to respondents for framing effect, reward incentives and audience effect.

Page	Content
1	Welcome and instructions
2	Training photo with guidelines
4	Showing a picture of a low, sitting desk and a high, standing desk in a office area.
5	Showing a picture of a staircase and an escalator in a train platform.
6	Showing a picture of a staircase with people surrounding and an escalator with people surrounding in a train platform.
7	Information about that the following pages will show the same photos but with new information added or changes in one of the pictures.
9	Showing a picture of a low, sitting desk and a high, standing desk with the information: "85 % of those who stand up during work hours have better blood pressure and a narrower waist".
10	Showing a picture of a staircase and an escalator with information on calories burned at each photo. The escalator equals 0 calories burned, while the stair equals 16 calories burned.

11	Showing a picture of a staircase with people surrounding and an escalator with people surrounding. The photo of the staircase is provided with a sign saying: "Great stair style, see you upstairs!"
12	Four personal questions about gender, age, post code and on average psychical activity
13	Thank you for your help.

Table 7.2: Pages shown to respondents for saliency

Page	Content
1	Welcome and instructions
2	Training photo with guidelines
3	Showing a picture of a sitting canteen area and a picture of a standing canteen area.
4	Information about that the following pages will show the same photos but with new information added or changes in one of the pictures.
5	Showing a picture of a sitting canteen area and a picture of a standing canteen area with a colourful high table.
6	Four personal questions about gender, age, post code and on average psychical activity
7	Thank you for your help.

Collected data should be analysed in order to determine effects of psychological mechanisms, chapter 8 presents the analysis methods and results.

8. Quantitative study

The purpose of this chapter is to present and analyse the data collected during the experiment. The quantitative study was conducted to test the hypotheses and make a conclusive assessment of which psychological factors that significantly influence everyday health decisions. The chapter begins with an introduction to the data, method, and tests used for performing the analysis. The descriptive statistics and the data screening process are presented prior to the actual analysis. Following this, the assumptions of the analysis are discussed. The findings are presented and interpreted as last element of the chapter.

8.1 Data for analysis

The data used in the quantitative study consists of a total of 65 respondents participated collected through the experiments. Due to technical issues, the first hypothesis regarding saliency was tested alone after the three other mechanisms were tested. This means that the saliency hypothesis is only based on 43 respondents.

8.2 Data screening

The data used for the analysis is screened prior to the analysis (Tabachnick & Fidell, 2013).

8.2.1 Missing values

In statistics, missing data, or missing values, occur when no data value is stored for the variable in an observation. Missing data are a common occurrence and can have a significant effect on the conclusions that can be drawn from the data. Responses with missing data are removed as a step in preparing data for analysis. This is done manually as the data set is of limited size. However, this could also have been done within SPSS by conducting a Missing Value Analysis. Missing Value Analysis (MVA) is used to analyse the pattern of missing values in the data.

The pattern and type of missing data are more important than the actual amount missing (Tabachnick & Fidell, 2013). The *missingness* of a data can be described as missing completely at random (MCAR), missing at random (MAR), or missing not at random (MNAR). The removed responses were of MNAR character as they were produced in test of the experiments by the research. The dates and time slot of tests were noted in order to remove those responses for a realistic pattern in answers. The MVA indicates that missingness in the data is 6. Those six responses were removed from the data set.

No responses other than the test answers (which all had missing values) did missed data value for a variable. A reason for this is that the respondent is together with the researcher when answering the

study in case of disputed points, thus, the research has the opportunity to minimise the degree of missing data arisen from omitting answers of all questions. But most importantly, the data collection software used (Copenhagen Con-joint) did not allow the respondents to skip any steps.

8.3 Descriptive statistics

The dependent variable is constructed from the actual differences between the answer before treatment and after treatment.

The selection of *the independent variables* to include in the analysis is based on the insight from the literature review and the Day Reconstruction study.

Three individual psychological mechanisms and one collective psychological mechanism are included in the analysis:

- Reward incentives
- Framing effects
- Salience effects
- The audience effect

8.4 Method of analysis

The analysis is performed as a two-way analysis of variance in IBM SPSS 21. An ANOVA is used, as the purpose is to compare means of more than two independent samples (i.e. the mechanisms). The two-way ANOVA aims at assessing the main effect of each independent variable.

The analysis is testing for the null hypothesis is that the treatments made no difference:

$H_0 = \mu_{ip} - \mu_{2p} = 0$

$H_A = \mu_{ip} - \mu_{2p} \neq 0$

Whereas i represents the observation per treatment, i= 1,2,3,4, and 2 (could have been j = 1,2) represents the treatment the after treatment effect. P represents each respondent.

This means that the analysis is based on paired comparison of repeated measures. The means are analysed as shown in table 8.1. The direction for analysis is horizontal. Each mean represents the mean of all answer to each choice the respondent's faces in the study (i.e. μ_1 is the mean of all answers on the picture related to the saliency mechanism, while μ_5 *is* the mean of all answers related to the picture with saliency treatment).

Table 8.1: Overview of hypothesis tests

Set-up	Before treatment	After treatment
1 (Saliency)	μ_1	μ_5
2 (Framing)	μ_2	μ_6
3 (Reward)	μ_3	μ_7
4 (Audience effects)	μ_4	μ_8

8.4.1 Statistical model

To ensure the reliability of the present study, the underlying assumptions of the above method will be presented in terms of the statistical model serving as basis for the analysis. This is relevant as a statistical model embodies a set of assumptions concerning the generation of the observed data, and similar data from a larger population.

The two-way analysis of variance aims to determine the estimated population mean of effect on the depend variable based on each independent variable (i.e. each μ).

The statistical model operates on sample level, meaning the mean of all observations across factor levels as opposed to the means of individual levels (γ_p). Sample statistics are used as estimators of the corresponding parameters in the population model. This means that the model statistical adjusts for effect of individual. Thus, the analysis of variance will take point of departure in estimates of the corresponding population parameter $\mu_{x.}$ In formula terms this sample statistics are found by removing the individual effect (γ_p) to achieve the overall goal of estimating the population parameters.

The sample estimate of any population parameter puts a hat on the parameter. So if beta is the parameter, beta hat is the estimate of that parameter value. In the below formulation is beta with a hat on used to denote the sample estimate of the population parameter. The present study is based on the following model:

$$\mu_{ip} = \gamma_p + \beta_i$$

The mean of effect adjusted for individual effects (the estimated population mean) is found in the following way;

$$\gamma_p + \beta_1 - (\gamma_p - \beta_2) = \widehat{\beta 1 - \beta 2}.$$

Whereas i denotes treatments, p denotes each respondent, 1 and 2 denotes the observation per treatment.

Having clarified the underlying assumption of the statistical method applied, it is possible to go further into the actual analysis.

8.5 Analysis of variance

This section presents and interprets the findings from the variance analysis. Before these are presented, a short reading guide is presented to enhance reader friendliness:

- Significance levels (α) equal to or less than 0.05 indicate that there are significant difference between preferences for a psychical active option and preferences for a psychical active option after treatment added.
- The results of the ANOVA are presented in an ANOVA table. These tables contain columns labeled "Sum of Squares", "df", "Mean Square", "F ", and "Sig". The columns that are critical for interpretation are the first and the last. The others are used mainly for intermediate computational purposes. These columns contain information on:
  The row, *Index,* in the ANOVA tables refers to the differences between the two measure levels. If the means for the two measure levels were equal, the sum of squares would be zero. The larger the difference between means, the larger the sum of squares.
- The "Sig." column shows if the number (or numbers) found in this column is (are) less than the critical value (α) set by the experimenter, then the effect is said to be significant.

Analyses of experiments testing for the null hypothesis ($\mu_i - \mu_2 = 0$) are presented below.

H1: The hypothesis about s*aliency* is confirmed, as the significance value for this variable is 0.000. Table 8.2 is an overview of the effect. As the significance value is less than alpha (0.05) it is concluded there is a statistical significant difference between the means of answers before treatment and after treatment of saliency. In other words, saliency of high tables will increase the likelihood to choose to stand up relative to sit down during lunch break. It is not possible to conclude on the saliency in general, but in this concrete situation, saliency does affect decision-making on psychical activity. Thus, standing up is preferred if the area of standing up contains more salient elements that the area for sitting.

This provides a clear indication that saliency should be considered as a relevant element in planning actions again urban diabetes.

The data used to determine whether changes in preferences differ significantly with respect to the independent variable and considering the possible effects appear in c.4.

Table 8.2: Variance analysis of H1

Dependent Variable: y

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	79192,186[a]	43	1841,679	26,414	,000
index	3365,628	1	3365,628	48,271	,000
id	75826,558	42	1805,394	25,894	,000
Error	2928,372	42	69,723		
Total	95334,000	86			
Corrected Total	82120,558	85			

a. R Squared = ,964 (Adjusted R Squared = ,928)

H2: The findings of the second hypothesis related to *framing effects* could neither reject H_0. With a significance value of 0.00, there is a statistical significant difference between preferences before and after the *framing* treatment. See the basis for the below statistical results in c.2.

By this, it can be deduced that a positive framed message about stand-up working positions will increase the likelihood of choosing a stand-up working position over a sit-down working position during work hours. This may stress the potential in focusing on positive messages to encourage to prevention behaviour. This finding is in line with the predictions by Rothman and Sayovey (1997) of how to get people to obtain a prevention behaviour.

One reflection relevant to consider for the result of H2 is that, in the experiment, the respondents were asked to focus on the pictures and the message(s), meaning that their task was to consider the message. It is a premise of the framing effect that the individual interprets the message – otherwise it does not lead to any effect even though it is a positive message. This stresses the need for not jumping to conclusions too fast and generalise findings – the positive framing mechanism does show effect as the message is considered, and that is exactly the argumentation for the choice of context.

Table 8.3: Variance analysis of H2

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	91013,302[b]	63	1444,656	5,257	,000
index	18871,143	1	18871,143	68,675	,000
ID	72142,159	62	1163,583	4,234	,000
Error	17036,857	62	274,788		
Total	108296,000	126			

Corrected Total	108050,159	125			

a. set_up = Framing
b. R Squared = ,842 (Adjusted R Squared = ,682)

H3: The psychological mechanism about *reward incentives* was also confirmed with a significance value of 0.000. See the basis for the results in appendix c.3. This means that Copenhagen dwellers tend to prefer taking the stairs over the escalator when concrete indications of gains are achieved.

This could be considered as an extension of H2, as information of gain is considered as a positive message of an optional choice in regards to psychical activity. The findings on H3 could be argued to be possible to consider in other of the presented situations in the situation catalogue as the same choice appears in more of these situation. However, to make such a conclusion requires another study, as it is not possible to determine if the context (train station) is holding a defining role.

Table 8.4: Variance analysis of H3

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	76957,024[b]	63	1221,540	7,885	,000
Index	7762,865	1	7762,865	50,111	,000
ID	69194,159	62	1116,035	7,204	,000
Error	9604,635	62	154,913		
Total	107519,000	126			
Corrected Total	86561,659	125			

a. set_up = Reward
b. R Squared = ,889 (Adjusted R Squared = ,776)

H4: The hypothesis about audience effects also showed a significant difference between the means before and after the treatment. The significance value is also 0.000. This stresses that visibility of the psychical active option to other train passengers increases the likelihood of train passengers choosing the stairs over the escalator. In this case, the effect of others seems to change behaviour. See the basis for the results in appendix c.4.

Table 8.5: Variance analysis of H4

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	70285,643[b]	63	1115,645	5,945	,000
index	3989,532	1	3989,532	21,259	,000
ID	66296,111	62	1069,292	5,698	,000
Error	11634,968	62	187,661		
Total	94381,000	126			
Corrected Total	81920,611	125			

a. set_up = 3
b. R Squared = ,858 (Adjusted R Squared = ,714)

Before summing up, another analysis of variance on the grand mean will be conducted in order to increase the validity of the study. This is presented in the next section.

8.5.1 The grand mean

The analysis of variance in the former section tests the difference between means for each psychological mechanism. However, to ensure validity, an analysis of variance is also conducted on the grand mean, meaning the mean of all effects of psychological mechanisms. It should be noted, that this analysis will not be a fully grand mean, as the data consists of two data set (data for H1 is collected alone due to technical issues). It does not make sense to analyse a common grand mean of different numbers of data points. Therefore the following analysis will be on the data set consisting of H2, H3 and H4. The principle of the grand mean is shown in table 8.6.

Table 8.6: Overview of hypothesis test of Grand mean

Set-up	**Before treatment**	**After treatment**
1 (Framing)	μ_1	μ_4
2 (Reward)	μ_2	μ_5
3 (Audience effects)	μ_3	μ_6

This way of considering the means does affect how the null hypothesis is constructed. Thus, the hypothesis tested in this section is as follows:

H_0: $\mu_1 - \mu_4 = 0$ and $\mu_2 - \mu_5 = 0$ and $\mu_3 - \mu_6 = 0$

H_A: $\mu_1 - \mu_4 = 0$ and $\mu_2 - \mu_5 = 0$ and $\mu_3 - \mu_6 \neq 0$

The analysis is shown on next page.

Table 8.7: Variance analysis of overall effects

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	140966,323[a]	65	2168,713	4,513	,000
set_up	14349,275	2	7174,638	14,932	,000
index_gr1	4213,344	1	4213,344	8,769	,003
ID	122403,704	62	1974,253	4,109	,000
Error	149915,381	312	480,498		
Total	310196,000	378			
Corrected Total	290881,704	377			

a. R Squared = ,485 (Adjusted R Squared = ,377)

Based on this, it is deduced that the null hypothesis is rejected with a significance level at 0.005. One could argue that it is not surprising results – keeping the results of each hypothesis in mind – but this analysis should more be considered as a validity review of the data analysed above.
The finding in the overall mean does stress the need for considering the psychological mechanisms within the decision-making process of psychical activity. What this analysis indicates is a significant effect of treatments based on a comparison between the mean of all means before treatment and the mean of all means after treatment as table 8.6 illustrates.

To sum up, both tests of the grand mean of H2, H3 and H3 shows a statistical significance. This stresses the need for Novo Nordisk to consider the importance of psychological mechanisms in the decision-making process of everyday decisions regarding psychical activity. Such significant results are a cause for reflections to the data collection.

8.5.2 Reflections on results

The above analysis does present extremely statistical significances, and it may be valuable to reflect on elements that may have affected this significance. These reflections does not change the significance value, but should be held in mind before accepting these results fully.

First of all, several respondents actively asked detailed questions regarding the purpose of the research. Their questions were answered, and this answer might affect the responses to some degree. When the respondents are aware of the purpose of researching psychical activity and choices, they may in some way be primed in their choices, resulting in their answers consciously or unconsciously may be affected in the direction of the purpose of this study.

Another reflection is related to the "lab"-like setting in the field. There is a risk that people answered what they consider as the right answer even though they would not make that decision in a field study. This is a relevant reflection as the topic of interest is psychical activity – a topic in which the respondents often are aware of the "right" answer. This could also be considered when answering. However, the respondents were informed that there were no correct answers.

Thirdly, the method of within-subjects experiments also comes with disadvantages. Within-subjects experiments are beneficial to apply due to elimination of effects allocated to individual variation. However, the same respondent being exposed to both pictures before and after treatment may result in respondents penetrate what response the research is "looking" for. This could have the effect of respondents answering with more extreme manners than if a between-subjects experiment was conducted.

8.6 Conclusion on the quantitative study

The quantitative study was conducted to test the hypotheses and make a conclusive assessment of which psychological factors that significantly influence everyday decisions regarding psychical activity. Guided by the insights from the literature review and the Day Reconstruction study, an analysis of variance was conducted.

All of the four studied psychological mechanisms – saliency, framing effect, reward incentives and audience effect - are statistically significant. Across measures of overall variance of means for each mechanism, the final model demonstrates an acceptable level of statistical significance for the grand mean of psychological mechanisms. This finding increases the validity of the research.

Results like the presented does not serve with much knowledge on targeting future actions for Novo Nordisk, this will be discussed further in the next section.

9. Discussion of results

In this section, the findings from the final analysis of variance are discussed and interpreted further. The discussion includes an evaluation of the significant individual mechanisms and the significant collective mechanism. This section will dive further into details, which might provide Novo Nordisk with knowledge of how to target Copenhagen dwellers.

9.1 Data interaction

The quantitative study reveals that the likelihood to choose the psychically active option depends on all of the four psychological variables tested. By focusing on these factors in designing actions, the development of type 2 diabetes among Copenhagen dwellers would arguably decrease, consequently strengthening the Novo Nordisk's corporate brand. However, one could argue that the results does not provide substantial detailed knowledge on whom these mechanisms affect the most – e.g. if they affect some groups of Copenhagen dwellers more than others.

An extended analysis was conducted to investigate whether a segmentation of the data indicates differences in the determinants of effective psychological mechanisms across Copenhagen dwellers. By understanding if there is different needs of the Copenhagen dwellers, the CCD project is able to initiate targeted actions to improve the health level of Copenhagen.

The last page of questions in the questionnaire provides information on each respondents subject variables. These concern gender, age, postal code and average exercise level. These will be analysed below. However, it should be noted that the variable on postal code is not included due to dispersion. Of course it is possible to categorise the postal codes into larger groups, but this is not considered valuable, as some areas will contain too little respondents to draw conclusion on. See the distribution in appendix D.1.

9.1.1 Gender interaction analysis

The first variable of interest will be gender. The significance value for the first variable, saliency for genders is 0.394. As this value is greater that 0.05 it is concluded there is a no statistical significant difference between the means of answers before treatment and after treatment of saliency within gender groups. This means that it is not possible deduce that gender is a variable affecting the effect of saliency. This provides knowledge regarding that future initiatives should not necessarily be segmented due to gender. See the basis for the below statistical results in d.2.

Table 9.1: Gender and saliency analysis of interaction

Dependent Variable: y

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	79244,192[a]	44	1801,004	25,672	,000
Index	3049,215	1	3049,215	43,464	,000
Index * sex	52,006	1	52,006	,741	,394
id	70511,452	41	1719,792	24,514	,000
Error	2876,367	41	70,155		
Total	95334,000	86			
Corrected Total	82120,558	85			

a. R Squared = ,965 (Adjusted R Squared = ,927)

The significance value for framing effect on gender is 0.534. Again, this value is greater that 0.05 and therefore it is concluded that there is a no statistical significant difference between the means of answers before treatment and after treatment of framing within gender groups. This is also the case for rewards (sig. value = 0,189) and audience effects (sig. value = 0.252)(see table 9.3 and table 9.4).

Table 9.2: Gender and framing analysis of interaction

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	91122,011[b]	64	1423,781	5,131	,000
Intercept	425,462	1	425,462	1,533	,220
index	18791,630	1	18791,630	67,715	,000
sex	,000	0	.	.	.
index * sex	108,710	1	108,710	,392	,534
ID	71224,956	61	1167,622	4,207	,000
Error	16928,148	61	277,511		
Total	108296,000	126			
Corrected Total	108050,159	125			

a. set_up = 1

b. R Squared = ,843 (Adjusted R Squared = ,679)

Table 9.3: Gender reward analysis of interaction

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	77227,234[b]	64	1206,676	7,886	,000
Intercept	21602,406	1	21602,406	141,171	,000
index	8032,433	1	8032,433	52,492	,000
sex	,000	0	.	.	.
index * sex	270,210	1	270,210	1,766	,189
ID	68549,019	61	1123,754	7,344	,000
Error	9334,425	61	153,023		
Total	107519,000	126			
Corrected Total	86561,659	125			

a. set_up = 2

b. R Squared = ,892 (Adjusted R Squared = ,779)

Table 9.4: Gender and audience effects analysis of interaction

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	70535,750[b]	64	1102,121	5,905	,000
Intercept	12047,758	1	12047,758	64,552	,000
index	4218,996	1	4218,996	22,605	,000
sex	,000	0	.	.	.
index * sex	250,108	1	250,108	1,340	,252
ID	66294,455	61	1086,794	5,823	,000
Error	11384,861	61	186,637		
Total	94381,000	126			
Corrected Total	81920,611	125			

a. set_up = 3

b. R Squared = ,861 (Adjusted R Squared = ,715)

To sum up, there is no statistical significance showing that decision-making of psychical activity including psychological mechanisms is determined by the gender of the decision maker. This is useful knowledge as it helps avoiding spending resources on gender-segmented initiatives. This does not mean that the specific way that initiatives are communicated (colours, wording, communication channels etc.) is not determined by gender, but the effects of psychological mechanisms are not determined by gender.

9.1.2 Age interaction analysis

The next variable of interest will be age groups. Almost all of the respondents are part of the age group of focus in this study. However, a few of respondents are under 18 and some are pensioners, their answers are still included. The reason for this is, that they may still be affected by the psychological mechanisms, even though they are not the specific target group of this study. It is considered as a positive side effect that other groups also are affected by the mechanisms even though the definition of situations is not based on their everyday situations. See the basis for the below statistical results in d.3.

The significance value for the first independent variable, *saliency* for age is 0.394. As this value is greater that 0.05 it is concluded there is a no statistical significant difference between the means of answers before treatment and after treatment of saliency within age groups. This means that it is not possible deduce that gender is a variable affecting the effect of the psychological mechanisms.

Table 9.5: Age and saliency analysis of interaction

Dependent Variable: y

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	79514,339[a]	46	1728,573	25,867	,000
index	1225,607	1	1225,607	18,340	,000
age	,000	0	.	.	.
index * age	322,153	3	107,384	1,607	,203
id	71849,631	39	1842,298	27,569	,000
Error	2606,219	39	66,826		
Total	95334,000	86			
Corrected Total	82120,558	85			

a. R Squared = ,968 (Adjusted R Squared = ,931)

Also, age groups do not determine responses affected by *framing effects*. The significance value is 0.839, thus it is not statistical significant. This means that there is a high probability that the relationship between age groups and effects happens by chance. Especially the framing effect has a high significance value; that is that the chance of age groups determining the effect of the mechanism has a high probability of happening by chance.

Table 9.6: Age and framing analysis of interaction

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	91112,446[b]	65	1401,730	4,965	,000
index	9971,542	1	9971,542	35,323	,000
age	,000	0	.	.	.
index * age	99,145	2	49,572	,176	,839
ID	70337,744	60	1172,296	4,153	,000
Error	16937,712	60	282,295		
Total	108296,000	126			
Corrected Total	108050,159	125			

a. set_up = 1 b. R Squared = ,843 (Adjusted R Squared = ,673)

The affect on decisions of rewards and audience effect is neither determined by age. This is shown in table 9.7 and table 9.8.

Table 9.7: Age and reward analysis of interaction

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	77469,867[b]	65	1191,844	7,865	,000
index	6691,441	1	6691,441	44,159	,000
age	,000	0	.	.	.
index * age	512,843	2	256,422	1,692	,193
ID	68765,712	60	1146,095	7,563	,000
Error	9091,792	60	151,530		
Total	107519,000	126			
Corrected Total	86561,659	125			

a. set_up = 2 b. R Squared = ,895 (Adjusted R Squared = ,781)

Table 9.8: Age and audience effects analysis of interaction

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	70996,762[b]	65	1092,258	5,999	,000
index	4300,156	1	4300,156	23,619	,000
age	,000	0	.	.	.
index * age	711,119	2	355,560	1,953	,151
ID	65926,063	60	1098,768	6,035	,000
Error	10923,849	60	182,064		

Total	94381,000	126			
Corrected Total	81920,611	125			

a. set_up = 3 b. R Squared = ,867 (Adjusted R Squared = ,722)

In summary, there is no statistical significance that decision-making of psychical activity including psychological mechanisms is determined by the age of the decision maker. Furthermore, age segmentation in using the four psychological mechanisms is not of relevance as there is no pattern in who is affected by the mechanisms and their age. This is all relevant knowledge for Novo Nordisk.

9.1.3 Exercise level interaction analysis

The last variable included in the analysis is the exercise level of the respondents.

The significance value for saliency for exercise level is 0.315. As this value is greater that 0.05 it is concluded there is a no statistical significant difference between the means of answers before treatment and after treatment of saliency within different levels of exercising. This means that it is not possible deduce that exercise level is a variable affecting the effect of the psychological mechanisms. See the basis for the below statistical results in d.4.

Table 9.9: Exercise and saliency analysis of interaction

Dependent Variable: y

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	79443,732[a]	46	1727,038	25,162	,000
montion	,000	0	.	.	.
index	1159,679	1	1159,679	16,896	,000
montion * index	251,546	3	83,849	1,222	,315
id	62462,895	39	1601,613	23,335	,000
Error	2676,826	39	68,637		
Total	95334,000	86			
Corrected Total	82120,558	85			

a. R Squared = ,967 (Adjusted R Squared = ,929)

Also, the framing mechanisms are not determined by average level of exercise of the respondents. This means that the respondents are affected by the mechanisms, but there is no pattern in the level of exercising and the effects hereof.

Table 9.10: Exercise and framing analysis of interaction

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	92641,983[b]	69	1342,637	4,880	,000
Intercept	490,334	1	490,334	1,782	,187
index	4596,794	1	4596,794	16,707	,000
Exercise	,000	0	.	.	.
index * Exercise	1628,681	6	271,447	,987	,443
ID	68729,074	56	1227,305	4,461	,000
Error	15408,176	56	275,146		
Total	108296,000	126			
Corrected Total	108050,159	125			

a. set_up = 1 b. R Squared = ,857 (Adjusted R Squared = ,682)

The average level of exercising of the respondents seems to be of interest in order to target the use of *visible reward incentives*. The significance value for this relationship is 0.018, which is less than the alpha of 0.05. Thus, it is concluded that there is a statistical significant difference between the means of answers before and answers after treatment of visible rewards within different levels of exercising.

