Toward Healthy Snack Choices

The Impact of Self-Regulation and Financial Incentives on Consumers' Food Intake

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The President:

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VORWORT

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ABSTRACT

The prevalence of overweight and obesity is at an alarming rate, also in Switzerland. Of the many factors associated with rising obesity, food industry marketing practices that are linked with increased consumption are among the most criticized factors (e.g., Seiders and Petty 2004, p. 154). Therefore, marketers of food items in the entire food chain, from primary producers to retailers, are eager to position themselves as health friendly in response to consumers' growing health consciousness.

Many people want to resist temptations and have good intentions to eat healthily but in the end fail to act on their intentions. Why is it so difficult to act on intentions or maintain attempts for changing health behavior, even for people who seem to be motivated? This so-called intention-behavior-gap has recently started to attract substantial attention and currently is one of the most researched aspects of health behavior.

The present study provides the first integrated analysis of the two topics self-regulation and financial incentives within the food domain. The aim of this thesis is to analyze the impact of self-regulation strategies and financial incentives in overcoming unhealthy snacking habits. In a 2x2-factorial design, the two motivational approaches are experimentally tested. Furthermore, it is examined which of these approaches have a stronger influence and whether interactions might accrue. Thereby, not only the perceived self-reported behavior is surveyed, but also the actual consumed snacking behavior is observed.

The results reveal that both self-regulation strategies and financial incentives positively reinforce consumers' choice of healthy snacks. Moreover, the results indicate that the combined effect seems to be overlapping rather than additive suggesting that financial incentives are possibly internalized by individuals, indicating that intrinsic and extrinsic interventions are interrelated.

Based on this analysis, the aim of this study is to derive implications to enhance healthier food choices. Thereto, along a road map a number of marketing tools are developed to conceptualize possible activities for the actors of the food industry following a holistic sustainable approach.

ZUSAMMENFASSUNG

Die Verbreitung von Übergewicht und Adipositas ist besorgniserregend, auch in der Schweiz. Von den vielen Faktoren, die im Zusammenhang mit Übergewicht stehen, werden die Marketingaktivitäten der Lebensmittelindustrie besonders stark kritisiert (Seiders and Petty 2004, p. 154). Daher ist es im Interesse von Marketingverantwortlichen der Food Industrie ihre Produkte und Services dem steigenden Gesundheitsbewusstsein der Konsumenten anzupassen.

Viele Menschen sind sich ihres ungesunden Ernährungsverhaltens sehr wohl bewusst. Dennoch verändern sie ihr Verhalten nicht. Weshalb reicht eine Intention, sich gesund zu ernähren, nicht aus, dieses Verhalten tatsächlich auszuführen? Diese Intentions-Verhaltens-Lücke gilt es zu analysieren.

Die vorliegende Arbeit liefert erstmals eine integrierte Untersuchung der beiden Themenfelder Selbst-Regulation und finanzielle Anreize im Ernährungsbereich. Im Rahmen eines 2x2-faktoriellen Experimentaldesigns wird getestet, inwieweit Selbst-Regulationsstrategien und finanzielle Anreize sowie deren Kombination dazu beitragen können, die ungesunden Snack-Gewohnheiten zu überwinden. Dabei wird nicht nur das wahrgenommene Verhalten abgefragt, sondern es wird auch das tatsächliche Verhalten in Form von konsumierten Produkten beobachtet.

Die Ergebnisse zeigen, dass sowohl Selbst-Regulationsstrategien und finanzielle Anreize gesundes Snackverhalten unterstützen. Darüber hinaus zeigen die Ergebnisse, dass die Kombination beider Faktoren nicht wirksamer ist als die der beiden Einzelfaktoren. Dieser Befund deutet darauf hin, dass die Verhaltenswirksamkeit beider Faktoren über denselben Prozess verläuft.

Basierend auf dieser Analyse ist es das Ziel, Handlungsimplikationen abzuleiten, um die Motivation der Konsumenten für ein gesundes Ernährungsverhalten zu steuern. Hierzu wurden basierend auf einer Roadmap zahlreiche Marketinginstrumente entwickelt, um Gestaltungsoptionen für die verschiedenen Akteure der Food-Industrie zu konzeptionalisieren. Dabei wurde ein holistischer, nachhaltiger Ansatz verfolgt.

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1 Introduction

1.1 Research Problem

"Fat Camp" on MTV, "The Biggest Loser" on NBC, and "Huge" on ABC are reality television shows in the United States enjoying increasing demand. All three shows document about people trying to lose weight and doing more exercise to overcome overweight and obesity. Similar television shows exist in Europe, for example, the show "African adventure – German teens battle their way through"[1] that entertains during the current summer break family households in Germany. The reality television format presents unscripted dramatic or humorous situations, and documents actual events usually featuring ordinary people. The reasons for the great demand of these shows are manifold e.g., similarity to self, desire to see the contestant win or lose (Young and Irwin 2006, p. 335).

The large demand for such weight control reality television shows might be explained by Taylor et al.'s (2006) study results which report that in general, people are aware that they consume more food and calories and eat more frequently than what they consider good, but more so for others than themselves. They perceive their own and other people's consumption behavior as irrational in the sense that they believe that they would be better off if they would consume less and care more about their future well-being (Stutzer 2007, p. 5). This irrationality implies that the big problem of overweight and obesity is consumers' self-control. An article by Akst (2009) in the Wall Street Journal puts it in a nutshell: "No one puts a gun to our heads and commands that we overeat and lead the life of a couch potato."[2] People do things as a result of circumstances, ignorance, and perhaps most of all, weakness of will.

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[1] The television show is called in German: „Abenteuer Afrika – Deutsche Teenies beissen sich durch". The show is about overweight adolescents who are living for three weeks with the African tribe Ju'/hoansi in the Namibian Kalahari Desert.

[2] Couch potato is a person who watches a lot of television and does not have an active style of life. University of Cambridge (1995), *Cambridge International Dictionary of English*, Cambridge, UK: Cambridge University Press.

1.1.1 The Prevalence of Obesity

The prevalence of overweight and obesity[3] is increasing at an alarming rate and has become a major challenge. Obesity, or excessive fatness, is not a new phenomenon; however, it is startling that overweight and obesity is increasing worldwide (Haslam 2007, p. 32).

As of 2005, according to the World Health Organization (WHO), worldwide 1.6 billion adults are overweight, at least 400 million adults are obese, and at least 20 million children under the age of 5 years are overweight. For the year 2015 the WHO predicts 2.3 billion of adults to be overweight and 700 million to be obese. In Europe, 400 million adults are overweight and 130 million obese, and 10-13% of deaths are attributable to complications from obesity (World Health Organization 2006).

Half or more of the adult population is now defined as being either overweight or obese in 13 Organisation for Economic Co-operation and Development (OECD) countries: Mexico, the United States, the United Kingdom, Australia, Greece, New Zealand, Luxembourg, Hungary, the Czech Republic, Portugal, Ireland, Spain, and Iceland. By comparison, overweight and obesity rates are much lower in Japan and Korea and in some European countries such as France and Switzerland, although these countries' rates are increasing as well (see Table 1).

[3] To calculate if a person is overweight or obese the body mass index (BMI) can be used which is a statistical measure of bodyweight on the basis on a person's weight and height. Details about the BMI can be found in Appendix 1.

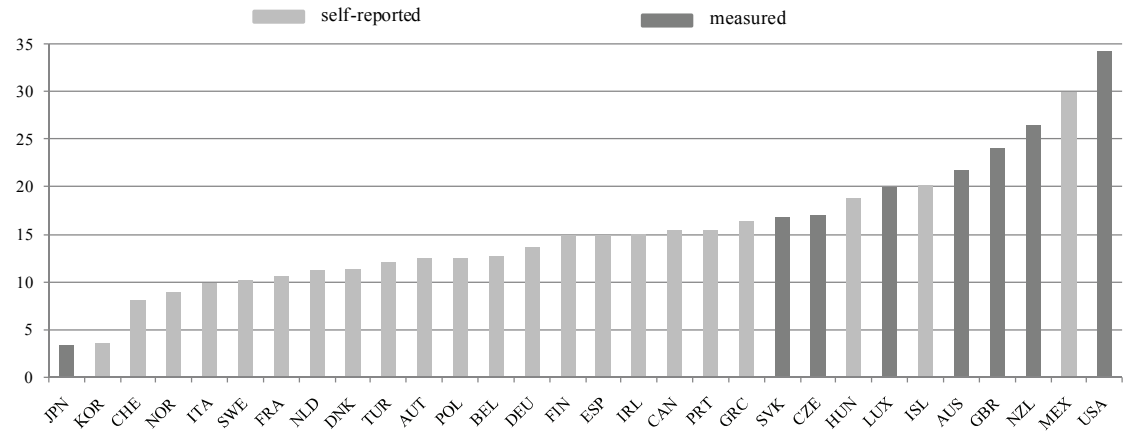
Table 1: Overweight and Obese Population Aged 15 Years and Older

	Females (in Percentages)			Males (in Percentages)			Total (in Percentages)		
	Overweight	Obese	Overweight and Obese	Overweight	Obese	Overweight and Obese	Overweight	Obese	Overweight and Obese
Australia	28.2	21.4	49.6	45.3	21.9	67.2	36.7	21.7	58.4
Austria	29.9	12.7	42.6	44.9	12.0	56.9	35.3	12.4	47.7
Belgium	24.4	13.4	37.8	38.7	11.9	50.6	31.4	12.7	44.1
Canada	24.9	14.3	39.2	38.0	16.5	54.5	31.4	15.4	46.8
Czech Republic	29.0	17.0	46.0	42.0	18.0	60.0	35.0	17.0	52.0
Denmark	26.4	11.8	38.2	40.9	11.0	51.9	33.2	11.4	44.6
Finland	28.8	14.0	42.8	40.7	16.0	56.7	34.0	14.9	48.9
France	21.2	10.4	31.6	32.0	10.5	42.5	26.5	10.5	37.0
Germany	28.7	12.8	41.5	43.5	14.4	57.9	36.0	13.6	49.6
Greece	34.9	18.3	53.2	48.1	14.3	62.4	41.3	16.4	57.7
Hungary	29.8	18.0	47.8	38.7	19.6	58.3	34.0	18.8	52.8
Iceland	32.2	21.3	53.5	47.7	18.9	66.6	40.1	20.1	60.2
Ireland	28.0	13.0	41.0	43.0	16.0	59.0	36.0	15.0	51.0
Italy	27.6	9.2	36.8	44.3	10.6	54.9	35.6	9.9	45.5
Japan	18.1	3.3	21.4	26.3	3.4	29.7	21.8	3.4	25.1
Korea	23.7	3.3	27.0	30.3	3.7	34.0	27.0	3.5	30.5
Luxembourg	25.6	18.8	44.3	41.5	20.9	62.4	34.7	20.0	54.8
Mexico	37.4	34.5	71.9	42.5	24.2	66.7	39.5	30.0	69.5
Netherlands	27.7	12.2	39.9	40.9	10.2	51.1	34.3	11.2	45.5
New Zealand	30.6	27.0	57.6	41.7	26.0	67.7	36.2	26.5	62.6
Norway	26.0	8.0	34.0	43.0	9.0	52.0	34.0	9.0	43.0
Poland	26.6	12.5	39.1	39.5	12.6	52.1	32.8	12.5	45.3
Portugal	31.4	16.1	47.5	41.4	14.6	56.0	36.2	15.4	51.6
Slovak Republic	24.4	15.9	40.3	39.5	18.1	57.6	29.5	16.7	46.2
Spain	28.6	14.7	43.4	43.6	15.1	58.6	36.2	14.9	51.1
Sweden	26.2	10.1	36.3	41.6	10.3	51.9	33.8	10.2	44.0
Switzerland	20.9	7.7	28.6	37.8	8.6	46.3	29.2	8.1	37.3
Turkey	28.9	14.5	43.4	33.6	9.7	43.3	31.6	12.0	43.4
United Kingdom	32.0	24.4	56.4	41.4	23.6	65.1	36.7	24.0	61.0
United States	26.2	35.3	61.5	40.0	33.3	73.3	33.0	34.3	67.3

Source: OECD Factbook 2010

The rate of obesity has more than doubled over the past 20 years in the United States, almost tripled in Australia, and more than tripled in the United Kingdom. Some 20-24% of adults in the United Kingdom, Australia, Iceland, and Luxembourg are obese, about the same rate as that prevailing in the United States in the early 1990s (see Figure 1). Obesity rates in many European countries have increased substantially over the past decade. In all countries, more men are overweight than women. However, in almost half of all OECD countries, more women are obese than men (Organisation for Economic Co-operation and Development 2010).

Figure 1: Obese Population Aged 15 and Older



Source: OECD Factbook 2010

In Switzerland, the number of overweight people has increased over all age groups. The first health survey for Switzerland conducted in 1992/93 (age > 15 years) across Switzerland indicates an obesity rate of 5.6% and an overweight rate of 25.9%. The second survey in 1997 indicates an obesity rate of 7.0% and an overweight rate of 28.5%. Five years later, in 2002, a third survey shows an obesity rate of 7.7% and an overweight rate of 29.4%. The latest public poll was conducted in 2007 and yielded a prevalence of 8.1% for obesity, and 29.2% for overweight (Schneider, Venetz, and Gallani Berardo 2009, p. 6). According to the latest health survey, the overweight situation has stabilized (Swiss Federal Statistical Office 2008). Table 2 summarizes the development of overweight and obesity in Switzerland over the past 15 years.

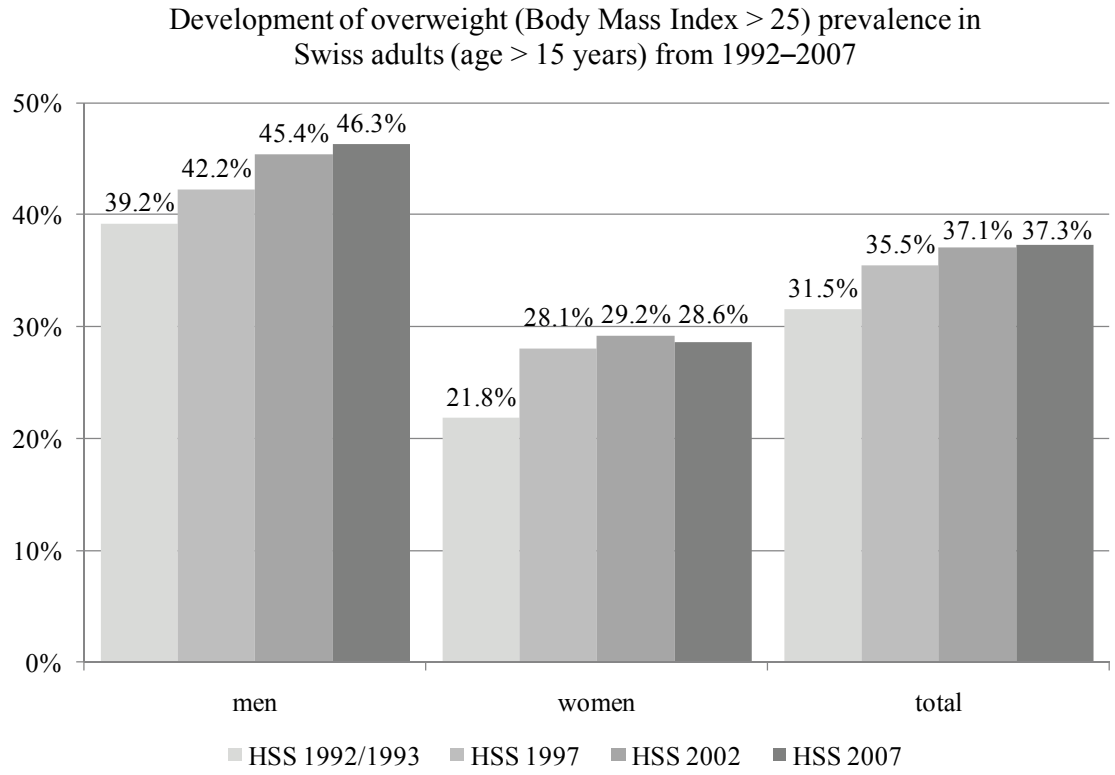
Table 2: Overweight and Obesity in Switzerland (1992-2007)

1992/1993		1997		2002		2007	
Overweight	Obese	Overweight	Obese	Overweight	Obese	Overweight	Obese
25.9%	5.6%	28.5%	7%	29.4%	7.7%	29.2%	8.1%
Total: 31.5%		Total: 35.5%		Total: 37.1%		Total: 37.3%	

Source: Swiss Federal Statistical Office 2008

Figure 2 depicts the development of overweight (body mass index ≥ 25) over the period 1992-2007, showing that the portion of the Swiss population suffering from overweight has increased considerably over the past 15 years. This development is particularly obvious in men; a steady state seems to have been reached for women. Differences in overweight and obesity among individuals with different levels of education are remarkably consistent across countries (Sassi et al. 2009, p. 10). In most countries a gradient is observed: the lower the education attainment, the higher the likelihood of being obese or overweight. Switzerland is not an exception as the obesity prevalence also decreases with higher educational level in both genders (Christakis and Fowler 2007, p. 370).

Figure 2: Development of Overweight in Switzerland



HSS = Health Survey Switzerland

Source: OECD Factbook 2010

Overweight and obesity are chronic, which makes it difficult to tackle the problem. The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended (Spiegelmann and Flier 2001, p. 531). Global increases in overweight and obesity are attributable to several factors, including a global shift in dietary patterns toward an increased intake of energy-dense food high in fat and sugars but low in vitamins, minerals, and other micronutrients and a trend toward decreased physical activity due to the increasingly sedentary nature of many forms of work, changing modes of transportation, and increasing urbanization (World Health Organization 2006).

Obesity is a major risk factor for many chronic diseases, including those listed in Table 3.

Table 3: Chronic Diseases Due to Overweight and Obesity

Chronic Diseases	Comments
Cardiovascular disease (mainly heart disease and stroke)	Already the world's number one cause of death, killing 17 million people each year
Diabetes	The WHO estimates that diabetes deaths will increase by more than 50% worldwide in the next 10 years
Musculoskeletal disorders	Especially arthritis and chronic back problems
Cancer	Especially endometrial, breast, colon, and liver

Source: World Health Organization 2006

The full long-term consequences of increased obesity rates at the aggregate level are not yet visible (Sturm 2002, p. 251). However, most studies show an increase in mortality rates associated with obesity, particularly with higher levels of obesity (Flegal, Carroll, and Ogden 2002, p. 1727). In Europe, obesity is responsible for 2-8% of all health costs (World Health Organization 2006).

1.1.2 Economic Costs of Overweight and Obesity in Switzerland

As Finkelstein et al. (2003, p. 219) point out, obesity is not only a health but also an economic phenomenon, and it entails important economic costs. The epidemic of overweight and obesity results in high costs to societies, as the resulting disabilities and diseases create enormous burdens for the health systems (World Health Organization 2006).

Health costs can be direct or indirect. Direct health costs are those for prevention, diagnostics, and treatments such as doctor or clinic visits. Direct treatment costs for obesity in Switzerland were estimated at 46.5 million Swiss francs for 2007. This sum includes drug costs of 24.5 million Swiss francs, counseling costs (e.g., nutritionists) of 3 million Swiss francs, and costs for surgical interventions at a minimum of 19 million Swiss francs (Schneider et al. 2009, p. 29). Indirect costs include wages, which overweight and obese employees lose because they are not able to work or are sick. Also, the value of future earnings that they cannot earn due to premature death can be subsumed under indirect health costs (Schneider and Schmid 2004, p. 3).

Other indirect costs include the substantial increases in hypertension, cardiovascular disease, and diabetes attributable to overweight and obesity. In recent years, researchers have investigated and demonstrated the link between weight gain and the develop-

ment of many other diseases such as stroke and breast, colorectal, colon, and rectum cancer (Schneider et al. 2009, p. 29).

Total direct and indirect costs caused by comorbidities attributable to overweight and obesity amount to 5755 million Swiss francs; about half can be assigned to each the the overweight and the obese population segments. The direct costs (3830 million Swiss francs) are considerably lower compared with the total costs including indirect costs (Schneider et al. 2009, p. 36).

Table 4: Total Costs of Overweight and Obesity in Switzerland

	Costs in Swiss Francs (millions)
Direct costs:	
- Medication	25
- Bariatric surgery	19
- Dietary counseling	3
Costs of comorbidities:	
Attributable costs	
- Total (direct and indirect) costs	5755
- Direct costs only	3830
Total:	
- Direct and indirect	**5802**
- Direct only	**3877**

Source: Schneider et al. 2009, p. 41

1.1.3 Causes of Obesity

A debate exists regarding the causes of obesity as well as its consequences (Cutler, Glaeser, and Shapiro 2003; Finkelstein et al. 2003). At first glance, it seems simple: Over a period of time, energy intake exceeds energy expenditure. But this simplistic view falls short. Identifying the causes of obesity is a complex and multi-faceted challenge. Research has established that genetic, environmental as well as behavioral factors relate to the obesity phenomenon (Rosin 2008, p. 7; Walsh 2008).

It might be possible that evolution has a role why humans have a genetic predisposition to enjoy sweet and salty tastes (Birch 1999; Desor, Greene, and Maller 1975) and feel attracted by high-fat food (Birch 1992, p. 255). In the past, enjoying these kinds of food might have been beneficial because a taste for salty, fatty, or sweet would have promoted the intake of foods that are good sources of essential nutrients (Birch 1999, p. 52). Although people live in a different food environment nowadays, they are still

prone to eat food products that are high in calories and are not initially allured by vegetables and fruits, which are not typically sweet, salty, or high in fat (Birch 1999, p. 55).

At the heart of obesity lies a homeostatic biological system that struggles to maintain energy balance to keep the body at a constant weight. This system is not well adapted to a fast-changing world, where the pace of technological progress has outstripped human evolution. Studies in humans have identified several specific genes associated with obesity (Butland et al. 2006, p. 7). Philipson and Posner (2003, p. 92) and Philipson (2001, p. 4) emphasize that the genetic factor of obesity may explain some differences among people but cannot explain the rapid change over time in the extent of obesity: if the cause was genetic transmission, such a change would be much slower than is observed. The gene pool does not change fast enough to justify the recent increase in overweight and obesity (Rosin 2008, p. 8). But it does seem that certain people have a higher genetic vulnerability to gain weight (Bouchard and Tremblay 1997, p. 943S).

Childhood obesity is closely related to increasing adult obesity (Anderson and Butcher 2006, p. 19). The food choices that develop during young adulthood are likely to maintain later life (Burton, Bates, and Huggins 2006; Haberman and Luffey 1998; Steptoe et al. 2002). Anderson and Butcher (2006, p. 28) explain that parents may pass along to their children a susceptibility to overweight in the presence of energy imbalance. According to Anderson and Butcher (2006, p. 32) it is complex to make a distinction between the parent's influence due to genetics and behavior. Parents obviously influence children's food selection. Thus, the possibility for children to gain weight in households in which more energy-dense foods are available seems natural. In addition, children's exercise is influenced by their parents' physical activities. The rates of obesity and overweight have rapidly developed in genetically stable populations; therefore, genetics alone cannot explain the huge increase in recent decades. Therefore, it appears more reasonable to assign the obesity phenomenon to other factors that are related to diet or physical activity, combined with genetic susceptibility (Rosin 2008, p. 8).

There are claims in Western societies that although people improve their understanding of the benefits of a healthy lifestyle they are becoming heavier and increasing their risk of suffering from diet-related illnesses (Rosin 2008, p. 13). For example, although the number of obese people in the United States has been steadily increasing, there has been a parallel growth in sales of organic and low-fat foods. According to Mancino

(2003, p. 8), this inconsistency can be explained by immediate gratification meaning that people attempt to incorporate beliefs about healthy eating into their food choices but also forgo good intentions because of situational factors such as time pressure, hunger, and the need for convenience. This gap between good intentions and failing to follow through with the intended behavior is in research terms called the intention-behavior gap.

Social psychology research elicit how people make their decisions (Maio et al. 2007, p, 100). Health-related behavior is complex. People experience a psychological conflict between what they want (e.g., fatty, sweet foods) and their wish to be healthy (Maio et al. 2007, p. 129). For example, most people know that eating fatty foods in excess is bad for them and eating fruits is beneficial. Yet they tend to enjoy eating foods high in calories or that are of too much salt and struggle to find the time to exercise. Moreover, there are various important behavior dimensions that further complicate the issue, such as overcoming existing habits, the role of different types of beliefs or the degree of control a person has over his or her environment, and his or her perceived vulnerability to risk (Maio et al. 2007, p. 102).

Also, it is important to take the cultural and social context of people's behaviors into account (e.g., influence of organizational cultures, media, and social pressure). Most notably, organizational behaviors have a substantial but often unconsidered role in regulating people's behavior. For example, organizations make the decisions about the assortment of snacks in a workplace and the accessibility and contents of vending machines (Butland et al. 2006, p. 50).

1.1.4 State of Research and Further Research Requirements

Healthy food choices are often made in environments that demand psychological endeavor to resist temptations (Baumeister and Newman 1994, p. 10). The more choice available the more difficult it is to oppose temptation. Every time a person decides to eat something, there are short-term and often long-term consequences. For example, in the short-run, a person might consume a hotdog to appease hunger for a quick lunch break. But eating that hotdog may have long-term results: The hotdog may contribute to being overweight (Johnson, Pham, and Johar 2007, p. 869). Many people want to resist temptations and have good intentions to eat healthily but in the end fail to act on their intentions (Webb and Sheeran 2006, p. 262).

How can consumers be motivated to eat more healthily? Motivation has generally been defined as an internal process that activates, guides, and maintains behavior over time

(Eccles and Wigfield 2002, p. 110). With respect to eating behavior, the general goal behind motivation strategies is to increase consumers' healthy eating behavior by increasing their motivation toward healthy food products. Motivation has been consistently deemed a necessary component for achievement (Rothschild 1999, p. 32). While some research suggests that intrinsic motivation should be preferred, others argue that extrinsic forms of motivation are often the reality (e.g., Deci, Koester, and Ryan 1999; Gibbons 1998; Lazear 2000).

While the intrinsic motivation approach in this research uses instruments grounded in psychology, the extrinsic motivation approach applies powerful economic mechanisms. In the following, the two approaches follow the distinction between intrinsic and extrinsic motivation, keeping in mind that the intrinsic approach has its roots in psychology and the extrinsic approach belongs to behavioral economics.

Self-regulation strategies are an approach of intrinsic motivation. Research on self-regulation strategies shows that specifically planning goals can be an effective tool in bridging the aforementioned intention-behavior gap (Orbell, Hodgkins, and Sheeran 1997; Sheeran and Orbell 1999). To date, most studies that employ self-regulation strategies in the health domain primarily focus on health-protective behaviors, such as breast cancer screening and increasing vitamin C intake as highlighted by Adriaanse, de Ridder, and de Wit (2009, p. 60). Implementing these types of behaviors is relatively straightforward, requiring essentially the inception of a desired response (e.g., attending a breast cancer screening, taking a vitamin C tablet). Fewer studies are available on the role of self-regulation strategies in overriding undesirable habits such as smoking, consuming excess alcohol, and eating unhealthily (for a similar perspective see Gollwitzer and Sheeran 2006). These types of health behavior may be much more complicated to alter, because they require the control of an unwanted response (e.g., quit smoking) and sometimes even the substitution of the undesired with a desired response (e.g., eating an apple instead of a chocolate bar) (Adriaanse et al. 2009, p. 60).

Following Gollwitzer and Sheeran's (2006) suggestion, it is argued that more research is needed enquiring the beneficial effects of self-regulation strategies in changing health-risk behaviors. As a result, this study addresses the efficiency of self-regulation strategies in decreasing unhealthy snack consumption and replacing them with healthy snacks.

The operant learning theory (Skinner 1963, p. 509) indicates that rewards may facilitate habit development. According to Stroebe (2000), economic incentives as a tool of extrinsic motivation are a good example of an approach to change habits. Also Reinholz, Kenning, Winter and Knecht (2007, p. 14) point in their study to the promising avenue of financial incentive-based approaches for stimulating people to act more health-related. For example, governments and road safety organizations have used incentives to induce safer driving. Operant learning theory also points out that most consumer behaviors, including lifestyle activities, are influenced by price increases. In this sense, governments can increase the costs of smoking, drinking alcohol, and even eating fatty food by increasing product prices through higher taxes or reducing availability through restrained sales. However, the use of economic levers requires an understanding of a variety of other societal factors. For example, if cigarettes are being taxed, but most smokers deem unable to quit, this approach may deteriorate health equality without reducing the percentage of smokers. Likewise, taxation policies on food should be thoughtfully applied, allowing for people's ability to change eating habits in the context of social norms and commercials of particular foods (Maio et al. 2007, p. 118).

1.1.5 Relevance of the Proposed Research

As mentioned before, obesity is a multi-faceted challenge. To capture the relevance of the proposed research, it is necessary to make a distinction between the view of public policy and management practice.

Fact is, of the many factors associated with rising obesity, food industry marketing practices that are linked with increased consumption are among the most criticized factors (Seiders and Petty 2004, p. 154). Therefore, marketers of food items, both retailers and manufacturers, are eager to position themselves as health friendly in response to consumers' growing health consciousness. Leeflang and van Raaij (1995, p. 378) note a clear trend regarding concern for health and an increase in the demand for, and supply of, health products, stating that "European consumers are very concerned about the nutritional content of food. This is in line with the tendency towards increased health consciousness." In the United States, a survey shows that 74% of consumers claimed to have changed their eating habits due to health and nutrition concerns, 87% considered nutrition an important factor in purchasing groceries, and 64% stated a willingness to pay more for healthier versions of food items (United Nations of Environmental Programme 2005). In Switzerland, 72% of consumers admit that healthy food is important for them (Rudolph and Glas 2008, p. 20). In response, retailers have been

stocking (and manufacturers have been producing) items that are diet, low-carbohydrate, low-calorie, low-sodium, low-fat, low-cholesterol, and so on as never before (see e.g., Higgins 2003; Horovitz 2003).

However, despite the attention given to dieting, the proportion of overweight adults keeps increasing, indicating that although they intend to do so, many consumers are not behaving health consciously (Cutler et al. 2003, p. 95). Marketers of the food industry are torn between hungry consumers who want to satisfy their cravings and public policy officials who question whether companies should be more responsive to these threats. The food industry's response to these threats appears according to Wansink and Huckabee (2005, p. 6) in three phases: denial, appealing to consumers' sovereignty, and developing win-win opportunities. In the first phase, many food companies deny their role in obesity by noting that rising obesity can also be associated with rising levels of inactivity. Their argument is that if the food industry is to be blamed for obesity, so are automobiles, cable TV, video games, remote controls, elevators, and the internet (Wansink and Huckabee 2005, p. 6).

The second phase is a free market appeal to consumers' sovereignty following the slogan "let the customer decide". In this phase many companies offer customized products while advocating an increase in activity (Wansink and Huckabee 2005, p. 6). The third phase of response then involves developing profitable win-win solutions to help consumer better control what they want to eat (Wansink and Huckabee 2005, p. 7). No company would want to modify a product in a way that discourages consumers from purchasing it or consuming it. It may be in their best interest, however, to help consumer better control what they consume in a single setting. Thus, food companies are not focused on making people fat; they are focused on making money. The answer to the obesity issue is not increased regulation, but changing the market in a way that helps consumers develop a new appetite for healthy food (Wansink and Huckabee 2005, p. 16).

Usually, the business objective is to permanently make a profit and to increase shareholder value. Marketing has predominantly the task of identifying customer needs, and thus to generate revenue (Kenning 2010). The society welcomes the idea that companies follow corporate social responsibility (CSR). According to Kotler and Lee (2005, p. 3), CSR is a commitment to improve community well-being through discretionary business practices and contributions of corporate resources. Corporate Social Marketing then, focuses according to Kotler and Lee (2005, p. 143), on individual behavior change, changes that will improve health and increase community involvement. But

what exactly is the operational performance that results from CSR? Several marketing studies have found that CSR programs have a significant influence on several customer-related outcomes (Bhattacharya and Sen 2004). More specifically, CSR is reported to affect, either directly or indirectly, consumer product responses (Brown 1998; Brown and Dacin 1997), customer-company identification (Sen and Bhattacharya 2001), customer donations to nonprofit organizations (Lichtenstein, Drumwright, and Braig 2004), and, more recently, customers' product attitude (Berens, Riel, and Bruggen 2005). Although this stream of research has contributed a great deal of insight, there is still a limited understanding of whether and how CSR affects financial outcomes of the firm, such as its market value. Recent research by Luo and Bhattacharya (2006, p. 16) suggests a nuanced understanding of the market returns to CSR initiatives. Their findings indicate that "doing good" has complicated implications and that customer satisfaction plays an important mediating role in the relationship between CSR and firm market value. Thus, CSR initiatives can contribute to the bottom line of a company, but there are important issues that have strong managerial implications (Luo and Bhattacharya 2006, p. 15). The value of making long-term investments that will produce social, environmental, and economic benefits for the communities in which it operates is of importance (Kotler and Lee 2005, p. 223). An initiative that reflects commitment to help people eating healthy and at the same time increases economic opportunities for the company is the win-win solution to target (Kotler and Lee 2005, p. 223).

If CSR is a profit to the overall objective, shareholders should communicate this clearly in its marketing communication activities Kenning (2010), because the main difficulty of promoting public health is that behaviors will only deliver gains for the people if they are maintained. However, the role of habit and limited personal self-control over behaviors are not well analyzed. Deeper understanding is needed of how habit impacts behavioral maintenance (Butland et al. 2006, p. 65).

This thesis sheds light on the intention-behavior gap and explains the influence of intrinsic (self-regulation strategies) and extrinsic (financial incentives) motivation approaches and their interplay on consumers' snacking behavior. Given the scope and exigency of the problem, surprisingly little evidence exists on this topic.

1.2 Research Purpose

1.2.1 Aim of the Research and Guiding Research Questions

The aim of this thesis is to analyze the role of intrinsic and extrinsic motivational approaches with regard to the intention-behavior-gap to improve understanding of consumers' eating behavior and contribute to effective social marketing activities of the involved actors in the entire food chain, from primary producers to retailers.

Specifically, the purpose of this research is to extend the current literature on food choice behavior and to investigate the impact of self-regulation strategies and financial incentives influencing decision-making processes.

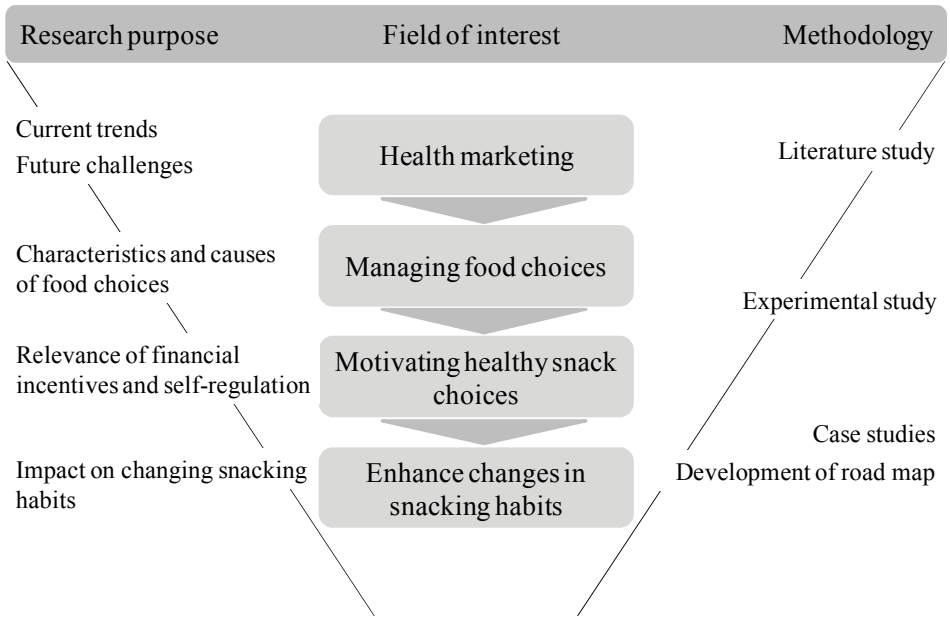
To enhance the theoretical and practical scope, the framework also identifies several personal determinants and moderating factors and specifies under which aspects the impact of self-regulation strategies and financial incentives on habit and self-control is intensified or attenuated. More specifically, this dissertation follows two *guiding research questions*:

- Why do people find it difficult to eat healthy although they know it would be good for them?
- What can be done to motivate and support consumers in overcoming the intention-behavior gap?

In order to answer these questions, different methodological approaches such as a literature review, an empirical study, and case studies are applied.

Figure 3 illustrates the procedural logic of this dissertation and draws on the particular fields of interest and the corresponding methodological approaches.

Figure 3: Procedural Logic of the Dissertation



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1.2.2 Scientific Understanding

Trust is essential in science because science represents a shared form of knowledge. An important consequence of trust is therefore, that each research project should be guided by a scientific philosophy (Hunt 1990, p. 12). In general, this study falls under the framework of marketing. According to Hunt (1990, p. 13), marketing itself is assigned to scientific realism, which is defined as coherent and intelligible. In contrast, critical rationalism of Popper (1972, p. 26) examines existing beliefs and theories critically.

According to Popper (1972, p. 49), the scientific process begins when observations are in conflict with existing theories. To solve this problem, researchers propose a theory and subject the logical consequences of the theory (hypotheses) to rigorous empirical tests. The aim of testing is the refutation of the hypotheses. Consequently, when a theory's prediction is falsified, it must be rejected. In contrast, theories that survive

falsification are said to be corroborated and tentatively accepted (Anderson 1983, p. 18). In contrast, scientific realism falls between direct realism and relativism. Moreover, scientific realism is a critical realism, arguing that the function of science is to use its method to improve the measurement processes, separate illusion from reality, and in doing so generate the most precise possible description and understanding of the world (Hunt 1990, p. 9).

Furthermore, because this study's research interest focuses on a problem that currently exists in reality, it can be assigned to the category of reality-oriented research. From a marketing point of view, this means that the research must describe, explain, and solve problems and phenomena of practical relevance within the framework of theory-driven empiricism (Tomczak 1992, p. 81). Thus, the reality-oriented research must meet the challenge capturing a topic scientifically correct (rigor) and at the same time verifying its practical value (relevance) (Varadarajan 2003, p. 369).

1.2.3 Contributions

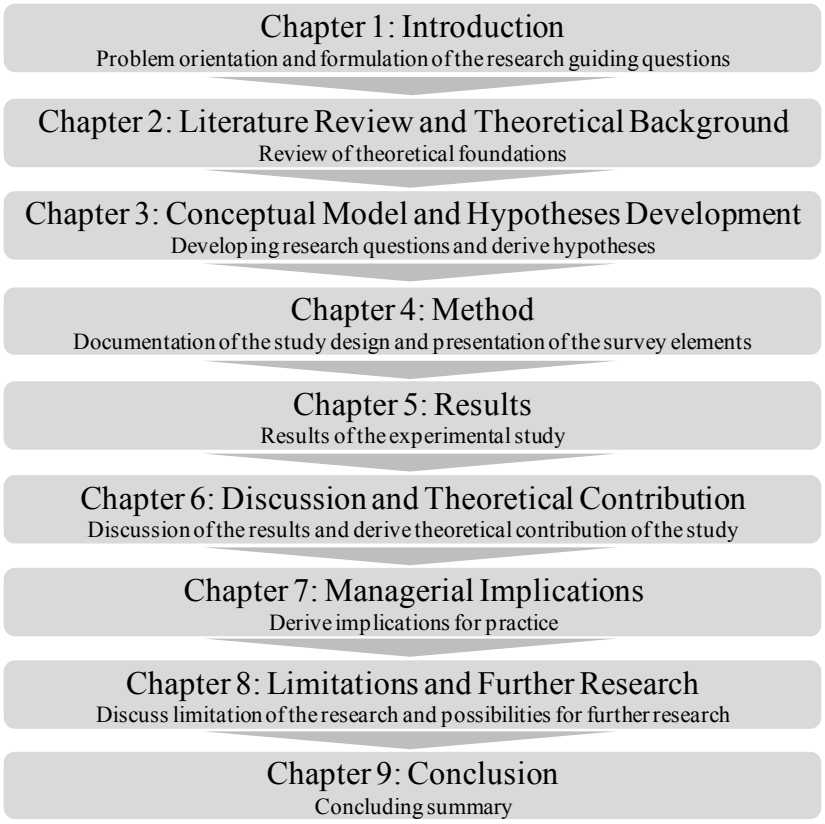
The knowledge gained from this dissertation (1) contributes to a better understanding of how to combat the current obesity epidemic more effectively by improving understanding of consumers' health-related choices, (2) extends existing goal progress literature in the context of food consumption, (3) introduces the concept of self-regulation and economic thinking to the marketing and consumer welfare literatures, and (4) further validates prior research regarding the impact of changing habits in the eating behavior field. The implications of this dissertation should be of interest to consumers, public policy-makers, consumer welfare advocates, and marketers interested in examining health-related decision processes.

1.3 Dissertation Structure

This dissertation is structured as follows: Chapter 1 presents an introduction to the topic and outlines the guiding research questions that underlie this thesis. Chapter 2 reviews the relevant literature on self-regulation strategies and financial incentives. On the basis of this theoretical background, several research questions that are investigated in the course of this dissertation, the appropriate research hypotheses and a conceptual model are developed in Chapter 3. To examine whether this set of hypotheses can be empirically validated, an experiment embedded in a causal model is conducted; Chapter 4 comprises a detailed documentation of the experimental design and the variables used in the survey instrument. Chapter 5 presents the results, and Chapter 6 discusses them and theoretical implications are obtained. In Chapter 7, comprehensive

management implications are derived. Finally, Chapter 8 addresses the study's limitations, and identifies promising possibilities for further research. The thesis closes with a conclusion.

Figure 4: Dissertation Structure



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2 Literature Review and Theoretical Background

2.1 Introduction

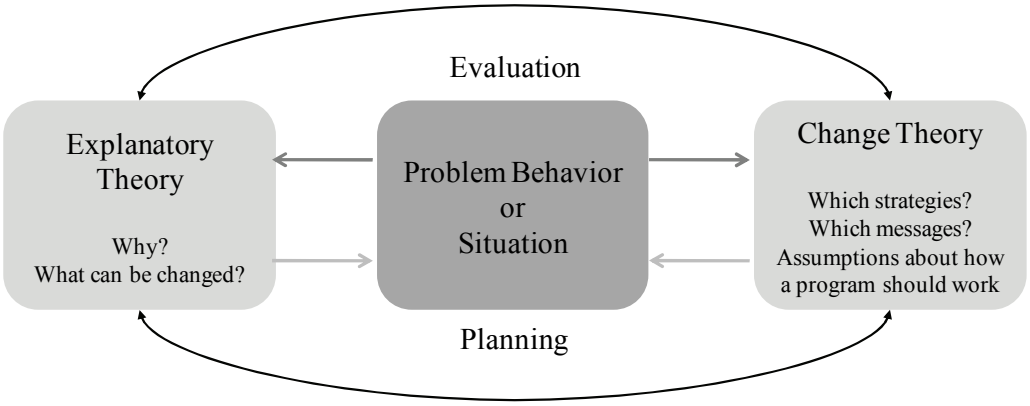
This chapter provides the theoretical basis for this dissertation as well as a general review of the relevant literature and seminal results from prior studies associated with the pertinent research questions. The review of literature includes work done in marketing, consumer psychology, economics, nutrition, and public policy areas. These theoretical foundations and the results found in related studies are used to formulate specific hypotheses, design the experiment and testing, and discuss the results in subsequent chapters.

In general, a theory provides a road map for studying problems, developing appropriate interventions, and evaluating their successes (Glanz, Rimer, and Su 2005, p. 5). In health research, theories can be further broken down into explanatory and change theories. An *explanatory theory* (= theory of the problem) describes the factors influencing behavior or a situation and identifies why a problem exists. It guides the search for modifiable factors such as knowledge, attitude, self-efficacy, social support, lack of sources, and so on that contribute to a problem. The Health Belief Model, Theory of Planned Behavior, and Social Cognition Theory are examples of explanatory theories (Glanz and Bishop 2010, pp. 401-403). Also the behavioral enaction models (e.g., Gollwitzer's Implementation Intention, Bagozzi's Goal Theory) as well as the Incentive Theory (e.g., Charness and Gneezy 2009; Fehr and Falk 2002) belong to the explanatory theories.

In contrast, a *change theory* (= theory of action) guides the development of health interventions and spells out strategies, tools and concepts that can be translated into program messages to change behavior. They are the jumping-off point for using theory as a basis for evaluation, and they push people to make explicit assumptions about how change behavior should work. Examples of change theories are Participatory Models, Diffusion of Innovation, and Community Organization, to mention a few (Glanz and Bishop 2010, p. 407).

Figure 5 shows the interrelationship between explanatory and change theories.

Figure 5: Explanatory and Change Theories



Source: Glanz et al. 2005, p. 6

This study follows the mindset of explanatory and change theories. First, to analyze the research questions under study, explanatory theories are used to explore the problem and identify possibilities to change behavior; and second, change theories are applied to develop strategies as to how people can be motivated to adhere to healthy eating behavior.

The first part of this chapter introduces the health behavior construct and elaborates how consumers form health attitude, intention, and behavior. To this end, the leading health behavior theories and models are introduced, outlining their core ideas and underlying assumptions as well as their application and efficacy specific to eating behavior. The focus is on the theory of planned behavior, because this theory provides for this study among others a theoretical basis. To explain the predictions of healthy eating behavior further, the construct habit and its relevant learning theory are elaborated.

In the second part, to present how health behavior might be changed concretely, research conducted in the context of motivation theories is discussed. Specifically, self-regulation strategies and financial incentives which are the theories that are used for the manipulation are explored as goal pursuit motivation. The last part of this chapter integrates these different theoretical streams and develops the foundation for the conceptual framework and hypotheses derived in Chapter 3.

2.2 Research on Eating Behavior Change

Several theories and models supporting health behavior change have been developed and validated to explain health behaviors, falling into two general categories:

- *Motivational theories and models* focus on the motivational factors that underpin people's decisions to perform (or not perform) health behaviors.
- *Multi-stage theories and models* describe the various stages within health behavior.

According to Armitage and Conner (2000) - two well-known researchers in health behavior - the leading and most commonly used health behavior change theories and models are the (1) Health Belief Model (HBM), (2) Social Cognitive Theory (SCT), (3) Transtheoretical Model (TTM), and (4) Theory of Reasoned Action/Planned Behavior (TPB)[4]. The next section reviews these models and theories of health behavior, outlining the key elements and underlying assumptions of each model and theory as well as their application and efficacy specific to eating behavior change.

2.2.1 Health Belief Model

The HBM, developed by Rosenstock (1974) and furthered by Janz and Becker (1984, pp. 1), was one of the first models to adapt theories from the behavioral sciences to study and examine health problems. According to the HBM, the probability that someone will take action to prevent illness depends on six key perceptions of a person (Glanz et al. 2005, p. 14):

1. *Perceived susceptibility:* The person's perception of the risk of contracting a health condition,
2. *Perceived severity*: The feelings regarding the consequences of contracting a health condition or of leaving it untreated,
3. *Perceived benefits:* The believed effectiveness of strategies designed to reduce the risk of contracting a health condition,

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[4] A search in the EBSCO database revealed the following hits (only including articles of scholarly peer-reviewed journals):
Health Belief Model (HBM): 1125 hits
Social Cognitive Theory (SCT): 2477 hits
Transtheoretical Model (TTM): 1350 hits
Theory of Reasoned Action/Theory of Planned Behavior (TRA/TPB): 1341/3081.

4. *Perceived barriers*: The potential negative consequences that may result from taking particular health actions (e.g., financial demands),
5. *Cues to action*: The factors that prompt action (e.g., a television ad or a reminder from a physician to get a mammogram), and
6. *Self-efficacy:* The person's ability to successfully perform an action.

All six factors affect the likelihood of performing health behaviors by influencing the perceived risk of contracting a health condition and expectations about outcome. Although the HBM was originally developed to explain health related behaviors, it has also helped researchers discover why these behaviors occur and identify approaches to change behavior (Glanz et al. 2005, p. 13).

The HBM has been used in a variety of public health settings over the years. Most often, the HBM was applied for health concerns that are prevention-related and asymptomatic, such as early cancer detection and hypertension screening (Glanz and Bishop 2010, p. 402). The HBM is also relevant for interventions to reduce risk factors for cardiovascular disease (see e.g., Kawash, Woolcott, and Sabby 1980; Sherman et al. 2008; Wang et al. 2007).

The HBM has also been employed in specific eating behaviors. Kloeblen et al. (1999) analyze folate intake among low-income pregnant women using the HBM to gain insight on knowledge, attitude, and beliefs. They discovered correlations consistent with the HBM between perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action and folate intentions. The strongest predictor of folate intention is perceived benefits (Kloeblen and Batish 1999, p. 332).