Table 9.11: Exercise and reward analysis of interaction

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	79190,068[b]	69	1147,682	8,719	,000
Intercept	4001,682	1	4001,682	30,400	,000
index	2291,932	1	2291,932	17,411	,000
Exercise	,000	0	.	.	.
index * Exercise	2233,045	6	372,174	2,827	,018
ID	62823,690	56	1121,852	8,522	,000
Error	7371,590	56	131,636		
Total	107519,000	126			
Corrected Total	86561,659	125			

a. set_up = 2
b. R Squared = ,915 (Adjusted R Squared = ,810)

To be able to turn these findings into valuable knowledge of targeting initiatives, it is relevant to dive further into which of the difference levels of exercising that is affected the most by the mechanism. The table below indicates the difference between means of level of average exercising.

Table 9.12: Means of effect based on the reward mechanism on exercise level

Exercise. Reward	Before (Index =2)	After (Index = 5)	Difference
Everyday (=0)[21]	19.3	26,7	7,4
5-6 times a week (=1)[22]	7	52	45
3-4 times a week (=2) [23]	-37.163	-29.833	7.33
1-2 times a week (=3)[24]	30.172	47.828	17.656
1-3 times a month (=4)[25]	-41.857	-17,143	24.714
1-10 times a year (=5)[26]	-21	2	19
Less than 1-10 times a year (=6)[27]	0	0	0

The reason for this pattern could be found in the assumption that people exercising regularly is more aware of calorie burning and thus may relate to the gain and loss of choices. This knowledge helps is targeting the use of the psychological mechanism about reward incentives.

However, it should be noted that there could be an error related to the word choice of exercising, since numerous respondents asked if the term contained walking for work, biking to the train station etc. The intention was to measure the level of planned exercising like being in the gym, playing tennis etc. After becoming aware of the ambiguousness, I explained the word for the respondents to limit the error related to this. Thus, the error is not considered as influential on the conclusion of rewards affected by the level of exercising.

The relationship between the last mechanism, the audience effect, and exercise level could not reject the null hypothesis with a significance value at 0.111. Thus, the level of exercising does not correlate with the effect of the audience mechanisms.

Table 9.13: Exercise and audience effects analysis of interaction

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	72189,211[b]	69	1046,220	6,021	,000
Intercept	4526,547	1	4526,547	26,048	,000

[21] Calculation: Interaction between 0 and 2: *-9 + 9 + 35,7 +(-16.4),* interaction between 0 and 5*: -9+0+35,7 + 0*

[22] Calculation: Interaction between 1 and 2: *-9+9+61 +(-54),* interaction between 1 and 5*: -9+0+61 +0*

[23] Calculation: Interaction between 2 and 2: *-9+9+-20.833 +(-16.333),* interaction between 2 and 5*: -9+0+-20.833 + 0*

[24] Calculation: Interaction between 3 and 2: *-9+9+56,828+(-26.656),* Interaction between 3 and 5: *-9+0+56.828-0*

[25] Calculation: Interaction between 4 and 2: *-9+9+-8,143 + -33.714.* Interaction between 4 and 5: *-9+0+-8,143+0*

[26] Calculation: Interaction between 5 and 2: *-9+9+11+-32,* Interaction between 5 and 5: *-9+0+11+0*

[27] Calculation: Interaction between 6 and 2: *-9+9+0+0,* Interaction between 6 and 5: *-9+0+0+0*

index	2686,451	1	2686,451	15,459	,000
Exercise	,000	0	.	.	.
index * Exercise	1903,568	6	317,261	1,826	,111
ID	58833,379	56	1050,596	6,046	,000
Error	9731,400	56	173,775		
Total	94381,000	126			
Corrected Total	81920,611	125			

a. set_up = 3 b. R Squared = ,881 (Adjusted R Squared = ,735)

9.2 Conclusion on segmentation analysis

Diving further into subject variables of the data to investigate whether segmentation on the psychological mechanisms indicate differences did not indicate much difference in the determinants across Copenhagen dwellers. Except from that the level of exercising influences the effect of the reward mechanisms, no other variables seems to affect the effect of the psychological mechanisms.

These findings are valuable, especially with regards to spend resources efficiently. As there are no differences determined by age and gender (and exercise level in some mechanisms), the CCD project should not spend resources on segmenting actions based on these parameters.

Also, the only subject variable – exercise level – shown to affect the decision-making process provides valuable knowledge. As the level of exercising is significantly shown to influence the effect of reward mechanisms, this might help in planning targeting initiatives for individuals exercising relatively much.

9.3 Assessing the quality of research

In this section, the reliability and validity of the research are discussed. Rogers (1961; cited by Raimond 1993:55) declares the need for explicit methodology and the credibility of this: "*Scientific methodology needs to be seen for what it truly is; a way of preventing me from deceiving myself in regard to my creatively formed subjective hunches which have developed out of the relationship between me and my material.*"

The following section will dive into the validity and the reliability of the research.

Reliability refers to the consistency and trustworthiness of the research findings. Reliability is often treated in relation to the issue of whether a finding is reproducible at other times and by other

researchers. The ability to reproduce the findings is ensured through transparency and standardisation (Flick, 2007; Easterby-Smith et al. 2008).

In terms of research strategy and design, a within-subjects experiment supports reliability, as it eliminates the risk related to individual differences, which are the primary concern of between-subjects experiments.

The reliability in the quantitative study is considered to be high, as explicitly argumentation for the choice of statistical measures and the assumptions of these is available. Furthermore, intermediate results of the quantitative study are available in the appendix to illustrate the basis for the results.

Validity is important in all forms of research methodology. The importance of validity is that it indicates the extent to which a measurement is free of error, thus meaning the best available approximation to the truth. If data were not valid any conclusions based on these would be inaccurate or false (Patzer, 1996). Below, the aspects of internal, external, and construct validity are discussed. These types of validity are used interactively to control for and minimise the impact of extraneous factors, which can confound the study and reduce the accuracy of the results (Marczyk, DeMatteo & Festinger, 2005).

Internal validity has to do with the causal relationships and how certain it is that the manipulation of the independent variables caused an effect on the dependent variables, and that the effect was caused purely from the manipulation of the independent variables and not some other factors (Patzer, 1996). It answers the question of whether the findings are good enough given the context (Olsen & Pedersen, 2005; Neuman, 2008). The internal validity of the present research depicting the cause-and-effect relationship between the independent and dependent variables is relatively high due to the fact that the experiments were held in lab-like settings, where there were practically no other stimuli to distort the results. However, it is not possible to control the stimuli the respondents meet before coming meeting the research. This means that the respondents might have been influenced by random stimuli (e.g. being primed), but this is not possible to control, as it requires an isolate of the respondents before. This will always be the case independently of methodology.

Specific on within-subjects designs, it has more statistical power than between-subjects designs, but there are a number of potential threats to the method's internal validity. Some of them are eliminated in the design of the experiment. These are related to time and environment concerns, however, the

baseline and treatment measurements are made with a time gap of approximately one minute, why this is not considered as an actual threat to the internal validity.

External validity refers to the degree to which the results can be generalised beyond the sample and applied to other populations, settings, and circumstances (Flick, 2007).

The extent to which the findings from a laboratory-like experiment can be generalised to all Copenhagen dwellers is likely to be lower than for a field-based experiment. The research design does not fall perfectly into one of the two categories, but is rather a combination as the treatments presented at an iPad with fully controlled inputs, but the respondents are met in the field close to the situation where the decisions are made. As a consequence of the research design, the external validity is considered as relatively high as the lab-like setting is brought to the field. However, a higher external validity is secured by keeping the whole experiment in lab-settings.

Nevertheless, the use of theory triangulation reveals that some of the determinants of psychological mechanisms affecting Copenhagen dwellers' behaviour are examined and supported in academic literature, which thereby indicates that these determinants might be generalised beyond this study.

Construct validity is related to interpreting causal relationships and refers to the congruence between the findings and the conceptual framework guiding the research (Marczyk et al., 2005). In other words, the degree to which a study measures what it claims to be measuring. Construct validity is focused on the independent variables by questioning whether the theory used to support the findings provides the correct explanation of the results (Marczyk et al., 2005). The present study is carefully investigating the relationship between choice behaviour and psychology as promised in the conceptual framework. The conceptual framework defines a clear context for testing in terms of the situations catalogue, which is the basis for the findings. Based on this the constructed validity is considered as high.

In sum, the overall reliability and validity in the multi method research is deemed satisfactory, given the reliability and internal, external, and construct validity found in Day Reconstruction study and the within-subject experiment and the quantitative study.

PART V
REFLECTION & CONCLUSION

10. Reflections

A relevant, but untouched aspect of human behaviour in the present thesis is learning and habit formation. Within psychology, habits are defined as behavioural patterns enacted automatically in response to a situation in which the behaviour has been performed repeatedly and consistently in the past (Verplanken & Aarts, 1999; Wood & Neal, 2009). Habitual behaviour is the crucial aim of the initiative in order to lower the rapid diffusion of urban diabetes and strengthen the corporate brand of Novo Nordisk. However, it is not possible to deduce and predict anything regarding the habitual formation potential of the situations based on the results, as the study is aimed to show if the psychological mechanisms tested by means of interventions affect health decisions.

However, one could argue that the characteristics of the decisions studies in this thesis may indicate that the interventions based on the psychological mechanisms hold the potential of developing habitual behaviour in a long-term perspective. The argumentations for this statement should be found in the following three elements from the recent literature.

Consistency and repetition: Recent studies have shown that habit strength increases following repetition of behaviour in a consistent context (Lally, van Jaarsveld, Potts, & Wardle, 2010; Lally, Wardle, & Gardner, 2011). To form a habit, the behaviour must be carried out repeatedly in the presence of the same contextual cues (Lally, van Jaarsveld, Potts, & Wardle, 2010). When a new action is performed, a mental association between situation and action is created, and repetition reinforces and establishes this association in declarative[28] and non-declarative[29] memory (Wood & Neal, 2009), making alternative actions less accessible in that situation (e.g. Danner, Aarts, & de Vries, 2007, 2008). The findings of this study rely on returning everyday situations in relative consistent context as the situation catalogue shows – each activity is a returning, daily activity.

***Behaviour complexity*:** Many everyday health behaviours can potentially become habitual: Observational studies have suggested that eating behaviours, physical activity, active travel and hand hygiene often have habitual components (see e.g. Aunger et al., 2010; de Bruijn & Gardner, 2011). The reason for this should be found in the complexity of the behaviour. It has been argued that behaviours, which require high levels of flexibility in performance, remain controlled by a deliberative planning system rather than becoming habitual (Redish et al., 2008). However, complex behaviours can become

[28] Declarative memories are memories that we can state explicitly based on prior experiences
[29] Non-declarative memories are memories that we cannot state explicitly that we know, but where we can still demonstrably show that some kind of information has been retained.

somewhat automatic but less so than simple behaviours. There is therefore potential to apply a habit formation approach in designing health behaviour change interventions. All four decisions leading to behaviour that are of low complexity, as it is behaviour that the majority has performed from childhood (standing up, walking the stairs etc.).

Intrinsic motivation: Health-promoting actions, which are extrinsically motivated, i.e., performed to attain tangible rewards, comply with instructions, or otherwise satisfy external demands may be less likely to be repeated than actions pursued due to genuine personal interest (i.e., intrinsic motivation) (Ryan & Deci, 2000). Intervention developers must therefore promote behaviours in a way that encourages people to internalise the need and desire for change, thus engendering self-determined, rather than compliant, behaviour change (Deci & Ryan, 1985). As introduced in the literature review, the collective mechanisms is efficient as they are not either on or off, but social mechanisms might have lasting effects. The strongest motivation may not in the long-term perspective be to note how many calories that the individual burns by taking the stairs, but being aware that the stairs are the option that is perceived as the "best" choice, with others also being aware of that. Striving to maintain a positive self-image may be a relevant intrinsic motivation in developing habitual behaviours based on the all four influential psychological mechanisms.

The collective mechanisms may be a defining element of the intervention's ability to develop habits because of its learning element. This can be explained by the intervention's ability to create a relationship between the stimuli and the response. This relationship is known as classic conditioning – inspired by Pavlov's dogs showing the human's ability to learn associating an element (e.g. product, behaviour etc.) with positive or negative outcome(s) (Plassmann et al., 2012). Classical conditioning predicts that by repeatedly pairing a motivationally significant stimulus (in the collective mechanism terms social approval) with a particular signal (for instance taking the stairs) will result in a conditioned response when the signal is encountered (for instance, taking the stairs in absence of others observing leading to real social approval) (Plassman et al., 2012). In other words, the sight of the sign with laudatory words next to the stairs may evoke a behavioural or conditioned response such as taking the stairs (initially elicited by (the perception of) other's observation). Related to the Panopticon, other's observation does not have to exist, but the perception of it may affect in the same way (e.g. the risk of others entering the staircase).

Taken together, showing effects on health decisions by means of saliency, framing effects, reward incentives and audience effect for Copenhagen dwellers is the first step in developing behaviour changing initiatives. However, to affect the rapid diffusion of urban diabetes, the presented situations

should result in habit formations. The aim of this thesis is not to create habits, however this is the overall aim of applying psychological mechanisms in this context. The psychical active decisions based on the four psychological mechanisms may hold the potential of forming habits because of the consistency and repetitiveness of the situations, the low-complexity behavioural task, and the increased intrinsic motivation of the collective mechanisms.

11. Conclusion

Novo Nordisk initiated the CCD project with the aim to play a part in helping to develop action plans in the world's greatest cities to lower the diffusion of urban diabetes. To be able to benefit from the project, it is required that Novo Nordisk is able to develop behaviour changing initiatives. Therefore this study strived to answer how Novo Nordisk can be recognised as a catalyst for change on the urban diabetes agenda. This study aimed to define how Novo Nordisk could develop actions that affect behaviour – and looked for the answer in the psychology of individual decision-making.

The research objective was answered by means of an exploratory mixed method research design. Based on a qualitative study, which served the purpose of establishing a realistic context to deduce realistic results on behaviour, and existing literature, four testable hypotheses was developed. The hypotheses aimed to test the four psychological mechanisms; saliency, framing effects, reward incentives and audience effects. To test the psychological mechanisms an experimental study was performed.

To determine psychological mechanisms that significantly affecting decisions regarding psychical activity, an analysis of variance was performed. This analysis lead to the conclusion that the mechanisms positively affecting the likelihood of choosing a psychical active option in an everyday decision situation is:

- Saliency
- Framing effect
- Reward incentives
- Audience effect

Based on these findings, an analysis was performed to investigate whether a segmentation of the data indicated differences in the determinants of effective psychological mechanisms across Copenhagen dwellers. Results concluded that the majority of the subject variables (gender and age) did not indicates significant differences in the determinants across Copenhagen dwellers. Except from level of exercising influencing the effect of the reward mechanisms, no other variables seems to affect the effect of the psychological mechanisms.

Showing effects on health decisions by means of the four psychological mechanisms for Copenhagen dwellers is the first step in developing behaviour changing initiatives. However, effects shown in a short-term study like the present study does not lead increased health level. To affect the rapid

diffusion of urban diabetes the decisions should result in habit formations. Habitual behaviour is the crucial aim of the initiatives in order to lower the rapid diffusion of urban diabetes and strengthen the corporate brand of Novo Nordisk. Based on the characteristics of the decisions, in which the psychological mechanisms have shown an effect, it is suggested that there are potential for habit formation. The decisions may hold the potential of forming habits because of the consistency and repetition of the decisions, the low complexity behavioural task and increased intrinsic motivation of the collective mechanisms.

The research provides Novo Nordisk with a picture of how influential psychological mechanisms can be in everyday decisions of psychical activity. The insights from the research can be utilised to better understand the value of including psychology into the utilisation of knowledge and design of prevention actions for the CCD project. Given this, the CCD project group can initiate strategic actions to affect individuals to make more optimal decision in terms of psychical activity, and thereby reach their ambitious role on the urban diabetes agenda.

12. Directions for further research

The findings of the present thesis leave room for further research. The directions for further research may focus on increased validity and effects in order contexts of the CCD project.

The present study shows solely effects in highly specific situations; the validity of the findings may be increased further by going into some of the other situations found in the Day Reconstruction study with the mechanisms. Also, including more respondents in the present study could be of interest for future research as this may increase the validity.

Due to the scope of the present thesis, the psychological mechanisms may not be influential to the same degree in other context. This means that the research could be examined in other cultures like the other focus cities of the CCD project. However, the findings stress the need for looking into effects of psychological mechanisms in the decision-making process in other focus cities. This could be found by executing the same research in other focus cities.

13. References

Aiello, J. R., & Douthitt, E. A. (2001). Social facilitation from Triplett to electronic performance monitoring. *Group Dynamics: Theory, Research, and Practice*, *5*(3), 163.

Ainslie, G. (1975). Specious reaward: a behavioural theory of impulsiveness and impulse control. *Psychol Bull.* 82: 463-496

Ainslie, George and Richard J. Herrnstein. 1981. Preference Reversal and Delayed Reinforcement. *Animal Learning Behavior,* 9:4

Allais, M. (1953). Le Comportement de l'Homme Rationnel devant le Risque: Critique des Postulats et Axiomes de l'Ecole Ame´ricaine. *Econometrica* 21, 503–546.

Allais, M., & Hagen, O. (1979). Expected utility hypothesis and the Allais paradox. *Reidel, Dordrecht.*

Allport, F. H. (1920). The influence of the group upon association and thought. *Journal of experimental psychology*, *3*(3), 159.

Allport, G. W. (1935). Attitudes. In Handbook of social psychology. Edited by C. Murchison, 798–844. *Worcester, MA: Clark Univ. Press.*

Ambler, T., Braeutigam, S., Stins, J., Rose, S., & Swithenby, S. (2004). Salience and choice: neural correlates of shopping decisions. *Psychology and Marketing*, *21*(4), 247-261.

American Diabetes Association: *Overweight.*
Retrieved from http://www.diabetes.org/are-you-at-risk/lower-your-risk/overweight.html

Armel, K. C., Beaumel, A., and Rangel, A. (2008). Biasing simple choices by manipulating relative visual attention. *Judgm. Decision making*

Arora, R., Stoner, C., & Arora, A. (2006). Using framing and credibility to incorporate exercise and fitness in individuals' lifestyle. *Journal of Consumer Marketing*, *23*(4), 199-207.

Attari, S. Z., DeKay, M. L., Davidson, C. I., & De Bruin, W. B. (2010). Public perceptions of energy consumption and savings. *Proceedings of the National Academy of Sciences*, *107*(37), 16054-16059.

Aunger, R., Schmidt, W. P., Ranpura, A., Coombes, Y., Maina, P. M., Matiko, C. N., & Curtis, V. (2010). Three kinds of psychological determinants for hand-washing behaviour in Kenya. *Social science & medicine*, *70*(3), 383-391.

Babbie, E. R. (2010). The practice of social research (International ed.; 12. ed. ed.). Belmont, Calif: Wadsworth Cengage.

Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Banerjee, A. V. (1992). A simple model of herd behaviour. *The Quarterly Journal of Economics*, 797-817.

Bargh, J. A. (1997). The automaticity of everyday life. In R. S. Wyer & T. K. Srull (Eds.), Advances in social cognition (Vol. 10, pp. 1-61). Hillsdale, NJ: Lawrence Erlbaum.

Baron, R.S. (1986). Distraction-Conflict Theory: Progress and Problems. Advances in Experimental Social Psychology, 19, 1-39.

Barr, S., & Gilg, A. (2006). Sustainable lifestyles: Framing environmental action in and around the home. *Geoforum*, *37*(6), 906-920.

Bateson, M., Nettle, D., & Roberts, G. (2006). Cues of being watched enhance cooperation in a real-world setting. *Biology letters*, *2*(3), 412-414.

Baumeister, R. F. (1982). A self-presentational view of social phenomena. *Psychological bulletin*, *91*(1), 3.

Baumeister, R. F. (1982). Self-esteem, self-presentation, and future interaction: A dilemma of reputation. Journal of Personality, 50, 29–45.

Belopolsky, A. V., & Theeuwes, J. (2010). No capture outside the atten-tional window. *Vision Research, 50,* 2543–2550.

Benzion, Uri; Amnon Rapoport and Joseph Yagil. (1989). Discount Rates Inferred From Decisions: An Experimental Study, *Management Sci.* 35, pp. 270-84.

Berger, J., & Heath, C. (2007). Where consumers diverge from others: Identity signalling and product domains. *Journal of Consumer Research*, *34*(2), 121-134.

Bernoulli, D. (1954) Exposition of a new theory on the measurement of risk; Econometrica 22 23–36 (Translation of Bernoulli, D. (1738) Specimen theoriae novae de mensura sortis; Papers Imp. Acad. Sci. St. Petersburg 5 175–192)

Bhaskar, R. (1978). On the possibility of social scientific knowledge and the limits of naturalism. *Journal for the Theory of Social Behaviour*, *8*(1), 1-28.

Bikhchandani, Sushil; Hirshleifer, David; Welch, Ivo (1992). "A Theory of Fads, Fashion, Custom, and Cultural Change as Informational Cascades". *Journal of Political Economy* 100 (5): 992–1026.

Bisman, J. E. (2002, July). The critical realist paradigm as an approach to research in accounting. In *Poster presentation at the Accounting Association of Australian and New Zealand Annual Conference, Perth, Australia*.

Bickel, W. K., Odum, A. L., & Madden, G. J. (1999). Impulsivity and cigarette smoking: Delay discounting in current, never, and ex-smokers. Psychopharmacology, 146, 447–454.

Bohm-Bawerk, E. (1889), The Positive Theory of Capital. *Macmillan, London*

Bordalo, P., Gennaioli, N., & Shleifer, A. (2013). *Salience theory of judicial decisions*. National Bureau of Economic Research.

Bordalo, P., Gennaioli, N., & Shleifer, A. (2010). *Salience theory of choice under risk*. National Bureau of Economic Research.

Bouchard, C. E., Shephard, R. J., & Stephens, T. E. (1994). Physical activity, fitness, and health: International proceedings and consensus statement. In *International Consensus Symposium on*

Physical Activity, Fitness, and Health, 2nd, May, 1992, Toronto, ON, Canada. Human Kinetics Publishers.

Budd, M. (1995), *Values of Art: Pictures, Poetry and Music*, London: Penguin.

Carver, C. S., & Scheier, M. F. (1982). Control theory: A useful conceptual framework for personality-social, clinical, and health psychology. Personality Bulletin, 92, 111-135.

Caspersen, C. J., Powell, K. E., & Christenson, G. M. (1985). Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. *Public health reports*, *100*(2), 126.

Cerf M., Harel J., Einhäuser W., Koch C. (2008). Predicting human gaze using low-level saliency combined with face detection. *Adv. Neural Inf. Process. Syst.* 20 1–7

Chaiken, S. & Trope, Y. (1999). *(Eds.) Dual-Process Theories In Social Psychology*. New York: Guildford Press.

Chapman, Gretchen B. (1996). Temporal Discounting and Utility for Health and Money. J. *Erper . Psych: Learning, Memory, Cognition* 22:3, pp. 771-91.

Churchland, P. (1979). Scientific realism and the plasticity of mind.

Cities Changing Diabetes, Booklet.
Retrieved from http://issuu.com/citieschangingdiabetes/docs/citieschangingdiabetesprospectus

Cities Changing Diabetes. *About.*
Retrieved from http://citieschangingdiabetes.com/about/

Clendenen, V. I., Herman, C. P., & Polivy, J. (1994). Social facilitation of eating among friends and strangers. *Appetite*, *23*(1), 1-13.

Colman, Andrew (2003). *Oxford Dictionary of Psychology*. New York: Oxford University Press. p. 77.

Com Case Competition (2015). Fight Urban Diabetes. Retrieved from http://www.comcasecompetition.dk/sites/default/files/ComCase15_FightUrbanDiabetes_21-01-15.pdf

Commons, J. R. (1934), *Myself. The Autobiography Of John R. Commons*, Madison: The University Of Madison Press (Reprinted In 1964).

Corbett, J., Barwood, M. J., Ouzounoglou, A., Thelwell, R., & Dicks, M. (2012). Influence of competition on performance and pacing during cycling exercise. *Med Sci Sports Exerc*, *44*(3), 509-15.

Corbetta M, Shulman G. L. (2002). Control of goal-directed and stimulus-driven attention in the brain. Nat Rev Neuroscience

Cottrell, N. (1972). Social facilitation. In C. McClintock (Ed.), *Experimental social psychology.* New York: Holt, Rinehart, & Winston.

Creswell, J. W. (2014). Research Design, Croydon.

Damasio, Antonio R. (1994) Descartes' Error And The Future Of Human Life. *Scientific American* 271.4

Danmarks Statistik (March 2015). Motorparken – bestandelen af personbiler. Retrieved from: http://www.dst.dk/Site/Dst/Udgivelser/nyt/GetPdf.aspx?cid=23509

Danner, U. N., Aarts, H., & de Vries, N. K. (2007). Habit formation and multiple means to goal attainment: Repeated retrieval of target means causes inhibited access to competitors. *Personality and Social Psychology Bulletin*, *33*(10), 1367-1379.

Dashiell, J. F. (1930). An experimental analysis of some group effects. *The journal of abnormal and social psychology*, *25*(2), 190.

Davenport, T., & Beck, J. (2002). *The attention economy: Understanding the new currency of business*. Boston: Harvard Business School Press.

de Bruijn, G. J., & Gardner, B. (2011). Active commuting and habit strength: an interactive and discriminant analyses approach. *American journal of health promotion*, *25*(3), e27-e36.

De Castro, J. M. (1994). Family and friends produce greater social facilitation of food intake than other companions. *Physiology & Behavior*, *56*(3), 445-455.

De Castro, J. M. (1990). Social facilitation of duration and size but not rate of the spontaneous meal intake of humans. *Physiology & Behavior*, *47*(6), 1129-1135.