In a study designed to examine the relationships between changes in knowledge, attitude, and diabetic control, Dunn et al. (1990) analyze the contributions of knowledge and attitude changes regarding metabolic improvement in their diabetic sample. The authors find that an attitudinal change is predictive of subsequent improvement in metabolic control whereas knowledge is not. Their results suggest that the general HBM may be less useful for the prediction of future behavior than instruments specific to diabetes (Dunn et al. 1990, p. 1138).

Wdowik et al. (2001) use a slightly extended version of the HBM. This model contains perceived susceptibility, benefits, and barriers, as well as cues to action from the HBM, in addition self-efficacy and outcome expectancies from the Social Cognitive Theory, plus intention and subjective norm from the Theory of Reasoned Ac-

tion. In a study of students with type 1 diabetes, the authors find that attitude is the most predictive construct in managing diabetes behavior. Although this study supports the expansion of the HBM to explain diabetes management, there is limited use of this expanded model in terms of eating behavior (Wdowik et al. 2001, p. 19).

Moreover, Garcia and Mann (2003) apply the HBM to analyze how students resist dieting. Sapp and Jensen (1998, p. 235) use the HBM to predict perceived and actual dietary quality. The study is based on data collected from 1502 general adults. Another study employs the HBM to understand the healthy eating approach of students. To do so, the authors apply the model to identify influencing factors of healthy eating habits (Deshpande, Basil, and Basil 2009, p. 145). Table 5 gives an overview of the studies applying the HBM to eating behavior.

Table 5: Studies Applying the HBM to Eating Behavior

Application	Sample	Author/Journal
Specific eating behavior related to folate intake	Low-income pregnant women	Kloeblen and Batish (1999) *Health Education Research*
Metabolic improvement for diabetes people	Patients of a diabetes program	Dunn et al. (1990) *Social Science and Medicine*
Diabetes management behavior	Students with type 1 diabetes	Wdowik, Kendall, Harris and Auld(2001) *Journal of Nutrition Education*
Reasons for resisting dieting	General students	Garcia and Mann (2003) *Journal of Health Psychology*
Prediction of perceived and actual dietary quality	General adults	Sapp and Jensen (1998) *Journal of Applied Social Psychology*
Influencing factors of healthy eating habits	General students	Deshpande, Basil and Basil (2009) *Health Marketing Quarterly*

Source: own illustration

Critical Appraisal

A meta-review of the HBM by Harrison, Mullen and Green (1992) showed that, although all correlations between HBM and behavior were statistically significant, the effect sizes were small (all r's < .21). Furthermore, Sheeran and Abraham's (1996) review of the HBM concluded that all HBM variables correlated only weakly with behavior. Sheeran and Abraham (1996) further suggested that weak predictive validity of the HBM was a result of poor definition of constructs, and no evidence for discriminant validity between HBM components and variables from other models.

2.2.2 Transtheoretical Model

Prochaska and DiClemente (1983) developed the Transtheoretical Model (TTM), also called Stages of Change Model, which relies on studies comparing the experiences of former smokers who quit on their own with former smokers who received professional treatment. The basic idea of the TTM is that behavior change is a process, not an event (Glanz and Bishop 2010, p. 401). The key constructs in this model include five stages (Glanz et al. 2005, p. 15):

1. *Precontemplation:* Person has no intention of taking action within the next six months,
2. *Contemplation:* Person intends to take action in the next six months,
3. *Preparation:* Person intends to take action within the next 30 days and has taken some behavioral steps in this direction,
4. *Action:* Person has changed behavior for less than six months, and
5. *Maintenance*: Person has changed behavior for more than six months.

The authors use six months because it is assumed that this timeframe is as far as most people plan a specific behavior change. However, definitions of the stages may slightly vary, depending on the behavior under study (Armitage and Conner 2000, p. 182). Additional core constructs in the TTM include processes of change that support people in moving from stage to stage. These processes include consciousness raising, self-liberation, social liberation, self-reevaluation, environmental reevaluation, stimulus control, and helping relationship. Regardless of whether people use these self-management methods or take part in professional programs, they go through the same stages of change (Prochaska and Velicer 1997, p. 41).

The TTM has been applied to several behaviors, including exercise (Marcas, Rakowski, and Rossi 1992), smoking cessation (DiClemente et al. 1991), alcohol treatment (DiClemente and Hughes 1990), and weight control (O'Connell and Velicer 1988).

Researchers have found that the stages of change in the TTM are also correlated with respect to specific dietary changes. For example Glanz et al. (1994) examine the association of dietary stages to eating practices and related demographic and psychosocial factors in a diverse population of workers. Findings indicate that the majority of the sample actively tried to reduce fat intake. Stage of change was asso-

ciated with fat, fiber, and fruit and vegetable intake in a stepwise manner (Glanz et al. 1994, p. 510).

Another study uses the TTM to evaluate dietary fat reduction (Ounpuu, Woolcott, and Greene 2000). The authors find that fat intake levels are lower for those in action and maintenance stages than for those in preparation, contemplation, and precontemplation stages (Ounpuu et al. 2000, p. 674). Moreover, other researchers find that fruit and vegetable intake is consistently greater in participants in the action and maintenance stages as compared with the pre-action stages (Campbell et al. 1999; Oliveira et al. 2005).

Knowledge with respect to optimal intakes of fruit and vegetables is the greatest in the maintenance stage (Van Duyn et al. 1998, p. 371). Several interventions have been designed that use education materials targeted to people in specific stages of change (Campbell et al. 1994; Perkins-Porras et al. 2005). Table 6 summarizes the studies applying the TTM to eating behavior.

Table 6: Studies Applying the TTM to Eating Behavior

Application	Sample	Author/Journal
Dietary stages of eating practices and related demographic and psychosocial factors	General population of workers	Glanz et al. (1994) *Health Education and Behavior*
Dietary fat reduction	General population of women in Ontario	Ounpuu et al. (2000) *Journal of the American Dietetic Association*
Fruit and vegetable intake along the stages	General population in United States	Campbell and Reynolds (1994) *Health Education and Behavior*
	Male college students	Oliveira et al. (2005) *Journal of Nutrition Education Behavior*
Knowledge and the optimal intake of fruit and vegetables along the stages	General population of U.S. adults	Van Duyn et al. (1998) *Journal of Nutrition Education*
Applicability of the TTM to predict readiness to increase fruit and vegetable intake	General population of US. adults	Campbell et al. (1994) *American Journal of Public Health*
	Adults of low-income area in the United Kingdom	Perkins-Porras et al. (2004) *Preventive Medicine*

Source: own illustration

Critical Appraisal

According to Armitage and Conner (2000, p. 183) the TTM has many appealing features. It has intuitive appeal, this means, it is linked to practice, and it appears to give some insight into the process of change. It also uses methods for moving people from one stage to the next and has been applied in a varied of settings. More problematic is the fact that the model is not operationalized in social cognitive terms, thus, telling only little about the role of such variables in the change process (Dijkstra et al. 1998, p. 549). Such a description might allow one to specify why a particular intervention is more or less important at one stage or another. The only social cognitive measure widely used, namely decisional balance, appears to be a rather simple measure and its links to other social cognition variables remains unclear. Another problem with the model is that the description of change is ultimately unsatisfying except in very global terms – there is only little knowledge at the micro level about how people change and why some individuals will be successful while others will be not (Armitage and Conner 2000, p. 183).

2.2.3 Social Cognitive Theory

Bandura (1991) developed the Social Cognitive Theory (SCT). According to the SCT, three main factors affect the likelihood that a person will change health behavior: self-efficacy, goals, and outcome expectancies. If people have self-efficacy, they can change behaviors even when faced with obstacles. If they do not believe that they can exercise control over their health behavior, they are not motivated to act or to persist through challenges. As a person adopts new behaviors, this causes changes in both the environment and the person. Behavior is not simply a product of the environment and the person: likewise environment is not simply a product of the person and behavior (Glanz et al. 2005, p. 20).

The SCT evolved from research on social learning theory, which emphasizes that people learn not only from their own experiences but by observing the actions of others and the benefits of those actions (Glanz et al. 2005, p. 20). Bandura (1991, p. 250) revises the social learning theory by adding the construct of self-efficacy and renaming it the SCT.

Researchers have used the SCT to predict a variety of health behavior and behavioral intentions (Ellickson and Bell 1990; Strecher et al. 1986). It has also been applied to numerous studies with respect to eating behavior. For example, Resnicow et al. (1997) analyze the fruit and vegetable intake of 1398 students using the SCT va-

riables including self-efficacy, outcome expectations, preferences, social norms, asking skills, and knowledge. The fruit and vegetable intake was assessed with seven-day records. The results show that only preferences and outcome expectancies remain significantly associated with fruit and vegetable intake (Resnicow et al. 1997, pp. 273).

Sheeshka et al.'s (1993) study indicates that the elements of SCT may explain a substantial amount of variance associated with intentions to adopt healthy eating practices. The study suggests that self-efficacy expectations partially depend on the perceived likelihood of an outcome (Sheeshka et al. 1993, pp. 1556).

Conn (1998) conducted a study among community-dwelling older women analyzing the ability of self-efficacy expectation and outcome expectancy to predict healthy eating behavior. Results demonstrate that self-efficacy is the strongest predictor of healthy eating, whereas outcome expectancy is not a significant predictor of dietary behavior (Conn 1998, pp. 78).

Ball et al. (2009) investigate the mechanisms underlying socioeconomic variations in adolescents' eating behaviors. The results show that cognitive factors are the strongest mediator of socio-economic variations in fruit intake, and for energy-dense snack food, availability of energy-dense snacks at home tend to be strong mediators (Ball et al. 2009, pp. 500).

Indeed, researchers often focus their attention on the construct of self-efficacy in the SCT (Bandura 1997). In particular, self-efficacy is shown to be important in coping with stress (Haney and Long 1995, p. 1726), recovery from illness (Bandura et al. 1988, p. 479), and effecting behavioral change (Ellickson and Bell 1990, p. 1299), among other things.

Moreover, the key role of self-efficacy in several health behavior models (i.e., theory of planned behavior) suggests that the concept of self-efficacy is probably more important than the SCT per se (Armitage and Conner 2000, p. 176). Table 7 gives an overview of the studies applying the SCT to eating behavior.

Table 7: Studies Applying the SCT to Eating Behavior

Application	Sample	Author/Journal
Influence of social cognitive variables on fruit and vegetable intake	General population of students	Resnicow et al. (1997) *Health Psychology*
Relationship between social cognitive variables and intention to adapt healthy eating practices	White-collar employees	Sheeshka et al. (1993) *Journal of the American Dietetic Association*
Ability of self-efficacy expectation and outcome expectancy to predict health behavior among older women	Community-dwelling older women	Conn (1998) *Women & Health*
Socioeconomic variations in adolescent's diet	General population of adolescents in Australia	Ball et al. (2009) *Health Education Research*

Source: own illustration

Critical Appraisal

SCT predicts a variety of health behaviors and behavioral intentions, although the model typically accounts for only small to medium proportions of variance in behavior (Resnicow et al. 1997, p. 273). Indeed, the central self-efficacy component is typically the dominant predictor of behavior (Parcel et al. 1995), and is often the main focus of research attention (Bandura 1997). The central role of self-efficacy in a number of health behavior models suggests that the concept of self-efficacy is probably more important than SCT per se. This is evident by direct comparison of SCT with other health behavior models (Dzewaltowski, Noble, and Shaw 1990, p. 388) and the recent development of the health action process approach, which succeeds SCT to some extent (Schwarzer 1992, p. 218).

2.2.4 Theory of Planned Behavior

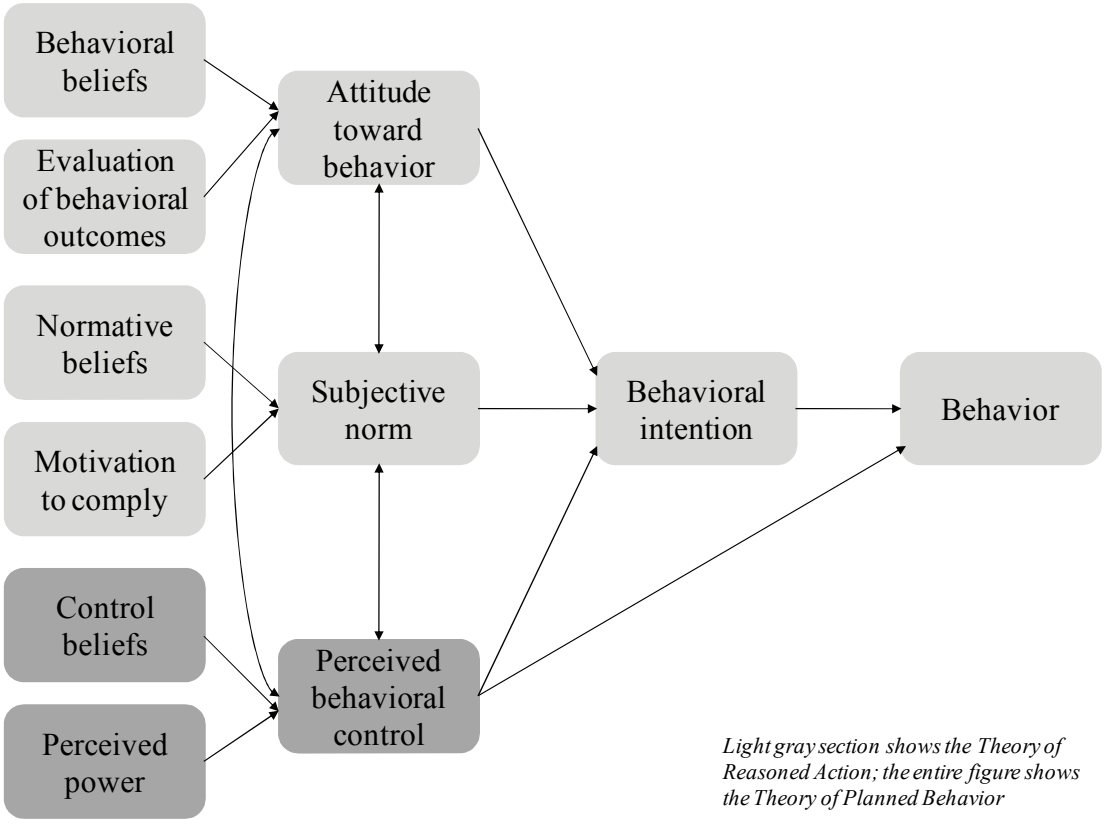
The Theory of Reasoned Action (TRA) posits that in general, people perform those behaviors that they intend to perform (Fishbein and Ajzen 1974, 1975). *Intention* is defined as a person's motivation to perform in a particular way and as the amount of effort the person is willing to exert to perform that specific behavior. In the TRA framework intention is determined by attitude and subjective norm (Armitage and Conner 2000, p. 177). *Attitude* toward the behavior results from relevant beliefs about the consequences of performing the specific behavior and the degree to which a person evaluates the consequences as being positive or negative. *Subjective norm* refers to normative beliefs about perceived social pressure from other people to en-

gage or not engage in a behavior. Normative beliefs refer to one's perceived behavioral expectations of important people or groups (e.g., spouse, friends, colleagues) (Fishbein and Ajzen 1974, p. 60).

Fishbein and Ajzen intended the TRA to predict behavior that is entirely under volitional control. However, as Ajzen (1988) concedes, most human behavior is not under such control. Therefore, Ajzen (1991) expands the TRA to the Theory of Planned Behavior (TPB) by taking behavioral control into account. Furthermore, to the extent that perceived control reflects actual control, *perceived behavioral control* directly influences behavior. In the framework of TPB, perceived behavioral control is a third determinant of intention: the easier the behavior of a person is, the more likely the person will intend to perform it (Ajzen 1991, p. 183).

The TPB is a widely used behavioral theory to understand and predict the determinants of health behavior. Over the years, TPB has been employed in many diverse health-related behaviors: smoking (Higgins and Conner 2003), alcohol abuse (Johnston and White 2003), HIV risk behaviors (Jemmott, Jemmott, and Hacker 1992), and exercise, on which an extensive body of research has been applied (Blue 1995; Godin 1993; Hausenblas, Carron, and Mack 1997).

Figure 6: Theory of Planned Behavior



Source: Fishbein and Ajzen 1975; Ajzen 1991

Several studies have also been conducted with respect to eating behavior using the TPB. Paisley and Sparks (1998) investigate the effect of perceived need to reduce fat using the TPB. The results show that perceived need to reduce fat intake, cognitive and affective components of attitude, and past behavior are significant predictors of expectation of reducing fat intake. Moreover, perceived body weight and estimated fat intake are significant predictors of perceived need to reduce fat intake (Paisley and Sparks 1998, p. 346).

Also, Povey et al. (2000) examine the additive and moderating effects of social influence variables within the TPB. The target behavior is the decision to eat healthily. The sample consisted of 235 people answering a questionnaire on TPB components, descriptive norms, perceived social support, and subsequent healthy eating. The results show good predictions of intentions (42% of variance) and behavior (15%). Neither descriptive norms nor social support added to the predictions more than the TPB variables (Povey et al. 2000, p. 997).

Ajzen and Timko (1986) conducted a survey with college students identifying general beliefs and attitudes in terms of health and illness, as well as specific beliefs and attitudes regarding a set of health-related behaviors selected in a pilot study. The authors conclude that specific health behaviors are largely unrelated to general attitudes toward medical services, concern about illness, evaluations of health practices, and health locus of control, but they did correlate quite well with equally specific attitudes toward, and perceived control over, each behavior (Ajzen and Timko 1986, p. 264).

Finally, Oygard and Rise (1996) assessed more than 500 young adults to investigate which factors predict the intention to eat healthier food. The TPB components accounted for 32% of the variance in behavioral intention. Attitude was the strongest predictor, followed by perceived control. A detailed analysis of the underlying cognitive structures reveals that the outcomes that discriminated most strongly between those who intended to eat healthier food, those who were undecided, and those who had no intention are that healthier food would improve the shape of the body, increase enjoyment of food, and reduce weight (Oygard and Rise 1996, p. 457).

Furthermore, there are several studies that examine the consumption of specific foods. Sparks et al. (1992) investigate the context of 173 people's attitudes toward the consumption of whole-grain bread and biscuits. The findings point out that a higher attitude variability is related to weaker relationships between the components of the TPB and that attitude variability is negatively associated with perceived control (Sparks et al. 1992, p. 62).

Sparks et al.'s (1998) study analyzes the consumption of a diet low in animal fats using the TPB. The results of the questionnaires of 235 members of the general population in the United Kingdom shows that self-identification of a health-conscious consumer has a predictive effect independent of the effects of other variables (Sparks and Guthrie 1998, p. 1399).

A further study investigated by Sparks and colleagues (1997) applies the TPB to the reduction of red meat and potato chips consumption. The results show that the items reflecting perceived control and difficulty load onto different components. Moreover, measure of perceived difficulty and not measures of perceived control contribute independent predictive effects of respondents' behavioral intentions to make the dietary changes (Sparks et al. 1997, p. 426).

All these studies indicate that attitude is the best predictor of intention and subjective norm rarely contributes. In general, the TPB is more successful in predicting intentions than behavior. For example, in a meta-analysis of 185 studies, Armitage and Conner (2001, p. 471) find that TPB accounts for 27% of the variance in behavior and 39% of the variance in intention. Table 8 summarizes the studies applying the TPB on eating behavior.

Table 8: Studies Applying the TPB to Eating Behavior

Application	Sample	Author/Journal
Effect of perceived need to reduce fat intake	General population of adults	Paisley and Sparks (1998) *Psychology & Health*
Additive and moderating effect of social influences within TPB to eat healthily	General population of adults	Povey et al. (2000) *Psychology & Health*
General belief and attitudes towards health and illness	College students	Ajzen and Timko (1986) *Journal of Basic and Applied Social Psychology*
Factors predicting the intention to eat healthier food	Young adults	Oygard and Rise (1996) *Health Education Research*
Attitude toward consumption of whole-grain bread and biscuits	General population of adults	Sparks et al. (1992) *European Journal of Social Psychology*
Consumption of a diet low in animal fat	General population of adults	Sparks et al. (1998) *Journal of Applied Social Psychology*
Reduction of red meat and potato chips consumption		Sparks et al. (1997) *Journal of Applied Social Psychology*

Source: own illustration

Critical Appraisal

Numerous reviews have provided support for the use of TRA and TPB in the prediction of a range of behaviors, and particularly health behaviors (Ajzen 1991). In spite of the impressive amount of variance which the TPB can account for, Conner and Armitage (1998, p. 1449) present both narrative and meta-analytic evidence to support extension of TPB. In particular, the authors showed that two variables independently contribute to the prediction of intention, over and above TPB variables: self-identity and moral norms. Self-identity refers to the relevant part of an actor's self which connects behavior to societal goals; moral norms are concerned with personal feelings of an obligation to perform or not perform a particular behavior. Be-

sides self-identity and moral norms there might be other variables that would support the extension of TPB. Future work extending TPB may therefore be required (Armitage and Conner 2000).

2.2.5 Summary of the Leading Theories of Behavior Change

To summarize, the application of health behavior theories and models in supporting eating behavior change is widespread, with use of various theories and models to evaluate change in fat, fruit, vegetable, and fiber intake, and overall healthy eating. Table 9 summarizes the four leading health behavior theories and models.

Table 9: Summary of Theories/Models: Focus and Key Concepts

Theory	Focus	Key Concepts
HBM	People's perceptions of the threat posed by a health problem, the benefits of avoiding the threat, and factors influencing the decision to act	• Perceived susceptibility • Perceived severity • Perceived benefits • Perceived barriers • Cues to action • Self-efficacy
TTM	People's motivation and readiness to change a problem behavior	• Precontemplation • Contemplation • Decision • Action • Maintenance
TPB	People's attitudes toward a behavior, perceptions of norms, and beliefs about the ease of difficulty of changing	• Behavioral intention • Attitude • Subjective norm • Perceived behavioral norm
SCT	Personal factors, environmental factors, and human behavior exert influence on each other	• Reciprocal determinism • Behavioral capability • Expectations • Self-efficacy • Observational learning • Reinforcements

Source: Glanz et al. 2005, p. 45

There are a number of social cognition models that have not been elaborated. The aim of the previous sections was to present and analyze the most commonly used health behavior change theories and models (see chapter 2.2). For the sake of completeness, the following models can be identified as further social cognitive models of health behavior (Armitage and Conner 2000).

- Protection Motivation Theory (Rogers 1983)
- Gollwitzer's Implementation Intentions (Gollwitzer 1993; Gollwitzer and Brandstätter 1997b) (will be elaborated in chapter 2.4)
- Bagozzi's Goal Theory (Bagozzi 1992, 1993)
- Health Action Process Approach (Schwarzer 1992)
- Rubicon Model (Heckhausen 1991)
- Kuhl's Action Control Theory (Kuhl 1981)
- Precaution Adoption Process (Weinstein 1988)

Based on the explanations and critical appraisals of the health behavior models presented in the previous chapters, all models deliver theoretical basis to explain the guiding research question posted in chapter 1.2.1 as to why people find it difficult to eat healthy although they know it would be good for them. Overall, the TPB has been proven to be a very useful model in predicting health behavior and more specifically, eating behavior. It has been used by far the most with respect to healthy eating behavior. Furthermore, the TPB allows integrating easily mediating variables in order to explain more variance. This thesis considers to test the direct causality between the motivating stimuli of a person regarding healthy eating and the actual resulting behavior (healthy eating). Therefore, a controlled experiment based on a well-known behavioral health framework that has been proved to be robust with respect to healthy eating behavior will be conducted considering mediating variables in addition to the TPB variables.

2.3 Motivation for Healthy Eating and Habit

Even though many people consider healthy eating important, the vast majority reports difficulties in consistently maintaining a healthy diet. For example, 72% of Swiss consumers who participated in the Food Consumption Study consider good nutrition important. At the same time, a third of the surveyed participants are not happy with their eating behavior and find it hard to maintain a healthy diet (Rudolph and Glas 2008, p. 20). Why is it so difficult to act on intentions or maintain attempts for changing health behavior, even for people who seem to be motivated? This so-called intention-behavior-gap has recently started to attract substantial attention and currently is one of the most researched aspects of health behavior (Sheeran 2002b; Sheeran, Webb, and Gollwitzer 2005b).

In the past, strategies, programs, and initiatives for healthy eating have been developed to work for everybody. However, an increasing body of research shows health disparities in diverse populations (Conner, Fitter, and Fletcher 1999; O'Connor et al. 2008). These findings highlight the importance of developing custom-tailored approaches to healthy food consumption communications (Kreuter and Skinner 2000, p. 2). This proposition becomes especially important for people struggling with deep-rooted unhealthy eating habits. Changing a bad healthy eating habit seems even more difficult than maintaining a good one. Given the automaticity character of unhealthy eating habits, additional motivation may be required to change them (Tam, Bagozzi, and Spanjol 2010, p. 286).

Most current theories of motivated behavior have the concept of intention at their core (Sheeran 2002a, p. 1). The basic idea is that people will engage in intentional behavior (i.e., will be motivated) if they expect the behavior to attain goals or to yield desired outcomes. People are thus said to be motivated when they behave with the intention of attaining a goal (Lewin 1926, 1951).

Even if people are certain they can do a task, they may have no compelling reason to do it. Intrinsic and extrinsic motivation theories focus on the question "Why?" and therefore are also considered the theories focused on the reasons for engagement (Eccles and Wigfield 2002, p. 112). When people are intrinsically motivated, they perform a task for its own sake because they are interested in and enjoy the activity. When people are extrinsically motivated, they engage in activities for instrumental or other reasons (Bénabou and Tirole 2003, p. 490).

Economists promote performance by incentive. In other words, rewards serve as "positive reinforcers" for the desired behavior (Bénabou and Tirole 2003, p. 489). In contrast, for psychologists, the effect of rewards is more controversial. They argue that rewards may actually impair performance, making them "negative reinforcers" (Deci et al. 1999, p. 639).

The next two sections elaborate two motivation approaches that are applied in this study: self-regulation strategy as a form of intrinsically motivated approach and financial incentive as an extrinsic motivated approach. These two approaches have been chosen due to following reasons:

The majority of the population reports the intention to eat healthier. Thus the question remains open as to why this majority actually continues to eat so little healthy food products? Reasons like missing availability and low product knowledge are

surely important, but insufficient reasons. The present study adopts a different approach to investigate this question. The starting point is the characterization of food purchase as a prototypical example of habitual behavior. The consumer has settled on a variety of snacks products, based on past experience and has become a loyal snacker. As a consequence, the desire for food products such as snacks automatically activates a chain of goal-related behaviors. The view that frequently and satisfactorily repeated behaviors are guided by habits is old (James 1980). Lately, the growing interest of social psychology in non-reasoned, schematic, and automatic processes has roused new interest in habits (Ouellette and Wood 1998; Verplanken and Aarts 1999). Habit is conceptualized as a form of goal-directed automatic behavior (Bargh 1996), which is mentally represented as a link between a goal and actions that are instrumental in attaining this goal. The more often the activation of a goal leads to the performance of the same action under the same circumstances, the stronger the link between the goal and action (i.e., the habit) will become. Normally habits are in line with once formed attitudes and intentions concerning a behavior. But in the case of trying to substitute an old, frequently repeated behavior by a new one, the old habit may counteract that particular new intention. Verplanken and Faes (1999) call these counterintentional habits. Therefore, the intention to change one's habitual food purchasing patterns may impede existing food purchasing habits.

The learning theory defines social behavior as acquisition of associations between environmental cues, people's responses, and experienced consequences (Hull 1943, p. 246). The learning theory embraces the long-assumed theory that cognitive processes do not mediate automatic responses to environmental stimuli. However, research has argued that cognition does play a role in the direct control of environmental cues over behavior (Bargh and Gollwitzer 1994, p. 72). Thus, predictive models of behavior indicate that action can emerge from conscious intentions or from implicit guides developed through past performance (Wood, Quinn, and Kashy 2002, p. 1281).

Verplanken (2009, p. 71) argues that previous research has equated habit with repeated behavior or past behavioral frequency and points out that there are two main conceptual problems with doing so. First, even though repetition is an essential requirement for habits to be developed, repetitive behavior is not necessarily habitual (Ajzen 2002, p. 110). Verplanken (2009, p. 71) illustrates this aspect: a doctor sends numerous patients to the operating table, but one hopes this has not become a habit. Second, habitual behavior is not only repetitive but is delineated by a certain degree

of automaticity (Aarts and Dijksterhuis 2000, p. 54; Ouellette and Wood 1998, p. 56; Verplanken and Aarts 1999, p. 112; Verplanken and Orbell 2003, p. 1320). Thus, equating habit with behavioral frequency would not capture the aspect of automaticity. According to Verplanken (2009, p. 71), the following definition describes the essence of habit: "A recurrent, often unconscious pattern of behavior that is acquired through frequent repetition." (American Heritage Dictionary of the English Language 2008).

In line with the equation of habit as behavioral frequency, researchers have most often measured habit by a single-item asking the respondents to rate how often they performed a certain behavior on a scale from "never" to "always" (Mittal 1988, p. 998).

Verplanken (2006, p. 641) suggests considering habit as a mental construct that consists of four aspects:

1. lack of awareness
2. difficulty to control
3. mental efficiency
4. experience of repetition

These four factors make it possible to measure the strength of a habit. A few studies analyze this construct with respect to eating behavior. For example, Weijzen et al.'s (2009) study concludes that people consume unhealthy snacks even after declaring their intentions to eat healthy snacks a day earlier. However, unintentional habits still find their way to influence snacking behavior (Verplanken and Faes 1999).

Brug and colleagues (2006) analyze potential predictors of fruit intake among adults of an internet research panel. Their study design includes attitude, subjective norms, self-efficacy, expected pros and cons, habit strength, intention, and fruit intake as variables. The results confirm that the TPB construct predicts fruit intake and that habit strength and different self-efficacy expectations may be additional determinants relevant to fruit intake (Brug et al. 2006, p. 76).

Reinaerts et al. (2007) incorporate a measure of habit strength in TPB-research on fruit consumption and demonstrate an additive effect of habit strength. Two other studies show an interactive effect of habit strength and TPB-variables in fruit consumption (De Bruijn 2010; De Bruijn et al. 2007). In three coordinated studies on eating, Verplanken (2006) shows that although repetition is necessary for habits to

develop, it should not be equated with frequency of occurrence but rather should be considered a mental construct involving features of automaticity, such as lack of awareness, difficulty of control, and mental efficiency.

Table 10 summarizes the most important studies analyzing habit strength in the context of eating behavior. As can be seen, all studies are of recent date. Additional research is warranted to explore habit strength fully with respect to specific eating behaviors.

Table 10: Studies Applying Habit Strength to Eating Behavior

Application	Sample	Author/Journal
Investigation of the factors that affect the intention-behavior consistency of healthy snack choices	General population of students	Weijzen et al. (2009) *Food Quality and Preference*
Habit as mental construct in eating behavior	General population of students	Verplanken (2006) *British Journal of Social Psychology*
Habit as mediator of the intention-behavior relationship	General population of adults	De Bruijn et al. (2007) *Psychology & Health*
General belief and attitudes towards health and illness	Undergraduate students	Tam et al. (2010) *Health Psychology*
Cognitions, intentions and habits as predictors of fruit intake	General population of adults of an Internet research panel	Brug et al. (2006) *Journal of Nutrition Education and Behavior*
Habit strength as explanation of fruit consumption	Undergraduate students	De Bruijn (2010) *Appetite*
Accessibility, exposure, parental consumption, and habit as contributors to explain children's fruit and vegetable consumption	4- to 12-year-old children	Reinaerts et al. (2007) *Appetite*

Source: own illustration

In consumer research the importance of habits for understanding everyday purchasing behaviors was recognized early on (e.g., Assael 1991). Consequently consumer researchers are especially interested in the question of how to change habitual purchasing behavior. Various marketing strategies have been developed to induce consumers who buy by habit to consider other brands: advertise a new feature in an existing brand, trying to change consumer priorities by introducing a feature consumers had not previously considered, or introduzing a line extension of an existing brand that offers a new benefit. But offering monetary incentives like price deals,

free product samples, or coupons are viewed as the most effective way of getting a habitual consumer to try alternative products.

An alternative approach to change purchase habits concentrates on motivational factors assumed to influence the goal intention formation process, and another research line focus on the process of enacting a new goal intention. That translating even a strong goal intention into actual behavior is often difficult, is confirmed by meta-analytic reviews of Ajzen and Fishbein's theory of planned behavior a model which has often been used to understand and predict consumers' behavior.

2.4 Self-Regulation as an Enhancement of Goal Pursuit

Self-regulation refers to the processes of goal setting and goal striving and includes dealing with a range of challenges that people may confront when trying to achieve something that is important to them but is difficult to attain (Mischel, Cantor, and Feldman 1996, p. 329). Even the most routine tasks of life require strategies of planning and self-monitoring to keep on track and to complete the performance (Mischel et al. 1996, p. 329). Many people form New Year's resolutions such as to lose weight, quit smoking, or reduce snacking, but a significant number fails to succeed in attaining these goals (Norcross, Ratzin, and Payne 1989, p. 205). To understand why some people fail to regulate themselves, it is important to understand the terms self-control and willpower.

Self-control is the ability to control one's emotion, behavior, and desires to manage one's future (Mischel 1996, p. 197). Hoch and Loewenstein (1991, p. 492) stated in their paper that a complete understanding of consumer behavior must recognize that people are influenced by both long-term rational concerns and more short-term emotional aspects. Thereby, the outcome of consumer decisions depends considerably on the conflict between the competing strengths of self-control and desire. The rational choice model assumes that the preferences are known to people and do not alter over time (Hoch and Loewenstein 1991). If so, then a decision that is made today about future behavior should be a decision which does not change as time goes by. Yet, a rift between long-term objectives and short-term desires can lead to time-inconsistent choices, where individuals make selections, perhaps under pressure or in haste, which would not have been made under a more objective perspective. This means, some individuals are disproportionately concerned with the present relative to the future (Frederick, Loewenstein, and O'Donoghue 2004, pp. 178). Even with enough information about the benefits of exercise, the nutrient content of food, and the health consequences of overweight and obesity, some people still choose to

adopt a lifestyle that leads to weight gain because the costs (in terms of time, money, and opportunity) of not doing so are just too high (Finkelstein, Ruhm, and Kosa 2005, p. 252). Hence, these people may be less likely to delay gratification as a result of a short-term orientation (Loewenstein and Thaler 1989, pp. 182). Thus, self-control refers to aspects of self-regulation under certain conditions in which the person's most automatic responses are not effective. When a desired goal is blocked or habitual responses fail, self-control is being performed (Mischel 1996, p. 197). *Willpower* is the strength to act in pursuit of a goal (Mischel 1996, p. 197). Friedrich Nietzsche defines willpower as any internally motivated action (Schwartz 1998, pp. 36).

Typically, self-regulation fails when people set goals that are too difficult to reach or when they adopt goals for external reasons, such as social pressure or because of expectations of what they should do (Koestner et al. 2002, p. 231). Another possible reason is that people resist from developing plans as to how they will pursuit their goal and how they will ensure persisting distractions and obstacles (De Ridder and Kuijer 2006, p. 622).

By framing the analysis of self-regulation around questions of willpower and the exertion of self-control, the intrinsically motivated approach of this study focuses on what people must do to gain control in eating situations, in which self-imposed delay of gratification for the sake of desired but temporarily delayed goals helps consumers turn their good intentions into reality (Mischel 1996, p. 197).

Gollwitzer (1993, 1999) suggests that effective goal pursuit can be facilitated by developing specific action plans that link anticipated critical situations to goal-directed responses and therefore, elicits (when actually encountered) automatic responses.

The theory of action phases (Gollwitzer 1990, p. 53) makes a distinction between a deliberative phase, which involves motivation, and an implementation phase, which involves volition. In the former phase, a goal intention is formed on the basis of feasibility and desirability criteria. This phase is similar to the process of forming a behavioral intention on the basis of attitude, subjective norm, and perceived behavioral control in the theory of planned behavior. The second phase deals with the selection of relevant actions that must be taken to start performing behavior by forming specific plans in terms of when, where, and how to act – that is, the formation of a self-regulation strategy (in the literature also called implementation intention) (Gollwitzer 1990, p. 60).

Forming a self-regulation strategy in which a mental link is created between a pre-specified future cue and a desired goal-directed response (Gollwitzer 1993) commits the person to perform certain goal-directed behaviors when the critical situation is actually encountered (Gollwitzer and Brandstätter 1997a, p. 187).

Many researchers have proved the salutary effects of forming self-regulation strategies on goal progress (Gollwitzer 1999; Sheeran, Webb, and Gollwitzer 2006). Various studies show that specific action plans improve people's success at achieving health goals, such as exercise (Prestwich, Lawton, and Conner 2003; Rise, Thompson, and Verplanken 2003), cancer screening (Orbell et al. 1997; Sheeran and Orbell 2000; Steadman, Rutter, and Quine 2006), and smoking (Higgins and Conner 2003), among others.

There are several studies attesting the utility of self-regulation strategies in the process of translating a behavioral intention into performance with respect to healthy eating behavior. For example, Verplanken and Faes (1999) conducted a test of the efficacy of self-regulation strategies in promoting a healthy diet. Student participants were asked to form self-regulation strategies to eat healthily on one particular day in the next five days, (i.e., plan exactly what to eat and drink during the specified day). Participants in the control condition did not form this plan. All of the participants were asked to keep a diary for five days in which they recorded everything they ate and drank. As expected, ratings by a dietician (who was blind to the purpose of the study) indicate that participants who formed self-regulation strategies ate significantly more healthily compared with the participants who had not made any action plans (Verplanken and Faes 1999, p. 598). The study yielded promising results. However, the results specified a composite score for the health-related quality of consumed foods, which could reflect a decrease in fatty foods, an increase in fruit and/or vegetable intake, or both (Adriaanse et al. 2009, p. 61). Kellar and Abraham (2005, p. 547) obtain similar findings with respect to students' recommended daily intake of fruit and vegetables over a one-week period.

Armitage (2004) tests the efficacy of self-regulation strategies in promoting a low-fat diet among a sample of 264 company employees using a well-validated food frequency index to assess behavior over a one-month period. Participants in the experimental group received an instruction at the end of a TPB questionnaire about eating a low-fat diet. The food frequency measure was used to measure three indexes of dietary intake. Within-participants analyses indicate that participants who formed self-regulation strategies show significant reductions in fat intake at follow-

up compared with the baseline according to all three indexes. Participants who had not formed self-regulation strategies reveal no significant change over the one-month period (Armitage 2004, p. 922). These findings show that a simple instruction to form a self-regulation strategy can be effective in promoting a healthy diet among representative samples. However, the dependent measure in this study (food frequency list) depended upon participants' ability to remember their food intake for a whole month, which may elicit memory bias. Therefore, Adriaanse and colleagues (2009, p. 61) suggest to verify whether these results hold under more severe conditions.

Achtziger et al. (2008) take a different approach in using self-regulation strategies to promote healthy eating. Instead of asking participants to plan what healthy foods they would eat, they asked participants to halve their consumption of an unhealthy snack food by planning to ignore the thought of unhealthy food when it entered their minds. All of the participants identified unhealthy foods and completed a TPB questionnaire regarding their belief about halving their consumption of the identified foods over the following week; in addition, a subset formed a self-regulation strategy. Findings from the study point out that forming if-then plans to engage in moderate snack consumption significantly reduced self-reported snack behavior over a one-week period (Achtziger et al. 2008, p. 383).

In two studies with graduate students, Adriaanse et al. (2009) investigate the efficacy of self-regulation strategies to replace unhealthy snacks with healthy snacks by linking different types of cues for unhealthy snacking (the "if"-part) to healthy snacking (the "then"-part). Results demonstrate that self-regulation strategies that specify motivational cues decreased unhealthy snack consumption, whereas the classic specification of where and when did not (Adriaanse et al. 2009, p. 64).

De Ridder et al. (2009) hypothesize in their study that (1) adopting a diet goal would be determined by (either intrinsic or extrinsic) motivation only, whereas (2) forming self-regulation strategies would be determined by intrinsic motivation and (either low or high) action orientation. The study includes a sample of normal weight students who were concerned about their dietary habits. Results show that intrinsic motivation and low action orientation prove to be significant predictors of intentions to implement a healthy diet goal. This was not the case for high action orientation. These findings recommend that self-regulatory skills may link to short-term strategies of initiating behavior change only (De Ridder et al. 2009, p. 625).

Furthermore, Luszczynska et al. (2007) investigate the effects of a self-regulation strategy training aiming to reduce saturated fat intake among patients after myocardial infarction. Data were collected three times: at approximately one week after myocardial infarction, two weeks after cardiac rehabilitation (approximately two months after myocardial infarction), and six months after rehabilitation (eight months after myocardial infarction). After the data collection two weeks after rehabilitation, patients were randomly assigned to the experimental (individually delivered self-regulation strategy training) or control group. The authors used daily saturated fat intake, total fat intake, and percentage of calories from fat as outcome variables. The results of the study indicate that people who receive a self-regulation strategy training reduced saturated fat intake significantly compared with people who did not receive training (Luszczynska et al. 2007, p. 495).

Another study by Stadler et al. (2010) investigates whether an intervention that combined information with self-regulation strategies had a better effect on eating fruits and vegetables compared with an information-only intervention. The sample consisted of women who participated for 24 months in a controlled intervention program. All participants received the same information intervention. Those participants in the information plus self-regulation strategy group received in addition a training on a self-regulation technique that integrates mental contrasting with self-regulation strategies. Results reveal that participants in both groups ate more fruits and vegetables during the first four months after intervention compared with the baseline. Two years later, participants in the information plus self-regulation group maintained a higher intake, whereas participants in the information group returned to baseline levels. Thus, the findings indicate that adding self-regulation training to an information intervention increases its effectiveness for long-term behavior change (Stadler et al. 2010, p. 278).

Finally, a study by Tam et al. (2010) examine whether matching self-regulation strategies to people's regulatory orientation affects the effectiveness of changing unhealthy snacking habits. A sample of undergraduate students self-reported in an online food diary their intake of healthy and unhealthy snacks over a two-day period. Results indicate that participants with weak unhealthy snacking habits consumed more healthy snacks when forming any type of self-regulation strategies, whereas participants with strong unhealthy snacking habits consumed more healthy snacks only when forming self-regulation strategies that matched their regulatory orientations. These findings highlight that self-regulation strategies that match regu-

latory orientation increase motivation intensity and put snacking under intentional control for people with strong unhealthy snacking habits (Tam et al. 2010, p. 287).

So far, several studies on self-regulation strategies and eating behavior have been conducted, but to the best of the author's knowledge, only four studies were concerned with changing existing eating patterns (Adriaanse et al. 2009; Armitage 2004; Tam et al. 2010; Verplanken and Faes 1999).

Table 11 summarizes the studies which applying self-regulation strategies to eating behavior.

Table 11: Studies Applying Self-Regulation Strategies to Eating Behavior

Application	Sample	Author/Journal
Self-regulation strategies pitted against individual differences in unhealthy habits	General population of students	Verplanken and Faes. (1999) *European Journal of Social Psychology*
Self-regulation strategies and fruit and vegetable intake	General population of students	Kellar and Abraham (2005) *British Journal of Social Psychology*
Efficacy of self-regulation strategies in promoting a low-fat diet	Company employees	Armitage (2004) *Health Psychology*
Self-regulation strategies and reducing unhealthy snacking	Undergraduate students	Achtziger et al. (2008) *Personality and Social Psychology*
Efficacy of self-regulation strategies to replace unhealthy snacks with healthy snacks	General population of students	Adriaanse et al. (2009) *Personality and Social Psychology Bulletin*
Role of motivation and action orientation in forming spontaneous self-regulation strategies for a healthy diet	Undergraduate students	De Ridder et al. (2009) *European Journal of Social Psychology*
Effects of self-regulation strategies training on the reduction of saturated fat intake	Patients after myocardial infarction	Luszczynska et al. (2007) *Journal of Psychosomatic Research*
Self-regulation strategies on eating fruits and vegetables over two years	Female members of a German health insurance association	Stadler et al. (2010) *Health Psychology*
Matching self-regulation strategies to people's regulatory orientation to change unhealthy snacking habits	Undergraduate students	Tam et al. (2010) *Health Psychology*

Source: own illustration

2.5 Financial Incentives as Goal Pursuit Motivation

Whereas self-regulation strategies as intrinsic rooted theories of motivation support the belief that the cause of responses is internal, in contrast, the incentive theory explains motivations in terms of external stimuli. The basic concept behind the theories of incentive motivation is to capture the way in which objects and events can acquire high motivational value and drive behavior, even if biological needs are absent. To select the most appropriate goal, an individual needs to define and compare the incentive values of competing desirable objects (Arana et al. 2003, p. 9632).

The term incentive value highlights the motivational nature of the wanting dimension, that is, it is the value that "incentivizes" actions; in other words, value that motivates (Dai, Ariely, and Brendl 2010, p. 325; Dickinson and Balleine 1995, p. 163).

Traditional *microeconomic theory* views the strict rational decision maker as *homo oeconomicus* without any restrictions regarding his or her perceptional, cognitive, and intellectual capacities. He or she maximizes a continuous target function and performs complicated calculations within a simplified environmental structure. The solution to the problem is found through simultaneous comparisons of all alternatives. The decision maker is endowed with great capabilities of solving simply-structured problems (Tietz 1990, p. 659).

Economic thinking assumes that consumers who understand and value the relationship between diet and health will rationally respond by choosing to eat a healthful diet. Yet behavioral economic research indicates that people regularly and predictably behave in ways that contradict this assumption, thus not making decisions in their own best interest. People may not discount according to classic economic theory but may instead be present biased, meaning that they may pursue immediate gratification instead of choosing behaviors that they would favor using their long-run preferences (Sindelar 2008, p. 450). Long-term thinking may not always prevail; if there are many decision alternatives with many characterizing dimensions, the decision situation may be too complex to establish a maximizable utility function, and consumers do not always make decisions according to strict economic rationality (Mancino and Andrews 2007, p. 1; Selten 1990, p. 650).

Economics is based on incentives, and it derives its strength from being able to predict how people change their behavior by providing financial incentives to engage in (or refrain from) various activities (Charness and Gneezy 2009, p. 910; Fehr and Falk 2002, p. 687). The underlying idea that the more an individual is paid – or the

higher the expected sanction – the higher his/her effort, is one of the main assumptions of the *incentive theory* (Festré and Garrouste 2008, p. 12). Using incentives to influence health habits is a frequently used instrument in economics. For example, negative incentives such as taxes are a common instrument in regulating healthy behavior of consumers. According to the classic economic theory, the consumption of a certain food product will decrease if the price of a particular food increases, and vice versa. Because of the influence of food prices on food consumption and ultimately on weight, there remains considerable interest among policymakers in the extent to which removal of subsidies, introduction of fat or calorie taxes, or other pricing strategies can influence current food consumption practices (Brownell and Frieden 2009, p. 1806).

In contrast to taxation, economists have dedicated far less attention to the use of positive incentives. This is astonishing considering that taxes might have serious consequences for markets and competition could be considered a second-best solution (Rudolph, Glas, and Kenning 2010). There is an increasing number of psychological research indicating that positive incentives are effective in changing addictive behavior such as drug use and smoking. This approach is rooted in *contingency management* (Sindelar 2008, pp. 449). The basic idea behind contingency management is that if a good behavior is rewarded, it is more likely to be repeated. Contingency management is so far mainly used in the mental health and substance abuse areas (Husky et al. 2008, p. 635).

One form of contingency management is the *token economy system,* designed to increase desirable and decrease undesirable behavior by using tokens – a form of extrinsic reward in which people receive rewards as a result of achieving some desirable behavior. The tokens are collected and later exchanged for a meaningful object or privilege (LeBlanc 2004, p. 3).

Voucher programs are another form of contingency management. In voucher-based contingency management people are able to collect vouchers that are exchangeable for retail items whenever people for example resisted drug use (Bettinger and Slonin 2006, p. 1625).

Another form of contingent management, used especially in the eating behavior field, is *food stamp programs*. Initially, the focus of food stamp programs was on providing participants with the purchasing power to receive enough to eat. These days, with the obesity epidemic, food stamp programs in the United States have in-

creased their emphasis on encouraging healthful food choices by participants, primarily through expanded educational efforts (Mancino and Andrews 2007, p. 1).

Incentives can overcome barriers and have proven effective in inducing changes in consumer behaviors such as increasing exercise (Charness and Gneezy 2009), smoking (Stern 1999) and eliminating addictive behaviors (Marteau, Ashcroft, and Oliver 2009).