De Hartog, J. J., Boogaard, H., Nijland, H., & Hoek, G. (2010). Do the health benefits of cycling outweigh the risks?. *Environmental health perspectives*, 1109-1116.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. Springer Science & Business Media.

DellaVigna, S., & Malmendier, U. (2004). *Overestimating Self_Control: Evidence from the Health Club Industry* (No. w10819). National Bureau of Economic Research.

Dunning, D., & Hayes, A. F. (1996). Evidence for egocentric comparison in social judgment. *Journal of personality and social psychology*, *71*(2), 213.

Easterby-Smith, M., Thorpe, R. Jackson, P. & Lowe, A. (2008). *Management Research* (3rd edn) Sage: London

Elster, J. (2000). *Ulysses unbound: Studies in rationality, precommitment, and constraints*. Cambridge University Press.

Esgate, A. & Groome, D. (2005). *An Introduction To Applied Cognitive Psychology*. Psychology Press. P. 201.

Esgate, A., Groome, D., & Baker, K. (2005). *An Introduction To Applied Cognitive Psychology*. Psychology Press.

Evans, J. St. B. T. & Over, D. E. (1996). Rationality And Reasoning. *Hove: Psychology Press.*

Eves, F. F., Webb, O. J., & Mutrie, N. (2006). A workplace intervention to promote stair climbing: greater effects in the overweight. *Obesity*, *14*(12), 2210-2216.

Festinger, L. (1950). Informal social communication. *Psychological review*, *57*(5), 271.

Festinger, L. (1954). A theory of social comparison processes. *Human relations*, *7*(2), 117-140.

Fielding, J. E. (1978). Successes of prevention. *The Milbank Memorial Fund Quarterly. Health and Society*,

Fisher, Irving. (1930). *The Theory of Interest.* NY: Macmillan.

Flick, U. (2007). *Managing quality in qualitative research*. Los Angeles, Calif.: Sage Publications.

Foucault, M. (1977). Discipline and Punish, trans. *Alan Sheridan (New York: Vintage, 1979)*, *191*.

Fox, C.R., and Poldrack, R.A. (2008). Prospect theory and the brain. Chapter in Glimcher, P., Camerer, C., Fehr, E. & Poldrack, R. (Eds). Handbook of Neuroeconomics. New York: Elsevier.

Frederick, S., Loewenstein, G. & O'Donoghue, T. (2002). Time Discounting And Time Preference: A Critical Review. *Journal Of Economic Literature* 40 (2): 351–401.

Frederick, S., Loewenstein, G. and O'Donoghue, T. (2002). Time Discounting and Time Preference: A Critical Review. *Journal of Economic Literature* 40, 351-401.

Gifford, A. (2002). Emotion and self-control. *Journal of Economic Behavior & Organization*, *49*(1), 113-130.

Gigerenzer, G. (2008). Why heuristics work. *Perspectives on psychological science*, *3*(1), 20-29.

Gigerenzer, G., & Selten, R. (2001). Rethinking rationality. *Bounded rationality: The adaptive toolbox*

Gilbert, D. T. (2002). Inferential correction. In T. Gilovich, D. Griffin & D. Kahneman (Eds.), *Heuristics and biases* (pp.167–184). *New York: Cambridge University Press.*

Gintis, H. (2000). Beyond Homo economicus: evidence from experimental economics. *Ecological Economics, 35* (3), 311-322.

Gintis, H., 2000. Game Theory Evolving. *Princeton University Press, NJ.*

Goffman, E. (1959). The presentation of self in everyday life.

Gordon-Larsen, P., Nelson, M. C., & Beam, K. (2005). Associations among active transportation, physical activity, and weight status in young adults. *Obesity Research*, *13*(5), 868-875.

Gravetter, F., & Forzano, L. A. (2015). *Research methods for the behavioral sciences*. Cengage Learning.
Guerin, B. (1993). *Social Facilitation*. Cambridge, U.K.: Cambridge University Press.

Hakim, C. (2000). *Research Design: Successful Designs for Social and Economic Research* (2nd edn). London: Routledge.

Haley, K. J., & Fessler, D. M. (2005). Nobody's watching?: Subtle cues affect generosity in an

anonymous economic game. *Evolution and Human behavior*, *26*(3), 245-256.

Hanko, K., Crusius, J., & Mussweiler, T. (2010). When I and me are different: assimilation and contrast in temporal self‐comparisons. *European Journal of Social Psychology*, *40*(1), 160-168.

Harré, R. (1986). Varieties of realism: A rationale for the natural sciences.

Hausenblas, H. A., Brewer, B. W., & Van Raalte, J. L. (2004). Self-presentation and exercise. *Journal of Applied Sport Psychology*, *16*(1), 3-18.

Healy, M., & Perry, C. (2000). Comprehensive criteria to judge validity and reliability of qualitative research within the realism paradigm. *Qualitative market research: An international journal*, *3*(3), 118-126.

Henderson, J. M., Weeks, P. A., Jr., & Hollingworth, A. (1999). The effects of semantic consistency on eye movements during complex scene viewing. *Journal of Experimental Psychology: Human Perception and Performance,* 25

Hendriksen, I. J., Zuiderveld, B. O. B., Kemper, H. C., & Bezemer, P. D. (2000). Effect of commuter cycling on physical performance of male and female employees. *Medicine and science in sports and exercise*, *32*(2), 504-510.

Hermansen, K., Bech, B. H., Dragsted, L.O., Hyldstrup, L., Jørgensen, K., Larsen, M. L., & Tjønneland, A. (2012). Kaffe, sundhed og sygdom. *Vidensråd for Forebyggelse.*

Higgins, E. T. (1996). Knowledge Activation: Accessibility, Applicability, And Salience. In E. T. Higgins & A. W. Kruglanski (Eds.), Social Psychology: Handbook Of Basic Principles (Pp. 133–168). *New York: The Guilford Press.*

Hollingworth W, Cohen D, Hawkins J, Hughes RA, Moore LA, Holliday JC, Audrey S, Starkey F, Campbell R. (2012). Reducing smoking in adolescents: cost-effectiveness results from the cluster randomized ASSIST (A Stop Smoking In Schools Trial), *Nicotine & Tobacco Research* 14 (2): 161-168.

Homans, G. C. (1961). Social behaviour: Its elementary forms.

Humphreys, M., & Garry, J. (2000). Thinking about salience. *Draft originally posted at http://www.people.fas.harvard.edu/~mnhumphr/papers1/salience.pdf*.

Hunt, K. J., & Schuller, K. L. (2007). The increasing prevalence of diabetes in pregnancy. *Obstetrics and gynecology clinics of North America*, *34*(2), 173-199.

International Diabetes Federation. (2014): *Diabetes Atlas*.
Retrieved from https://www.idf.org/sites/default/files/Atlas-poster-2014_EN.pdf

Itti, L. , Koch, C. & Niebur, E. (1998). A Model of Saliency-Based Visual Attention for Rapid Scene Analysis. *IEEE Transactions on Pattern Analysis and Machine Intelligence* 20(11):1254-1259.

Itti, L., & Koch, C. (2001). Computational modeling of visual attention. *Nature reviews neuroscience*, *2*(3)

Izuma, K., Saito, D. N., & Sadato, N. (2010). Processing of the incentive for social approval in the ventral striatum during charitable donation. *Journal of Cognitive Neuroscience*, *22*(4), 621-631.

James, W. (1890). *The Principles of Psychology.* New York: Holt.

Jensen, N. E. (1967). An introduction to Bernoullian utility theory: I. Utility functions. *The Swedish journal of economics*, 163-183.

Jevons, H. S. (1905). Essays on Economics, *London: Macmillan*

Jevons, W. S. (1888). The Theory of Political Economy, third edition. *London, Macmillan.*

Judson, O. (February 2010). Stand Up While You Read This! *The New York Times*

Kahneman, D. (2003). A Perspective On Judgment And Choice: Mapping Bounded Rationality. *American Psychologist* 58.9

Kahneman, D. & Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica,* 263-291.

Kahneman, D., & Frederick, S. (2002). Representativeness revisited: Attribute substitution in intuitive judgment. In T. Gilovich, D. Griffin & D. Kahneman (Eds.), *Heuristics and Biases* (pp. 49–81). *New York: Cambridge University Press.*

Kahneman, D., & Miller, D. T. (1986). Norm Theory: Comparing Reality To Its Alternatives. *Psychological Review*, *93*(2), 136.

Kahneman, D., Krueger, A. B., Schkade, D. A., Schwarz, N., & Stone, A. A. (2004). A survey method for characterizing daily life experience: The day reconstruction method. *Science*, 306(5702), 1776-1780.

Kaufman, B. E. (1999). Emotional arousal as a source of bounded rationality. *Journal of Economic Behavior & Organization*, *38*(2), 135-144.

Klein, G. (2003). Intuition at work. *New York: Doubleday.*

Koch, C. (2004). *The Quest for Consciousness: A Neurobiological Approach*. Englewood, CO: Roberts & Company.

Koch, C., & Ullman, S. (1985). Shifts in selective visual attention: towards the underlying neural circuitry. *Human Neurobiology*, 4, 219 – 227.

Krajbich, I., Armel, K. C., & Rangel, A. (2010). Visual fixations and the computation and comparison of value in simple choice. *Nat. Neuroscience.* 13

Kruglanski, A. W., & Mayseless, O. (1990). Classic and current social comparison research: Expanding the perspective. *Psychological bulletin*, *108*(2), 195.

La Cour, T. (2014). *Vi sidder os ihjel*

Laibson, David I. (1997). Golden Eggs and Hyperbolic Discounting. *Quarterly Journal of Economics,* 112,443-477.

Laland, K. 2001. Imitation, Social Learning, and Preparedness as Mechanisms of Bounded Rationality in *Bounded Rationality: The Adaptive Toolbox*, ed. G. Gigerenzer and R. Selten. *Cambridge: MIT Press.*

Lally, P., Van Jaarsveld, C. H., Potts, H. W., & Wardle, J. (2010). How are habits formed: Modelling habit formation in the real world. *European Journal of Social Psychology*, *40*(6), 998-1009.

Lally, P., Wardle, J., & Gardner, B. (2011). Experiences of habit formation: A qualitative study. *Psychology, health & medicine*, *16*(4), 484-489.

LeDoux J.E. (2000) Emotion Circuits in the Brain. *Annual Review of Neuroscience*, 23:155-184.

Leibenstein, H. (1950). Bandwagon, snob, and Veblen effects in the theory of consumers' demand. *The Quarterly Journal of Economics*, 183-207.

Leigh, G. (2014). *Most liveable city Copenhagen*. Monocle.
Retrieved from http://monocle.com/film/affairs/most-liveable-city-copenhagen/

Lewin, K. (1951). Field theory in social science: selected theoretical papers.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry* (Vol. 75). Sage.

Lirgg, C. D. and Feltz, D. L. (1991). Teacher versus peer models revisited: effects on motor performance and self-efficacy. *Research Quarterly for Exercise and Sport*, 62, 217–224.

Logue, A.W. (1995). Self-control. Prentice-Hall, Englewood Cliffs, NJ

Macrae, C. N., & Bodenhausen, G. V. (2000). Social cognition: Thinking categorically about others. *Annual review of psychology*, *51*(1), 93-120.

Marczyk, G., DeMatteo, D., & Festinger, D. (2005). Essentials of research design and methodology. *John Wiley & Sons Inc.*

Mbanya, J. C. N., Motala, A. A., Sobngwi, E., Assah, F. K., & Enoru, S. T. (2010). Diabetes in sub-Saharan Africa. *The lancet*, *375*(9733), 2254-2266.

McClure S. M., Laibson D.I., Loewenstein G., Cohen J.D. (2004). Separate neural systems value immediate and delayed monetary rewards. *Science 306*:503–507.

McGrath, J. E. (1970). Social and psychological factors in stress. *Illinois Univeristy At Urbana Dept Of Psychology.*

McLeod, D. M., & Detenber, B. H. (1999). Framing effects of television news coverage of social protest. *Journal of Communication*, *49*(3), 3-23.

Merriam, S. B. (2001). Quantitative Research And Case Study Applications In Education (2nd Ed.). *San Francisco: Jossey-Bass.*

Meyerowitz, B. E., & Chaiken, S. (1987). The effect of message framing on breast self-examination attitudes, intentions, and behavior. *Journal of personality and social psychology*, *52*(3): 500.

Meyerowitz, B. E., Wilson, D. K., & Chaiken, S. (1991, June). Loss-framed messages increase breast

self-examination for women who perceive risk. In *meeting of the American Psychological Society, Washington, DC*.

Milosavljevic, M., & Cerf, M. (2008). First attention then intention: Insights from computational neuroscience of vision. *International Journal of Advertising*, *27*(3), 381-398.

Mussweiler, T., Gabriel, S., & Bodenhausen, G. V. (2000). Shifting social identities as a strategy for deflecting threatening social comparisons. *Journal of personality and social psychology*, *79*(3), 398.

NHS Choices. *Diabetes introduction*.
Retrieved from: http://www.nhs.uk/Conditions/Diabetes/Pages/Introduction.aspx

Novo Nordisk, About Novo Nordisk.
Retrieved from: http://www.novonordisk.com/about-novo-nordisk/default.html

Novo Nordisk (28 March 2014). Cities Changing Diabetes press release.
Retrieved from http://www.multivu.com/assets/7140059/documents/7140059-danish-original.pdf

Novo Nordisk. (2014). Annual Report.
Retrieved from:
http://www.novonordisk.com/content/dam/Denmark/HQ/Commons/documents/Novo-Nordisk-Annual-Report-2014.pdf

Novo Nordisk, Company brochure. Retrieved from
http://www.novonordisk.com/content/dam/Denmark/HQ/aboutus/documents/Welcome-to-the-world-of-novonordisk.pdf

Novo Nordisk. (May 2015): Cities fight urban diabetes.
Retrieved from http://www.novonordisk.com/about-novo-nordisk/default/stories/citizenship/cities-fight-urban-diabetes.html

O'Connor, A. M. (1989). Effects of framing and level of probability on patients' preferences for cancer chemotherapy. *Journal of Clinical Epidemiology*, *42*(2), 119-126.

O'Donoghue, T., & Rabin, M. (1999). Doing it now or later. *American Economic Review*, 103-124.

Parks-Stamm, E. J., Heilman, M. E., & Hearns, K. A. (2008). Motivated to penalize: Women's strategic rejection of successful women. *Personality and Social Psychology Bulletin*, *34*(2), 237-247.

Pettinelli, M. (2014). What is Logical or Rational Thinking, and how does it relate to Reasoning, Heuristics, Biases and the Rationality Debate?

Petty, R. E., & Wegener, D. T. (1991). Thought systems, argument quality, and persuasion. In R. S. Wyer Jr. & T. Srull (Eds.), *Advances in social cognition* (Vol. 4, pp. 147–161). Hillsdale, NJ: Erlbaum.

Pieters R., Wedel M. (2004). Attention capture and transfer in advertising: brand, pictorial, and text-size effects. *J. Mark.*

Plassmann, H., Ramsøy, T. Z., & Milosavljevic, M. (2012). Branding the brain: A critical review and outlook. *Journal of Consumer Psychology*, *22*(1), 18-36.

Platon. (1828). *Platons Protagoras*. Translated by B. Jowett in 1999.

Raafat, R. M., Chater, N., & Frith, C. (2009). Herding in humans. *Trends in cognitive sciences*, *13*(10), 420-428.

Rae, J. (1834). Statement of Some New Principles on the Subject of Political Economy, Exposing the Fallacies of the System of Free Trade, and of Some Other Doctrines Maintained in the Wealth of Nations. *Hilliard, Gray, and Co.*, Boston.

Raimond, P. (1993). *Management Projects*. London: Chapman & Hall

Rauschenberger, R. (2003). Attentional capture by auto- and allocues. *Psychonomic Bulletin & Review*

Rege, M., & Telle, K. (2004). The impact of social approval and framing on cooperation in public good situations. *Journal of public Economics*, *88*(7), 1625-1644.

Rhee, J. W. (1997). Strategy and issue frames in election campaign coverage: A social cognitive account of framing effects. *Journal of Communication*, *47*(3), 26-48.

Robberson, M. R., & Rogers, R. W. (1988). Beyond fear appeals: Negative and positive persuasive appeals to health and self‐esteem. *Journal of Applied Social Psychology*, *18*(3), 277-287.

Robson, C. (2002). Real World Research (2nd edn.) Oxford: Blackwell.

Rogers, C. R. (1961). On becoming a person. *London: Constable.*

Rothman, A. J., & Salovey, P. (1997). Shaping perceptions to motivate healthy behaviour: the role of message framing. *Psychological bulletin*, *121*(1), 3.

Rothman, A. J., Salovey, P., Antone, C., Keough, K., & Martin, C. D. (1993). The influence of message framing on intentions to perform health behaviors. *Journal of Experimental Social Psychology*, 29, 408 -433.

Rowe, C. J., & Broadie, S. (2002). *Nicomachean ethics*. Oxford University Press.

Saunders, M. N., Saunders, M., Lewis, P., & Thornhill, A. (2011). Research methods for business students. 5 edition. *Pearson Education* India.

Sayer, A. (1992). Method in social science: A realist approach. *Psychology Press.*

Sayer, A. (2000). Realism and social science. *Sage.*

Schvaneveldt, R.W.; Meyer, D.E. (1973), "Retrieval and comparison processes in semantic memory", in Kornblum, S., *Attention and performance IV*, New York: Academic Press, pp. 395–409

Schwarz, N., & Clore, G. L. (1983). Mood, Misattribution, And Judgments Of Well-Being: Informative And Directive Functions Of Affective States. *Journal Of Personality And Social Psychology*, *45*(3), 513.

Schwarz, N., & Vaughn, L. A. (2002). The availability heuristic revisited: Ease of recall and content of recall as distinct sources of information. In T. Gilovich, D. Griffin & D. Kahneman (Eds.), *Heuristics and biases* (pp. 103–119). Cambridge: Cambridge University Press.

Schrier, O. J. (Ed.). (1998). *The Poetics of Aristotle and the Tractatus Coislinianus: a bibliography from about 900 till 1996* (Vol. 184). Brill.

Shah, S., O'Byrne, M., Wilson, M., & Wilson, T. (2011). Elevators or stairs? *Canadian Medical Association Journal*, *183*(18).

Shapiro, J. M. (2005). Is there a daily discount rate? Evidence from the food stamp nutrition cycle. Journal of Public Economics, 89, 303–325.

Sher, S and McKenzie, C. R. M. (2005). Information leakage from logically equivalent frames. *Cognition, 101*

Suls, J., Martin, R., & Wheeler, L. (2002). Social comparison: Why, with whom, and with what effect?. *Current directions in psychological science*, *11*(5), 159-163.

Taylor, S. E., Wayment, H. A., & Carrillo, M. (1996). Social comparison, self-regulation, and motivation.

Taylor, S.E., 1982. The availability bias in social perception and interaction. In: Kahneman, D., Slovic, P., Tversky, A. (Eds.), Judgment Under Uncertainty: Heuristics & Biases. *Cambridge University Press, Cambridge*, pp. 190–200.

Tesser, A. (1988). Toward a self-evaluation maintenance model of social behavior. *Advances in experimental social psychology*, *21*(181-228).

Thurstone, L. L. (1927). A law of comparative judgment. *Psychological review*, *34*(4), 273.

Thurstone, L. L. (1934). The vectors of mind. *Psychological review*, *41*(1), 1.

Todd, P. M., & Gigerenzer, G. (2012). What is ecological rationality? *Ecological rationality: Intelligence in the world*, 3-30.

Triplett, N. (1898). The dynamogenic factors in pace making and competition. *The American journal of psychology*, *9*(4), 507-533.

Tsai, W. S., Yang, Q., & Liu, Y. (2013). Young Chinese consumers' snob and bandwagon luxury consumption preferences. *Journal of International Consumer Marketing*, *25*(5), 290-304.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, *185*(4157), 1124-1131.

Tversky, A., & Kahneman, D. (1983). Extension Versus Intuitive Reasoning: The Conjunction Fallacy In Probability Judgment. *Psychological Review*, 90(4), 293–315.

Tversky, A., & Kahneman, D. (1986). Rational choice and the framing of decisions. *Journal of business*, 251-278.

Tversky, Amos; Daniel Kahneman (1992). Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and Uncertainty* 5 (4)

United Nations. (2014). World Urbanisation Prospects. *Department of Economic and Social Affairs*. New York.

van Kleef, E., Otten, K., & van Trijp, H. C. (2012). Healthy snacks at the checkout counter: a lab and field study on the impact of shelf arrangement and assortment structure on consumer choices. *BMC public health*, *12*(1), 1072.

van Zoest, W., Donk, M., & Theeuwes, J. (2004). The role of stimulus-driven and goal driven control in saccadic visual selection. *Journal of Experimental Psychology: Human Perception and Performance, 30* (4)

Verplanken, B., & Aarts, H. (1999). Habit, attitude, and planned behaviour: is habit an empty construct or an interesting case of goal-directed automaticity?. *European review of social psychology*, *10*(1), 101-134.

von Neumann, J., & Morgenstern, O. (1947). *Theory of games and economic behaviour*, 2nd ed. Princeton, NJ: Princeton University Press.

Wheeler, D. D. (1970). Processes in word recognition. *Cognitive Psychology*, 1, 59–85.

Wills, T. A. (1981). Downward comparison principles in social psychology. *Psychological bulletin*, *90*(2), 245.

Wilson, T. D. (2002). Strangers to ourselves: Discovering the adaptive unconscious. *Cambridge, MA: Belknap Press of Harvard University Press.*

Wood, J. V., & Taylor, K. L. (1991). Serving self-relevant goals through social comparison.

Wood, W., & Neal, D. T. (2009). The habitual consumer. *Journal of Consumer Psychology*, *19*(4), 579-592.

Worchel, S., Lee, J., & Adewole, A. (1975). Effects of supply and demand on ratings of object value. *Journal of Personality and Social Psychology,* 32, 906−914.

World Health Organization. (1994). Prevention of diabetes mellitus. *Report of a WHO StudyGroup. Geneva: World Health organization*; no. 844.

World Health Organization. (January 2015): *Obesity and overweight.* Fact sheet No 311. Retrieved from http://www.who.int/mediacentre/factsheets/fs311/en/

Zaichkowsky, J. L. (1985). Measuring the involvement construct. *Journal of consumer research*, 341-352.

Zajonc, R. B. (1965). Social facilitation. *Research Center for Group Dynamics, Institute for Social Research, University of Michigan.*

Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *American psychologist*, *35*(2), 151.

Zajonc, R. B. (1998). Emotions. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.*), The handbook of social psychology (Vol. 2, 4th ed., pp. 591–632). Boston: McGraw-Hill.*

Appendix

List of appendix

A. Conceptual framework

A.1 Day reconstruction scheme incl. guidance

Undersøgelse: Fortæl mig om din dag i går.

Du bedes tænke tilbage på din dag i går.

I den venstre kolonne lister du de aktiviteter, du lavede i går i kronologisk rækkefølge. Fx først morgenmad, så arbejde. Dernæst list i den højre kolonne den cirka tid, du brugte på hver aktivitet. Tiden angives i timer og(/eller) minutter. Fx 1 t 15 min eller 5 min.

Husk, at der ikke findes nogen korrekt besvarelse. Mangler du linjer i tabellen fortsætter du under tabellen.

Før du starter bedes du svare på følgende:

Alder:	
Køn:	
Profession/arbejde:	
Bopæl (kommune):	

Aktiviteter	Tidsforbrug

Mange tak for din hjælp.