There are a few studies that investigate incentives on eating behavior in form of taxes. Caraher and Cowburn (2005) identify articles of policy relevance from a systemized search in six databases. The literature reveals that the dominant approach to raise general revenues was a food tax. The results reveal that small taxes whose purpose is to promote the health of key groups (e.g., children) are more likely to receive public support. The authors conclude that taxing food can influence food behavior within closed systems such as schools and workplaces.

Furthermore, there are a few studies that elaborate financial incentives and their influence on healthy eating from a descriptive point of view. All studies agree that financial incentives as an economic approach should be considered when health policies are being set up. At the same time, the studies point out to crowding-out effects (Hanoch and Gummerum 2008; Marteau et al. 2009; Waterlander et al. 2010).

Yet, to the author's best knowledge, there exist no studies that analyze the influence of financial incentives to encourage people to change their unhealthy snack behavior. The main idea of this approach is that financial incentives may move some people past the threshold needed to engage in healthy snack behavior.

2.6 Summary

Persuading people to eat healthier is a major challenge in modern societies. This chapter discusses two research approaches. One approach applies powerful economic mechanisms (e.g., higher taxes for unhealthy food products). Studies show that the demand for sugar-sweetened beverages can be reduced significantly by increasing prices (e.g., Brownell and Frieden 2009; Epstein et al. 2010). The other approach under discussion uses instruments grounded in psychology (e.g., Chandon and Wansink 2007; Garg, Wansink, and Inman 2007). However, both ways are often discussed as unrelated concepts. This is astonishing because an interplay of both ways could positively affect the power of prevention. This holds particularly true considering that taxes might have serious consequences for markets and competition and could be considered a second-best solution (Rudolph et al. 2010). Against

this background, this study aims to shed light on the interaction between intrinsic and extrinsic motivational approaches.

Specifically, in this research, it is tested whether self-regulation mechanism and financial incentives can be used to overcome the intention-behavior gap and foster healthy snack behavior.

In the present study the consumption of snacks will be applied to promoted change in eating behaviors. A snack is defined as any type of food that is consumed between meals (De Graaf 2006). Our focus on snacking as the type of eating behavior to be targeted by self-regulation strategies was based on two reasons. First, self-regulation strategies should be targeted to a specific goal (such as snacking) instead of to a more general goal (such as eating) in order for the newly planned response to effectively compete with the old habitual response (Holland, Aarts, and Langendam 2006). Second, a focus on snacking was deemed relevant because previous studies have consistently demonstrated that snack consumption is an important contributor to overweight (De Graaf 2006; Jahns, Siega-Riz, and Popkin 2001; Zizza, Siega-Riz, and Popkin 2001).

Furthermore, it is examined which of these approaches have a stronger influence and whether interactions might accrue. Thus, comparing the two interventions provides insight into the interplay between intrinsic and extrinsic processes underlying the healthy eating behavior.

No previous research has focused on identifying how motivational factors (intrinsic and extrinsic) affect consumers' snack choices by incorporating elements from behavioral economics into consumer decision making acknowledging that conflicting goals of a person may influence consumers' product decisions.

This project is interdisciplinary in that it combines knowledge from different research areas (e.g., consumer behavior, behavioral economics, and psychology). Therefore, the framework of the presented research project is based on multiple conceptualizations derived from the literature on self-regulation, incentives, and habit.

3 Hypotheses Development and Conceptual Model

3.1 Development of Research Questions

The outlined research problem and literature review form the basis for the hypotheses development. This research empirically tests these hypotheses using the experiment described in Chapter 4. To develop the hypotheses, first, research questions are derived on the basis of the theories presented in the previous chapter. Second, the conceptual model transfers the research questions into an abstract level on which basis the hypotheses are being developed.

At the core of the framework, the dependent variable refers to how people actually make their snack choices. The operationalization of the dependent variable takes place in two ways. First, to capture the actual food choice, the snack behavior on site was measured by (1) systematically observing which snack participants chose and (2) counting the number of the particular snack taken. Second, perceived (self-reported) snack behavior was measured.

The main goal is to answer the following question:

Why do consumers intend to stick to healthy snack behavior and fail to do so?

As explained in chapter 2.6, this study focuses on snacking behavior. It is assumed that consumers have an initial intention to reduce snack consumption and perceive a degree of confidence regarding their ability to do so before making food choices. Therefore, the research question addresses the impact of antecedents of the theory of planned behavior according to Ajzen (1991, p. 179), which implies that intentions have an effect on behavior.

How do personal determinants predict healthy snack behavior?

However, in Armitage and Conner's (2001) meta-analytical study, the theory of planned behavior indicates that correlations between intentions and behavior are modest.

In general, literature concludes that past behavior predicts future behavior even when the variables of the theory of planned behavior, which offer direct antecedents of behavior, are controlled. One possible explanation of this effect is habit. Repeated behavior can turn into a habit and become a stronger trigger of future behavior than attitudes and intentions (Ouellette and Wood 1998; Verplanken, Hofstee, and Janssen 1998). In addition to the first research question then, habit should be

taken into account when studying the determinants of predicting the ability to reduce snack consumption.

How do habits affect healthy snack behavior?

Many people form New Year's resolutions such as "I am going to lose weight" and "I am going to quit smoking", or "I am going to reduce snacking". Unfortunately, a significant portion fails to succeed in attaining these goals (Norcross et al. 1989, p. 205). Instead of following their intentions, many consumers find themselves guided by deep-rooted habits. How can existing behavioral patterns (e.g., eating an apple instead of a chocolate bar) be changed? Is there a way to facilitate the formation of new habits?

In general, there are two ways of motivating people to change their behavior: appeal to (1) a person's social commitment (intrinsic motivation) or (2) a person's economic rationality (extrinsic motivation) (Uusitalo 1999). However, these two motivations are often discussed as separate concepts. This is astonishing considering that an interplay of both could positively affect the power of prevention (Rudolph et al. 2010, p. 1). This study assesses, on the one hand, self-regulation strategies (intrinsic motivated approach) and, on the other hand, financial incentives (extrinsic motivated approach). Therefore, the following research questions focus on these two motivation approaches:

How do self-regulation strategies affect consumers' healthy snack behavior?

How do financial incentives affect consumers' healthy snack behavior?

Are there interaction effects between intrinsic and extrinsic approaches?

In addition to the empirical investigation, this study focuses on the implications of the analysis for practice. Therefore, the following question is as important as the previous questions:

What implications can be derived from the analyses aiming to foster efficiency of marketing communication efforts enhancing healthy snack behavior?

3.2 Hypotheses and Conceptual Model

3.2.1 The Impact of TPB Antecedents on Healthy Snack Behavior

Over the past few years, awareness of the links between diseases such as diabetes, coronary heart disease, and cancer and health behavior such as healthy eating has increased dramatically (Payne, Jones, and Harris 2004, p. 489). Nevertheless, people still find it difficult to engage in healthy eating behavior. To help people adopt healthy eating behaviors, it is crucial to understand the underlying factors as to why some people eat healthily whereas others fail to do so. The underlying determinants can be explained on the basis of the findings of the *theory of planned behavior* (Ajzen 1991), a health behavior change model frequently used to explain a variety of health behaviors (Armitage 2005; Courneya and Bobick 2000; Johnston et al. 2004; Payne, Jones, and Harris 2002).

The theory of planned behavior is an extension of the *theory of reasoned action*, developed by Fishbein and Ajzen (1975), which states that a person's behavioral intention depends on the person's attitude and subjective norms about the behavior. The former refers to "a person's general feeling of favorableness or unfavorableness toward some stimulus object" (Fishbein and Ajzen 1975, p. 216), and the latter refers to "the person's perception that most people who are important to him/her think he/she should or should not perform the behavior in question" (Fishbein and Ajzen 1975, p. 302). If a person intends to engage in a behavior, it is likely that he or she will do it (Fishbein and Ajzen 1974, p. 335). Although the theory of reasoned action has been applied to various kinds of social behaviors, it lacks predictive power. The model was developed to predict behavior of a person's will; however, it is important to acknowledge behaviors over which people have incomplete volitional control. To overcome this limitation, the theory of planned behavior introduces an additional factor as an antecedent of behavioral intention: perceived behavioral control (Ajzen 1991, p. 181).

Perceived behavioral control refers to people's perceptions of their ability to perform a given behavior (Ajzen 1991, p. 184). The construct of perceived behavioral control differs from Rotter's (1966) concept of perceived *locus of control*. Whereas locus of control is a generalized expectancy that remains stable across situations, perceived behavioral control varies across situations. For example, a man may believe that in general his outcomes are determined by his own behavior (internal locus of control); however, at the same time, he may believe that his chances of eating healthily are poor (low perceived behavioral control) (Ajzen 1991, p. 183).

Atkinson (1964) also addresses perceived behavioral control in his *theory of achievement motivation*. An important factor in this theory is the desire to succeed, which is defined as the perceived probability of succeeding at a given task. This approach has similarities to the construct perceived behavioral control, as used in the theory of planned behavior, because it refers to a specific behavioral context and not to a predisposition (Atkinson 1964, p. 242).

Most compatible with the perceived behavioral control construct of the theory of planned behavior is Bandura's concept of perceived *self-efficacy*. Bandura (1977) defines self-efficacy as people's confidence in their ability to organize and execute courses of action required to deal with prospective situations. In other words, Bandura's (1982, 1991) investigations show that people's behavior is strongly influenced by their confidence in their ability to perform. Within the theory of planned behavior, the construct of self-efficacy or perceived behavioral control is placed in a more general framework of the relationships between attitudes, intentions, and behavior. According to the theory of planned behavior, perceived behavioral control can be used together with behavioral intentions to predict behavioral achievement (Ajzen 1991, p. 184).

Considerable research draws on the theory of planned behavior to predict health behaviors, such as smoking (Higgins and Conner 2003), alcohol consumption (Johnston and White 2003), cancer self-examinations (Orbell et al. 1997), exercise (Hagger, Chatzisarantis, and Biddle 2002), and diet (Armitage and Conner 1999). No comprehensive review of the literature on healthy eating currently exists. However, a few studies use the theory of planned behavior to examine the consumption of specific foods (e.g., chips) and the consumption of foods from specific groups (e.g., fat consumption) (Armitage and Conner 1999; Conner, Norman, and Bell 2002; Povey et al. 2000). In general, the studies conclude that attitude is the best predictor of intention and that subjective norm rarely contribute.

In summary, following the theory of planned behavior, consumers act in accordance with their intentions and perceptions of control over their behavior: in turn, intentions are influenced by attitudes toward the behavior, subjective norms, and perceptions of behavioral control. Therefore, the following two hypotheses can be derived:

$H_{1A\text{-}C}$: The more positive the ($_A$) attitude and ($_B$) social normative pressure to reduce unhealthy snack consumption and ($_C$) the greater the perceived behavioral control to reduce unhealthy snack consumption, the stronger the intention of a person to reduce unhealthy snack consumption.

H2A-B: The stronger the ($_A$) intention to reduce unhealthy snack consumption and ($_B$) the greater the perceived behavioral control to reduce unhealthy snack consumption, the healthier the snack behavior of a person.

3.2.2 The Impact of Habit on Healthy Snack Behavior

In social psychology, past behavior has often been included as a predictor of future behavior in addition to variables from the theory of reasoned action and the theory of planned behavior, because not all behaviors are preceded by conscious intentions. However, most past behavior measures consist of single-item self-reports of behavioral frequency, which may not be best in terms of reliability and validity (Verplanken and Aarts 1999, p. 102; Wood et al. 2002, p. 1281).

Following the behavioral research tradition, habit has long been equated with behavioral frequency (e.g. Hull 1943) and social psychologists adopt this view (e.g. Triandis 1977). However, there are convincing arguments that behavioral frequency should not be equated with habit (Ajzen 2002). For example, a person who is put on medication has to take a pill every day, but only gradually will this action turn into a daily habit. Some behaviors turn rapidly into habits (e.g., taking a new route to work), whereas others require lots of practice (e.g., learning to drive a car). Finally, equating frequency with habit implies that habit strength increases with increasing frequency which is not realistic (Verplanken 2006, p. 640).

According to *learning theory*, social behavior is characterized by acquiring associations among environmental cues, people's responses, and experienced consequences (Hull 1943, p. 246). According to Wood et al. (2002, p. 1281), habits are actions that in the past have been repeated in stable contexts. Furthermore, Wood et al.'s (2002, p. 1282) study demonstrate that habitual behaviors are associated with fewer thoughts and less intense emotions than non-habitual behaviors. Thus, in addition to the history of repetition and context stability, which are necessary conditions in developing a habit, the psychological experience of automated behavior is an important characteristic of a habit (Verplanken 2006, p. 640). Habits are intentional in the sense of being goal-directed and seem hard to break. However, with reflection, people consider themselves capable of controlling many of their habits. Usually people are not aware of all behavioral options that may be present in their everyday life. Therefore, without being aware, they make lots of routine choices and decisions. Thus, habits are efficient to the extent that they require little mental effort to execute (Bargh 1996, p. 170).

In line with the conception of habit outlined thus far, Verplanken and Aarts (1999, p. 104) define habits as "learned sequences of acts that have become automatic responses to specific cues, and are functional in obtaining certain goals or end states." Therefore, Verplanken (2006, p. 641) suggests considering habit a mental construct consisting of several aspects: lack of awareness, difficulty to control, and mental efficiency, in addition to the experience of repetition.

Although repetition of behavior is a necessary condition for a habit to be developed, the defining quality of habit is the automaticity and efficiency of behavior happening in stable contexts, as several studies demonstrate (Conner et al. 2007; De Bruijn et al. 2007; Tam et al. 2010; Verplanken 2006).

In summary, instead of enacting the intentions, many people find themselves guided by old habits they wish to overcome (Verplanken and Faes 1999, p. 592). The following two hypotheses complement hypotheses $H_{1A\text{-}C}$ and $H_{2A\text{-}B}$ with habit as an additional predictor of behavior:

H_{1D}: The stronger the unhealthy snack habit, the weaker the intention of a person to reduce unhealthy snack consumption.

H_{2C}: The stronger the unhealthy snack habit, the weaker the healthy snack behavior of a person.

3.2.3 The Impact of Self-Regulation on Healthy Snack Behavior

Overall, the theory of planned behavior has been used with varying degrees of success when applied to health behavior. As outlined in section 3.2.1, various health behavior fields examine the theory of planned behavior (e.g. Armitage and Conner 1999; Hagger et al. 2002; Higgins and Conner 2003; Johnston and White 2003; Orbell et al. 1997). The majority of these studies show a weak intention-behavior relationship (Payne et al. 2004, p. 490). Although people form an intention, they often do not follow through with the intended behavior (Budden and Sagarin 2007, p. 392). Therefore, the question arises: How can the intention-behavior relationship be strengthened?

Thus far, healthy eating strategies have been developed to work for everybody. However, recent research provides strong support to question this "one size fits all" healthy eating strategy and recommends an individually aligned approach to food consumption research (Conner et al. 1999; O'Connor et al. 2008). This proposition becomes especially necessary for people with strong unhealthy snacking habits. People with strong unhealthy snacking habits are driven by the automaticity of the

habit and therefore might require additional motivation compared with people with weak unhealthy snacking habits (Tam et al. 2010, p. 286).

On the one hand, there exists extensive literature showing how difficult it is to reach a goal by appealing to people's rationality only. On the other hand, there are numerous studies on the role social norms have in pursuing a goal, such as staying healthy by eating well and exercising. These two discourses seldom cross paths. The idea of combining them is by no means new, but it is still rarely found in models of behavior that guide empirical research (Uusitalo 1999, p. 435). To that end, it is proposed to combine intrinsic and extrinsic motivation approaches and to study their interplay to explore the source of motivation needed to change unhealthy snack behavior.

Motivation means "to move"; thus, in this basic sense, the study of motivation is the study of action (Eccles and Wigfield 2002, p. 110). Modern theories of motivation focus more on the relationships between beliefs, values, and goals and action. Motivation theories have emerged from different intellectual traditions (Weiner 1992). In prior literature, four motivation streams exist: (1) beliefs about competence and expectancy of success, (2) the reasons why people engage in different activities, (3) integration of expectancy and value constructs, and (4) links between motivation and cognitive processes (Eccles and Wigfield 2002, p. 110). This study focuses on theories that are closely linked to expectancy-value models of behavior. Whereas expectancies refer to the beliefs about how a person performs on different tasks or activities, values are about incentives or reasons for doing the activity (Eccles and Wigfield 2002, p. 110).

This study aims to analyze how the intention-behavior relationship can be strengthened. For this purpose, it is important to focus on the *theories of reasons* to determine *why* people do not engage in healthy snack behavior, even though they know about the benefits of doing so.

In this context, several theories distinguish between intrinsic and extrinsic motivation (Sansone and Harackiewicz 2000). When people are intrinsically motivated, they perform the task for its own sake because they are interested in and enjoy the activity. In contrast, when people are extrinsically motivated, they engage in activities for instrumental or other reasons (Bénabou and Tirole 2003, p. 490; Eccles and Wigfield 2002, p. 112).

A key foundation of *extrinsic motivation* is that it is a construct that pertains whenever an activity is done to attain some separable outcome. The *self-determination theory* (Deci et al. 1994) proposes that extrinsic motivation can vary greatly in the degree to which it is autonomous. For example, a student doing her homework only because she fears parental sanctions if not doing it is extrinsically motivated. A student who does the homework because he personally believes it is valuable for his career is also extrinsically motivated, because he is doing it for an instrumental value rather than out of interest (Ryan and Deci 2000, p. 60).

Intrinsic motivation emerges in various forms. On the one hand, there are forms that may be innate, such as curiosity or a general need to feel competent and autonomous. On the other hand, intrinsic motivation may be related to the individual's environmental circumstances such as personal interests, values, and goals, to name a few (Ryan and Deci 2000, p. 57). For example, many people adopt some of the eating values of parents and other influential adults in their lives.

With increasing age and experience, most people become able to control and direct their own behavior (self-regulation) (Ryan and Deci 2000, p. 54). They are more likely to restrain their impulses and emotional reactions, internalize restrictions that they have come across in the past, and evaluate their own behavior (Ryan and Deci 2000, p. 54). Nevertheless, many people do not regulate their own eating behavior effectively.

Self-regulation processes are evident in most aspects of social behavior. Even the most routine tasks of daily life require strategies of planning and self-monitoring to keep on track and complete (Mischel et al. 1996, p. 329). To understand why some people fail to regulate themselves, it is important to comprehend the constructs of self-control and willpower. *Self-control* refers to aspects of self-regulation under certain conditions in which the person's most automatic responses are not effective. In other words, when a desired goal is blocked or habitual responses fail, self-control is performed. *Willpower* is the strength to act in the pursuit of a goal. By framing the analysis of self-regulation around questions of willpower and the exertion of self-control, this study focuses on what people must do to gain control in eating situations, in which self-imposed delay of gratification for the sake of desired but temporarily delayed goals helps consumers turn their good intentions into reality (Mischel 1996, p. 197). When people believe that the performance of a particular behavior is under their control, they can consider strategies of manipulating their

own attention, motivation, and emotion to influence their action – that is, to self-regulate (Kuhl 1984, p. 123).

Thus, self-regulation theories involve how people plan to overcome predictable problems on the way to goal achievement, given that they are committed to a certain goal (Rise et al. 2003, p. 2003). On this basis, Gollwitzer (1999, p. 493) develops the idea that people are likely to form intentions whenever they expect that a particular behavior will be difficult to perform, and furthermore, this event in itself may activate several self-regulatory processes that facilitate translating the intention into action.

The *theory of action phases* (Gollwitzer 1990, p. 53) makes a distinction between a deliberative phase, which involves motivation, and an implementation phase, which involves volition. In the former phase, a goal intention is formed on the basis of feasibility and desirability criteria. This phase is similar to the process of forming a behavioral intention on the basis of attitude, subjective norm, and perceived behavioral control in the theory of planned behavior. The second phase involves the selection of relevant actions to be taken to get started to perform behavior by forming specific plans in terms of when, where, and how to act – that is, the formation of a *self-regulation strategy* (also called *implementation intention*) (Gollwitzer 1990, p. 60).

There are several studies attesting to the utility of self-regulation strategies in the process of translating a behavioral intention into actual performance in eating behavior (Gollwitzer 1993; Gollwitzer and Brandstätter 1997b; Orbell et al. 1997; Sheeran and Orbell 1999, 2000; Verplanken and Faes 1999). However, to the best of the author's knowledge, only a few studies involve changing existing eating habits (Achtziger et al. 2008; Adriaanse et al. 2009; Armitage 2004; Verplanken and Faes 1999). Furthermore, it was particularly of interest how individuals with strong snacking habits react on self-regulation strategy as a motivator to consume healthy snack food. Therefore, the following hypotheses are proposed:

H_3: People who form a self-regulation strategy are more likely to pick a healthy snack than people who do not form a self-regulation strategy.

H_4: People with strong snacking habits are more likely to pick a healthy snack when they form a self-regulation strategy compared to when they do not form a self-regulation strategy.

H5: The relation between intention toward reducing snack behavior and self-reported snack behavior will be stronger for those people who form a self-regulation strategy than people who do not form a self-regulation strategy.

3.2.4 The Impact of Financial Incentives on Healthy Snack Behavior

As outlined in section 3.2.3, the aim of this study is to discover whether the interplay of intrinsic and extrinsic motivation approaches is effective in improving snacking habits of consumers. Hypotheses H_3-H_5 are rooted in the intrinsic motivation theory; in contrast, this section elaborates financial incentive as a form of extrinsic motivation.

Traditional microeconomic theory views the strict rational decision maker as homo *oeconomicus* without any restrictions concerning his or her perceptional, cognitive, and intellectual capacities. Thus, economists tend to assume that people act in their own best interest (Knickman and Orleans 2004, p. 175).

According to economic thinking consumers understand and value the relationship between diet and health in a rational way and will therefore choose to eat a healthful diet. But behavioral economics research detects that people often behave in ways that contradict this assumption, thus not following their intentions in their own best interest. Economics uses incentives to engage in (or refrain from) various activities (Charness and Gneezy 2009, p. 910; Fehr and Falk 2002, p. 687).

The main reason this study uses financial incentives is that it may be possible to encourage people to change their habitual unhealthy snack behavior by offering monetary incentives, as doing so may move some people past the threshold needed to engage in healthy snack behavior. Moreover, it was particularly of interest how individuals with strong snacking habits react on financial incentives as motivators to consume healthy snack food. Therefore, the following hypotheses are proposed:

H6: People who are provided a financial incentive are more likely to pick a healthy snack than people who are not provided a financial incentive.

H7: People with strong snacking habits are more likely to pick a healthy snack when they are provided a financial incentive compared to when they are not provided a financial incentive.

H8: The relation between intention toward reducing snack behavior and self-reported snack behavior will be stronger for those individuals

who are provided a financial incentive than people who are not provided a financial incentive.

3.2.5 Crowding Out and Crowding In Effects

As outlined in the preceding two sections this study analyzes the direct as well as moderating effects of both self-regulation strategies and financial incentives on the intention-behavior relationship. In addition, this study examines the combination of the two types of motivation – more precisely, the way in which the two motivation approaches strengthen or weaken each other.

In economics, it is in general taken as granted that the more an individual is paid – or the higher the expected sanction – the higher his or her effort is (Festré and Garrouste 2008, p. 12). Many studies in economics and psychology demonstrate that rewards, and in particular monetary rewards, may crowd out intrinsic motivation. In other words, motivational crowding theory suggests that external interventions (e.g., monetary incentives, punishments) may undermine intrinsic motivation and have detrimental consequences on people's motivation and hence, on effort (Frey and Jegen 2000, p. 2).

More recently, Fehr and Falk (2002) point out to some limits of the crowding out theory. They consider that "even if crowding out effects are operative it may still be efficient to use material incentives. This is so because, from an economic point of view, it is the total sum of incentives that matters" (Fehr and Falk 2002, p. 717). They further highlight that studies on intrinsic motivation thus far have only examined the interaction between various forms of explicit rewards and intrinsic motivation. Hence, it is necessary to look at the relationships between implicit rewards and intrinsic motivation. The absence of explicit incentives does not mean that material incentives are absent. In fact, implicit incentives which are based on reciprocity are in fact the most relevant and powerful incentives in the context of economics. Fehr and Falk (2002, p. 717) assert a great interest to know how material incentives interact with intrinsic motivation.

Bénabou and Tirole (2006) follow this idea with their studies highlighting that experimental results that are assumed to support the negative effect of rewards can have different interpretation and eventually lead to contradictory findings. Thus, the idea that intrinsic motivation can be crowded out by extrinsic one could be biased.

According to Festré and Garrouste (2008, p. 24), the self-determination theory (SDT) offers a convincing way to reconcile various experimental results and theo-

retical approaches. The SDT, developed by Deci and Ryan (2000), proposes that psychological needs such as autonomy, competence and relatedness fundamentally determine individuals' well-being. Thus, extrinsic motivation acts upon the conscious part of behavior, that is, intrinsic motivation. According to the SDT, intrinsically motivated activities are those that individuals find interesting and would do independently of operationally separable consequences (Deci and Ryan 2000, p. 233). SDT proposes that extrinsic motivations are possibly internalized by individuals. In this case, a regulatory process permits a crowding in effect to occur. In this context, the role of relatedness is crucial because it provides the primary impetus for internalizing values and regulatory processes (Deci and Ryan 1991, p. 255).

To the author's knowledge there exists only one study thus far, in the domain of food, analyzing the effect of both interventions (self-regulation strategy plus financial incentive). Bamberg's (2002b, p. 584) results provide empirical evidence that the combined effects of extrinsic and intrinsic intervention seem to be more overlapping than additive. Taking the theory elaborated before into account, the question raises of how independent intrinsic and extrinsic processes are. On the basis of this elaboration, the following hypothesis is proposed:

H_9: There is an interaction effect of self-regulation and financial incentive on calorie intake. Specifically, (A) the effect of a financial incentive on low calorie intake will not be available when a self-regulation strategy is formed. In contrast, (B) the effect of a financial incentive on low calorie intake will be available when a self-regulation strategy is not formed.

3.2.6 The Mediating Role of Self-Esteem

Self-esteem is important if not crucial to human beings' happiness and well-being. It is a popular and important construct in the social sciences and everyday life. Blascovich and Tomaka (1991, p. 115) define it as the extent to which one prizes, values, approves, or likes oneself.

In this context, vanity is a dominant theme, at least in Western culture. Discourse on vanity can be found in various disciplines such as anthropology, economics, and even consumer research. In marketing, definitions of vanity comprise two primary dimensions: physical and achievement. Physical vanity is defined as an excessive concern for, and/or a positive view of, one's physical appearance. Achievement

vanity is an excessive concern for, and/or a positive view of, one's personal achievement (Netemeyer, Burton, and Lichtenstein 1995, p. 612).

There is a strong emphasis on outward appearance in Western societies (Franzoi and Herzog 1987; Netemeyer et al. 1995; Richins 1991). A great body of research has reported that physical attractiveness is positively related to benefits such as increased social popularity and power, as well as increased self-esteem (Adams 1977; Goldman and Lewis 1977; Jackson, Sullivan, and Hymes 1984; Krantz 1987). According to the Swiss food consumption study (Rudolph and Glas 2008, p. 106), 56% of Swiss people were on a diet in 2008 (partly due to health concerns). Given the substantial benefits of attractiveness in Western culture, it is not surprising that many people become greatly concerned with their appearance and pursue greater physical attractiveness (Watson et al. 1999, p. 446).

Healthy eating is an important part of promoting well-being. Researchers have extensively studied self-esteem's relationship to health behavior. High self-esteem has been found to predict positive health practices in general as well as healthy food consumption and exercise. In contrast, low self-esteem has been linked to unhealthy eating behaviors (Health Canada 2000, p. 28).

As discussed in section 3.2.3, many people use their best efforts to achieve healthy eating. But people must not only serve their goals; they must also protect their self-esteem. As Jones and Berglas (1978, p. 203) point out, people often undermine the attainment of a goal in an effort to protect self-esteem. Therefore, it is of interest to explore how people integrate self-regulatory strategies of goal pursuit aimed at the protection of self-esteem. Given the well-established relationship between self-esteem and health behavior, the impact of self-regulation strategies on health behavior may be mediated by self-esteem.

In summary, the preceding sections propose that (1) self-regulation affects snack behavior, (2) self-regulation affects people's self-esteem, and (3) self-esteem affects snack behavior. It is proposed that self-regulation influences a person's snack behavior by virtue of its effect on his or her self-esteem. Thus, the following hypothesis is formulated:

H10: Self-esteem mediates the influence of a self-regulation strategy on healthy snack behavior.

According to Thierry's (2001) *reflection theory of compensation*, there is a relationship between payment and self-esteem. Thierry (2001, p. 151) proposes that the

payment a person receives includes a variety of meanings that people consider vital to that person's self-esteem. Payment reflects information about what is happening in other fields (external to the person), the meaning of which connects to the person's self-esteem (Thierry 2001, p. 152). Self-esteem is a relatively stable individual difference, based largely on early childhood and socialization experiences (Coopersmith 1967, p. 154).

Therefore, considering the reflection theory of compensation and the fact that high self-esteem relates to positive health behaviors, it is proposed that (1) financial incentives affect snack behavior, (2) financial incentives affect people's self-esteem, and (3) self-esteem affects snack behavior. Thus, this study argues that the financial incentive influences a person's snack behavior by virtue of its effect on his or her self-esteem. Therefore, suggesting that financial incentives affect self self-esteem, with a subsequent impact on snack behavior, the following hypothesis applies:

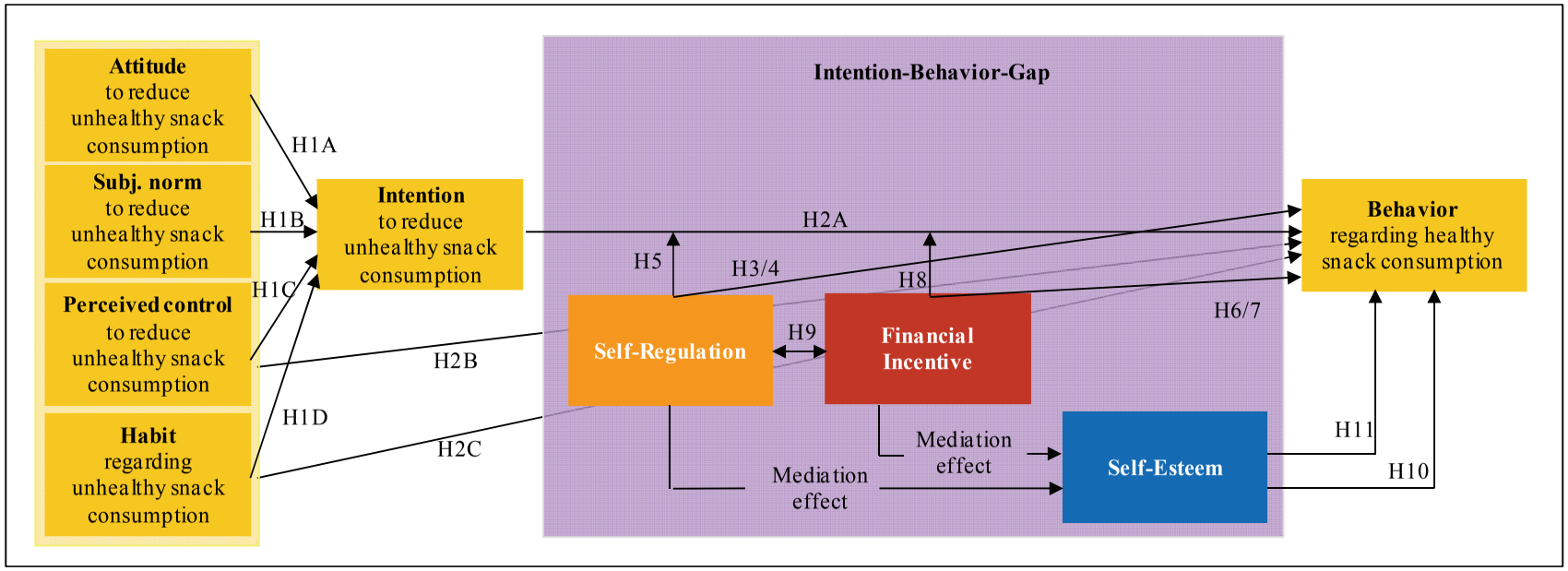
H_{11}: Self-esteem mediates the influence of a financial incentive on healthy snack behavior.

3.2.7 Conceptual Model

The conceptual model depicted in Figure 7 summarizes the hypotheses developed and explains how the experiment is theoretically conceptualized. The model makes a novel contribution to the literature by pointing out that motivating consumers to eat healthier is neither straightforward nor simple. The majority of previous conceptualizations concentrate on the initiation of a desired eating behavior (e.g., eating more fruits or vegetables) rather than changing an existing behavioral pattern (e.g., eating an apple instead of a candy bar). Changing behavior is usually more difficult than initiating new ones, especially when the old one is habitual (Adriaanse et al. 2009, p. 61).

The model presented in Figure 7 postulates that sometimes substituting an undesirable behavioral response is required. People with deep-rooted unhealthy snack habits especially require additional motivation. Analyzing the interplay of the two motivation approaches may positively affect the power of prevention and thus lead to more effective snack habits.

Figure 7: Conceptual Model of the Dissertation



Source: own illustration

3.3 Summary

The proposed research pertains to various conceptual foundations. Using existing theoretical constructs, this study draws on a novel combination of acknowledged and tested methodological approaches by applying them to a context in which these approaches have not been considered extensively. This chapter develops a hypothesis system which is summarized in Table 12. The two basis hypotheses (H_{1A-1D} to H_{2A-2C}) assume that attitude, subjective norms, and perceived behavioral control toward reducing snack consumption as well as habits regarding snacking behavior predict intentions towards reducing snack consumption and healthy snack behavior. Moreover, it is hypothesized that self-regulation strategies (H_3) and financial incentives (H_6) enhance healthy snack consumption (main effect) and moderate the intention-behavior relationship (H_5 and H_8). Furthermore, it is presumed that the interventions self-regulation strategy and financial incentive show an interaction effect on healthy snack behavior ($H_{9A/B}$). In addition, it is hypothesized that people with strong snacking habits are more likely to pick healthy snacks when self-regulation strategies or financial incentives are in place (H_4 and H_7). To examine the underlying psychological process further, hypotheses H_{10} and H_{11} refer to self-esteem, which is expected to act as a mediator between self-regulation strategy and financial incentives, respectively, and healthy snack behavior. The hypotheses system summarized in Table 12 represents the foundation for the subsequent empirical analysis.

Table 12: Summary of Hypotheses H_1-H_{11}

hypothesis	assumed relation			effect	method
H_{1A}	attitude	→ (+)	intention	direct	multiple regression
H_{1B}	subjective norm	→ (+)	intention		
H_{1C}	perceived control	→ (+)	intention		
H_{1D}	habit	→ (-)	intention		
H_{2A}	intention	→ (+)	(s.r.) behavior	direct	multiple regression
H_{2B}	perceived control	→ (+)	(s.r.) behavior		
H_{2C}	habit	→ (-)	(s.r.) behavior		
H_3	self-regulation	→ (+)	calorie intake	direct	ANOVA / t-test
H_4	strong habit/SR	→ (+)	calorie intake	direct	ANOVA / t-test
H_5	intention x SR	→ (+)	(s.r.) behavior	moderated	hierarchical regression
H_6	financial incentive	→ (+)	calorie intake	direct	ANOVA / t-test
H_7	strong habit/FI	→ (+)	calorie intake	direct	ANOVA / t-test
H_8	intention x FI	→ (+)	(s.r.) behavior	moderated	hierarchical regression
$H_{9A/B}$	SR x FI	→ (+)	calorie intake	interaction	ANOVA / t-test
H_{10}	self-esteem/SR	→ (+)	calorie intake	mediated	linear regressions
H_{11}	self-esteem/FI	→ (+)	calorie intake	mediated	linear regressions

(s.r.) = self-reported; SR = Self-regulation; FI = Financial incentive

Source: own illustration

4 Method

4.1 Scientific Approach

A scientific experiment is considered the ideal method of inquiry in the current context. First, experiments allow testing the direct causality between a stimulus (intrinsic and extrinsic stimulus) and the resulting behavior (Aronson, Wilson, and Akert 2008, p. 9). Second, the theories from which the hypotheses are derived (self-regulation strategy and financial incentives) are usually based on experimental methods (see i.e. Achtziger et al. 2008; Charness and Gneezy 2009; Verplanken and Faes 1999). Third, controlled experiments represent the most convincing method of creating the counterfactual version, because they directly construct a control group using randomization (Harrison and List 2004, p. 1014).

A baseline questionnaire conducted before the on-site observation and a follow-up questionnaire afterward were used to ensure that the theories of the main hypotheses to be tested – namely, the intention-behavior gap – were developed on the basis of a well-known behavioral health framework: the theory of planned behavior.

4.1.1 Introduction to Experimental Research

An experiment is a scientific approach in which one or more independent variables are systematically manipulated to observe and identify any effect on dependent variables (Montgomery 2005, p. 1). Non-experimental factors that could influence the effects must be controlled (Aaker and Day 1983, p. 271).

There are three types of variables important in experimental research:

1. The *independent variables* whose impact is being investigated. In the present study, these are the parameters of intrinsic and extrinsic motivation approaches.

2. *Dependent variables* that provide information about the influence of the independent variables. The most important dependent variable of this research project is the actual eating behavior of the consumer. In addition, self-esteem as a mediation variable is being observed in this context.

3. *External factors* affecting independent and dependent variables and thus disturbing the relationship between these two variables. Confounding factors must be kept constant during the study period if elimination is not possible (Cozby 2003, p. 145).

The systematic manipulation of independent variables and the control of extraneous factors associated with characteristics of the test units differentiate experimental from non-experimental research (Cozby 2003, p. 69). Non-experimental research does not conduct controlled variations of the independent variables. Consequently, the aim of experiments is to verify as precisely as possible hypothetically causal influences between independent and dependent variables (Perdue and Summers 1986, p. 317). According to Bollen (1989, p. 40), the classic definitions of causality have established three necessary conditions:

1. *Cause preceding effect*: The variation of the independent variables must take place before the variation of the dependent variables.
2. *Correlation*: Dependent variables and independent variables co-vary.
3. *Exclusion*: By controlling confounding effects, no other explanations exist determining the variation of the dependent variables. However, if other causes exist, they must be held constant within the examination period.

Experimental research can meet these conditions almost perfectly.

Extant literature differentiates between randomized experiments and quasi-experiments. Randomized experiments have units that are assigned to treatments or conditions using procedures that mimic a lottery, whereas quasi-experiments involve treatments that are not assigned randomly, mostly because the units under study – individual people, work groups, schools, neighborhoods – self-select themselves into treatments or are assigned by administrators on the basis of an analysis of who merits or needs the opportunity to be tested (Cook and Shadish 1994, p. 546). According to Cozby (2003, p. 194), "quasi-experimental settings emerge from the need to conduct applied research in situations in which a true experiment is not possible (Shadish, Cook, and Campbell 2002, p. 14).

This research project is allocated in the applied research field. Because employees of specific work groups were selected as subjects for this study, the experiment can be categorized as quasi-experimental.

Two types of experiments are to be distinguished. The first, laboratory experiments, as the name suggests, are experiments in which the experimental treatment is introduced in an artificial or laboratory setting. For example, consumers might be exposed to a new product in a simulated supermarket (Aaker and Day 1983, p. 247). In such a setting, the experiment is happening in a controlled environment, and participants of the experiment are explicitly aware of their role as subjects (Berekoven,

Eckert, and Ellenrieder 2006, p. 159). The second type of experiment, the so-called field experiment, is conducted in the field. For example, a group of students receives an incentive to go to the gym and another group of students does not. The behavior of both groups is compared. A field experiment is the experimental treatment or intervention introduced in a completely natural setting (Aaker and Day 1983, p. 248). The respondents usually are not aware that an experiment is being conducted. Thus, the responses tend to be natural (Aaker and Day 1983, p. 248; Berekoven et al. 2006, p. 159).

4.1.2 Validity Criteria

In experimental research, the concept of validity is of great importance. Validity is the extent to which a construct measures what it is intended to measure (Hair et al. 2003, p. 246). According to Campbell and Stanley (1966), who originated the concept of validity, as further elaborated by Cook and Campbell (1976, 1979), there are three types of validity: (1) internal, (2) external, and (3) construct.

Internal validity addresses whether an observed covariation should be considered a causal relationship. In other words, internal validity exists when the variation of the dependent variable can be solely ascribed to the variation of the independent variable. This is the case when no alternative explanation for the observed effect on the dependent variable can be identified (Calder, Phillips, and Tybout 1982, p. 240; Cook and Campbell 1979, p. 37). Laboratory experiments tend to allow greater control over the experiment, thus reducing alternative explanations of the results and increasing internal validity. Field experiments are difficult to control. Often extraneous explanations exist, confounding the results. Although it is possible to control these factors, field experiments still tend to have less internal validity than laboratory experiments.

External validity examines whether an observed causal relationship can be generalized to and across different measures, persons, settings, and times. In other words, external validity refers to the applicability of the experimental results to situations beyond the actual experimental context. The external validity of laboratory experiments is limited because the artificial setting does not resemble the natural environment in any detail. Because field experiments take place in a natural setting for the participants, they tend to have much greater external validity than laboratory experiments and therefore offer greater reliability (Aaker and Day 1983, p. 248).

In an operational setting, it is difficult to fulfill both internal and external validity. Efforts to increase internal validity often decrease external validity. Therefore, the goal is a balance of the two validity criteria (Calder et al. 1982, p. 240; Cook and Campbell 1979, p. 37).

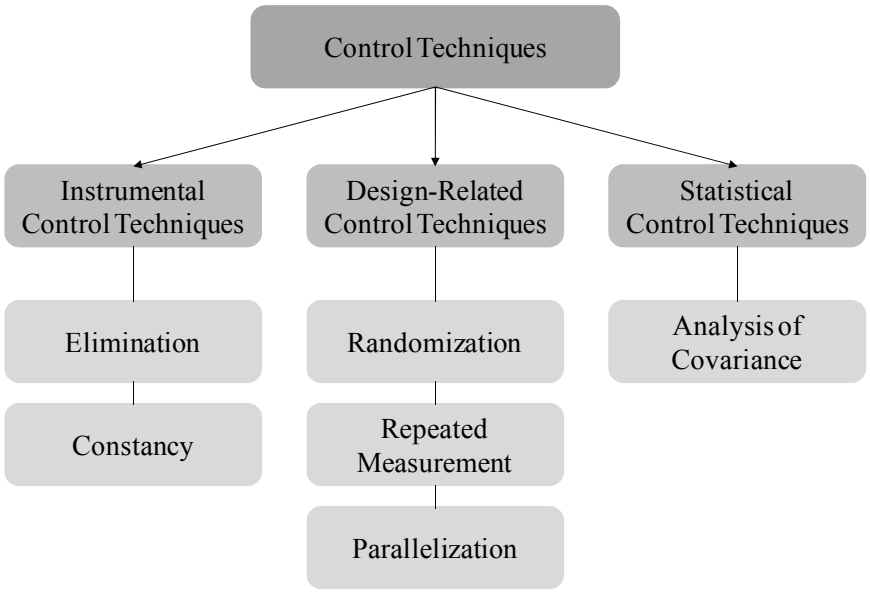
The present investigation is based on a field experiment. Subjects were asked about their snacking behavior, a stimulus that affects their daily lives. To increase internal validity, a baseline and follow-up survey were conducted, and several extraneous variables were integrated into the questionnaire. Furthermore, the survey was conducted under the supervision of a research team at the University of St.Gallen.

Construct validity considers whether the treatment manipulations are related to direct measures of the latent variables they were designed to alter. In other words, construct validity aims to clarify whether the conducted manipulation in the experiment actually has an effect on the target construct (Perdue and Summers 1986, p. 318). This effect requires adequate convergent and discriminant validity. Both are considered subcategories of construct validity. To establish construct validity, it is important to demonstrate evidence of both convergent and discriminant validity. *Convergent validity* requires that measures that should be related to each other are in reality related, and *discriminant validity* requires that measures that should not be related to each other are in reality unrelated (Trochim and Donnelly 2006, p. 221). To assess the convergence of measures and manipulations, Perdue and Summers (1986, p. 318) recommend to integrate manipulation checks into experiments.

4.1.3 Control Techniques

The validity of an experiment can be disturbed by many confounding factors. These are categorized as either design or noise factors. *Design factors* are easy and inexpensive to control in the experiment. In contrast, *noise factors* are difficult to control and can derive from internal or external sources. For example, the climate in which an experiment is taking place is an external source of noise. Therefore, it is important to exercise control over both design and noise factors so the results of the experiment are as meaningful (no design factors present) and clear (minimal influence of noise factors variables) as possible (Dean and Voss 1999, pp. 217). Sarris (1999, pp. 179) breaks down these factors in three groups of control techniques: (1) instrumental control techniques, (2) design-related control techniques, and (3) statistical control techniques. Figure 8 shows the most important control techniques.

Figure 8: Control Techniques



Source: Sarris 1999

Instrumental control techniques ensure that external conditions remain constant except for those being manipulated. *Elimination* is a control technique whereby extraneous variables are completely removed from an experiment. For example, distractions can be eliminated by seating the participants in a quiet room. *Constancy* is achieved when an extraneous variable is reduced to a single value that is experienced by all participants. For example, if the location of the experiment is assumed to have an impact, then the different experimental groups should be observed in the same room (Sarris 1999, p. 180).

Design-related control techniques focus on disturbing factors based on sample characteristics. *Randomization* ensures that each participant has an equal chance of being assigned to any group in an experiment – in other words, that the participant's personal traits have no systemic impact on the dependent variable. Due to its simple application, randomization is one of the most frequently used control techniques. *Repeated measurement* suggests that a single group of participants is subsequently involved in all different experimental conditions. However, if participants are surveyed several times, learning effects may occur, resulting in adapted behavior. Quite often, only a small number of participants are available for an experiment. In this case, it is important to find people whose characteristics are highly correlated with the dependent variable. This control technique is called *parallelization*. For example, if age is considered a disturbing factor, participants should be randomly

categorized in clusters, balancing the age factor and thereby eliminating its disturbing impact (Sarris 1999, p.186).

Statistical control techniques refer to disturbing factors ex ante and within the research design, which can explain possible biases during data analysis. Covariates assumed to be disturbing factors (e.g., specialized knowledge about the topic to be surveyed) should be included in the experiment (Sarris 1999, p. 198).

This study uses several control techniques that are described in the subsequent chapters. An overview of the control techniques used and a reference to the details are given in Table 13.

Table 13: Control Techniques Used in this Study

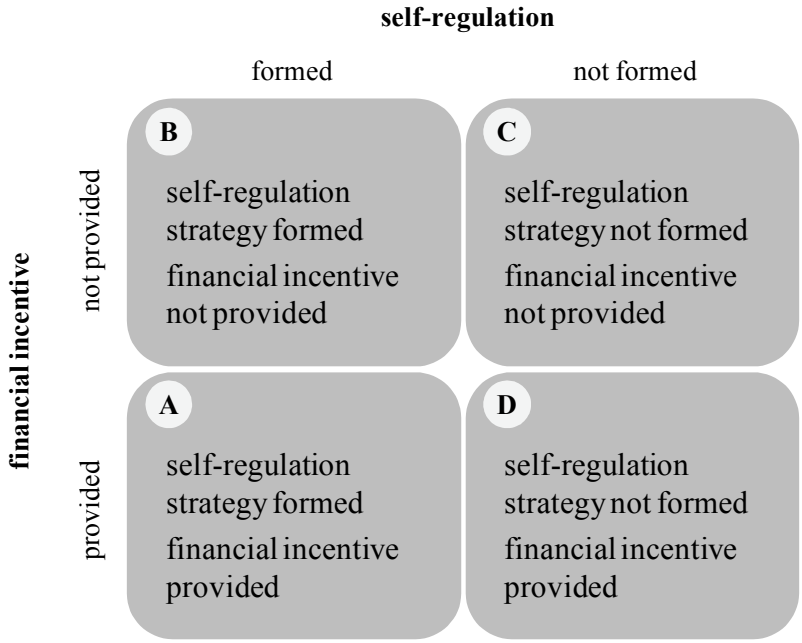
Control technique	Application	Reference for details
Instrumental control techniques		
• Elimination	Seating participants in a quiet room	Section 4.3
• Constancy	The location to observe what snack people choose was for every participant the same: in-house cafeteria. Therefore all participants experience the same environment to choose and eat snacks.	Section 4.4, part 2
Design-related control techniques		
• Randomization	Participants could stop by to fill out the survey whenever they had time. Distribution of envelopes containing the survey was prepared to guarantee randomization.	Section 4.4, part 1 (description) Section 5.5.1 (results)
• Repeated measurement	All participants are involved in three stages of the study in a between-subjects design.	Sections 4.2 & 4.4
• Parallelization	Participants highly correlated with dependent variable by explicitly inviting people who like consuming snacks.	Section 4.3 (description) Section 5.3 (results)
Statistical control technique		
• Analysis of covariance	Various covariates are included in the study.	Section 4.5.5 (description) Section 5.4.4 & 5.7.2.5 (results)

Source: own illustration

4.2 Research Design

To test the hypotheses, a controlled field experiment using a 2 *(self-regulation strategy: formed vs. not formed)* x 2 (*financial incentive: provided vs. not provided*) between-subjects factorial design was conducted (see Figure 9). Because this study considers exploring the effect of two independent variables on a dependent variable simultaneously, the factorial design seems the most appropriate in this context. The power of a factorial design is that it provides the ability to determine interactive effects between independent variables (Aaker and Day 1983, pp. 257). Moreover, Churchill and Iacobucci (2002, p. 710) point out that factorial designs are efficient and have broad applications, because each factor is studied in combination with other factors.