A.2 Answer of each respondent

Respondent 1

Alder:	36 år
Køn:	Mand
Profession:	Video journalist
Bopæl (Kommune):	Københavns Kommune

Aktivitet	**Tid**
1. Spise morgenmad	20 min
2. Køre til arbejde	30 min
3. Arbejde ved min computer	6 t
4. Frokost	20 min
5. Møde på arbejde	1 t 30 min
6. Køre hjem fra arbejde	30 min
7. Hente min søn fra børnehave	20 min
8. Lave aftensmad	45 min
9. Se fjernsyn	1 t

Respondent 2

Alder:	39 år
Køn:	Kvinde
Profession:	Konsulent
Bopæl (Kommune):	Frederiksberg

Aktivitet	**Tid**
1. Lave morgenmad	15 min
2. Følge børnene i skole	20 min
3. Køre til arbejde med metro	10 min
4. Arbejde ved computer	5 t
5. Frokost	20 min
6. Møder	1 t 30 min
7. Transport hjem fra arbejde	10 min
8. Yoga	45 t
9. Hente børn	20 min
10. Lave mad	30 min
11. Lege med børnene	30 min
12. Putte børnene	20 min
13. Tale i telefon	30 min

Respondent 3

Alder:	29 år
Køn:	Kvinde
Profession:	Sygeplejeske (Rigshospitalet)

Bopæl (Kommune):	Rødovre

Aktivitet	**Tid**
Spise morgenmad	20 min
Køre børnene i skole	15 min
Gøre rent	1 t
Handle ind	20 min
I fitness	1 t
Hente børnene	15 min
Køre på arbejde	30 min
Arbejde	6 t
Spisepause	30 min
Hjem fra arbejde	30 min

Respondent 4

Alder:	56 år
Køn:	Kvinde
Profession:	Butiksejer
Bopæl (Kommune):	Frederiksberg

Aktivitet	**Tid**
Morgenmad	10 min
Cykle til arbejde	20 min
Arbejde	7 t
Frokost	20 min
Cykle hjem fra arbejde	20 min
Løbe	30 min
Cafe med veninder	3 t
Arbejde	30 min

Respondent 5

Alder:	51 år
Køn:	Mand
Profession:	Selvstændig konsulent
Bopæl (Kommune):	København

Aktivitet	**Tid**
Morgenmad	20 min
Telefonmøde	1 t
Papirarbejde	3 t
Frokost	30 min
Køre til kunde	20 min
Møde med kunde	1 t 30 min

Kaffe med tidligere kollega	45 min
Køre hjem	20 min
Mails	30 min
Gøre rent	1 t
Forberede præsentation	1 t 15 min
Aftensmad	30 min
Surfe på internettet	1 t

Respondent 6

Alder:	24 år
Køn:	Mand
Profession:	Studerende og studentermedhjælper
Bopæl (Kommune):	København

Aktivitet	**Tid**
Morgenmad	15 min
Hen til fitness	10 min
Hold i fitness centret	1 t
Hjem fra fitness	10 min
Transport til KU (Red. Københavns Universitet) m. S-tog	20 min
Forelæsning[30]	3 t
Frokost	15 min
Læse	2 t
Transport hjem fra KU	20 min
Læse	2 t
Forberede mad til madklub	1 t
Madklub med venner	3 t
Rydde op	30 min

Respondent 7

Alder:	28 år
Køn:	Mand
Profession:	Lærer
Bopæl (Kommune):	København

[30] Respondent 6: forelæsning antages som arbejde på lige fod med fuldtidsarbejde, da studiet er fuldtidsstudie

Aktivitet	Tid
Bad	20 min
Morgenmad	20 min
Gå til arbejde	20 min
Undervise i Dansk	1 t 15 min
Rette opgaver	2 t
Undervise i Historie	1 t 15 min
Frokost	40 min
Forberedelse til næste uge	3 t
Hjem fra arbejde	20 min
Fodboldtræning	1 t 30 min
Aftensmad	30 min
Se serie på Netflix	2 t

Respondent 8

Alder:	55 år
Køn:	Mand
Profession:	Kontorassistent i København Kommune
Bopæl (Kommune):	Rødovre

Aktivitet	Tid
Lufte hunden	20 min
Morgenmad	15 min
Bad	30 min
Sætte en tøjvask over	5 min
Afsted på arbejde	30 min
Budgetting	2 t
Møde	1 t
Møde	1 t
Frokost	45 min
Arbejde på kontoret	3 t
Handle ind på vej hjem	1 t
Lave aftensmad	1 t
Læse avis og se fjernsyn	3 t

Respondent 9

Alder:	41 år
Køn:	Kvinde
Profession:	Designer
Bopæl (Kommune):	København

Aktivitet	Tid
Bad	30 min
Smøre madpakker	20 min
Vække børnene	15 t
Spise morgenmad	30 min
Køre børnene til skole	30 t
Køre til møde på Østerbro	30 min
Møde	1 t
Undervise på KADK	3 t
Frokostmøde	1 t
På kontoret	3 t
Til møde i banken	1 t
Hente børnene i fritidshjemmet	30 min
Lave mad	1 t
Lektier	1 t
Putte børnene	15 min
Afslapning foran fjernsynet	1 t 30 min

Respondent 10

Alder:	46
Køn:	Mand
Profession:	Tømre
Bopæl (Kommune):	Valby

Aktivitet	Tid
Bad	15 min
Køre på arbejde	15 min
Morgenmad	30 min
Arbejde	6 t
Frokost	30 min
Arbejde	4 t
Handle ind	30 min
Til træning	1 t
Hjem og lave mad	1 t
Hygge på sofaen	2 t

Respondent 11

Alder:	51 år
Køn:	Mand
Profession:	Ingeniør, afdelingsleder
Bopæl (Kommune):	København

Aktivitet	Tid
Løbe	45 min
Bad	30 min
Vække børnene	30 min
Morgenmad	30 t

Køre på arbejde	40 min
Møde inde i byen	1 min
Køre på kontoret	30 min
Frokost	30 min
Arbejde	4 t
Møde	2 t
Hente søn	45 min
Køre ham til fodbold	15 min
Lave aftensmad	30 min
Spise aftensmad	30 min
Afslapning	2 t

A.3 Day Reconstruction data and results

Aktivitet	**Total time spend**	**Mean**
Morgenmad	15 min + 20 min + 20 min + 10 min + 20 min + 15 min + 20 min + 30 min + 30 min + 15 min + 30 min = 225 min	≈ 21 min/dag
Transport i fritiden	20 min + 20 min + 30 min + 0 min + 0 min + 0 min + 0 min + 60 min + 0 min + 60 min + 0 min = 190 min	≈ 17 min/dag*
Fritidsaktiviteter (motion)	45 min + 1 t + 30 min + 1 t + 1t 30 min + 0 min + 0 min + 45 min + 60 min + 0 min + 20 min = 410 min	≈ 37 min/dag
Transport til og fra arbejde	1 t + 20 min + 1 t + 40 min + 40 min + 40 min + 40 min + 30 min + 1 t + 15 min + 1 t 10 min = 475	≈ 43 min/dag
Arbejdstid	7 t 30 min + 6 t 30 min + 6 t + 7 t + 7 t 15 min + 7 t+7 t 15 min + 4 t + 10 t + 6 t + 5 t = 4410 min	400 min/dag ≈ 6 t 40 min/dag
Meetings	1 t 30 min + 1 t 30 min + 2 t 30 min + 0 + 0 +0 + 3 t + 1 t + 2 t = 690 min	≈ 1 t 2 min/dag
Ved computer	5 t + 6 t + 1 t 15 min + 5 t + 5 t +0 + 0 + 0 + 0 + 0 + 0 = 1335	≈ 2 timer /dag
Frokost	20 min + 20 min + 0 min + 20 min + 30 min + 15 min + 40 min +30 min + 30 min + 1 t + 45 min = 310 min	≈ 28 min /dag
Passiv fritidsaktivitet (Se TV, Internet surfing)	1 t + 30 min + 0 min + 0 min + 1 t + 0 min + 2 t + 2 t + 2 t + 1t 30 min + 3 t = 600 min	≈ 55 min/dag
Aftensmad	45 min + 30 min + 30 min + 0 min + 30 min + 1 t + 30 min + 1 t + 1 t + 1 t + 30 min = 435 min	≈ 40 min/dag

*This number is not mirroring the day, as respondent 4 and 7 stated that they were doing leisure activities as soccer, but they did not notice the transportation for these.

A.4 Full list of psychical active situations and related mechanisms

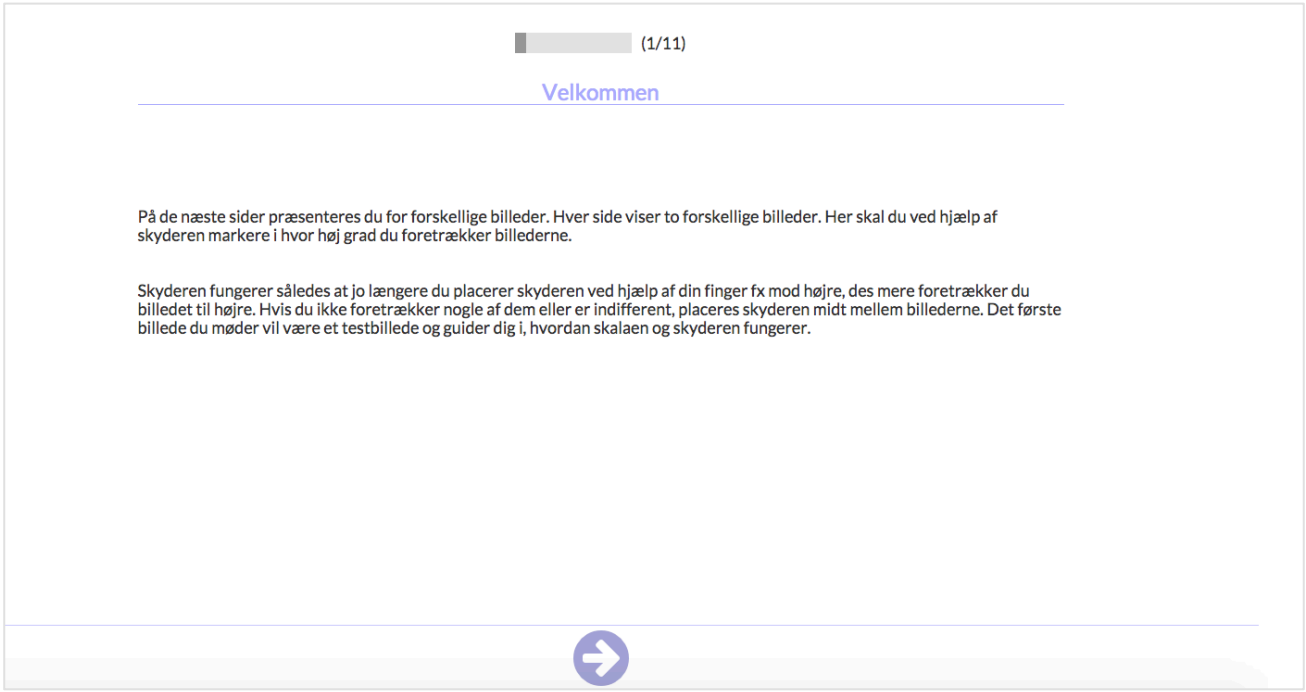
Psychological variables	Situations
Framing effects Reward incentives The audience effects Bandwagon effects	Deskwork (working position)
Framing effects Salience effects Reward incentives	Talking on the phone
Bandwagon effects Reward incentives	In meeting (working position)
Framing effects Reward incentives Bandwagon effects	Coffee break (working position)
Salience effects Bandwagon effects Reward incentives	Lunch (working position)
Framing effects Reward incentives Salience effects Bandwagon effects	At lunch break (getting around)
Framing effects Reward incentives Salience effects	At the car park (getting around)
Framing effects Reward incentives Salience effects Social comparison Audience effects	From train platform to street level (getting around)
Reward incentives Framing effects Salience effects	Transportation for the workplace (transportation)
Audience effects	Transportation for leisure activities (transportation)

Reward incentives Framing effects	
Audience effects Reward incentives Framing effects	Transportation for grocery shopping (transportation)

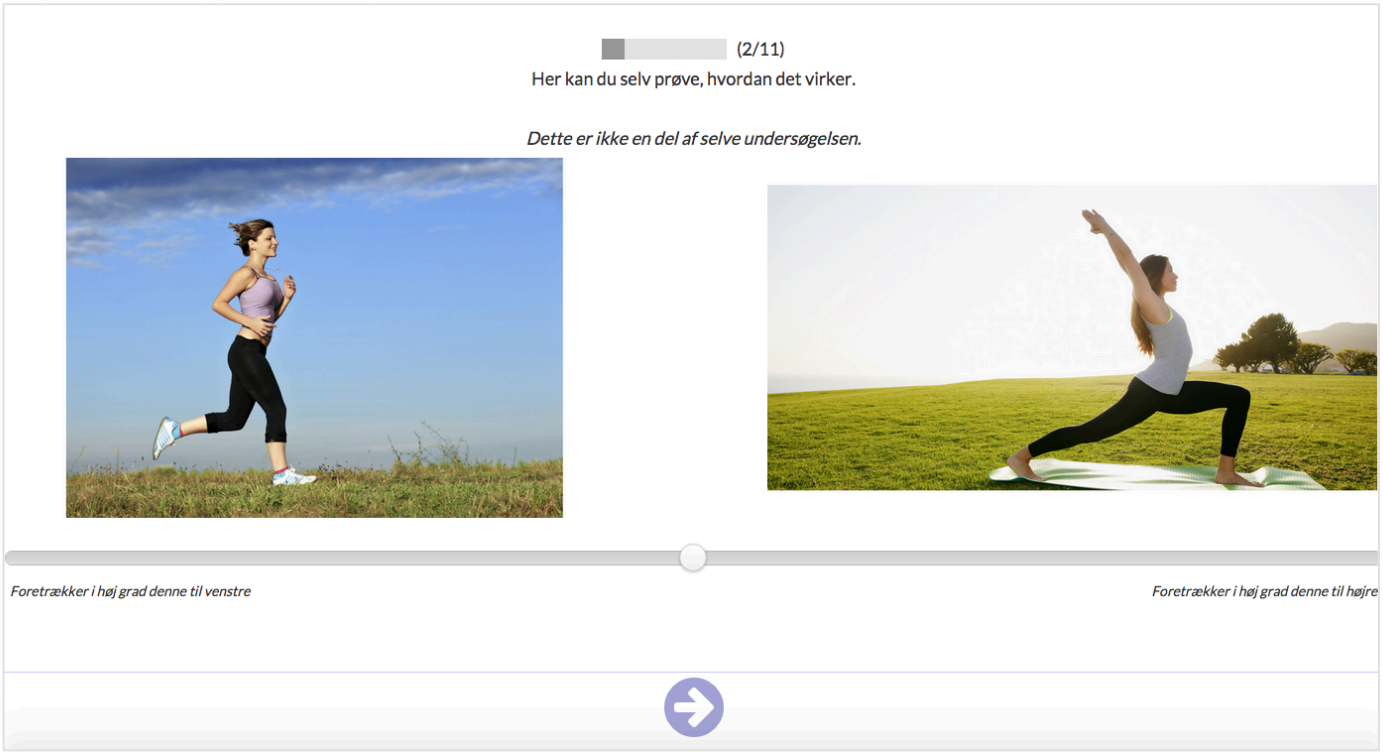
B. Research design and data collection

B.1 Experiment: Questionnaire for framing effects, reward incentives and audience effects

Page 1 Welcome and instructions



Page 2 Training photo with guidelines

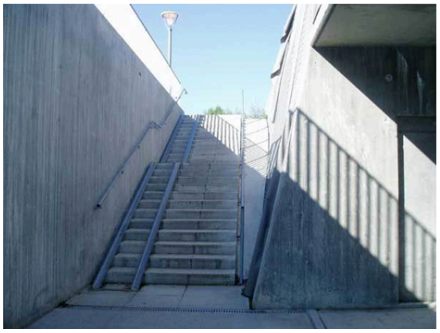


Page 3

(3/11)

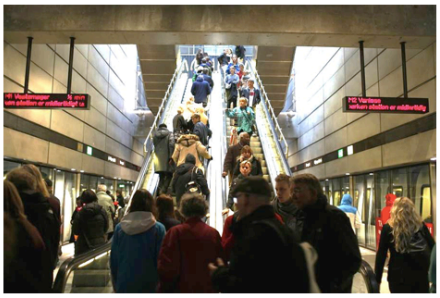
Page 4

(4/11)



Page 5

(5/11)



Page 6 Information about the following pages will show the same photos but with new information

Nu præsenteres du for det samme billede én gang til. Opgaven er stadig den samme som indtil nu. Denne gang er der enten en information eller en tydelig ændring på ét de to billeder.

Page 7

(7/11)

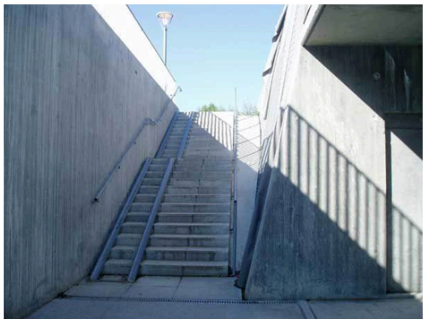
85 % af dem, der står op i løbet af arbejdsdagen har et bedre blodtryk og en smallere talje

Page 8

(8/11)

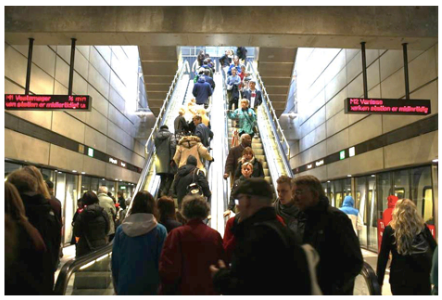
0 kalorier forbrændt

16 kalorier forbrændt



Page 9

(9/11)



Page 10

(10/11)

Afslutningsvist er her fire spørgsmål:

Spørgsmål 1: Hvilket køn er du?

- Mand
- Kvinde

Spørgsmål 2: Hvor gammel er du?

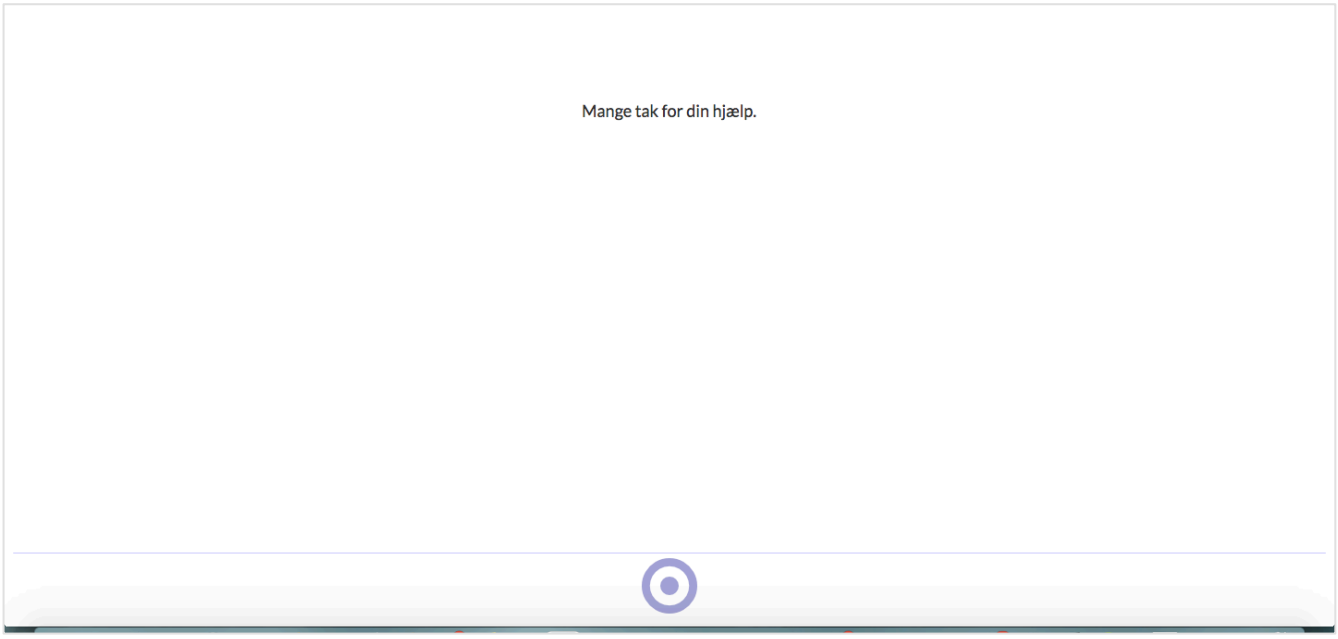
- Under 18
- 18-35
- 35-60
- 60-80
- Over 80

Spørgsmål 3: Hvilket postnummer er du bosat i?

Spørgsmål 3: Hvor ofte dyrker du motion?

- Hver dag
- 5-6 gange om ugen
- 3-4 gange om ugen
- 1-2 gange om ugen
- 1-3 gange om måneden
- 1-10 gange om året
- Sjældnere end 1-10 gange om året

Page 11



B.2 Experiment: Questionnaire for Saliency

Page 1

(1/7)

Velkommen

På de næste sider præsenteres du for forskellige billeder. Hver side viser to forskellige billeder. Her skal du ved hjælp af skyderen markere i hvor høj grad du foretrækker billederne.

Skyderen fungerer således at jo længere du placerer skyderen ved hjælp af din finger fx mod højre, des mere foretrækker du billedet til højre. Hvis du ikke foretrækker nogle af dem eller er indifferent, placeres skyderen midt mellem billederne. Det første billede du møder vil være et testbillede og guider dig i, hvordan skalaen og skyderen fungerer.

Page 2

(2/7)

Her kan du selv prøve, hvordan det virker.

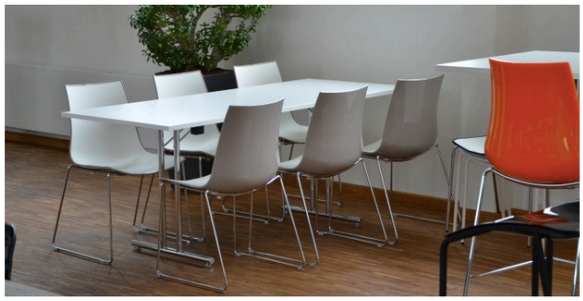
Dette er ikke en del af selve undersøgelsen.

Foretrækker i høj grad denne til venstre

Foretrækker i høj grad denne til højre

Page 3

(3/7)

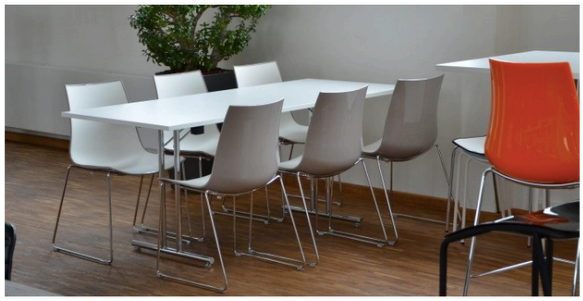


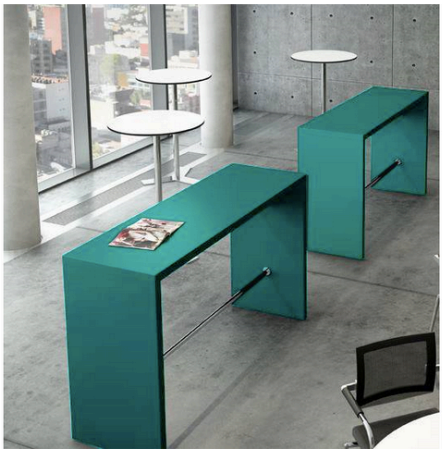
Page 4

Nu præsenteres du for det samme billede én gang til. Opgaven er stadig den samme som indtil nu. Denne gang er der enten en information eller en tydelig ændring på ét de to billeder.

Page 5

(5/7)





Page 6

(6/7)

Afslutningsvist er her fire spørgsmål:

Spørgsmål 1: Hvilket køn er du?

- Mand
- Kvinde

Spørgsmål 2: Hvor gammel er du?

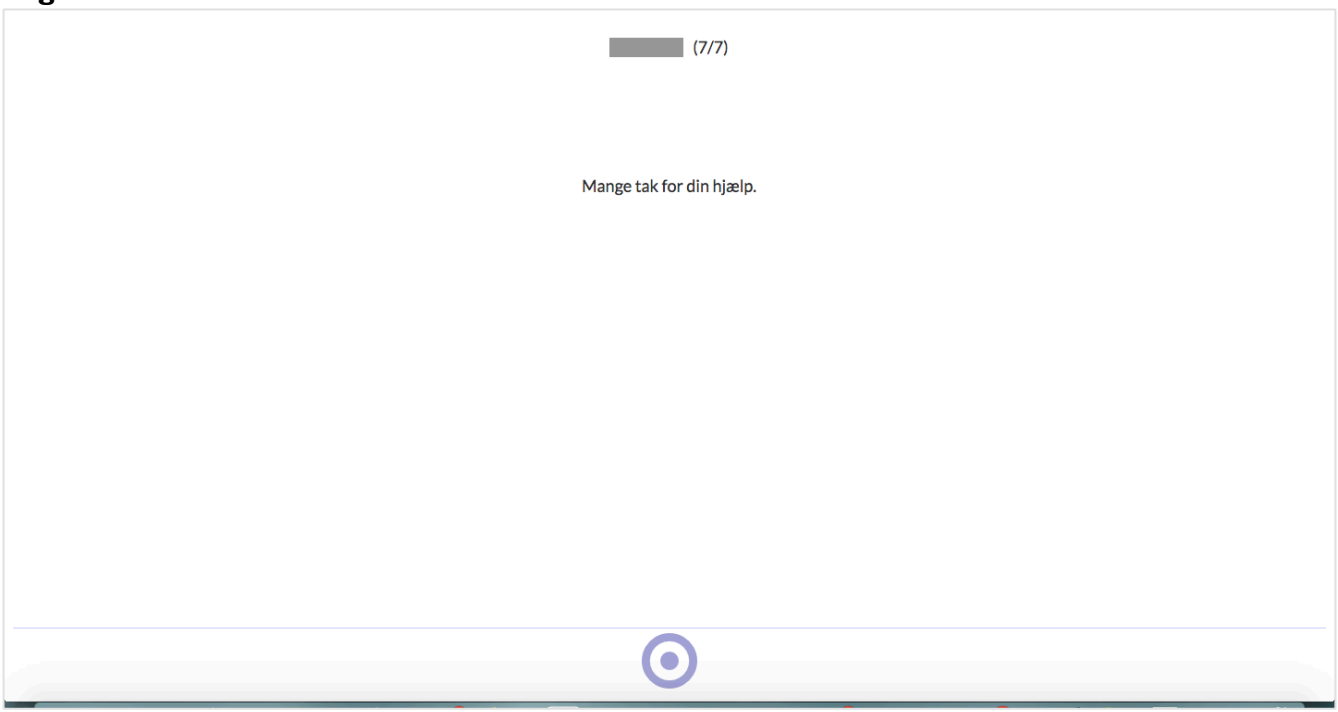
- Under 18
- 18-35
- 35-60
- 60-80
- Over 80

Spørgsmål 3: Hvilket postnummer er du bosat i?

Spørgsmål 3: Hvor ofte dyrker du motion?