Figure 9: Experimental Groups



Source: own illustration

Furthermore, this study used a between-subjects design. This approach guarantees that subjects are not sensitized to the true nature of the experiment, because subjects are observed in one and only one treatment condition. Therefore, the observations from different subjects are independent. In contrast, subjects in a within-subject de-

sign are exposed to more than one stimulus, which could influence their responses through carry-over effects (Keppel and Wickens 2004, pp. 369).

As mentioned in section 1.2.2, this dissertation is based on the paradigm of reality-oriented marketing research. Transferring the results to practical settings is a key challenge; therefore, the research should be embedded in a natural environment, to ensure that the analysis focuses on the real behavior of the subjects and fulfilling the postulate of high external validity. These requirements can be best met by using a field experiment that takes place in the environment of the subjects. Winer (1999, pp. 350) stresses the importance of doing field experiments with representative participants. Moreover, some researchers have criticized the frequent use of student samples in consumer research because they do not reflect the general population (e.g. Peterson 2001, p. 450).

4.3 Recruitment of Participants

Being aware that above mentioned criticism was crucial in particular for this experiment, it was of great benefit to be able to recruit the participants for this study from more than 2000 employees of Migros, Switzerland's biggest retailer. Migros happens to be a close partner of the Institute of Retail Management of the University of St.Gallen. This close partnership enabled to make use of the employees' e-mail addresses.

The following four aspects ensured that participants who represent a fair average of the Swiss population have been recruited.

- The headquarter building houses more than 2000 employees and provided access to about 600 e-mail addresses. These 600 employees were invited to voluntarily participate in a marketing study of the University of St. Gallen.
- The employees at the headquarters building cover many different departments such as finance, controlling, marketing, human resources, strategy, culture, maintenance and others, which provide a good mixture of subjects for the sample.
- Migros is a traditional Swiss company that attracts average Swiss people to work for the company. In addition, the company is located in the heart of Zurich, the biggest city in Switzerland. Therefore, the employees of the Migros headquarters are a good representation of the Swiss population.
- Last but not least, Migros' headquarter has an in-house-cafeteria frequently visited by the majority of the employees, a pivotal feature for this experiment.

The invitation was titled “Do You Like Snack Food?” to help ensure that respondents regularly eat snacks. The invitation text was aligned toward “Marketing of Snack Articles.” It was framed this way to avoid attracting mainly people who behave and eat very healthily. The invitation e-mail did not reveal that the study was an experiment. As an incentive, each participant received a voucher for a snack and drink redeemable in Migros’ in-house-cafeteria and was also entered in a drawing for a weekend for two in a hotel in the Swiss mountains, where they could join a cooking course with a famous Swiss chef. The first incentive was part of the experiment, which participants did not realize. The second incentive was offered to encourage people to participate.

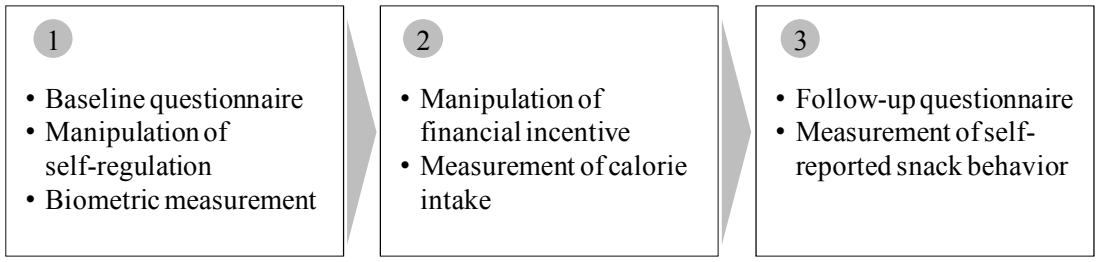
To ensure a thorough procedure, two possible time slots were offered, each lasting two hours, to fill out the survey. It was also communicated that the survey would not take longer than 15 minutes. These two facets of the survey made it possible to ensure no overcrowding in the room and still allowed the participants to choose the time when it suited them best during their working hours. A conference room was used with space for 30 people. This room guaranteed that participants can fill out the questionnaire without disturbance.

4.4 Research Procedure

The procedure of the experiment closely followed the procedures outlined by Verplanken and Faes (1999), Achtziger et al. (2008), and Charness and Gneezy (2009). The studies of Verplanken and Faes (1999) and Achtziger et al. (2008) investigate how consumers change their consumption after receiving a self-regulation strategy toward healthy food behavior. Their experimental design can be adapted for the current context of the manipulation of self-regulation. Charness and Gneezy’s (2009) study examines the impact monetary incentives have on exercise. Part of their experimental design was adopted for the financial incentives manipulation of this study.

The study consisted of three parts. The overall procedure of the experiment is illustrated in Figure 10.

Figure 10: Procedure of the Experiment



Source: own illustration

Part 1

The first part of the experiment consisted of the baseline survey. A researcher from the University of St. Gallen welcomed each participant entering the survey room and gave him or her an envelope containing all necessary documents and materials to fill out the survey. The researcher asked each participant for his or her name, checked off the name on the participant list, and added the letter and number to which the participant was assigned. This was important, because several data obtained from each participant during the course of the study needed to be matched. Each envelope had a letter according to one of the four conditions:

A: Self-regulation strategy formed, financial incentive provided

B: Self-regulation strategy formed, financial incentive not provided

C: Self-regulation strategy not formed, financial incentive not provided

D: Self-regulation strategy not formed, financial incentive provided.

A number followed each letter (1-35). The envelopes were sequenced in advance in the following order: A01, B01, C01, D01, A02, B02, C02, D02, A03, B03, C03, D03, and so on.

Because it was not predictable when participants would stop by to fill out the survey, this procedure assured that participants were randomly assigned to the four conditions and guaranteed that the distribution across the four conditions was balanced.

The envelope contained the following:

- Survey (marked with the same letter and number of the envelope – e.g., C03),
- Voucher for the snack as a thank-you (marked with the same letter and number of the envelope – e.g., C03),
- Ballpoint, and
- Measuring tape as a keychain used to measure waist circumference (also a give-away each participant could take along).

The questionnaire – which can be found in Appendix 3 – was divided into six parts:

1. *Definition of snack:* To ensure that all participants had the same definition of the term *snack*, the first page of the survey provided a simple definition of text combined with pictures.
2. *Snack habits:* To obtain information about snack habits, the survey prompted subjects to answer a few questions about their snack habits as well as their attitude and ambitions to reduce their snack behavior during the next week.
3. *Self-regulation assignment:* The survey directed those participants assigned to receive a self-regulation strategy to read and answer questions about a self-regulation task (Section 4.5.2. outlines details).
4. *Information about participants' mindset:* This section enquired about confounding variables such as health and nutrition knowledge and outcome expectancies.
5. *Personal data:* Subjects disclosed information about personal issues: gender, income, household size, physical activity, and education. The questionnaire also prompted them to assess their own risk exposure toward diseases associated with obesity.
6. *Health check:* The last part of the questionnaire contained questions about whether the participants had interest in a health check. They were directed to measure their weight, height, and waist circumference using the measuring tape included in the envelope. To facilitate accurate measurements of weight and height, a scale and a meter in a corner of the conference room were placed, separated by dividing walls to ensure privacy. The questionnaire contained a short instruction of how to measure waist circumference correctly. On average, ten people at a time were sitting in the room to fill out the survey;

thus, the University of St. Gallen team was able to support participants in measuring biometric details if necessary.

After completing the survey, participants handed it in and received a risk table to assess their health condition on the basis of the health check. Furthermore, they received a small leaflet with details on how to redeem the snack voucher and an announcement of a follow-up survey one week later.

Part 2

As the field experiment should reflect daily life as real as possible the experiment was carried out during the morning coffee break at Migros' in-house-cafeteria.

The morning coffee break can be considered sacred in Swiss society – at work as well as privately. For many people this so-called "z'Nüni"[5] is in the German speaking part the very moment to eat one or more croissants – a high-calorie snack.

During the following week (five days) after the written survey was filled out, participants could redeem their snack voucher Monday through Friday from 8:30 AM until 10:30 AM. This time-frame was chosen after consulting the head of the in-house-cafeteria about when the majority of Migros' employees took a morning break.

Every morning, a staff member of the University of St. Gallen was standing behind a display table at the entrance of the in-house-cafeteria offering snacks appetizingly arranged in nice baskets. In accordance with the objective of this research project, unhealthy and healthy snacks were defined as snacks being offered to the participants. Therefore, the snacks between which participants could choose from were either high-calorie, high-fat *unhealthy snacks* and low-calorie, low-fat *healthy snacks* following a set-up used by Read and van Leeuwen (1998, p. 191). There were two fruits to choose from as a healthy snack: grapes and mandarins.

These two fruits were selected for the following reasons:

1. The study is a field experiment, and therefore, the setting must be as realistic as possible. The study took place in November, when both grapes and mandarins are in season. Offering strawberries at that time, for example, would not have been realistic.
2. The fruits had to be eatable without complications (e.g., no peeling, no washing necessary).

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[5] In English: Mid-morning break.

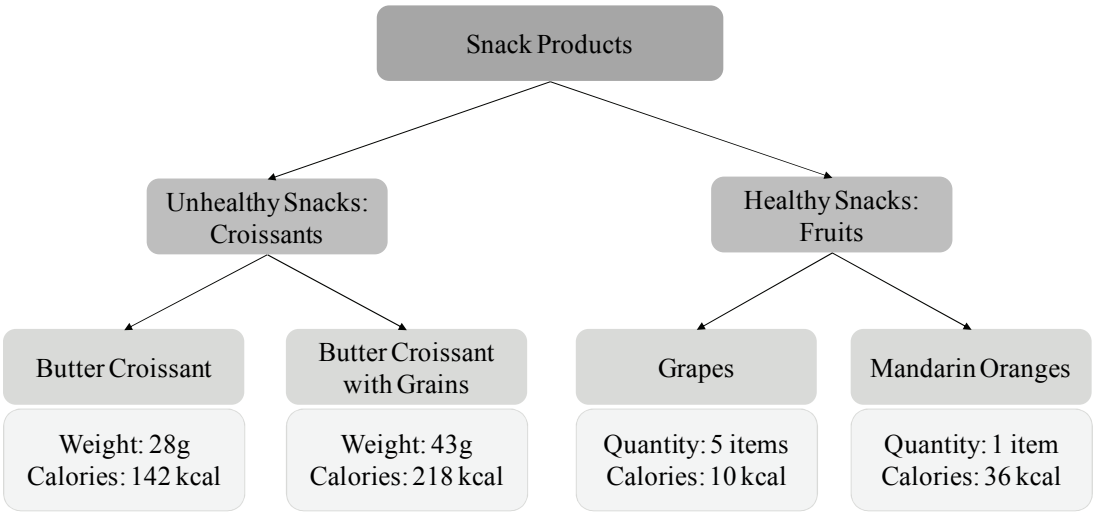
3. The fruits had to be countable. Therefore, we offered fruits for which people normally take more than one. It was expected that on average, people eat more than 1 grape and – if offered for free – more than one mandarin. A pre-test established that people eat on average 15 grapes (3 bunches of 5 grapes each) and one to two mandarins. In contrast, in general, people would eat only one apple or banana.
4. The calorie content of mandarin and grapes had to be low and comparable to each other (1 mandarin = 36 kcal, 15 grapes = 30 kcal). Both fruits were determined healthy snacks.

In contrast to mandarins and grapes as healthy snacks, two different butter croissants were offered as an unhealthy snack: a small pure butter croissant and a slightly larger butter croissant with some grains. The reasoning for the two choices was as follows:

1. In Switzerland it is tradition to eat a butter croissant during the morning break. It can also be called a habit.
2. There are smaller and bigger versions of butter croissants. For this experiment, sizes that allowed taking more than one croissant were chosen. Again, the products must be countable.
3. Butter croissants contain 128 kcal (small = 28g) and 248 kcal (big = 43g) calories and therefore are considered an unhealthy snack.

Figure 11 shows details of each product offered to the subjects during the experiment:

Figure 11: Snack Products Offered During the Experiment



Source: own illustration

The vouchers included in the envelope were of two different colors. Those participants who received a green voucher did not receive a manipulation of extrinsic motivation. They simply had the choice of a snack from the fruit or croissant basket. The participants could take as many fruits or croissants as they liked as a snack. Those participants who received a red voucher were assigned to the experimental condition of financial incentives. Before choosing their snack, these participants were informed that they would receive a voucher with a value of 5 Swiss francs[6] for their lunch if they choose a fruit instead of a butter croissant as snack. This lunch voucher was redeemable two weeks later.

The redemption of the snack voucher served as an objective behavioral measurement. An assistant of the experiment, instructed by the University of St. Gallen, was situated inconspicuously behind the experiment location to take note discretely of what the subjects chose (fruit or croissant) and count the number of items chosen (e.g., three bunches of grapes = 30 kcal, two small butter croissants = 256 kcal).

[6] The value of 5 Swiss francs for the lunch voucher was chosen on the basis of usual sales promotion which often uses half price sales advertisement. Since a lunch menu in Migros in-house cafeteria costs around 10-14 Swiss francs, a round sum was chosen.

Part 3

After the snack week, participants received by internal postal delivery a short follow-up questionnaire (see details in Appendix 5). This second questionnaire was announced after the first one. This questionnaire included questions on the following four aspects:

1. *Perceived (self-reported) snack consumption* during the manipulation week.
2. *Commitment to the goal intention* as to how much participants felt committed to follow their intention to reduce their snack consumption.
3. *Manipulation-checks* on self-regulation and financial incentives.
4. *Future-related questions* regarding how self-regulation and financial incentives would support them in the long-run to eat more healthily.[7]

4.5 Measurement

To test the postulated relationship empirically, the variables of interest must become measurable.

The main study – the experiment – is embedded in the theory of planned behavior as basic conceptual framework. This set-up implies that this study distinguished two kinds of *independent variables*. Independent variables in the experiment are operationalized by manipulation. In this case, it was necessary to define the number of characteristics of the independent variables as well as determine the size of gaps between the characteristics. To check the quality of the manipulations, pretests are usually conducted prior to the main investigation (Montgomery 2005, pp. 12). Furthermore, manipulation checks are included in the main investigation to control the experimental design (Perdue and Summers 1986, p. 318).

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[7] One month after the first biometric measurement, participants were invited to pass by the conference room a second time to repeat the weight and waist circumference measurement. Unfortunately, only 45 subjects of the total (176) showed up. A reminder e-mail invitation did not help to motivate people to come a second time for these measurements. On the basis of participants' comments, three reasons were determined that explain the low turnout:

1. The second biometric measurement was scheduled a week before Christmas break.
2. Taking biometric measurements is a delicate topic; participants were willing to give measurements once, and that is probably enough in a field experiment.
3. Some participants may have thought that their weight and waist circumference did not change in the interim time, so they were convinced that it was unnecessary to participate a second time.

Due to the low attendance, the second biometric measurement was not included in the analyses.

Operationalizing the other independent variables (antecedents of the theory of planned behavior and habit) relies on established scales using indicators. In this case, the literature recommends screening existing studies using similar measurements and validating the transferability to the current research project (Homburg and Giering 1996, p. 18).

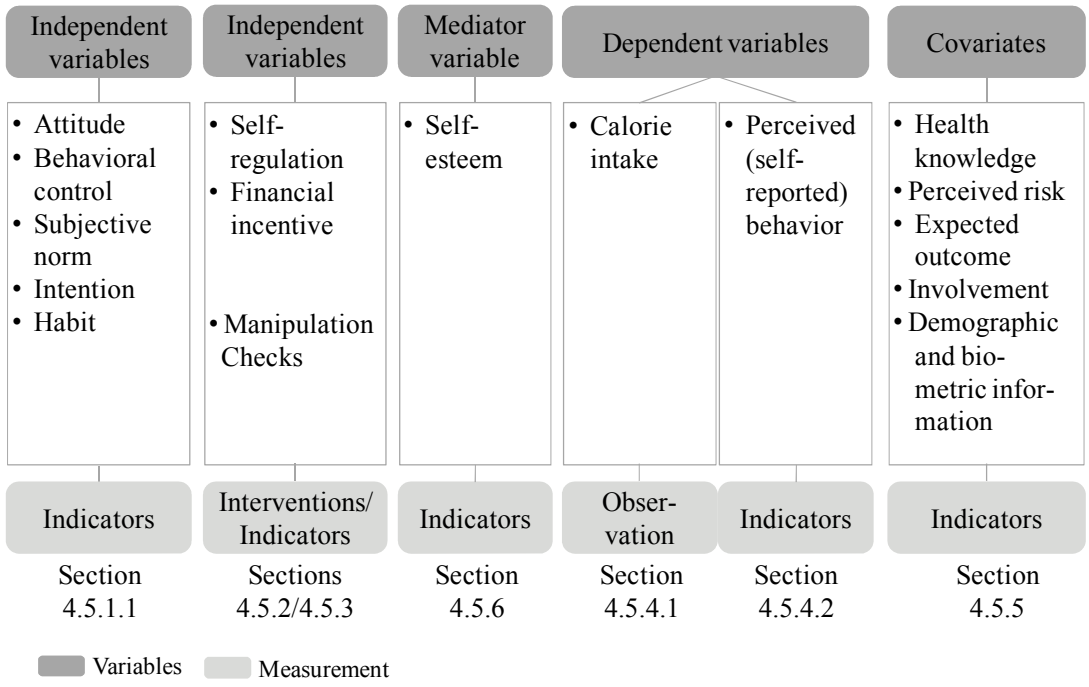
The *dependent variables* are also operationalized in two ways: First, the calorie intake of consumers was measured by observing which kind of snack they choose and calculating the number of the snacks chosen; and second, the perceived (self-reported) eating behavior was measured using indicators.

Moreover, the mediator variable and four covariates were operationalized using established indicators.

Most of the measurement scales are in English. Moreover, it was necessary to assign measurements from related disciplines (e.g., psychology, economics). Thus, adaptation to the current context was essential. To control for unambiguousness of the derived and partially self-developed indicators, a pretest ahead of the main survey was administered (Homburg and Giering 1996, pp. 11).

Figure 12 gives an overview of the different measurements of this study. These measurements are elaborated in subsequent sections.

Figure 12: Measurements



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4.5.1 Operationalization of the Independent Variables

4.5.1.1 Antecedents of the Theory of Planned Behavior

To measure the four antecedents of the theory of planned behavior (attitude, perceived behavioral control, subjective norm, and behavioral intention) scales introduced by Verplanken and Faes (1999, p. 597) and Achtziger et al. (2008, p. 383) were used. Attitude to reduce snack consumption was measured using a semantic differential composed of eight bipolar seven-point items (Achtziger et al. 2008, p. 383; Verplanken and Faes 1999, p. 597) anchored on a seven-point scale as follows: "pleasant" (1) and "unpleasant" (7), "healthy" (1) and "unhealthy" (7), "important" (1) and "unimportant" (7), "satisfying" (1) and "unsatisfying" (7), "positive" (1) and "negative" (7), "useful" (1) and "useless" (7), and "good" (1) and "bad" (7).

Behavioral intention was measured by asking the extent to which participants intend and try to eat fewer snacks according to the procedure Achtziger et al. (2008, p. 383) outline. Respondents indicated their answers on a seven-point scale anchored by "strongly disagree" (1) and "strongly agree" (7).

The construct *perceived behavioral control* was measured by asking the extent to which participants believed that they were able to eat fewer snacks in the next week following the paper of Achtziger et al. (2008, p. 383). Respondents indicated their answers on a seven-point scale anchored by “strongly disagree” (1) and “strongly agree” (7).

Subjective norm was measured using a single item asking to what extent participants believed that people who are important to them think that they should eat fewer snacks in the next week. Respondents indicated their answers on a seven-point scale anchored by “strongly disagree” (1) and “strongly agree” (7). The decision to test this variable using a single item was based on test economic reasons: Because the study was conducted with professionals during their working hours, it was important to keep the survey within a reasonable length. Subjective norm indicates a person’s own estimate of the social pressure to perform or not perform the target behavior (Francis et al. 2004, p. 9); this form of sensitivity can be covered easily by one item. Furthermore, several previous studies successfully apply a single-item scale (see Achtziger et al. 2008; Verplanken and Faes 1999; Verplanken et al. 2005).

4.5.1.2 Snacking Habit

The construct *snacking habit* was measured using a scale introduced by Verplanken and Orbell (2003, p. 1313). The instrument contains 12 items measuring five factors of habit strength, referred to as the Self-Report Habit Index: (1) the history of repetition of behavior, (2) the difficulty of controlling behavior, (3) the lack of awareness, (4) efficiency, (5) and the identity element. Respondents indicated their answers on a seven-point scale anchored by “strongly disagree” (1) and “strongly agree” (7). Previous studies show a good reliability and validity of this scale.

4.5.2 Operationalization of the Interventions

4.5.2.1 Self-Regulation Strategy

The manipulation of the *self-regulation strategy* followed the procedure of Verplanken (2006). Participants in the experimental condition self-regulation strategy were given a self-regulation task, which was integrated into the questionnaire. The task was divided into three parts:

1. Information on the state of health of the Swiss population,
2. Phenomenon self-control, and
3. Assignment/tasks.

The first and second parts were short readings on the health condition of Swiss consumers and the phenomenon self-control in general. The first section contained facts about the number of people in Switzerland who were overweight and obese and the health costs resulting from disabilities and diseases due to overweight problems. The facts were brief, compact, and impressive, aimed at catching the attention of the participant in the experimental condition.

The second part described scientific research on the causes of obesity and the phenomenon self-control. The term "self-control" instead of "self-regulation" was used purposely, because the pretest showed that participants struggled with "self-regulation" and were more familiar with "self-control". The reading described self-regulation strategies as planning tools for eating healthy snack on a specific occasion as a way of concretely implementing the intention of reducing unhealthy snack consumption. Participants were then asked to commit themselves to eat a fruit whenever they feel like eating an unhealthy snack such as a croissant or a chocolate bar.

The third part directed participants to read the last sentence again and write down two to three keywords they associated with when reading the sentence. This procedure encourages participants to involve themselves in the task (Adriaanse et al. 2009, p. 65). The second assignment was to define a certain weekday when the participants would choose a fruit instead of a croissant when they redeemed the voucher they received as a thank you for participating in the study.

The self-regulation assignment is depicted in Figure 13.

Figure 13: Self-Regulation Intervention

B. Self-Control Assignment

We kindly ask you now to read the following information about the health of the Swiss population and about the phenomenon self-control. Afterwards, please work through the two assignments.

Information about the health of the Swiss population:

Did you know, that:

- **2.3 million Swiss** are overweight (i.e. body mass index ≥25) or even obese (i.e. body mass index ≥30)? This corresponds to **37% of the Swiss population**.
- **2.7 billion Swiss francs** need to be financed **yearly** in Switzerland for diseases resulting from overweight? This corresponds to **6% of the Swiss health costs.**
- **Coronary heart diseases** are a chronically consequence of overweight and represent worldwide the **most frequent cause of death?** Yearly **17 million people** die due to heart disease.

Research proves that nutrition based on fruits and vegetables influences health positively.

(Source: Swiss Health Survey, Swiss Federal Statistical Office, 2007; World Health Organization 2006)

Phenomenon self-control:

A representative Swiss study emphasizes that the main reason for unhealthy eating habits is the **lack of self-control of consumers**. In other word, consumers would like to eat healthy, but fail to do so, because their self-control is not endless. For example, if a person withholds him-/herself all day long to eat a chocolate bar, he/she cannot resist temptations anymore in the evening.