- Hver dag
- 5-6 gange om ugen
- 3-4 gange om ugen
- 1-2 gange om ugen
- 1-3 gange om måneden
- 1-10 gange om året
- Sjældnere end 1-10 gange om året

Page 7



C. Quantitative research

C.1 Data extract for effects of saliency mechanism

Dependent Variable: y

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	79192,186[a]	43	1841,679	26,414	,000
Intercept	13213,442	1	13213,442	189,513	,000
index	3365,628	1	3365,628	48,271	,000
id	75826,558	42	1805,394	25,894	,000
Error	2928,372	42	69,723		
Total	95334,000	86			
Corrected Total	82120,558	85			

a. R Squared = ,964 (Adjusted R Squared = ,928)

Parameter Estimates

Dependent Variable: y

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	-21,744	5,973	-3,641	,001	-33,797	-9,691
[index=1]	-12,512	1,801	-6,948	,000	-16,146	-8,877
[index=2]	0[a]	.	.	.	.	.
[id=1708]	57,500	8,350	6,886	,000	40,649	74,351
[id=1709]	,500	8,350	,060	,953	-16,351	17,351
[id=1710]	6,500	8,350	,778	,441	-10,351	23,351
[id=1711]	33,000	8,350	3,952	,000	16,149	49,851
[id=1712]	24,000	8,350	2,874	,006	7,149	40,851
[id=1713]	-12,500	8,350	-1,497	,142	-29,351	4,351
[id=1714]	-22,000	8,350	-2,635	,012	-38,851	-5,149
[id=1715]	74,500	8,350	8,922	,000	57,649	91,351
[id=1716]	-,500	8,350	-,060	,953	-17,351	16,351
[id=1717]	67,500	8,350	8,084	,000	50,649	84,351
[id=1718]	1,000	8,350	,120	,905	-15,851	17,851
[id=1719]	-1,000	8,350	-,120	,905	-17,851	15,851
[id=1720]	54,500	8,350	6,527	,000	37,649	71,351
[id=1721]	2,000	8,350	,240	,812	-14,851	18,851
[id=1722]	-11,500	8,350	-1,377	,176	-28,351	5,351
[id=1723]	23,500	8,350	2,814	,007	6,649	40,351
[id=1724]	-14,000	8,350	-1,677	,101	-30,851	2,851
[id=1725]	6,500	8,350	,778	,441	-10,351	23,351
[id=1726]	2,000	8,350	,240	,812	-14,851	18,851
[id=1727]	68,500	8,350	8,204	,000	51,649	85,351
[id=1728]	9,500	8,350	1,138	,262	-7,351	26,351
[id=1729]	59,000	8,350	7,066	,000	42,149	75,851
[id=1730]	7,500	8,350	,898	,374	-9,351	24,351
[id=1731]	48,000	8,350	5,748	,000	31,149	64,851
[id=1732]	-8,000	8,350	-,958	,344	-24,851	8,851
[id=1733]	54,000	8,350	6,467	,000	37,149	70,851
[id=1734]	7,000	8,350	,838	,407	-9,851	23,851
[id=1735]	-16,000	8,350	-1,916	,062	-32,851	,851
[id=1736]	73,500	8,350	8,802	,000	56,649	90,351
[id=1737]	-9,000	8,350	-1,078	,287	-25,851	7,851
[id=1738]	15,000	8,350	1,796	,080	-1,851	31,851
[id=1739]	-7,000	8,350	-,838	,407	-23,851	9,851
[id=1747]	-7,500	8,350	-,898	,374	-24,351	9,351
[id=1748]	74,000	8,350	8,862	,000	57,149	90,851
[id=1756]	-7,000	8,350	-,838	,407	-23,851	9,851
[id=1757]	50,500	8,350	6,048	,000	33,649	67,351
[id=1758]	14,500	8,350	1,737	,090	-2,351	31,351

[id=1759]	-3,500	8,350	-,419	,677	-20,351	13,351
[id=1760]	-22,000	8,350	-2,635	,012	-38,851	-5,149
[id=1761]	-3,000	8,350	-,359	,721	-19,851	13,851
[id=1762]	-13,500	8,350	-1,617	,113	-30,351	3,351
[id=1763]	-5,000	8,350	-,599	,553	-21,851	11,851
[id=1764]	0[a]	.	.	.	.	.

a. This parameter is set to zero because it is redundant.

C.2 Data extract for effects of framing mechanism

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	91013,302[b]	63	1444,656	5,257	,000
Intercept	245,841	1	245,841	,895	,348
index	18871,143	1	18871,143	68,675	,000
ID	72142,159	62	1163,583	4,234	,000
Error	17036,857	62	274,788		
Total	108296,000	126			
Corrected Total	108050,159	125			

a. set_up = 1
b. R Squared = ,842 (Adjusted R Squared = ,682)

Parameter Estimatesa
Dependent Variable: y_ny

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	31,238	11,814	2,644	,010	7,622	54,854
[index=1]	-24,476	2,954	-8,287	,000	-30,380	-18,572
[index=4]	0[b]	.	.	.	.	.
[ID=1660]	-16,500	16,577	-,995	,323	-49,636	16,636
[ID=1661]	-19,000	16,577	-1,146	,256	-52,136	14,136
[ID=1662]	-17,500	16,577	-1,056	,295	-50,636	15,636
[ID=1663]	24,500	16,577	1,478	,144	-8,636	57,636
[ID=1666]	-33,000	16,577	-1,991	,051	-66,136	,136
[ID=1667]	-32,500	16,577	-1,961	,054	-65,636	,636
[ID=1668]	-47,500	16,577	-2,865	,006	-80,636	-14,364
[ID=1669]	-19,000	16,577	-1,146	,256	-52,136	14,136
[ID=1670]	-14,000	16,577	-,845	,402	-47,136	19,136
[ID=1671]	-16,000	16,577	-,965	,338	-49,136	17,136
[ID=1672]	-18,500	16,577	-1,116	,269	-51,636	14,636
[ID=1673]	-23,000	16,577	-1,387	,170	-56,136	10,136
[ID=1674]	-50,500	16,577	-3,046	,003	-83,636	-17,364
[ID=1675]	-55,000	16,577	-3,318	,002	-88,136	-21,864
[ID=1676]	-33,000	16,577	-1,991	,051	-66,136	,136
[ID=1677]	3,000	16,577	,181	,857	-30,136	36,136
[ID=1678]	-21,500	16,577	-1,297	,199	-54,636	11,636
[ID=1679]	-18,000	16,577	-1,086	,282	-51,136	15,136
[ID=1680]	-14,500	16,577	-,875	,385	-47,636	18,636
[ID=1681]	19,500	16,577	1,176	,244	-13,636	52,636
[ID=1682]	-28,000	16,577	-1,689	,096	-61,136	5,136
[ID=1683]	-27,500	16,577	-1,659	,102	-60,636	5,636
[ID=1684]	-43,000	16,577	-2,594	,012	-76,136	-9,864
[ID=1685]	-36,500	16,577	-2,202	,031	-69,636	-3,364
[ID=1686]	-50,500	16,577	-3,046	,003	-83,636	-17,364
[ID=1687]	9,500	16,577	,573	,569	-23,636	42,636
[ID=1688]	10,000	16,577	,603	,549	-23,136	43,136
[ID=1689]	-28,000	16,577	-1,689	,096	-61,136	5,136
[ID=1690]	-36,500	16,577	-2,202	,031	-69,636	-3,364
[ID=1691]	-3,500	16,577	-,211	,833	-36,636	29,636
[ID=1692]	-25,000	16,577	-1,508	,137	-58,136	8,136
[ID=1693]	-58,000	16,577	-3,499	,001	-91,136	-24,864
[ID=1694]	-38,500	16,577	-2,323	,024	-71,636	-5,364
[ID=1695]	-31,500	16,577	-1,900	,062	-64,636	1,636
[ID=1696]	-36,000	16,577	-2,172	,034	-69,136	-2,864
[ID=1697]	-48,000	16,577	-2,896	,005	-81,136	-14,864
[ID=1698]	-17,500	16,577	-1,056	,295	-50,636	15,636
[ID=1699]	2,000	16,577	,121	,904	-31,136	35,136
[ID=1700]	-43,000	16,577	-2,594	,012	-76,136	-9,864

[ID=1701]	13,000	16,577	,784	,436	-20,136	46,136
[ID=1702]	-32,000	16,577	-1,930	,058	-65,136	1,136
[ID=1703]	10,000	16,577	,603	,549	-23,136	43,136
[ID=1704]	11,500	16,577	,694	,490	-21,636	44,636
[ID=1705]	-51,000	16,577	-3,077	,003	-84,136	-17,864
[ID=1706]	-43,500	16,577	-2,624	,011	-76,636	-10,364
[ID=1707]	8,500	16,577	,513	,610	-24,636	41,636
[ID=1740]	13,000	16,577	,784	,436	-20,136	46,136
[ID=1741]	-32,000	16,577	-1,930	,058	-65,136	1,136
[ID=1742]	5,000	16,577	,302	,764	-28,136	38,136
[ID=1743]	-43,500	16,577	-2,624	,011	-76,636	-10,364
[ID=1744]	26,000	16,577	1,568	,122	-7,136	59,136
[ID=1745]	-61,000	16,577	-3,680	,000	-94,136	-27,864
[ID=1746]	21,000	16,577	1,267	,210	-12,136	54,136
[ID=1749]	-52,000	16,577	-3,137	,003	-85,136	-18,864
[ID=1750]	-18,500	16,577	-1,116	,269	-51,636	14,636
[ID=1751]	6,500	16,577	,392	,696	-26,636	39,636
[ID=1752]	14,500	16,577	,875	,385	-18,636	47,636
[ID=1753]	11,000	16,577	,664	,509	-22,136	44,136
[ID=1754]	-46,000	16,577	-2,775	,007	-79,136	-12,864
[ID=1755]	-48,500	16,577	-2,926	,005	-81,636	-15,364
[ID=1765]	-53,000	16,577	-3,197	,002	-86,136	-19,864
[ID=1766]	-12,500	16,577	-,754	,454	-45,636	20,636
[ID=1767]	0[b]	.	.	.	.	.

a. set_up = 1

b. This parameter is set to zero because it is redundant.

C.3 Data extract for effects of reward mechanism

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	76957,024[b]	63	1221,540	7,885	,000
Intercept	20957,341	1	20957,341	135,284	,000
index	7762,865	1	7762,865	50,111	,000
ID	69194,159	62	1116,035	7,204	,000
Error	9604,635	62	154,913		
Total	107519,000	126			
Corrected Total	86561,659	125			

a. set_up = 2
b. R Squared = ,889 (Adjusted R Squared = ,776)

Parameter Estimates[a]

Dependent Variable: y_ny

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	46,849	8,871	5,281	,000	29,117	64,581
[index=2]	-15,698	2,218	-7,079	,000	-20,131	-11,265
[index=5]	0[b]	.	.	.	.	.
[ID=1660]	-4,500	12,446	-,362	,719	-29,380	20,380
[ID=1661]	-24,000	12,446	-1,928	,058	-48,880	,880
[ID=1662]	-10,000	12,446	-,803	,425	-34,880	14,880
[ID=1663]	-33,000	12,446	-2,651	,010	-57,880	-8,120
[ID=1666]	-43,500	12,446	-3,495	,001	-68,380	-18,620
[ID=1667]	-3,000	12,446	-,241	,810	-27,880	21,880
[ID=1668]	-68,500	12,446	-5,504	,000	-93,380	-43,620
[ID=1669]	-41,000	12,446	-3,294	,002	-65,880	-16,120
[ID=1670]	-9,500	12,446	-,763	,448	-34,380	15,380
[ID=1671]	-40,000	12,446	-3,214	,002	-64,880	-15,120
[ID=1672]	-6,500	12,446	-,522	,603	-31,380	18,380
[ID=1673]	-43,500	12,446	-3,495	,001	-68,380	-18,620
[ID=1674]	-69,500	12,446	-5,584	,000	-94,380	-44,620
[ID=1675]	-4,500	12,446	-,362	,719	-29,380	20,380
[ID=1676]	-11,500	12,446	-,924	,359	-36,380	13,380
[ID=1677]	-60,500	12,446	-4,861	,000	-85,380	-35,620
[ID=1678]	-36,000	12,446	-2,892	,005	-60,880	-11,120
[ID=1679]	-3,500	12,446	-,281	,779	-28,380	21,380
[ID=1680]	6,500	12,446	,522	,603	-18,380	31,380
[ID=1681]	4,000	12,446	,321	,749	-20,880	28,880
[ID=1682]	1,000	12,446	,080	,936	-23,880	25,880
[ID=1683]	-40,500	12,446	-3,254	,002	-65,380	-15,620
[ID=1684]	-51,000	12,446	-4,098	,000	-75,880	-26,120
[ID=1685]	-48,500	12,446	-3,897	,000	-73,380	-23,620
[ID=1686]	-19,000	12,446	-1,527	,132	-43,880	5,880
[ID=1687]	-20,000	12,446	-1,607	,113	-44,880	4,880
[ID=1688]	-11,500	12,446	-,924	,359	-36,380	13,380
[ID=1689]	-50,000	12,446	-4,017	,000	-74,880	-25,120
[ID=1690]	-16,000	12,446	-1,286	,203	-40,880	8,880
[ID=1691]	-52,500	12,446	-4,218	,000	-77,380	-27,620
[ID=1692]	-13,000	12,446	-1,044	,300	-37,880	11,880
[ID=1693]	7,500	12,446	,603	,549	-17,380	32,380
[ID=1694]	-56,000	12,446	-4,499	,000	-80,880	-31,120
[ID=1695]	-56,000	12,446	-4,499	,000	-80,880	-31,120
[ID=1696]	-11,000	12,446	-,884	,380	-35,880	13,880
[ID=1697]	-11,000	12,446	-,884	,380	-35,880	13,880
[ID=1698]	-12,000	12,446	-,964	,339	-36,880	12,880
[ID=1699]	-37,000	12,446	-2,973	,004	-61,880	-12,120

[ID=1700]	-46,500	12,446	-3,736	,000	-71,380	-21,620
[ID=1701]	-8,000	12,446	-,643	,523	-32,880	16,880
[ID=1702]	-8,000	12,446	-,643	,523	-32,880	16,880
[ID=1703]	-15,500	12,446	-1,245	,218	-40,380	9,380
[ID=1704]	-8,000	12,446	-,643	,523	-32,880	16,880
[ID=1705]	-68,500	12,446	-5,504	,000	-93,380	-43,620
[ID=1706]	4,000	12,446	,321	,749	-20,880	28,880
[ID=1707]	-56,500	12,446	-4,539	,000	-81,380	-31,620
[ID=1740]	-9,500	12,446	-,763	,448	-34,380	15,380
[ID=1741]	-9,000	12,446	-,723	,472	-33,880	15,880
[ID=1742]	-14,500	12,446	-1,165	,248	-39,380	10,380
[ID=1743]	-47,000	12,446	-3,776	,000	-71,880	-22,120
[ID=1744]	2,500	12,446	,201	,841	-22,380	27,380
[ID=1745]	-7,500	12,446	-,603	,549	-32,380	17,380
[ID=1746]	-8,000	12,446	-,643	,523	-32,880	16,880
[ID=1749]	-47,500	12,446	-3,816	,000	-72,380	-22,620
[ID=1750]	-33,500	12,446	-2,692	,009	-58,380	-8,620
[ID=1751]	-53,000	12,446	-4,258	,000	-77,880	-28,120
[ID=1752]	-1,500	12,446	-,121	,904	-26,380	23,380
[ID=1753]	-9,500	12,446	-,763	,448	-34,380	15,380
[ID=1754]	-72,500	12,446	-5,825	,000	-97,380	-47,620
[ID=1755]	-61,000	12,446	-4,901	,000	-85,880	-36,120
[ID=1765]	-64,000	12,446	-5,142	,000	-88,880	-39,120
[ID=1766]	-3,500	12,446	-,281	,779	-28,380	21,380
[ID=1767]	0[b]	.	.	.	.	.

a. set_up = 2

b. This parameter is set to zero because it is redundant.

C.4 Data extract for effects of audience mechanism

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	70285,643[b]	63	1115,645	5,945	,000
Intercept	12460,389	1	12460,389	66,398	,000
index	3989,532	1	3989,532	21,259	,000
ID	66296,111	62	1069,292	5,698	,000
Error	11634,968	62	187,661		
Total	94381,000	126			
Corrected Total	81920,611	125			

a. set_up = 3

b. R Squared = ,858 (Adjusted R Squared = ,714)

Parameter Estimates[a]

Dependent Variable: y_ny

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	44,127	9,763	4,520	,000	24,611	63,643
[index=3]	-11,254	2,441	-4,611	,000	-16,133	-6,375
[index=6]	0[b]	.	.	.	.	.
[ID=1660]	-3,000	13,699	-,219	,827	-30,384	24,384
[ID=1661]	-39,000	13,699	-2,847	,006	-66,384	-11,616
[ID=1662]	-6,500	13,699	-,474	,637	-33,884	20,884
[ID=1663]	-20,500	13,699	-1,496	,140	-47,884	6,884
[ID=1666]	-37,500	13,699	-2,737	,008	-64,884	-10,116
[ID=1667]	-40,500	13,699	-2,956	,004	-67,884	-13,116
[ID=1668]	-48,000	13,699	-3,504	,001	-75,384	-20,616
[ID=1669]	-21,500	13,699	-1,569	,122	-48,884	5,884
[ID=1670]	-7,500	13,699	-,547	,586	-34,884	19,884
[ID=1671]	-46,500	13,699	-3,394	,001	-73,884	-19,116
[ID=1672]	-7,500	13,699	-,547	,586	-34,884	19,884
[ID=1673]	-25,500	13,699	-1,861	,067	-52,884	1,884
[ID=1674]	-6,500	13,699	-,474	,637	-33,884	20,884
[ID=1675]	-74,500	13,699	-5,438	,000	-101,884	-47,116
[ID=1676]	-5,000	13,699	-,365	,716	-32,384	22,384
[ID=1677]	-19,000	13,699	-1,387	,170	-46,384	8,384
[ID=1678]	-28,500	13,699	-2,080	,042	-55,884	-1,116
[ID=1679]	-7,000	13,699	-,511	,611	-34,384	20,384
[ID=1680]	-38,000	13,699	-2,774	,007	-65,384	-10,616
[ID=1681]	-80,000	13,699	-5,840	,000	-107,384	-52,616
[ID=1682]	-10,000	13,699	-,730	,468	-37,384	17,384
[ID=1683]	-41,000	13,699	-2,993	,004	-68,384	-13,616
[ID=1684]	-54,000	13,699	-3,942	,000	-81,384	-26,616
[ID=1685]	-46,500	13,699	-3,394	,001	-73,884	-19,116
[ID=1686]	-37,500	13,699	-2,737	,008	-64,884	-10,116
[ID=1687]	-11,000	13,699	-,803	,425	-38,384	16,384
[ID=1688]	-7,000	13,699	-,511	,611	-34,384	20,384
[ID=1689]	-7,500	13,699	-,547	,586	-34,884	19,884
[ID=1690]	-16,500	13,699	-1,204	,233	-43,884	10,884
[ID=1691]	-39,000	13,699	-2,847	,006	-66,384	-11,616
[ID=1692]	-9,000	13,699	-,657	,514	-36,384	18,384
[ID=1693]	3,000	13,699	,219	,827	-24,384	30,384
[ID=1694]	-51,000	13,699	-3,723	,000	-78,384	-23,616
[ID=1695]	-56,000	13,699	-4,088	,000	-83,384	-28,616
[ID=1696]	-19,500	13,699	-1,423	,160	-46,884	7,884
[ID=1697]	-12,500	13,699	-,912	,365	-39,884	14,884
[ID=1698]	-14,000	13,699	-1,022	,311	-41,384	13,384
[ID=1699]	-45,000	13,699	-3,285	,002	-72,384	-17,616
[ID=1700]	-57,000	13,699	-4,161	,000	-84,384	-29,616

[ID=1701]	-7,500	13,699	-,547	,586	-34,884	19,884
[ID=1702]	-10,500	13,699	-,766	,446	-37,884	16,884
[ID=1703]	-12,500	13,699	-,912	,365	-39,884	14,884
[ID=1704]	-13,500	13,699	-,985	,328	-40,884	13,884
[ID=1705]	-70,500	13,699	-5,146	,000	-97,884	-43,116
[ID=1706]	-4,500	13,699	-,328	,744	-31,884	22,884
[ID=1707]	-55,500	13,699	-4,051	,000	-82,884	-28,116
[ID=1740]	-3,500	13,699	-,255	,799	-30,884	23,884
[ID=1741]	-5,000	13,699	-,365	,716	-32,384	22,384
[ID=1742]	-11,000	13,699	-,803	,425	-38,384	16,384
[ID=1743]	-59,000	13,699	-4,307	,000	-86,384	-31,616
[ID=1744]	,500	13,699	,036	,971	-26,884	27,884
[ID=1745]	-5,500	13,699	-,401	,689	-32,884	21,884
[ID=1746]	-5,500	13,699	-,401	,689	-32,884	21,884
[ID=1749]	-66,000	13,699	-4,818	,000	-93,384	-38,616
[ID=1750]	-33,500	13,699	-2,445	,017	-60,884	-6,116
[ID=1751]	-55,000	13,699	-4,015	,000	-82,384	-27,616
[ID=1752]	-40,500	13,699	-2,956	,004	-67,884	-13,116
[ID=1753]	-9,500	13,699	-,693	,491	-36,884	17,884
[ID=1754]	-69,500	13,699	-5,073	,000	-96,884	-42,116
[ID=1755]	-59,000	13,699	-4,307	,000	-86,384	-31,616
[ID=1765]	-64,000	13,699	-4,672	,000	-91,384	-36,616
[ID=1766]	-45,500	13,699	-3,321	,002	-72,884	-18,116
[ID=1767]	0[b]	.	.	.	.	.

a. set_up = 3

b. This parameter is set to zero because it is redundant.

C.5. Data extract for analysis of Grand Mean

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	140966,323[a]	65	2168,713	4,513	,000
Intercept	19314,296	1	19314,296	40,196	,000
set_up	14349,275	2	7174,638	14,932	,000
index_gr1	4213,344	1	4213,344	8,769	,003
ID	122403,704	62	1974,253	4,109	,000
Error	149915,381	312	480,498		
Total	310196,000	378			
Corrected Total	290881,704	377			

a. R Squared = ,485 (Adjusted R Squared = ,377)

Parameter Estimates

Dependent Variable: y_ny

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	38,302	9,160	4,182	,000	20,279	56,324
[set_up=1]	-11,341	2,762	-4,107	,000	-16,775	-5,907
[set_up=2]	2,952	2,762	1,069	,286	-2,482	8,386
[set_up=3]	0[a]	.	.	.	.	.
[index_gr1=1,00]	-6,677	2,255	-2,961	,003	-11,114	-2,240
[index_gr1=2,00]	0[a]	.	.	.	.	.
[ID=1660]	-8,000	12,656	-,632	,528	-32,901	16,901
[ID=1661]	-27,333	12,656	-2,160	,032	-52,235	-2,432
[ID=1662]	-11,333	12,656	-,896	,371	-36,235	13,568
[ID=1663]	-9,667	12,656	-,764	,446	-34,568	15,235
[ID=1666]	-38,000	12,656	-3,003	,003	-62,901	-13,099
[ID=1667]	-25,333	12,656	-2,002	,046	-50,235	-,432
[ID=1668]	-54,667	12,656	-4,320	,000	-79,568	-29,765
[ID=1669]	-27,167	12,656	-2,147	,033	-52,068	-2,265
[ID=1670]	-10,333	12,656	-,816	,415	-35,235	14,568
[ID=1671]	-34,167	12,656	-2,700	,007	-59,068	-9,265
[ID=1672]	-10,833	12,656	-,856	,393	-35,735	14,068
[ID=1673]	-30,667	12,656	-2,423	,016	-55,568	-5,765
[ID=1674]	-42,167	12,656	-3,332	,001	-67,068	-17,265
[ID=1675]	-44,667	12,656	-3,529	,000	-69,568	-19,765
[ID=1676]	-16,500	12,656	-1,304	,193	-41,401	8,401
[ID=1677]	-25,500	12,656	-2,015	,045	-50,401	-,599
[ID=1678]	-28,667	12,656	-2,265	,024	-53,568	-3,765
[ID=1679]	-9,500	12,656	-,751	,453	-34,401	15,401
[ID=1680]	-15,333	12,656	-1,212	,227	-40,235	9,568
[ID=1681]	-18,833	12,656	-1,488	,138	-43,735	6,068
[ID=1682]	-12,333	12,656	-,975	,331	-37,235	12,568
[ID=1683]	-36,333	12,656	-2,871	,004	-61,235	-11,432
[ID=1684]	-49,333	12,656	-3,898	,000	-74,235	-24,432
[ID=1685]	-43,833	12,656	-3,464	,001	-68,735	-18,932
[ID=1686]	-35,667	12,656	-2,818	,005	-60,568	-10,765
[ID=1687]	-7,167	12,656	-,566	,572	-32,068	17,735
[ID=1688]	-2,833	12,656	-,224	,823	-27,735	22,068
[ID=1689]	-28,500	12,656	-2,252	,025	-53,401	-3,599
[ID=1690]	-23,000	12,656	-1,817	,070	-47,901	1,901
[ID=1691]	-31,667	12,656	-2,502	,013	-56,568	-6,765
[ID=1692]	-15,667	12,656	-1,238	,217	-40,568	9,235
[ID=1693]	-15,833	12,656	-1,251	,212	-40,735	9,068
[ID=1694]	-48,500	12,656	-3,832	,000	-73,401	-23,599
[ID=1695]	-47,833	12,656	-3,780	,000	-72,735	-22,932
[ID=1696]	-22,167	12,656	-1,752	,081	-47,068	2,735

[ID=1697]	-23,833	12,656	-1,883	,061	-48,735	1,068
[ID=1698]	-14,500	12,656	-1,146	,253	-39,401	10,401
[ID=1699]	-26,667	12,656	-2,107	,036	-51,568	-1,765
[ID=1700]	-48,833	12,656	-3,859	,000	-73,735	-23,932
[ID=1701]	-,833	12,656	-,066	,948	-25,735	24,068
[ID=1702]	-16,833	12,656	-1,330	,184	-41,735	8,068
[ID=1703]	-6,000	12,656	-,474	,636	-30,901	18,901
[ID=1704]	-3,333	12,656	-,263	,792	-28,235	21,568
[ID=1705]	-63,333	12,656	-5,004	,000	-88,235	-38,432
[ID=1706]	-14,667	12,656	-1,159	,247	-39,568	10,235
[ID=1707]	-34,500	12,656	-2,726	,007	-59,401	-9,599
[ID=1740]	5,479E-013	12,656	,000	1,000	-24,901	24,901
[ID=1741]	-15,333	12,656	-1,212	,227	-40,235	9,568
[ID=1742]	-6,833	12,656	-,540	,590	-31,735	18,068
[ID=1743]	-49,833	12,656	-3,938	,000	-74,735	-24,932
[ID=1744]	9,667	12,656	,764	,446	-15,235	34,568
[ID=1745]	-24,667	12,656	-1,949	,052	-49,568	,235
[ID=1746]	2,500	12,656	,198	,844	-22,401	27,401
[ID=1749]	-55,167	12,656	-4,359	,000	-80,068	-30,265
[ID=1750]	-28,500	12,656	-2,252	,025	-53,401	-3,599
[ID=1751]	-33,833	12,656	-2,673	,008	-58,735	-8,932
[ID=1752]	-9,167	12,656	-,724	,469	-34,068	15,735
[ID=1753]	-2,667	12,656	-,211	,833	-27,568	22,235
[ID=1754]	-62,667	12,656	-4,952	,000	-87,568	-37,765
[ID=1755]	-56,167	12,656	-4,438	,000	-81,068	-31,265
[ID=1765]	-60,333	12,656	-4,767	,000	-85,235	-35,432
[ID=1766]	-20,500	12,656	-1,620	,106	-45,401	4,401
[ID=1767]	0[a]	.	.	.	.	.

a. This parameter is set to zero because it is redundant.

D. Discussion of findings

D.1. Distribution of postcodes

postnr

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1680	2	2,3	2,3	2,3
	1799	2	2,3	2,3	4,7
	1805	2	2,3	2,3	7,0
	1806	2	2,3	2,3	9,3
	1816	2	2,3	2,3	11,6
	1901	2	2,3	2,3	14,0
	1902	2	2,3	2,3	16,3
	1904	4	4,7	4,7	20,9
	2000	18	20,9	20,9	41,9
	2100	8	9,3	9,3	51,2
	2200	6	7,0	7,0	58,1
	2300	6	7,0	7,0	65,1
	2400	4	4,7	4,7	69,8
	2450	2	2,3	2,3	72,1
	2500	8	9,3	9,3	81,4
	2605	2	2,3	2,3	83,7
	2610	2	2,3	2,3	86,0
	2650	2	2,3	2,3	88,4
	2720	2	2,3	2,3	90,7
	2791	4	4,7	4,7	95,3
	2900	4	4,7	4,7	100,0
	Total	86	100,0	100,0	

D.2. Data extract for Interaction analysis of gender

Analysis of interaction: Gender and saliency

Dependent Variable: y

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	79244,192[a]	44	1801,004	25,672	,000
Intercept	16073,534	1	16073,534	229,114	,000
index	3049,215	1	3049,215	43,464	,000
index * sex	52,006	1	52,006	,741	,394
id	70511,452	41	1719,792	24,514	,000
Error	2876,367	41	70,155		
Total	95334,000	86			
Corrected Total	82120,558	85			

a. R Squared = ,965 (Adjusted R Squared = ,927)

Parameter Estimates

Dependent Variable: y

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	-21,115	6,035	-3,499	,001	-33,304	-8,927
[index=1] * [sex=0]	-17,179	8,577	-2,003	,052	-34,501	,143
[index=1] * [sex=1]	-13,769	2,323	-5,927	,000	-18,461	-9,078
[index=2] * [sex=0]	-6,590	8,577	-,768	,447	-23,912	10,731
[index=2] * [sex=1]	0[a]	.	.	.	.	.
[id=1708]	57,500	8,376	6,865	,000	40,585	74,415
[id=1709]	5,500	8,376	,657	,515	-11,415	22,415
[id=1710]	6,500	8,376	,776	,442	-10,415	23,415
[id=1711]	38,000	8,376	4,537	,000	21,085	54,915
[id=1712]	24,000	8,376	2,865	,007	7,085	40,915
[id=1713]	-7,500	8,376	-,895	,376	-24,415	9,415
[id=1714]	-17,000	8,376	-2,030	,049	-33,915	-,085
[id=1715]	79,500	8,376	9,492	,000	62,585	96,415
[id=1716]	-,500	8,376	-,060	,953	-17,415	16,415
[id=1717]	67,500	8,376	8,059	,000	50,585	84,415
[id=1718]	1,000	8,376	,119	,906	-15,915	17,915
[id=1719]	-1,000	8,376	-,119	,906	-17,915	15,915
[id=1720]	54,500	8,376	6,507	,000	37,585	71,415
[id=1721]	2,000	8,376	,239	,812	-14,915	18,915
[id=1722]	-11,500	8,376	-1,373	,177	-28,415	5,415
[id=1723]	28,500	8,376	3,403	,002	11,585	45,415
[id=1724]	-14,000	8,376	-1,671	,102	-30,915	2,915
[id=1725]	6,500	8,376	,776	,442	-10,415	23,415
[id=1726]	7,000	8,376	,836	,408	-9,915	23,915
[id=1727]	68,500	8,376	8,178	,000	51,585	85,415
[id=1728]	14,500	8,376	1,731	,091	-2,415	31,415
[id=1729]	64,000	8,376	7,641	,000	47,085	80,915
[id=1730]	7,500	8,376	,895	,376	-9,415	24,415
[id=1731]	48,000	8,376	5,731	,000	31,085	64,915
[id=1732]	-3,000	8,376	-,358	,722	-19,915	13,915
[id=1733]	54,000	8,376	6,447	,000	37,085	70,915
[id=1734]	12,000	8,376	1,433	,160	-4,915	28,915
[id=1735]	-11,000	8,376	-1,313	,196	-27,915	5,915
[id=1736]	73,500	8,376	8,775	,000	56,585	90,415
[id=1737]	-4,000	8,376	-,478	,635	-20,915	12,915
[id=1738]	15,000	8,376	1,791	,081	-1,915	31,915
[id=1739]	-7,000	8,376	-,836	,408	-23,915	9,915
[id=1747]	-2,500	8,376	-,298	,767	-19,415	14,415
[id=1748]	74,000	8,376	8,835	,000	57,085	90,915
[id=1756]	-2,000	8,376	-,239	,812	-18,915	14,915
[id=1757]	50,500	8,376	6,029	,000	33,585	67,415

[id=1758]	14,500	8,376	1,731	,091	-2,415	31,415
[id=1759]	-3,500	8,376	-,418	,678	-20,415	13,415
[id=1760]	-17,000	8,376	-2,030	,049	-33,915	-,085
[id=1761]	-3,000	8,376	-,358	,722	-19,915	13,915
[id=1762]	-13,500	8,376	-1,612	,115	-30,415	3,415
[id=1763]	0[a]	.	.	.	.	.
[id=1764]	0[a]	.	.	.	.	.

a. This parameter is set to zero because it is redundant.

Analysis of interaction: Gender and framing effects

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	91122,011[b]	64	1423,781	5,131	,000
Intercept	425,462	1	425,462	1,533	,220
index	18791,630	1	18791,630	67,715	,000
sex	,000	0	.	.	.
index * sex	108,710	1	108,710	,392	,534
ID	71224,956	61	1167,622	4,207	,000
Error	16928,148	61	277,511		
Total	108296,000	126			
Corrected Total	108050,159	125			

a. set_up = 1

b. R Squared = ,843 (Adjusted R Squared = ,679)

Parameter Estimates[a]

Dependent Variable: y_ny

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	30,459	11,938	2,552	,013	6,589	54,330
[index=1]	-22,919	3,873	-5,918	,000	-30,664	-15,174
[index=4]	0[b]	.	.	.	.	.
[sex=0]	12,887	16,929	,761	,449	-20,965	46,739
[sex=1]	0[b]	.	.	.	.	.
[index=1] * [sex=0]	-3,773	6,029	-,626	,534	-15,829	8,282
[index=1] * [sex=1]	0[b]	.	.	.	.	.
[index=4] * [sex=0]	0[b]	.	.	.	.	.
[index=4] * [sex=1]	0[b]	.	.	.	.	.
[ID=1660]	-16,500	16,659	-,990	,326	-49,811	16,811
[ID=1661]	-30,000	16,659	-1,801	,077	-63,311	3,311
[ID=1662]	-17,500	16,659	-1,051	,298	-50,811	15,811
[ID=1663]	24,500	16,659	1,471	,147	-8,811	57,811
[ID=1666]	-44,000	16,659	-2,641	,010	-77,311	-10,689
[ID=1667]	-32,500	16,659	-1,951	,056	-65,811	,811
[ID=1668]	-47,500	16,659	-2,851	,006	-80,811	-14,189
[ID=1669]	-30,000	16,659	-1,801	,077	-63,311	3,311
[ID=1670]	-14,000	16,659	-,840	,404	-47,311	19,311
[ID=1671]	-27,000	16,659	-1,621	,110	-60,311	6,311
[ID=1672]	-18,500	16,659	-1,111	,271	-51,811	14,811
[ID=1673]	-34,000	16,659	-2,041	,046	-67,311	-,689
[ID=1674]	-50,500	16,659	-3,031	,004	-83,811	-17,189
[ID=1675]	-66,000	16,659	-3,962	,000	-99,311	-32,689
[ID=1676]	-33,000	16,659	-1,981	,052	-66,311	,311
[ID=1677]	3,000	16,659	,180	,858	-30,311	36,311
[ID=1678]	-21,500	16,659	-1,291	,202	-54,811	11,811
[ID=1679]	-18,000	16,659	-1,081	,284	-51,311	15,311
[ID=1680]	-25,500	16,659	-1,531	,131	-58,811	7,811
[ID=1681]	19,500	16,659	1,171	,246	-13,811	52,811

[ID=1682]	-39,000	16,659	-2,341	,023	-72,311	-5,689
[ID=1683]	-38,500	16,659	-2,311	,024	-71,811	-5,189
[ID=1684]	-54,000	16,659	-3,242	,002	-87,311	-20,689
[ID=1685]	-36,500	16,659	-2,191	,032	-69,811	-3,189
[ID=1686]	-50,500	16,659	-3,031	,004	-83,811	-17,189
[ID=1687]	9,500	16,659	,570	,571	-23,811	42,811
[ID=1688]	-1,000	16,659	-,060	,952	-34,311	32,311
[ID=1689]	-28,000	16,659	-1,681	,098	-61,311	5,311
[ID=1690]	-36,500	16,659	-2,191	,032	-69,811	-3,189
[ID=1691]	-3,500	16,659	-,210	,834	-36,811	29,811
[ID=1692]	-25,000	16,659	-1,501	,139	-58,311	8,311
[ID=1693]	-58,000	16,659	-3,482	,001	-91,311	-24,689
[ID=1694]	-38,500	16,659	-2,311	,024	-71,811	-5,189
[ID=1695]	-42,500	16,659	-2,551	,013	-75,811	-9,189
[ID=1696]	-47,000	16,659	-2,821	,006	-80,311	-13,689
[ID=1697]	-59,000	16,659	-3,542	,001	-92,311	-25,689
[ID=1698]	-28,500	16,659	-1,711	,092	-61,811	4,811
[ID=1699]	2,000	16,659	,120	,905	-31,311	35,311
[ID=1700]	-43,000	16,659	-2,581	,012	-76,311	-9,689
[ID=1701]	13,000	16,659	,780	,438	-20,311	46,311
[ID=1702]	-43,000	16,659	-2,581	,012	-76,311	-9,689
[ID=1703]	-1,000	16,659	-,060	,952	-34,311	32,311
[ID=1704]	11,500	16,659	,690	,493	-21,811	44,811
[ID=1705]	-62,000	16,659	-3,722	,000	-95,311	-28,689
[ID=1706]	-54,500	16,659	-3,272	,002	-87,811	-21,189
[ID=1707]	8,500	16,659	,510	,612	-24,811	41,811
[ID=1740]	13,000	16,659	,780	,438	-20,311	46,311
[ID=1741]	-43,000	16,659	-2,581	,012	-76,311	-9,689
[ID=1742]	-6,000	16,659	-,360	,720	-39,311	27,311
[ID=1743]	-43,500	16,659	-2,611	,011	-76,811	-10,189
[ID=1744]	15,000	16,659	,900	,371	-18,311	48,311
[ID=1745]	-72,000	16,659	-4,322	,000	-105,311	-38,689
[ID=1746]	21,000	16,659	1,261	,212	-12,311	54,311
[ID=1749]	-63,000	16,659	-3,782	,000	-96,311	-29,689
[ID=1750]	-18,500	16,659	-1,111	,271	-51,811	14,811
[ID=1751]	-4,500	16,659	-,270	,788	-37,811	28,811
[ID=1752]	14,500	16,659	,870	,387	-18,811	47,811
[ID=1753]	0[b]	.	.	.	.	.
[ID=1754]	-46,000	16,659	-2,761	,008	-79,311	-12,689
[ID=1755]	-48,500	16,659	-2,911	,005	-81,811	-15,189
[ID=1765]	-53,000	16,659	-3,182	,002	-86,311	-19,689
[ID=1766]	-12,500	16,659	-,750	,456	-45,811	20,811
[ID=1767]	0[b]	.	.	.	.	.

a. set_up = 1

b. This parameter is set to zero because it is redundant.

Analysis of interaction: Gender and reward incentives

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	77227,234[b]	64	1206,676	7,886	,000
Intercept	21602,406	1	21602,406	141,171	,000
index	8032,433	1	8032,433	52,492	,000
sex	,000	0	.	.	.
index * sex	270,210	1	270,210	1,766	,189
ID	68549,019	61	1123,754	7,344	,000
Error	9334,425	61	153,023		
Total	107519,000	126			
Corrected Total	86561,659	125			

a. set_up = 2

b. R Squared = ,892 (Adjusted R Squared = ,779)

Parameter Estimates[a]

Dependent Variable: y_ny

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	45,622	8,865	5,147	,000	27,896	63,347
[index=2]	-13,243	2,876	-4,605	,000	-18,994	-7,492
[index=5]	0[b]	.	.	.	.	.
[sex=0]	-6,525	12,571	-,519	,606	-31,663	18,612
[sex=1]	0[b]	.	.	.	.	.
[index=2] * [sex=0]	-5,949	4,477	-1,329	,189	-14,901	3,003
[index=2] * [sex=1]	0[b]	.	.	.	.	.
[index=5] * [sex=0]	0[b]	.	.	.	.	.
[index=5] * [sex=1]	0[b]	.	.	.	.	.
[ID=1660]	-4,500	12,370	-,364	,717	-29,236	20,236
[ID=1661]	-14,500	12,370	-1,172	,246	-39,236	10,236
[ID=1662]	-10,000	12,370	-,808	,422	-34,736	14,736
[ID=1663]	-33,000	12,370	-2,668	,010	-57,736	-8,264
[ID=1666]	-34,000	12,370	-2,749	,008	-58,736	-9,264
[ID=1667]	-3,000	12,370	-,243	,809	-27,736	21,736
[ID=1668]	-68,500	12,370	-5,537	,000	-93,236	-43,764
[ID=1669]	-31,500	12,370	-2,546	,013	-56,236	-6,764
[ID=1670]	-9,500	12,370	-,768	,445	-34,236	15,236
[ID=1671]	-30,500	12,370	-2,466	,017	-55,236	-5,764
[ID=1672]	-6,500	12,370	-,525	,601	-31,236	18,236
[ID=1673]	-34,000	12,370	-2,749	,008	-58,736	-9,264
[ID=1674]	-69,500	12,370	-5,618	,000	-94,236	-44,764
[ID=1675]	5,000	12,370	,404	,687	-19,736	29,736
[ID=1676]	-11,500	12,370	-,930	,356	-36,236	13,236
[ID=1677]	-60,500	12,370	-4,891	,000	-85,236	-35,764
[ID=1678]	-36,000	12,370	-2,910	,005	-60,736	-11,264
[ID=1679]	-3,500	12,370	-,283	,778	-28,236	21,236
[ID=1680]	16,000	12,370	1,293	,201	-8,736	40,736
[ID=1681]	4,000	12,370	,323	,748	-20,736	28,736
[ID=1682]	10,500	12,370	,849	,399	-14,236	35,236
[ID=1683]	-31,000	12,370	-2,506	,015	-55,736	-6,264
[ID=1684]	-41,500	12,370	-3,355	,001	-66,236	-16,764
[ID=1685]	-48,500	12,370	-3,921	,000	-73,236	-23,764
[ID=1686]	-19,000	12,370	-1,536	,130	-43,736	5,736
[ID=1687]	-20,000	12,370	-1,617	,111	-44,736	4,736
[ID=1688]	-2,000	12,370	-,162	,872	-26,736	22,736
[ID=1689]	-50,000	12,370	-4,042	,000	-74,736	-25,264
[ID=1690]	-16,000	12,370	-1,293	,201	-40,736	8,736
[ID=1691]	-52,500	12,370	-4,244	,000	-77,236	-27,764
[ID=1692]	-13,000	12,370	-1,051	,297	-37,736	11,736
[ID=1693]	7,500	12,370	,606	,547	-17,236	32,236
[ID=1694]	-56,000	12,370	-4,527	,000	-80,736	-31,264
[ID=1695]	-46,500	12,370	-3,759	,000	-71,236	-21,764
[ID=1696]	-1,500	12,370	-,121	,904	-26,236	23,236
[ID=1697]	-1,500	12,370	-,121	,904	-26,236	23,236
[ID=1698]	-2,500	12,370	-,202	,841	-27,236	22,236
[ID=1699]	-37,000	12,370	-2,991	,004	-61,736	-12,264
[ID=1700]	-46,500	12,370	-3,759	,000	-71,236	-21,764
[ID=1701]	-8,000	12,370	-,647	,520	-32,736	16,736
[ID=1702]	1,500	12,370	,121	,904	-23,236	26,236
[ID=1703]	-6,000	12,370	-,485	,629	-30,736	18,736
[ID=1704]	-8,000	12,370	-,647	,520	-32,736	16,736
[ID=1705]	-59,000	12,370	-4,770	,000	-83,736	-34,264
[ID=1706]	13,500	12,370	1,091	,279	-11,236	38,236
[ID=1707]	-56,500	12,370	-4,567	,000	-81,236	-31,764
[ID=1740]	-9,500	12,370	-,768	,445	-34,236	15,236
[ID=1741]	,500	12,370	,040	,968	-24,236	25,236
[ID=1742]	-5,000	12,370	-,404	,687	-29,736	19,736

[ID=1743]	-47,000	12,370	-3,799	,000	-71,736	-22,264
[ID=1744]	12,000	12,370	,970	,336	-12,736	36,736
[ID=1745]	2,000	12,370	,162	,872	-22,736	26,736
[ID=1746]	-8,000	12,370	-,647	,520	-32,736	16,736
[ID=1749]	-38,000	12,370	-3,072	,003	-62,736	-13,264
[ID=1750]	-33,500	12,370	-2,708	,009	-58,236	-8,764
[ID=1751]	-43,500	12,370	-3,516	,001	-68,236	-18,764
[ID=1752]	-1,500	12,370	-,121	,904	-26,236	23,236
[ID=1753]	0[b]	.	.	.	.	.
[ID=1754]	-72,500	12,370	-5,861	,000	-97,236	-47,764
[ID=1755]	-61,000	12,370	-4,931	,000	-85,736	-36,264
[ID=1765]	-64,000	12,370	-5,174	,000	-88,736	-39,264
[ID=1766]	-3,500	12,370	-,283	,778	-28,236	21,236
[ID=1767]	0[b]	.	.	.	.	.

a. set_up = 2

b. This parameter is set to zero because it is redundant.

Analysis of interaction: Gender and audience effects

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	70535,750[b]	64	1102,121	5,905	,000
Intercept	12047,758	1	12047,758	64,552	,000
index	4218,996	1	4218,996	22,605	,000
sex	,000	0	.	.	.
index * sex	250,108	1	250,108	1,340	,252
ID	66294,455	61	1086,794	5,823	,000
Error	11384,861	61	186,637		
Total	94381,000	126			
Corrected Total	81920,611	125			

a. set_up = 3

b. R Squared = ,861 (Adjusted R Squared = ,715)

Parameter Estimates[a]

Dependent Variable: y_ny

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	42,946	9,790	4,387	,000	23,370	62,522
[index=3]	-8,892	3,176	-2,800	,007	-15,243	-2,541
[index=6]	0[b]	.	.	.	.	.
[sex=0]	-6,638	13,883	-,478	,634	-34,400	21,123
[sex=1]	0[b]	.	.	.	.	.
[index=3] * [sex=0]	-5,723	4,944	-1,158	,252	-15,610	4,163
[index=3] * [sex=1]	0[b]	.	.	.	.	.
[index=6] * [sex=0]	0[b]	.	.	.	.	.
[index=6] * [sex=1]	0[b]	.	.	.	.	.
[ID=1660]	-3,000	13,662	-,220	,827	-30,318	24,318
[ID=1661]	-29,500	13,662	-2,159	,035	-56,818	-2,182
[ID=1662]	-6,500	13,662	-,476	,636	-33,818	20,818
[ID=1663]	-20,500	13,662	-1,501	,139	-47,818	6,818
[ID=1666]	-28,000	13,662	-2,050	,045	-55,318	-,682
[ID=1667]	-40,500	13,662	-2,965	,004	-67,818	-13,182
[ID=1668]	-48,000	13,662	-3,514	,001	-75,318	-20,682
[ID=1669]	-12,000	13,662	-,878	,383	-39,318	15,318
[ID=1670]	-7,500	13,662	-,549	,585	-34,818	19,818
[ID=1671]	-37,000	13,662	-2,708	,009	-64,318	-9,682
[ID=1672]	-7,500	13,662	-,549	,585	-34,818	19,818
[ID=1673]	-16,000	13,662	-1,171	,246	-43,318	11,318
[ID=1674]	-6,500	13,662	-,476	,636	-33,818	20,818
[ID=1675]	-65,000	13,662	-4,758	,000	-92,318	-37,682

[ID=1676]	-5,000	13,662	-,366	,716	-32,318	22,318
[ID=1677]	-19,000	13,662	-1,391	,169	-46,318	8,318
[ID=1678]	-28,500	13,662	-2,086	,041	-55,818	-1,182
[ID=1679]	-7,000	13,662	-,512	,610	-34,318	20,318
[ID=1680]	-28,500	13,662	-2,086	,041	-55,818	-1,182
[ID=1681]	-80,000	13,662	-5,856	,000	-107,318	-52,682
[ID=1682]	-,500	13,662	-,037	,971	-27,818	26,818
[ID=1683]	-31,500	13,662	-2,306	,025	-58,818	-4,182
[ID=1684]	-44,500	13,662	-3,257	,002	-71,818	-17,182
[ID=1685]	-46,500	13,662	-3,404	,001	-73,818	-19,182
[ID=1686]	-37,500	13,662	-2,745	,008	-64,818	-10,182
[ID=1687]	-11,000	13,662	-,805	,424	-38,318	16,318
[ID=1688]	2,500	13,662	,183	,855	-24,818	29,818
[ID=1689]	-7,500	13,662	-,549	,585	-34,818	19,818
[ID=1690]	-16,500	13,662	-1,208	,232	-43,818	10,818
[ID=1691]	-39,000	13,662	-2,855	,006	-66,318	-11,682
[ID=1692]	-9,000	13,662	-,659	,513	-36,318	18,318
[ID=1693]	3,000	13,662	,220	,827	-24,318	30,318
[ID=1694]	-51,000	13,662	-3,733	,000	-78,318	-23,682
[ID=1695]	-46,500	13,662	-3,404	,001	-73,818	-19,182
[ID=1696]	-10,000	13,662	-,732	,467	-37,318	17,318
[ID=1697]	-3,000	13,662	-,220	,827	-30,318	24,318
[ID=1698]	-4,500	13,662	-,329	,743	-31,818	22,818
[ID=1699]	-45,000	13,662	-3,294	,002	-72,318	-17,682
[ID=1700]	-57,000	13,662	-4,172	,000	-84,318	-29,682
[ID=1701]	-7,500	13,662	-,549	,585	-34,818	19,818
[ID=1702]	-1,000	13,662	-,073	,942	-28,318	26,318
[ID=1703]	-3,000	13,662	-,220	,827	-30,318	24,318
[ID=1704]	-13,500	13,662	-,988	,327	-40,818	13,818
[ID=1705]	-61,000	13,662	-4,465	,000	-88,318	-33,682
[ID=1706]	5,000	13,662	,366	,716	-22,318	32,318
[ID=1707]	-55,500	13,662	-4,063	,000	-82,818	-28,182
[ID=1740]	-3,500	13,662	-,256	,799	-30,818	23,818
[ID=1741]	4,500	13,662	,329	,743	-22,818	31,818
[ID=1742]	-1,500	13,662	-,110	,913	-28,818	25,818
[ID=1743]	-59,000	13,662	-4,319	,000	-86,318	-31,682
[ID=1744]	10,000	13,662	,732	,467	-17,318	37,318
[ID=1745]	4,000	13,662	,293	,771	-23,318	31,318
[ID=1746]	-5,500	13,662	-,403	,689	-32,818	21,818
[ID=1749]	-56,500	13,662	-4,136	,000	-83,818	-29,182
[ID=1750]	-33,500	13,662	-2,452	,017	-60,818	-6,182
[ID=1751]	-45,500	13,662	-3,331	,001	-72,818	-18,182
[ID=1752]	-40,500	13,662	-2,965	,004	-67,818	-13,182
[ID=1753]	0[b]	.	.	.	.	.
[ID=1754]	-69,500	13,662	-5,087	,000	-96,818	-42,182
[ID=1755]	-59,000	13,662	-4,319	,000	-86,318	-31,682
[ID=1765]	-64,000	13,662	-4,685	,000	-91,318	-36,682
[ID=1766]	-45,500	13,662	-3,331	,001	-72,818	-18,182
[ID=1767]	0[b]	.	.	.	.	.

a. set_up = 3

b. This parameter is set to zero because it is redundant.

D.3. Data extract for Interaction analysis of age

Analysis of interaction: Age and saliency

Dependent Variable: y

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	79514,339[a]	46	1728,573	25,867	,000
Intercept	10767,935	1	10767,935	161,134	,000
index	1225,607	1	1225,607	18,340	,000
age	,000	0	.	.	.
index * age	322,153	3	107,384	1,607	,203
id	71849,631	39	1842,298	27,569	,000
Error	2606,219	39	66,826		
Total	95334,000	86			
Corrected Total	82120,558	85			

a. R Squared = ,968 (Adjusted R Squared = ,931)

Parameter Estimates

Dependent Variable: y

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
[index=1] * [age=0]	-40,000	7,080	-5,650	,000	-54,320	-25,680
[index=1] * [age=1]	-33,500	5,939	-5,641	,000	-45,512	-21,488
[index=1] * [age=2]	-22,094	5,958	-3,708	,001	-34,146	-10,042
[index=1] * [age=3]	-53,500	6,180	-8,658	,000	-65,999	-41,001
[index=2] * [age=0]	-32,000	7,080	-4,520	,000	-46,320	-17,680
[index=2] * [age=1]	-22,500	5,939	-3,789	,001	-34,512	-10,488
[index=2] * [age=2]	-4,906	5,958	-,823	,415	-16,958	7,146
[index=2] * [age=3]	-46,500	6,180	-7,525	,000	-58,999	-34,001
[id=1708]	43,000	8,175	5,260	,000	26,465	59,535
[id=1709]	-14,000	8,175	-1,713	,095	-30,535	2,535
[id=1710]	6,500	8,175	,795	,431	-10,035	23,035
[id=1711]	33,000	8,175	4,037	,000	16,465	49,535
[id=1712]	9,500	8,175	1,162	,252	-7,035	26,035
[id=1713]	-12,500	8,175	-1,529	,134	-29,035	4,035
[id=1714]	1,426E-013	8,175	,000	1,000	-16,535	16,535
[id=1715]	74,500	8,175	9,113	,000	57,965	91,035
[id=1716]	-15,000	8,175	-1,835	,074	-31,535	1,535
[id=1717]	67,500	8,175	8,257	,000	50,965	84,035
[id=1718]	1,000	8,175	,122	,903	-15,535	17,535
[id=1719]	-15,500	8,175	-1,896	,065	-32,035	1,035
[id=1720]	54,500	8,175	6,667	,000	37,965	71,035
[id=1721]	10,000	8,175	1,223	,229	-6,535	26,535
[id=1722]	10,500	8,175	1,284	,207	-6,035	27,035
[id=1723]	45,500	8,175	5,566	,000	28,965	62,035
[id=1724]	-28,500	8,175	-3,486	,001	-45,035	-11,965
[id=1725]	-8,000	8,175	-,979	,334	-24,535	8,535
[id=1726]	-12,500	8,175	-1,529	,134	-29,035	4,035
[id=1727]	68,500	8,175	8,379	,000	51,965	85,035
[id=1728]	-5,000	8,175	-,612	,544	-21,535	11,535
[id=1729]	44,500	8,175	5,444	,000	27,965	61,035
[id=1730]	7,500	8,175	,917	,365	-9,035	24,035
[id=1731]	48,000	8,175	5,872	,000	31,465	64,535
[id=1732]	0[a]	.	.	.	.	.
[id=1733]	76,000	8,175	9,297	,000	59,465	92,535
[id=1734]	-7,500	8,175	-,917	,365	-24,035	9,035
[id=1735]	-16,000	8,175	-1,957	,058	-32,535	,535
[id=1736]	95,500	8,175	11,682	,000	78,965	112,035
[id=1737]	-9,000	8,175	-1,101	,278	-25,535	7,535
[id=1738]	,500	8,175	,061	,952	-16,035	17,035

[id=1739]	-21,500	8,175	-2,630	,012	-38,035	-4,965
[id=1747]	-22,000	8,175	-2,691	,010	-38,535	-5,465
[id=1748]	96,000	8,175	11,744	,000	79,465	112,535
[id=1756]	-21,500	8,175	-2,630	,012	-38,035	-4,965
[id=1757]	50,500	8,175	6,178	,000	33,965	67,035
[id=1758]	0[a]	.	.	.	.	.
[id=1759]	-3,500	8,175	-,428	,671	-20,035	13,035
[id=1760]	0[a]	.	.	.	.	.
[id=1761]	-3,000	8,175	-,367	,716	-19,535	13,535
[id=1762]	-13,500	8,175	-1,651	,107	-30,035	3,035
[id=1763]	-5,000	8,175	-,612	,544	-21,535	11,535
[id=1764]	0[a]	.	.	.	.	.

a. This parameter is set to zero because it is redundant.

Analysis of interaction: Age and framing effects

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	91112,446[b]	65	1401,730	4,965	,000
Intercept	154,644	1	154,644	,548	,462
index	9971,542	1	9971,542	35,323	,000
age	,000	0	.	.	.
index * age	99,145	2	49,572	,176	,839
ID	70337,744	60	1172,296	4,153	,000
Error	16937,712	60	282,295		
Total	108296,000	126			
Corrected Total	108050,159	125			

a. set_up = 1

b. R Squared = ,843 (Adjusted R Squared = ,673)

Parameter Estimatesa

Dependent Variable: y_ny

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	35,083	12,832	2,734	,008	9,415	60,752
[index=1]	-19,167	9,700	-1,976	,053	-38,570	,237
[index=4]	0[b]	.	.	.	.	.
[age=1]	-3,736	17,599	-,212	,833	-38,940	31,468
[age=2]	-56,274	17,679	-3,183	,002	-91,637	-20,911
[age=3]	0[b]	.	.	.	.	.
[index=1] * [age=1]	-5,528	10,478	-,528	,600	-26,486	15,431
[index=1] * [age=2]	-6,452	10,999	-,587	,560	-28,454	15,549
[index=1] * [age=3]	0[b]	.	.	.	.	.
[index=4] * [age=1]	0[b]	.	.	.	.	.
[index=4] * [age=2]	0[b]	.	.	.	.	.
[index=4] * [age=3]	0[b]	.	.	.	.	.
[ID=1660]	-16,500	16,802	-,982	,330	-50,108	17,108
[ID=1661]	-19,000	16,802	-1,131	,263	-52,608	14,608
[ID=1662]	-17,500	16,802	-1,042	,302	-51,108	16,108
[ID=1663]	24,500	16,802	1,458	,150	-9,108	58,108
[ID=1666]	-33,000	16,802	-1,964	,054	-66,608	,608
[ID=1667]	-32,500	16,802	-1,934	,058	-66,108	1,108
[ID=1668]	-47,500	16,802	-2,827	,006	-81,108	-13,892
[ID=1669]	34,000	16,802	2,024	,047	,392	67,608
[ID=1670]	-14,000	16,802	-,833	,408	-47,608	19,608
[ID=1671]	-16,000	16,802	-,952	,345	-49,608	17,608
[ID=1672]	-18,500	16,802	-1,101	,275	-52,108	15,108
[ID=1673]	30,000	16,802	1,786	,079	-3,608	63,608

[ID=1674]	-50,500	16,802	-3,006	,004	-84,108	-16,892
[ID=1675]	-55,000	16,802	-3,273	,002	-88,608	-21,392
[ID=1676]	20,000	16,802	1,190	,239	-13,608	53,608
[ID=1677]	3,000	16,802	,179	,859	-30,608	36,608
[ID=1678]	-21,500	16,802	-1,280	,206	-55,108	12,108
[ID=1679]	-18,000	16,802	-1,071	,288	-51,608	15,608
[ID=1680]	38,500	16,802	2,291	,025	4,892	72,108
[ID=1681]	19,500	16,802	1,161	,250	-14,108	53,108
[ID=1682]	25,000	16,802	1,488	,142	-8,608	58,608
[ID=1683]	25,500	16,802	1,518	,134	-8,108	59,108
[ID=1684]	-43,000	16,802	-2,559	,013	-76,608	-9,392
[ID=1685]	-43,000	16,802	-2,559	,013	-76,608	-9,392
[ID=1686]	-50,500	16,802	-3,006	,004	-84,108	-16,892
[ID=1687]	9,500	16,802	,565	,574	-24,108	43,108
[ID=1688]	63,000	16,802	3,750	,000	29,392	96,608
[ID=1689]	-28,000	16,802	-1,667	,101	-61,608	5,608
[ID=1690]	-36,500	16,802	-2,172	,034	-70,108	-2,892
[ID=1691]	-3,500	16,802	-,208	,836	-37,108	30,108
[ID=1692]	-25,000	16,802	-1,488	,142	-58,608	8,608
[ID=1693]	-58,000	16,802	-3,452	,001	-91,608	-24,392
[ID=1694]	-38,500	16,802	-2,291	,025	-72,108	-4,892
[ID=1695]	21,500	16,802	1,280	,206	-12,108	55,108
[ID=1696]	17,000	16,802	1,012	,316	-16,608	50,608
[ID=1697]	-48,000	16,802	-2,857	,006	-81,608	-14,392
[ID=1698]	-17,500	16,802	-1,042	,302	-51,108	16,108
[ID=1699]	55,000	16,802	3,273	,002	21,392	88,608
[ID=1700]	-49,500	16,802	-2,946	,005	-83,108	-15,892
[ID=1701]	66,000	16,802	3,928	,000	32,392	99,608
[ID=1702]	21,000	16,802	1,250	,216	-12,608	54,608
[ID=1703]	10,000	16,802	,595	,554	-23,608	43,608
[ID=1704]	64,500	16,802	3,839	,000	30,892	98,108
[ID=1705]	-51,000	16,802	-3,035	,004	-84,608	-17,392
[ID=1706]	9,500	16,802	,565	,574	-24,108	43,108
[ID=1707]	61,500	16,802	3,660	,001	27,892	95,108
[ID=1740]	6,500	16,802	,387	,700	-27,108	40,108
[ID=1741]	21,000	16,802	1,250	,216	-12,608	54,608
[ID=1742]	5,000	16,802	,298	,767	-28,608	38,608
[ID=1743]	9,500	16,802	,565	,574	-24,108	43,108
[ID=1744]	19,500	16,802	1,161	,250	-14,108	53,108
[ID=1745]	-8,000	16,802	-,476	,636	-41,608	25,608
[ID=1746]	74,000	16,802	4,404	,000	40,392	107,608
[ID=1749]	-52,000	16,802	-3,095	,003	-85,608	-18,392
[ID=1750]	-25,000	16,802	-1,488	,142	-58,608	8,608
[ID=1751]	0[b]	.	.	.	.	.
[ID=1752]	14,500	16,802	,863	,392	-19,108	48,108
[ID=1753]	11,000	16,802	,655	,515	-22,608	44,608
[ID=1754]	-46,000	16,802	-2,738	,008	-79,608	-12,392
[ID=1755]	4,500	16,802	,268	,790	-29,108	38,108
[ID=1765]	0[b]	.	.	.	.	.
[ID=1766]	-12,500	16,802	-,744	,460	-46,108	21,108
[ID=1767]	0[b]	.	.	.	.	.

a. set_up = 1

b. This parameter is set to zero because it is redundant.

Analysis of interaction: Age and reward incentives

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	77469,867[b]	65	1191,844	7,865	,000
Intercept	10827,100	1	10827,100	71,452	,000
index	6691,441	1	6691,441	44,159	,000

age	,000	0	.	.	.
index * age	512,843	2	256,422	1,692	,193
ID	68765,712	60	1146,095	7,563	,000
Error	9091,792	60	151,530		
Total	107519,000	126			
Corrected Total	86561,659	125			

a. set_up = 2
b. R Squared = ,895 (Adjusted R Squared = ,781)

Parameter Estimatesa
Dependent Variable: y_ny

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	-,583	9,402	-,062	,951	-19,390	18,223
[index=2]	-26,833	7,107	-3,776	,000	-41,050	-12,617
[index=5]	0b	.	.	.	.	.
[age=1]	46,125	12,894	3,577	,001	20,333	71,917
[age=2]	-15,917	12,952	-1,229	,224	-41,825	9,992
[age=3]	0b	.	.	.	.	.
[index=2] * [age=1]	13,750	7,676	1,791	,078	-1,605	29,105
[index=2] * [age=2]	9,833	8,059	1,220	,227	-6,286	25,953
[index=2] * [age=3]	0b	.	.	.	.	.
[index=5] * [age=1]	0b	.	.	.	.	.
[index=5] * [age=2]	0b	.	.	.	.	.
[index=5] * [age=3]	0b	.	.	.	.	.
[ID=1660]	-4,500	12,310	-,366	,716	-29,123	20,123
[ID=1661]	-24,000	12,310	-1,950	,056	-48,623	,623
[ID=1662]	-10,000	12,310	-,812	,420	-34,623	14,623
[ID=1663]	-33,000	12,310	-2,681	,009	-57,623	-8,377
[ID=1666]	-43,500	12,310	-3,534	,001	-68,123	-18,877
[ID=1667]	-3,000	12,310	-,244	,808	-27,623	21,623
[ID=1668]	-68,500	12,310	-5,565	,000	-93,123	-43,877
[ID=1669]	23,000	12,310	1,868	,067	-1,623	47,623
[ID=1670]	-9,500	12,310	-,772	,443	-34,123	15,123
[ID=1671]	-40,000	12,310	-3,249	,002	-64,623	-15,377
[ID=1672]	-6,500	12,310	-,528	,599	-31,123	18,123
[ID=1673]	20,500	12,310	1,665	,101	-4,123	45,123
[ID=1674]	-69,500	12,310	-5,646	,000	-94,123	-44,877
[ID=1675]	-4,500	12,310	-,366	,716	-29,123	20,123
[ID=1676]	52,500	12,310	4,265	,000	27,877	77,123
[ID=1677]	-60,500	12,310	-4,915	,000	-85,123	-35,877
[ID=1678]	-36,000	12,310	-2,925	,005	-60,623	-11,377
[ID=1679]	-3,500	12,310	-,284	,777	-28,123	21,123
[ID=1680]	70,500	12,310	5,727	,000	45,877	95,123
[ID=1681]	4,000	12,310	,325	,746	-20,623	28,623
[ID=1682]	65,000	12,310	5,280	,000	40,377	89,623
[ID=1683]	23,500	12,310	1,909	,061	-1,123	48,123
[ID=1684]	-51,000	12,310	-4,143	,000	-75,623	-26,377
[ID=1685]	4,500	12,310	,366	,716	-20,123	29,123
[ID=1686]	-19,000	12,310	-1,543	,128	-43,623	5,623
[ID=1687]	-20,000	12,310	-1,625	,109	-44,623	4,623
[ID=1688]	52,500	12,310	4,265	,000	27,877	77,123
[ID=1689]	-50,000	12,310	-4,062	,000	-74,623	-25,377
[ID=1690]	-16,000	12,310	-1,300	,199	-40,623	8,623
[ID=1691]	-52,500	12,310	-4,265	,000	-77,123	-27,877
[ID=1692]	-13,000	12,310	-1,056	,295	-37,623	11,623
[ID=1693]	7,500	12,310	,609	,545	-17,123	32,123
[ID=1694]	-56,000	12,310	-4,549	,000	-80,623	-31,377
[ID=1695]	8,000	12,310	,650	,518	-16,623	32,623
[ID=1696]	53,000	12,310	4,306	,000	28,377	77,623
[ID=1697]	-11,000	12,310	-,894	,375	-35,623	13,623
[ID=1698]	-12,000	12,310	-,975	,334	-36,623	12,623
[ID=1699]	27,000	12,310	2,193	,032	2,377	51,623

[ID=1700]	6,500	12,310	,528	,599	-18,123	31,123
[ID=1701]	56,000	12,310	4,549	,000	31,377	80,623
[ID=1702]	56,000	12,310	4,549	,000	31,377	80,623
[ID=1703]	-15,500	12,310	-1,259	,213	-40,123	9,123
[ID=1704]	56,000	12,310	4,549	,000	31,377	80,623
[ID=1705]	-68,500	12,310	-5,565	,000	-93,123	-43,877
[ID=1706]	68,000	12,310	5,524	,000	43,377	92,623
[ID=1707]	7,500	12,310	,609	,545	-17,123	32,123
[ID=1740]	43,500	12,310	3,534	,001	18,877	68,123
[ID=1741]	55,000	12,310	4,468	,000	30,377	79,623
[ID=1742]	-14,500	12,310	-1,178	,243	-39,123	10,123
[ID=1743]	17,000	12,310	1,381	,172	-7,623	41,623
[ID=1744]	55,500	12,310	4,509	,000	30,877	80,123
[ID=1745]	56,500	12,310	4,590	,000	31,877	81,123
[ID=1746]	56,000	12,310	4,549	,000	31,377	80,623
[ID=1749]	-47,500	12,310	-3,859	,000	-72,123	-22,877
[ID=1750]	19,500	12,310	1,584	,118	-5,123	44,123
[ID=1751]	0[b]	.	.	.	.	.
[ID=1752]	-1,500	12,310	-,122	,903	-26,123	23,123
[ID=1753]	-9,500	12,310	-,772	,443	-34,123	15,123
[ID=1754]	-72,500	12,310	-5,890	,000	-97,123	-47,877
[ID=1755]	3,000	12,310	,244	,808	-21,623	27,623
[ID=1765]	0[b]	.	.	.	.	.
[ID=1766]	-3,500	12,310	-,284	,777	-28,123	21,123
[ID=1767]	0[b]	.	.	.	.	.

a. set_up = 2

b. This parameter is set to zero because it is redundant.

Analysis of interaction: Age and audience effects

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	70996,762[b]	65	1092,258	5,999	,000
Intercept	6665,389	1	6665,389	36,610	,000
index	4300,156	1	4300,156	23,619	,000
age	,000	0	.	.	.
index * age	711,119	2	355,560	1,953	,151
ID	65926,063	60	1098,768	6,035	,000
Error	10923,849	60	182,064		
Total	94381,000	126			
Corrected Total	81920,611	125			

a. set_up = 3

b. R Squared = ,867 (Adjusted R Squared = ,722)

Parameter Estimatesa

Dependent Variable: y_ny

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	-3,833	10,306	-,372	,711	-24,447	16,781
[index=3]	-25,333	7,790	-3,252	,002	-40,916	-9,751
[index=6]	0[b]	.	.	.	.	.
[age=1]	46,694	14,134	3,304	,002	18,423	74,966
[age=2]	-15,881	14,198	-1,119	,268	-44,280	12,518
[age=3]	0[b]	.	.	.	.	.
[index=3] * [age=1]	16,611	8,414	1,974	,053	-,220	33,442
[index=3] * [age=2]	13,762	8,833	1,558	,125	-3,907	31,431
[index=3] * [age=3]	0[b]	.	.	.	.	.
[index=6] * [age=1]	0[b]	.	.	.	.	.
[index=6] * [age=2]	0[b]	.	.	.	.	.

[index=6] * [age=3]	0[b]	.	.	.	.	.
[ID=1660]	-3,000	13,493	-,222	,825	-29,990	23,990
[ID=1661]	-39,000	13,493	-2,890	,005	-65,990	-12,010
[ID=1662]	-6,500	13,493	-,482	,632	-33,490	20,490
[ID=1663]	-20,500	13,493	-1,519	,134	-47,490	6,490
[ID=1666]	-37,500	13,493	-2,779	,007	-64,490	-10,510
[ID=1667]	-40,500	13,493	-3,002	,004	-67,490	-13,510
[ID=1668]	-48,000	13,493	-3,557	,001	-74,990	-21,010
[ID=1669]	42,500	13,493	3,150	,003	15,510	69,490
[ID=1670]	-7,500	13,493	-,556	,580	-34,490	19,490
[ID=1671]	-46,500	13,493	-3,446	,001	-73,490	-19,510
[ID=1672]	-7,500	13,493	-,556	,580	-34,490	19,490
[ID=1673]	38,500	13,493	2,853	,006	11,510	65,490
[ID=1674]	-6,500	13,493	-,482	,632	-33,490	20,490
[ID=1675]	-74,500	13,493	-5,521	,000	-101,490	-47,510
[ID=1676]	59,000	13,493	4,373	,000	32,010	85,990
[ID=1677]	-19,000	13,493	-1,408	,164	-45,990	7,990
[ID=1678]	-28,500	13,493	-2,112	,039	-55,490	-1,510
[ID=1679]	-7,000	13,493	-,519	,606	-33,990	19,990
[ID=1680]	26,000	13,493	1,927	,059	-,990	52,990
[ID=1681]	-80,000	13,493	-5,929	,000	-106,990	-53,010
[ID=1682]	54,000	13,493	4,002	,000	27,010	80,990
[ID=1683]	23,000	13,493	1,705	,093	-3,990	49,990
[ID=1684]	-54,000	13,493	-4,002	,000	-80,990	-27,010
[ID=1685]	8,500	13,493	,630	,531	-18,490	35,490
[ID=1686]	-37,500	13,493	-2,779	,007	-64,490	-10,510
[ID=1687]	-11,000	13,493	-,815	,418	-37,990	15,990
[ID=1688]	57,000	13,493	4,224	,000	30,010	83,990
[ID=1689]	-7,500	13,493	-,556	,580	-34,490	19,490
[ID=1690]	-16,500	13,493	-1,223	,226	-43,490	10,490
[ID=1691]	-39,000	13,493	-2,890	,005	-65,990	-12,010
[ID=1692]	-9,000	13,493	-,667	,507	-35,990	17,990
[ID=1693]	3,000	13,493	,222	,825	-23,990	29,990
[ID=1694]	-51,000	13,493	-3,780	,000	-77,990	-24,010
[ID=1695]	8,000	13,493	,593	,555	-18,990	34,990
[ID=1696]	44,500	13,493	3,298	,002	17,510	71,490
[ID=1697]	-12,500	13,493	-,926	,358	-39,490	14,490
[ID=1698]	-14,000	13,493	-1,038	,304	-40,990	12,990
[ID=1699]	19,000	13,493	1,408	,164	-7,990	45,990
[ID=1700]	-2,000	13,493	-,148	,883	-28,990	24,990
[ID=1701]	56,500	13,493	4,187	,000	29,510	83,490
[ID=1702]	53,500	13,493	3,965	,000	26,510	80,490
[ID=1703]	-12,500	13,493	-,926	,358	-39,490	14,490
[ID=1704]	50,500	13,493	3,743	,000	23,510	77,490
[ID=1705]	-70,500	13,493	-5,225	,000	-97,490	-43,510
[ID=1706]	59,500	13,493	4,410	,000	32,510	86,490
[ID=1707]	8,500	13,493	,630	,531	-18,490	35,490
[ID=1740]	51,500	13,493	3,817	,000	24,510	78,490
[ID=1741]	59,000	13,493	4,373	,000	32,010	85,990
[ID=1742]	-11,000	13,493	-,815	,418	-37,990	15,990
[ID=1743]	5,000	13,493	,371	,712	-21,990	31,990
[ID=1744]	55,500	13,493	4,113	,000	28,510	82,490
[ID=1745]	58,500	13,493	4,336	,000	31,510	85,490
[ID=1746]	58,500	13,493	4,336	,000	31,510	85,490
[ID=1749]	-66,000	13,493	-4,891	,000	-92,990	-39,010
[ID=1750]	21,500	13,493	1,593	,116	-5,490	48,490
[ID=1751]	0[b]	.	.	.	.	.
[ID=1752]	-40,500	13,493	-3,002	,004	-67,490	-13,510
[ID=1753]	-9,500	13,493	-,704	,484	-36,490	17,490
[ID=1754]	-69,500	13,493	-5,151	,000	-96,490	-42,510
[ID=1755]	5,000	13,493	,371	,712	-21,990	31,990
[ID=1765]	0[b]	.	.	.	.	.
[ID=1766]	-45,500	13,493	-3,372	,001	-72,490	-18,510
[ID=1767]	0[b]	.	.	.	.	.

a. set_up = 3
b. This parameter is set to zero because it is redundant.

D.4. Data extract for Interaction analysis of exercise level

Analysis of interaction: Exercise level and saliency

Dependent Variable: y

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	79443,732[a]	46	1727,038	25,162	,000
Intercept	146,261	1	146,261	2,131	,152
montion	,000	0	.	.	.
index	1159,679	1	1159,679	16,896	,000
montion * index	251,546	3	83,849	1,222	,315
id	62462,895	39	1601,613	23,335	,000
Error	2676,826	39	68,637		
Total	95334,000	86			
Corrected Total	82120,558	85			

a. R Squared = ,967 (Adjusted R Squared = ,929)

Parameter Estimates

Dependent Variable: y

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
[montion=1] * [index=1]	33,000	8,285	3,983	,000	16,243	49,757
[montion=1] * [index=2]	46,000	8,285	5,552	,000	29,243	62,757
[montion=2] * [index=1]	-45,923	6,079	-7,554	,000	-58,220	-33,626
[montion=2] * [index=2]	-37,077	6,079	-6,099	,000	-49,374	-24,780
[montion=3] * [index=1]	-34,480	5,974	-5,771	,000	-46,564	-22,396
[montion=3] * [index=2]	-21,520	5,974	-3,602	,001	-33,604	-9,436
[montion=4] * [index=1]	9,250	6,550	1,412	,166	-3,998	22,498
[montion=4] * [index=2]	30,750	6,550	4,695	,000	17,502	43,998
[id=1708]	71,000	8,285	8,570	,000	54,243	87,757
[id=1709]	14,000	8,285	1,690	,099	-2,757	30,757
[id=1710]	6,500	8,285	,785	,437	-10,257	23,257
[id=1711]	33,000	8,285	3,983	,000	16,243	49,757
[id=1712]	24,000	8,285	2,897	,006	7,243	40,757
[id=1713]	1,000	8,285	,121	,905	-15,757	17,757
[id=1714]	-22,000	8,285	-2,655	,011	-38,757	-5,243
[id=1715]	88,000	8,285	10,622	,000	71,243	104,757
[id=1716]	-,500	8,285	-,060	,952	-17,257	16,257
[id=1717]	0[a]	.	.	.	.	.
[id=1718]	1,000	8,285	,121	,905	-15,757	17,757
[id=1719]	-1,000	8,285	-,121	,905	-17,757	15,757
[id=1720]	68,000	8,285	8,208	,000	51,243	84,757
[id=1721]	15,500	8,285	1,871	,069	-1,257	32,257
[id=1722]	-11,500	8,285	-1,388	,173	-28,257	5,257
[id=1723]	-24,500	8,285	-2,957	,005	-41,257	-7,743
[id=1724]	-62,000	8,285	-7,484	,000	-78,757	-45,243
[id=1725]	-41,500	8,285	-5,009	,000	-58,257	-24,743
[id=1726]	2,000	8,285	,241	,811	-14,757	18,757
[id=1727]	68,500	8,285	8,268	,000	51,743	85,257
[id=1728]	9,500	8,285	1,147	,258	-7,257	26,257
[id=1729]	59,000	8,285	7,122	,000	42,243	75,757
[id=1730]	21,000	8,285	2,535	,015	4,243	37,757
[id=1731]	0[a]	.	.	.	.	.
[id=1732]	5,500	8,285	,664	,511	-11,257	22,257
[id=1733]	54,000	8,285	6,518	,000	37,243	70,757
[id=1734]	20,500	8,285	2,474	,018	3,743	37,257
[id=1735]	-16,000	8,285	-1,931	,061	-32,757	,757
[id=1736]	87,000	8,285	10,501	,000	70,243	103,757
[id=1737]	-9,000	8,285	-1,086	,284	-25,757	7,757

[id=1738]	15,000	8,285	1,811	,078	-1,757	31,757
[id=1739]	-7,000	8,285	-,845	,403	-23,757	9,757
[id=1747]	-7,500	8,285	-,905	,371	-24,257	9,257
[id=1748]	87,500	8,285	10,562	,000	70,743	104,257
[id=1756]	-7,000	8,285	-,845	,403	-23,757	9,757
[id=1757]	64,000	8,285	7,725	,000	47,243	80,757
[id=1758]	14,500	8,285	1,750	,088	-2,257	31,257
[id=1759]	-3,500	8,285	-,422	,675	-20,257	13,257
[id=1760]	-22,000	8,285	-2,655	,011	-38,757	-5,243
[id=1761]	-3,000	8,285	-,362	,719	-19,757	13,757
[id=1762]	0[a]	.	.	.	.	.
[id=1763]	-5,000	8,285	-,604	,550	-21,757	11,757
[id=1764]	0[a]	.	.	.	.	.

a. This parameter is set to zero because it is redundant.

Analysis of interaction: Exercise level and framing effects

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	92641,983[b]	69	1342,637	4,880	,000
Intercept	490,334	1	490,334	1,782	,187
index	4596,794	1	4596,794	16,707	,000
Exercise	,000	0	.	.	.
index * Exercise	1628,681	6	271,447	,987	,443
ID	68729,074	56	1227,305	4,461	,000
Error	15408,176	56	275,146		
Total	108296,000	126			
Corrected Total	108050,159	125			

a. set_up = 1

b. R Squared = ,857 (Adjusted R Squared = ,682)

Parameter Estimates[a]

Dependent Variable: y_ny

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	1,294E-013	16,588	,000	1,000	-33,229	33,229
[index=1]	-28,000	23,458	-1,194	,238	-74,993	18,993
[index=4]	0[b]	.	.	.	.	.
[Exercise=0]	-10,800	20,982	-,515	,609	-52,831	31,231
[Exercise=1]	50,250	21,943	2,290	,026	6,292	94,208
[Exercise=2]	-16,533	20,540	-,805	,424	-57,680	24,613
[Exercise=3]	31,297	20,421	1,533	,131	-9,611	72,205
[Exercise=4]	-13,000	20,794	-,625	,534	-54,655	28,655
[Exercise=5]	-18,000	23,458	-,767	,446	-64,993	28,993
[Exercise=6]	0[b]	.	.	.	.	.
[index=1] * [Exercise=0]	14,600	25,697	,568	,572	-36,878	66,078
[index=1] * [Exercise=1]	-12,500	28,730	-,435	,665	-70,054	45,054
[index=1] * [Exercise=2]	7,067	24,228	,292	,772	-41,467	55,600
[index=1] * [Exercise=3]	3,406	23,822	,143	,887	-44,315	51,127
[index=1] * [Exercise=4]	-10,000	25,078	-,399	,692	-60,237	40,237
[index=1] * [Exercise=5]	29,000	33,175	,874	,386	-37,458	95,458
[index=1] * [Exercise=6]	0[b]	.	.	.	.	.
[index=4] * [Exercise=0]	0[b]	.	.	.	.	.
[index=4] * [Exercise=1]	0[b]	.	.	.	.	.
[index=4] * [Exercise=2]	0[b]	.	.	.	.	.
[index=4] * [Exercise=3]	0[b]	.	.	.	.	.
[index=4] * [Exercise=4]	0[b]	.	.	.	.	.
[index=4] * [Exercise=5]	0[b]	.	.	.	.	.
[index=4] * [Exercise=6]	0[b]	.	.	.	.	.
[ID=1660]	29,500	16,588	1,778	,081	-3,729	62,729

[ID=1661]	27,000	16,588	1,628	,109	-6,229	60,229
[ID=1662]	28,500	16,588	1,718	,091	-4,729	61,729
[ID=1663]	24,500	16,588	1,477	,145	-8,729	57,729
[ID=1666]	0[b]	.	.	.	.	.
[ID=1667]	-32,500	16,588	-1,959	,055	-65,729	,729
[ID=1668]	-47,500	16,588	-2,864	,006	-80,729	-14,271
[ID=1669]	-19,000	16,588	-1,145	,257	-52,229	14,229
[ID=1670]	-14,000	16,588	-,844	,402	-47,229	19,229
[ID=1671]	-16,000	16,588	-,965	,339	-49,229	17,229
[ID=1672]	32,500	16,588	1,959	,055	-,729	65,729
[ID=1673]	28,000	16,588	1,688	,097	-5,229	61,229
[ID=1674]	-4,500	16,588	-,271	,787	-37,729	28,729
[ID=1675]	-9,000	16,588	-,543	,590	-42,229	24,229
[ID=1676]	3,500	16,588	,211	,834	-29,729	36,729
[ID=1677]	39,500	16,588	2,381	,021	6,271	72,729
[ID=1678]	15,000	16,588	,904	,370	-18,229	48,229
[ID=1679]	33,000	16,588	1,989	,052	-,229	66,229
[ID=1680]	22,000	16,588	1,326	,190	-11,229	55,229
[ID=1681]	19,500	16,588	1,176	,245	-13,729	52,729
[ID=1682]	-28,000	16,588	-1,688	,097	-61,229	5,229
[ID=1683]	23,500	16,588	1,417	,162	-9,729	56,729
[ID=1684]	8,000	16,588	,482	,631	-25,229	41,229
[ID=1685]	0[b]	.	.	.	.	.
[ID=1686]	-50,500	16,588	-3,044	,004	-83,729	-17,271
[ID=1687]	9,500	16,588	,573	,569	-23,729	42,729
[ID=1688]	10,000	16,588	,603	,549	-23,229	43,229
[ID=1689]	23,000	16,588	1,387	,171	-10,229	56,229
[ID=1690]	0[b]	.	.	.	.	.
[ID=1691]	-3,500	16,588	-,211	,834	-36,729	29,729
[ID=1692]	21,000	16,588	1,266	,211	-12,229	54,229
[ID=1693]	-12,000	16,588	-,723	,472	-45,229	21,229
[ID=1694]	-38,500	16,588	-2,321	,024	-71,729	-5,271
[ID=1695]	-31,500	16,588	-1,899	,063	-64,729	1,729
[ID=1696]	-36,000	16,588	-2,170	,034	-69,229	-2,771
[ID=1697]	-48,000	16,588	-2,894	,005	-81,229	-14,771
[ID=1698]	-17,500	16,588	-1,055	,296	-50,729	15,729
[ID=1699]	2,000	16,588	,121	,904	-31,229	35,229
[ID=1700]	-43,000	16,588	-2,592	,012	-76,229	-9,771
[ID=1701]	59,000	16,588	3,557	,001	25,771	92,229
[ID=1702]	-32,000	16,588	-1,929	,059	-65,229	1,229
[ID=1703]	56,000	16,588	3,376	,001	22,771	89,229
[ID=1704]	57,500	16,588	3,466	,001	24,271	90,729
[ID=1705]	0[b]	.	.	.	.	.
[ID=1706]	-43,500	16,588	-2,622	,011	-76,729	-10,271
[ID=1707]	8,500	16,588	,512	,610	-24,729	41,729
[ID=1740]	59,000	16,588	3,557	,001	25,771	92,229
[ID=1741]	-32,000	16,588	-1,929	,059	-65,229	1,229
[ID=1742]	51,000	16,588	3,075	,003	17,771	84,229
[ID=1743]	-43,500	16,588	-2,622	,011	-76,729	-10,271
[ID=1744]	72,000	16,588	4,341	,000	38,771	105,229
[ID=1745]	-15,000	16,588	-,904	,370	-48,229	18,229
[ID=1746]	21,000	16,588	1,266	,211	-12,229	54,229
[ID=1749]	-52,000	16,588	-3,135	,003	-85,229	-18,771
[ID=1750]	-29,500	16,588	-1,778	,081	-62,729	3,729
[ID=1751]	6,500	16,588	,392	,697	-26,729	39,729
[ID=1752]	14,500	16,588	,874	,386	-18,729	47,729
[ID=1753]	0[b]	.	.	.	.	.
[ID=1754]	0[b]	.	.	.	.	.
[ID=1755]	-48,500	16,588	-2,924	,005	-81,729	-15,271
[ID=1765]	-53,000	16,588	-3,195	,002	-86,229	-19,771
[ID=1766]	-12,500	16,588	-,754	,454	-45,729	20,729
[ID=1767]	0[b]	.	.	.	.	.

a. set_up = 1

b. This parameter is set to zero because it is redundant.

Analysis of interaction: Exercise level and reward incentives

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	79190,068[b]	69	1147,682	8,719	,000
Intercept	4001,682	1	4001,682	30,400	,000
index	2291,932	1	2291,932	17,411	,000
Exercise	,000	0	.	.	.
index * Exercise	2233,045	6	372,174	2,827	,018
ID	62823,690	56	1121,852	8,522	,000
Error	7371,590	56	131,636		
Total	107519,000	126			
Corrected Total	86561,659	125			

a. set_up = 2
b. R Squared = ,915 (Adjusted R Squared = ,810)

Parameter Estimates[a]

Dependent Variable: y_ny

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	-9,000	11,473	-,784	,436	-31,984	13,984
[index=2]	9,000	16,226	,555	,581	-23,504	41,504
[index=5]	0[b]	.	.	.	.	.
[Exercise=0]	35,700	14,513	2,460	,017	6,628	64,772
[Exercise=1]	61,000	15,178	4,019	,000	30,595	91,405
[Exercise=2]	-20,833	14,207	-1,466	,148	-49,294	7,627
[Exercise=3]	56,828	14,125	4,023	,000	28,533	85,124
[Exercise=4]	-8,143	14,382	-,566	,574	-36,954	20,669
[Exercise=5]	11,000	16,226	,678	,501	-21,504	43,504
[Exercise=6]	0[b]	.	.	.	.	.
[index=2] * [Exercise=0]	-16,400	17,774	(-,923	,360	-52,006	19,206
[index=2] * [Exercise=1]	-54,000	19,872	-2,717	,009	-93,809	-14,191
[index=2] * [Exercise=2]	-16,333	16,758	-,975	,334	-49,903	17,236
[index=2] * [Exercise=3]	-26,656	16,477	-1,618	,111	-59,664	6,352
[index=2] * [Exercise=4]	-33,714	17,346	-1,944	,057	-68,462	1,034
[index=2] * [Exercise=5]	-32,000	22,947	-1,395	,169	-77,967	13,967
[index=2] * [Exercise=6]	0[b]	.	.	.	.	.
[index=5] * [Exercise=0]	0[b]	.	.	.	.	.
[index=5] * [Exercise=1]	0[b]	.	.	.	.	.
[index=5] * [Exercise=2]	0[b]	.	.	.	.	.
[index=5] * [Exercise=3]	0[b]	.	.	.	.	.
[index=5] * [Exercise=4]	0[b]	.	.	.	.	.
[index=5] * [Exercise=5]	0[b]	.	.	.	.	.
[index=5] * [Exercise=6]	0[b]	.	.	.	.	.
[ID=1660]	68,000	11,473	5,927	,000	45,016	90,984
[ID=1661]	48,500	11,473	4,227	,000	25,516	71,484
[ID=1662]	62,500	11,473	5,447	,000	39,516	85,484
[ID=1663]	-33,000	11,473	-2,876	,006	-55,984	-10,016
[ID=1666]	0[b]	.	.	.	.	.
[ID=1667]	-3,000	11,473	-,261	,795	-25,984	19,984
[ID=1668]	-68,500	11,473	-5,970	,000	-91,484	-45,516
[ID=1669]	-41,000	11,473	-3,574	,001	-63,984	-18,016
[ID=1670]	-9,500	11,473	-,828	,411	-32,484	13,484
[ID=1671]	-40,000	11,473	-3,486	,001	-62,984	-17,016
[ID=1672]	62,000	11,473	5,404	,000	39,016	84,984
[ID=1673]	25,000	11,473	2,179	,034	2,016	47,984
[ID=1674]	3,000	11,473	,261	,795	-19,984	25,984
[ID=1675]	68,000	11,473	5,927	,000	45,016	90,984
[ID=1676]	4,500	11,473	,392	,696	-18,484	27,484

[ID=1677]	-44,500	11,473	-3,879	,000	-67,484	-21,516
[ID=1678]	-20,000	11,473	-1,743	,087	-42,984	2,984
[ID=1679]	65,000	11,473	5,665	,000	42,016	87,984
[ID=1680]	22,500	11,473	1,961	,055	-,484	45,484
[ID=1681]	4,000	11,473	,349	,729	-18,984	26,984
[ID=1682]	1,000	11,473	,087	,931	-21,984	23,984
[ID=1683]	28,000	11,473	2,440	,018	5,016	50,984
[ID=1684]	17,500	11,473	1,525	,133	-5,484	40,484
[ID=1685]	0[b]	.	.	.	.	.
[ID=1686]	-19,000	11,473	-1,656	,103	-41,984	3,984
[ID=1687]	-20,000	11,473	-1,743	,087	-42,984	2,984
[ID=1688]	-11,500	11,473	-1,002	,320	-34,484	11,484
[ID=1689]	18,500	11,473	1,612	,112	-4,484	41,484
[ID=1690]	0[b]	.	.	.	.	.
[ID=1691]	-52,500	11,473	-4,576	,000	-75,484	-29,516
[ID=1692]	59,500	11,473	5,186	,000	36,516	82,484
[ID=1693]	80,000	11,473	6,973	,000	57,016	102,984
[ID=1694]	-56,000	11,473	-4,881	,000	-78,984	-33,016
[ID=1695]	-56,000	11,473	-4,881	,000	-78,984	-33,016
[ID=1696]	-11,000	11,473	-,959	,342	-33,984	11,984
[ID=1697]	-11,000	11,473	-,959	,342	-33,984	11,984
[ID=1698]	-12,000	11,473	-1,046	,300	-34,984	10,984
[ID=1699]	-37,000	11,473	-3,225	,002	-59,984	-14,016
[ID=1700]	-46,500	11,473	-4,053	,000	-69,484	-23,516
[ID=1701]	64,500	11,473	5,622	,000	41,516	87,484
[ID=1702]	-8,000	11,473	-,697	,489	-30,984	14,984
[ID=1703]	57,000	11,473	4,968	,000	34,016	79,984
[ID=1704]	64,500	11,473	5,622	,000	41,516	87,484
[ID=1705]	0[b]	.	.	.	.	.
[ID=1706]	4,000	11,473	,349	,729	-18,984	26,984
[ID=1707]	-56,500	11,473	-4,924	,000	-79,484	-33,516
[ID=1740]	63,000	11,473	5,491	,000	40,016	85,984
[ID=1741]	-9,000	11,473	-,784	,436	-31,984	13,984
[ID=1742]	58,000	11,473	5,055	,000	35,016	80,984
[ID=1743]	-47,000	11,473	-4,096	,000	-69,984	-24,016
[ID=1744]	75,000	11,473	6,537	,000	52,016	97,984
[ID=1745]	65,000	11,473	5,665	,000	42,016	87,984
[ID=1746]	-8,000	11,473	-,697	,489	-30,984	14,984
[ID=1749]	-47,500	11,473	-4,140	,000	-70,484	-24,516
[ID=1750]	-24,000	11,473	-2,092	,041	-46,984	-1,016
[ID=1751]	-53,000	11,473	-4,619	,000	-75,984	-30,016
[ID=1752]	-1,500	11,473	-,131	,896	-24,484	21,484
[ID=1753]	0[b]	.	.	.	.	.
[ID=1754]	0[b]	.	.	.	.	.
[ID=1755]	-61,000	11,473	-5,317	,000	-83,984	-38,016
[ID=1765]	-64,000	11,473	-5,578	,000	-86,984	-41,016
[ID=1766]	-3,500	11,473	-,305	,761	-26,484	19,484
[ID=1767]	0[b]	.	.	.	.	.

a. set_up = 2

b. This parameter is set to zero because it is redundant.

Analysis of interaction: Exercise level and audience effects

Dependent Variable: y_ny

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	72189,211[b]	69	1046,220	6,021	,000
Intercept	4526,547	1	4526,547	26,048	,000
index	2686,451	1	2686,451	15,459	,000
Exercise	,000	0	.	.	.
index * Exercise	1903,568	6	317,261	1,826	,111
ID	58833,379	56	1050,596	6,046	,000
Error	9731,400	56	173,775		

Total	94381,000	126			
Corrected Total	81920,611	125			

a. set_up = 3
b. R Squared = ,881 (Adjusted R Squared = ,735)

Parameter Estimates[a]

Dependent Variable: y_ny

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	1,000	13,182	,076	,940	-25,407	27,407
[index=3]	1,722E-013	18,643	,000	1,000	-37,346	37,346
[index=6]	0[b]	.	.	.	.	.
[Exercise=0]	29,300	16,675	1,757	,084	-4,103	62,703
[Exercise=1]	49,000	17,439	2,810	,007	14,066	83,934
[Exercise=2]	-29,700	16,323	-1,819	,074	-62,400	3,000
[Exercise=3]	43,250	16,229	2,665	,010	10,740	75,760
[Exercise=4]	-28,500	16,525	-1,725	,090	-61,604	4,604
[Exercise=5]	12,000	18,643	,644	,522	-25,346	49,346
[Exercise=6]	0[b]	.	.	.	.	.
[index=3] * [Exercise=0]	-16,600	20,422	-,813	,420	-57,510	24,310
[index=3] * [Exercise=1]	-42,000	22,833	-1,839	,071	-87,739	3,739
[index=3] * [Exercise=2]	-4,600	19,254	-,239	,812	-43,171	33,971
[index=3] * [Exercise=3]	-11,500	18,932	-,607	,546	-49,425	26,425
[index=3] * [Exercise=4]	-9,000	19,930	-,452	,653	-48,924	30,924
[index=3] * [Exercise=5]	-42,000	26,365	-1,593	,117	-94,815	10,815
[index=3] * [Exercise=6]	0[b]	.	.	.	.	.
[index=6] * [Exercise=0]	0[b]	.	.	.	.	.
[index=6] * [Exercise=1]	0[b]	.	.	.	.	.
[index=6] * [Exercise=2]	0[b]	.	.	.	.	.
[index=6] * [Exercise=3]	0[b]	.	.	.	.	.
[index=6] * [Exercise=4]	0[b]	.	.	.	.	.
[index=6] * [Exercise=5]	0[b]	.	.	.	.	.
[index=6] * [Exercise=6]	0[b]	.	.	.	.	.
[ID=1660]	66,500	13,182	5,045	,000	40,093	92,907
[ID=1661]	30,500	13,182	2,314	,024	4,093	56,907
[ID=1662]	63,000	13,182	4,779	,000	36,593	89,407
[ID=1663]	-20,500	13,182	-1,555	,126	-46,907	5,907
[ID=1666]	0[b]	.	.	.	.	.
[ID=1667]	-40,500	13,182	-3,072	,003	-66,907	-14,093
[ID=1668]	-48,000	13,182	-3,641	,001	-74,407	-21,593
[ID=1669]	-21,500	13,182	-1,631	,109	-47,907	4,907
[ID=1670]	-7,500	13,182	-,569	,572	-33,907	18,907
[ID=1671]	-46,500	13,182	-3,527	,001	-72,907	-20,093
[ID=1672]	63,000	13,182	4,779	,000	36,593	89,407
[ID=1673]	45,000	13,182	3,414	,001	18,593	71,407
[ID=1674]	63,000	13,182	4,779	,000	36,593	89,407
[ID=1675]	-5,000	13,182	-,379	,706	-31,407	21,407
[ID=1676]	11,500	13,182	,872	,387	-14,907	37,907
[ID=1677]	-2,500	13,182	-,190	,850	-28,907	23,907
[ID=1678]	-12,000	13,182	-,910	,367	-38,407	14,407
[ID=1679]	63,500	13,182	4,817	,000	37,093	89,907
[ID=1680]	-21,500	13,182	-1,631	,109	-47,907	4,907
[ID=1681]	-80,000	13,182	-6,069	,000	-106,407	-53,593
[ID=1682]	-10,000	13,182	-,759	,451	-36,407	16,407
[ID=1683]	29,500	13,182	2,238	,029	3,093	55,907
[ID=1684]	16,500	13,182	1,252	,216	-9,907	42,907
[ID=1685]	0[b]	.	.	.	.	.
[ID=1686]	-37,500	13,182	-2,845	,006	-63,907	-11,093
[ID=1687]	-11,000	13,182	-,834	,408	-37,407	15,407
[ID=1688]	-7,000	13,182	-,531	,598	-33,407	19,407
[ID=1689]	63,000	13,182	4,779	,000	36,593	89,407
[ID=1690]	0[b]	.	.	.	.	.

[ID=1691]	-39,000	13,182	-2,958	,005	-65,407	-12,593
[ID=1692]	60,500	13,182	4,589	,000	34,093	86,907
[ID=1693]	72,500	13,182	5,500	,000	46,093	98,907
[ID=1694]	-51,000	13,182	-3,869	,000	-77,407	-24,593
[ID=1695]	-56,000	13,182	-4,248	,000	-82,407	-29,593
[ID=1696]	-19,500	13,182	-1,479	,145	-45,907	6,907
[ID=1697]	-12,500	13,182	-,948	,347	-38,907	13,907
[ID=1698]	-14,000	13,182	-1,062	,293	-40,407	12,407
[ID=1699]	-45,000	13,182	-3,414	,001	-71,407	-18,593
[ID=1700]	-57,000	13,182	-4,324	,000	-83,407	-30,593
[ID=1701]	62,000	13,182	4,703	,000	35,593	88,407
[ID=1702]	-10,500	13,182	-,797	,429	-36,907	15,907
[ID=1703]	57,000	13,182	4,324	,000	30,593	83,407
[ID=1704]	56,000	13,182	4,248	,000	29,593	82,407
[ID=1705]	0[b]	.	.	.	.	.
[ID=1706]	-4,500	13,182	-,341	,734	-30,907	21,907
[ID=1707]	-55,500	13,182	-4,210	,000	-81,907	-29,093
[ID=1740]	66,000	13,182	5,007	,000	39,593	92,407
[ID=1741]	-5,000	13,182	-,379	,706	-31,407	21,407
[ID=1742]	58,500	13,182	4,438	,000	32,093	84,907
[ID=1743]	-59,000	13,182	-4,476	,000	-85,407	-32,593
[ID=1744]	70,000	13,182	5,310	,000	43,593	96,407
[ID=1745]	64,000	13,182	4,855	,000	37,593	90,407
[ID=1746]	-5,500	13,182	-,417	,678	-31,907	20,907
[ID=1749]	-66,000	13,182	-5,007	,000	-92,407	-39,593
[ID=1750]	-24,000	13,182	-1,821	,074	-50,407	2,407
[ID=1751]	-55,000	13,182	-4,172	,000	-81,407	-28,593
[ID=1752]	-40,500	13,182	-3,072	,003	-66,907	-14,093
[ID=1753]	0[b]	.	.	.	.	.
[ID=1754]	0[b]	.	.	.	.	.
[ID=1755]	-59,000	13,182	-4,476	,000	-85,407	-32,593
[ID=1765]	-64,000	13,182	-4,855	,000	-90,407	-37,593
[ID=1766]	-45,500	13,182	-3,452	,001	-71,907	-19,093
[ID=1767]	0[b]	.	.	.	.	.

a. set_up = 3

b. This parameter is set to zero because it is redundant.