Research results show that concrete planning can help to steer our behavior. The intention to overcome unhealthy eating habits can be followed through if you concretely implement the intention of eating healthily. Commit yourself to:

"Whenever I feel like eating an unhealthy snack such as a croissant or a chocolate bar, I suppress the impulse to eat those snack products!"

Your assignment:

1. Please read the sentence in the green box again and note 2-3 keywords, which come into your mind.

   _____

2. Take the opportunity and put your plan into action. In the enclosed envelope you find a voucher for a morning snack and coffee. Define now for yourself, when you will redeem this voucher for a healthy snack (e.g. grapes or mandarins). Think about the weekday and mark it below. On this particular day, you are going to eat a healthy snack.

   ☐ Mon, 23.11.09 ☐ Tue, 24.11.09 ☐ Wed, 25.11.09 ☐ Thu, 26.11.09 ☐ Fri, 27.11.09

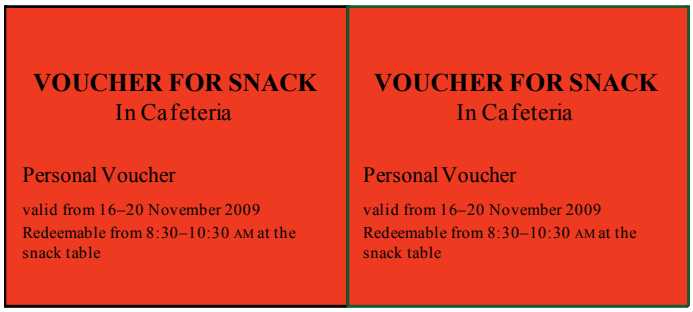
Source: own illustration

4.5.2.2 Financial Incentive

The manipulation of the *financial incentive* followed the procedure of Charness und Gneezy (2009).

The participants in the experimental condition financial incentive received a red voucher (see Figure 14) as a thank you for participating in the study. Participants with the red voucher were told prior to redeeming their voucher that they would receive a lunch voucher, worth 5 Swiss francs, if they chose a fruit instead of a butter croissant as a snack. It is assumed that this information affects subject's self-reported goal intention to eat healthily (Bamberg 2002b, p. 578).[8]

Figure 14: Financial Incentive Intervention – Red Voucher

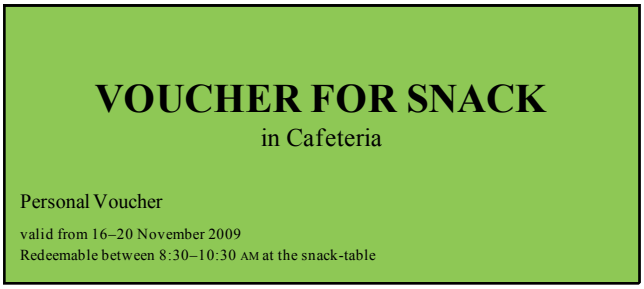


Source: own illustration

The participants assigned to the non-experimental condition received a green voucher (see Figure 15) as a thank you for participating in the study. Participants with the green voucher were not told the option of receiving a financial incentive when choosing a fruit instead of a butter croissant. In contrast, they were told to take the snack they liked.

[8] Participants in the experimental condition financial incentive received a second voucher to redeem for a free snack. Unfortunately, not enough participants redeemed their voucher to make adequate analyzes across the experimental groups. The reason was that many people did not have the chance to pass by a second time during the same week due to meetings.

Figure 15: Financial Incentive Intervention – Green Voucher



Source: own illustration

4.5.3 Operationalization of the Manipulation Checks

Following Perdue and Summer's (1986, p. 318) advice, several manipulation checks were included in the measurement instrument. For this purpose, specific items were developed to allow for verification of the success of the manipulations. To confirm the self-regulation manipulation, four items were included asking participants how they have been invited to form self-regulation strategies (e.g., "I was supposed to resist unhealthy snacks", "I planned to resist unhealthy snack products the next time I am confronted with"). For the financial incentive manipulation, one item asked participants to rate the following statement on a seven-point scale (1 = strongly disagree", 7 = "strongly agree"): "The snack voucher which I received was linked to a financial incentive if redeeming it for a healthy snack."

4.5.4 Operationalization of the Dependent Variables

As mentioned in chapter 3.1, at the core of the framework, the dependent variable refers to how people actually make their snack choices. The literature identifies various approaches to assess eating behavior. However, a remarkable amount of research actually relies on marks on self-report questionnaire. Sometimes these questionnaires ask people to report what they have done, will do, or would do. More often, they ask people to report what they think, how they feel, or why they do what they do. In other words, most personality and social psychological studies gather self-reports of inner states (Baumgartner 2007, p. 397). There is nothing wrong with asking people to report how they believe they have behaved; this study also includes a self-reported measurement. Moreover, this study includes direct observation of what Knee et al. (2005, p. 998) call actual behavior.

Thus, as mentioned at beginning of section 4.5, the operationalization of the dependent variable takes place in two ways.

4.5.4.1 Calorie Intake

First, to capture the actual food choice, the snack behavior on site was measured by (1) systematically observing which snack participants chose (butter croissant or fruit) and (2) counting the number of the particular snack taken. Because participants were offered a snack for their morning break, it was assumed that the chosen product would actually be consumed during the break[9].

The researcher of the University of St. Gallen and an assistant who was briefed beforehand were on site each morning from 8:30 AM to 10:30 AM inside the entrance of the in-house-cafeteria of Migros. The researcher was behind the snack table and informed the participants who came to redeem their voucher about the option of choosing between a fruit and a croissant. In addition, the researcher told those participants with a red voucher (experimental condition) the additional incentive of receiving a voucher with a value of 5 Swiss francs for their lunch if they choose the fruit. The assistant in the background was responsible for noting which snack was chosen and how many using the following code:

- M for mandarin
- G for grapes
- Small BC for small butter croissant
- Big BC for big butter croissant

Next to the letter, the assistant noted the number of snacks being chosen. The following examples illustrate the denomination:

- M 2 means two mandarin
- G 6 means six bunches of five grapes each
- Small BC 2 means two small butter croissants

After the participant left the snack table, his or her voucher was handed to the assistant, who matched the number of the voucher (e.g., C03) to the notes of the actual behavior (e.g., Small BC 2).

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[9] Most of the participants consumed their snacks in the in-house cafeteria which was observed by the researchers of the University of St.Gallen.

4.5.4.2 Perceived (Relf-Reported) Snack Behavior

Second, perceived (self-reported) snack behavior was measured in the follow-up questionnaire one week after the manipulations took place. The operationalization is based on Luszczynska et al.'s (2004, 583) approach, which emphasizes the evaluative nature of the behavioral construct. In other words, participants reflect their own behavior of reducing snack consumption from the past week. Other approaches used in the literature to measure eating behavior are time-consuming; they cover 30 or more items. In contrast, Luszczynska et al. (2004, p. 583) use a one-item scale, which proved sufficiently reliable and valid. For this study, the scale was extended by three more indicators to ensure validity and reliability. The responses were anchored by "strongly disagree" (1) and "strongly agree" (7).

4.5.5 Operationalization of the Covariates

To maximize the explanatory power of the study, four factors were included as metric covariates (also called control variables): (1) health knowledge of the participants, (2) their risk perception, (3) their outcome expectancies, and (4) involvement. In addition, demographic and biometric variables were added for covariation

Hair, Anderson, Tatham, and Black (2006, p. 406) point out that metric covariates are typically included in an experimental design to extract extraneous influences from the dependent variables, thus increasing the within-group variance. Covariates are assumed to be linearly related to the dependent variables and thus allow for more sensitive tests of treatment effects. Therefore, the impact of systematic biases or respondent characteristics that are not central to the study can be controlled (Churchill and Iacobucci 2002, p. 135). The rationale for including each covariate and the corresponding scales are briefly addressed next.

4.5.5.1 Health Knowledge

Health knowledge has been shown to affect preventive health behaviors positively (Jayanti and Burns 1998, p. 9). According to Moorman and Matulich (1993), health knowledge influences choice of healthy eating. They find a positive correlation between health knowledge and improved dietary habits. In general, knowledge facilitates information search, and therefore, highly knowledgeable consumers acquire and retain more information compared with people with less knowledge (Moorman and Matulich 1993, p. 210). The construct health knowledge is based on the scale Jayanti and Burns (1998, p. 624) developed. The scale consists of five indicators, referring to the person's storehouse of information about preventive health care be-

haviors. Respondents indicated answers on a seven-point scale anchored with "strongly disagree" (1) and "strongly agree" (7).

4.5.5.2 Risk Perception

For the assessment of *risk perception*, three items were used indicating relative vulnerability, developed by Schwarzer and Renner (2000, p. 489). The question asked for the estimation of the following risk factors: heart disease, high blood pressure, and stroke. The factor diabetes was added, because it seemed an important detail within the context of this study. Responses were given on seven-point bipolar scales anchored at "much below average" (-3) and "much above average" (+3).

4.5.5.3 Outcome Expectancies

Outcome expectancies refer to the perception of possible consequences of one's action. A person who believes that he or she can produce a desired effect can conduct a more active and self-determined life course (Schwarzer and Renner 2000, p. 487). The covariate outcome expectancies was measured using three items following Schwarzer and Renner's (2000, p. 489) procedure. Participants were asked, "What do you think will be the personal consequences for yourself if you would reduce your unhealthy snack consumption?" After this header, responses were elicited to three specific questions on seven-point scales anchored with "strongly disagree" (1) and "strongly agree" (7): "If I would reduce my unhealthy snack consumption, then… (a) I would feel physically more attractive, (b) I would feel better mentally, and (c) I would have no (or fewer) body weight problems."

4.5.5.4 Involvement

According to Johnson and Eagly (1989, p. 290), *involvement* describes the personal relevance or importance that a certain stimulus has for a person. Involvement can be distinguished between enduring and situational involvement (Burnkrant and Howard 1984; Celsi and Olson 1988; Greenwald and Leavitt 1984). For the context under study, situational involvement is relevant. Situational involvement determines whether information is processed in an in-depth or a more heuristic way and therefore might influence to what extent nutrition- and health-related information is noticed and processed. Situational involvement was measured using a three-item seven-point scale adopted from Miniard et al. (1991, p. 97) anchored with "concentrating very little" (1) and" concentrating very hard" (7), "paying very little attention" (1) and "paying a lot of attention" (7), and "very uninvolved" (1) and "very involved" (7).

4.5.5.5 Demographic and Biometric Information

Socio-demographic factors could also have effects as control variables or moderators of either the direction or the intensity of the relationship between independent and dependent variables (Baron and Kenny 1986, p. 1179). Therefore, the study included age and gender. Participants also were asked to indicate their level of physical activity per week, their weight and height for the body mass index, and waist circumference.

4.5.6 Operationalization of the Mediator Variable

Self-esteem is a core element of mental health (Mann et al. 2004, p. 357). The beliefs and evaluations of people hold about themselves determine who they are, what they can do and what they can become (Burns 1982, p. 143). People experience positive affect and boosts to self-esteem when they succeed at the goals and negative affect and drops in self-esteem when they fail (Carver 2003, p. 114; Carver and Scheier 1998, p. 243).

The construct self-esteem was measured using the five-item construct of physical concern developed by Netemeyer, Burton, and Lichtenstein (1995, p. 624). The construct self-esteem is scored on a seven-point scale anchored with “strongly disagree” (1) and “strongly agree” (7).

5 Results

Recall that Chapter 4 describes the two surveys designed to implement the different variations of the experimental design. The baseline questionnaire included a one-page self-regulation assignment. The self-regulation assignment and the scales used in the questionnaire were discussed in details with several experts (details appear in Appendix 6).

5.1 Pretest

To verify the research instrument, a pretest clarifying the following points was conducted:

- Comprehensibility of the items and manipulation tasks presented
- Sense of chronology
- Exact time for completing the questionnaire
- Technical procedure
- Tendency of responses to provide a clue about the subsequent results.

Nineteen people took part in the pretest. On the basis of the results, minor changes regarding the formulation of the manipulation text and a few items of certain constructs were made to increase the comprehensibility of the provided text.

When the survey was finalized, participants were randomly assigned to one of the four experimental groups which have been explained in chapter 4.2 and are reiterated below:

A: Self-regulation strategy formed, financial incentive provided

B: Self-regulation strategy formed, financial incentive not provided

C: Self-regulation strategy not formed, financial incentive not provided

D: Self-regulation strategy not formed, financial incentive provided.

5.2 Power Analysis

Researchers in the social, behavioral, and biomedical sciences stress the importance of power analyses (Maxwell, Kelley, and Rausch 2008). By definition, the power of a statistical test is the probability that its null hypothesis (H_0) will be rejected given that it is in fact false. Thus, tests that lack statistical power are of limited use be-

cause they cannot reliably discriminate between H_0 and the alternative hypothesis H_1 (Faul et al. 2007, p. 175).

To determine the statistical power of the analysis under study, a power analysis was conducted using the procedure described in Cohen (1992, p. 157) and the statistical software G*Power (Faul et al. 2007).

Cohen defined *d* as the difference between two means (M_1-M_2) divided by the standard deviation, σ, of either group. Cohen defined effect sizes as "small, when *d* = .2", "medium, when *d* = .5", and "large, when *d* = .8".

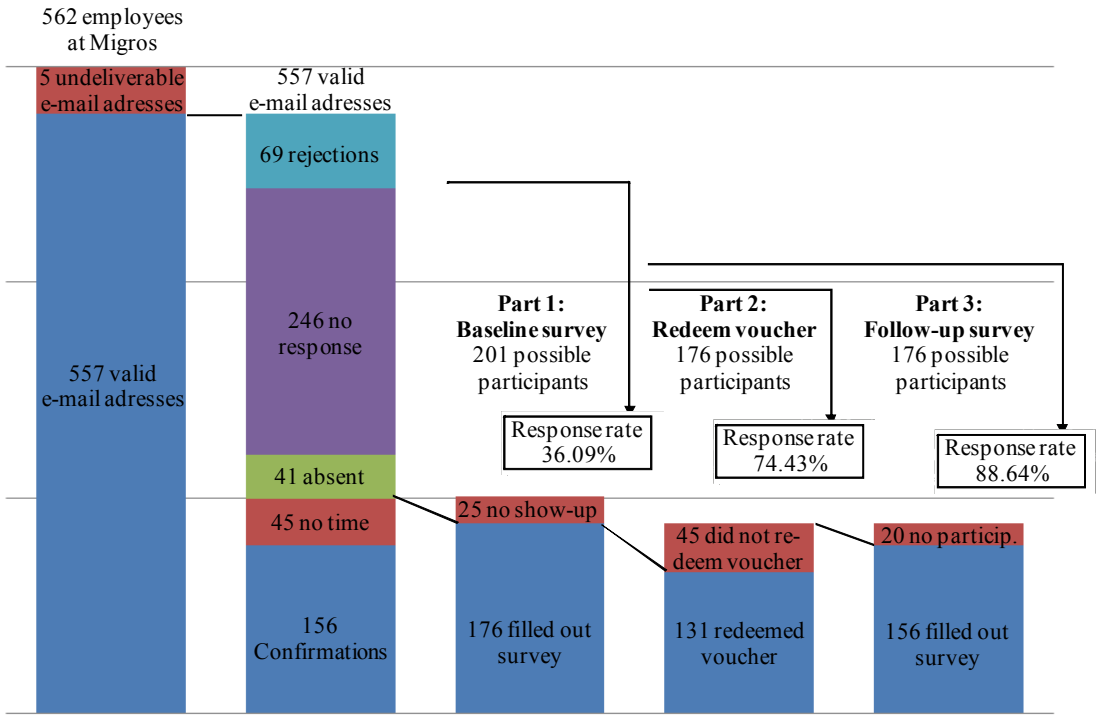
To date, no published study has directly examined the combined effects of self-regulation strategy and financial incentive on snack behavior. However, a comprehensive meta-analysis by Gollwitzer & Sheeran (2006, pp. 92) on the basis of 94 studies that involved 8461 participants shows that the overall impact of forming self-regulation strategies on behavioral enactment and goal attainment has an effect of medium-to-large magnitude (*d* = .65). 88% of the studies involved experimental designs (i.e., random assignment of participants to the condition self-regulation strategy formed versus control conditions) which increase confidence in the findings (Sheeran et al. 2005a, p. 292). Furthermore, findings indicated that the effect sizes obtained in correlational and experimental studies were equivalent (Gollwitzer and Sheeran 2006, p. 94).

An a priori power analysis indicated that with a sample of 132 and setting alpha equal to .05, the present study would have had sufficient power (approximately .95) to detect medium-large sized effects (f = .25) in analysis of covariance. The full sample recruited for this study consisted of 176 (Part 1), 131 (part 2) and 156 (part 3) participants. A post-hoc power analysis of the present study with the three sample sizes setting alpha equal to .05 revealed that the study had a power of approximately .9 (n = 176), and .86 (n = 156) detecting a large effect, and .79 (n = 131) detecting a medium-large effect.

5.3 Characteristics of the Sample

The experiment was conducted in November 2009. A total of 176 employees of the Swiss company Migros participated in the study, representing a response rate of 36.09%. This large number enabled to assign more than 40 subjects to each experimental field. It was possible to keep the majority of the recruited subjects during the whole experiment. Figure 16 gives an overview about the response rates of the data collection.

Figure 16: Response Rate of the Data Collection



Source: own illustration

There are a few missing values in the data set, which are scattered randomly on various questions and persons. The exclusion of incomplete records is associated with a large loss of information (Herrmann, Homburg, and Klarmann 2007, p. 64). To overcome this limitation, it is possible to replace missing values with valid values. The selection of suitable imputation can try to find realistic values that are most likely close to the true values (Brosius 2008, p. 282). These methods are particularly without a problem if the missing values occur purely by chance. The dominant procedure in the literature for the determination of parameters such as mean, variance and covariance with incomplete data matrices, and so on is going back to the Expectation Maximization (EM)-algorithm of Dempster et al. (1977). The iterative EM-algorithm is superior to conventional methods, but in addition to the randomness of failure mechanism it assumes normal distribution of data and is therefore only to metric scaled data applicable (Herrmann et al. 2007, p. 74).

To check the shape of a distribution, there are various tests to be used. The Kolgomorov-Smirnov-Test tests the null hypothesis that the data of the sample are from a normally distributed population. The scores of the data under study are significant at a level of 5%. However, this strict criterion rejects the null hypothesis even for

small deviations from the normal distribution. To retain the null hypothesis is for samples sizes of n > 100 unlikely. Therefore, Kline (2005, p. 40) proposes to examine in addition the skew and kurtosis of the observed variables. Normally distributed variables have a skew and kurtosis of zero. Since empirical data are normally rarely perfect, it is said that there is a significant deviation of the normal distribution if the value of the skew is more than 2.0 and the one of the kurtosis more than 7.0 (Curran, West, and Finch 1996, p. 26). Table 14 summarizes the results of these values. All indicators remain well below the required values and thus fulfill the normal distribution. Therefore, in accordance with the EM-algorithm a complete data set can be generated to replace missing values with valid values for all indicator-based measurements.

Table 14: Skew and Kurtosis

Item	Skew	Kurtosis	Item	Skew	Kurtosis	Item	Skew	Kurtosis
Attitude			*Perceived Control*			*Habit*		
A03.2	-.304	-.661	A04.3	-.126	-.980	A02.1	-.114	-1.030
A03.4	-.229	-.188	A04.4	-.039	-1.065	A02.3	.212	-1.070
A03.5	-.744	-.203	A04.5	-.284	-1.023	A02.5	-.187	-1.071
Subjective Norm			*Intention*			A02.6	-.291	-1.109
A04.6	.967	-.159	A04.1	-.149	-1.160	A02.7	-.146	-1.089
			A04.2	-.119	-1.253	A02.8	-.577	-.603
Health Knowledge			*Perceived Risk*			*Expected Outcome*		
C03.1	-.597	.158	D01.1	.408	-.935	A05.1	-.321	-1.349
C03.4	-.482	.254	D01.2	.485	-.670	A05.2	.087	-1.220
C03.5	-.899	1.352	D01.3	.267	-.941	A05.3	-.228	-1.249
			D01.4	.502	-.846			
Self-Esteem			*Perceived Behavior*			*Involvement*		
C01.1	-.662	.950	G02.1	.163	-1.189	D04.1	-1.271	3.001
C01.2	-.946	1.219	G02.2	.198	-1.375	D04.2	-1.098	1.753
C01.3	-.488	-.189	G02.3	-.037	-1.147	D04.3	.-1.019	1.406
C01.4	-.335	.144	G02.4	.214	-.699			
C01.5	-.430	-.356						

Source: own illustration

Table 15, depicting the participants' characteristics in terms of gender and household size, shows that household sizes correspond largely with the Swiss population. However, women (61%) are over-represented proportional to their percentage of the total population (51%). According to the Swiss food consumption study (Rudolph and Glas 2008, p. 23) though, women are more concerned with nutrition. Against this background, a greater participation of female consumers seems reasonable.

Table 15: Gender and Household Distribution of the Participants

Characteristic		Sample (n = 176)		Population
Gender	Female	n = 108	61%	51%
	Male	n = 68	39%	49%
Household size	1 person	n = 47	27%	36%
	2 persons	n = 86	49%	32%
	3 persons	n = 17	10%	13%
	4 persons	n = 19	11%	13%
	5 persons or more	n = 7	4%	6%

Source: own illustration/Swiss Federal Statistical Office 2008

Table 16 shows the distribution of further sociodemographic characteristics of the sample. Note that broad population groups are represented. The age varies between 19 and 61 years, though the 25-34 years of age group is more heavily represented. A breakdown by level of education shows that groups with vocational education and university education are most frequent represented. The gross income of the surveyed households is on average between 7000 and 9500 Swiss francs.

Table 16: Participants' Age, Education and Income Distribution

Characteristic		Frequency	Percentage
Age	≤ 24 years	18	10%
	25-34 years	84	48%
	35-44 years	44	25%
	45-54 years	23	13%
	≥ 55 years	7	4%
Education	Middle school	3	2%
	Vocational education	75	42%
	High school	14	8%
	University	81	46%
	Doctorate	3	2%
Income (in Swiss francs)	≤ 2499	2	1%
	2500-3999	4	2%
	4000-5499	8	5%
	5500-6999	23	13%
	7000-9499	38	22%
	9500-10,999	32	19%
	11,000-12,499	16	9%
	≥ 12,500	49	29%

Source: own illustration

Furthermore, the biometric distribution is of interest. The aim of the study was to obtain a sample of normal-weight subjects who had some risk for becoming overweight. The majority of the sample had a normal body mass index (83% of women, 71% of men), though 10% of women and 29% of men were at risk for becoming overweight, because their body mass index was greater than 24.99, respectively. In addition, one-third of both female and male subjects showed higher risks for becoming overweight because their waist circumference was greater than 80 cm or 94 cm, respectively. These results indicate a successful recruiting of the intended sample (see Table 17).

Table 17: Body Mass Index and Waist Circumference of the Participants

Characteristic		Frequency	Percentage per Gender	Cumulative Percentage
Body-mass-index	**female**			
(BMI)	BMI < 18.5	6	6.1	3.7
	18.5 ≤ BMI ≥ 24.99	83	83.8	55.3
	BMI ≥ 25	10	10.1	61.5
	male			
	BMI < 18.5	0	0	61.5
	18.5 ≤ BMI ≥ 24.99	44	71.0	88.8
	BMI ≥ 25	18	29.0	100.0
Waist circumference	**female**			
(waist)	waist ≤ 80 cm	65	67.7	41.4
	waist > 80 cm	31	32.3	61.1
	male			
	waist ≤ 94	43	70.5	88.5
	waist > 94	18	29.5	100.0

Source: own illustration

People who eat snacks regularly were invited to participate in the survey. Therefore, the study included an item about the past behavioral frequency of eating snack food and was measured by asking how many times participants had eaten snack food items during the previous seven days. The response scale ranged from not at all (0), once (1), twice (2), and so on, to 14 times (14) and more than 14 times (15). Participants reported high scores on this particular item (M = 7.31, SD = 3.832), indicating that the intended sample was recruited.

In the context of eating behavior, physical activity is an important aspect. Therefore, respondents were asked to indicate how often they engage in physical activity per week. On average, participants engaged in physical exercise about two times per week (M = 2.21), which is low. Younger people (less than or equal to 24 years of age) reported engaging in physical activity fewer than two times (M = 1.83) per week; people between 45 and 54 years of age reported exercising more than two times per week (M = 2.34). Table 18 presents an overview.

Table 18: Physical Exercise Distribution of the Participants

Physical activity frequency	Percentage
Not at all	11%
Once a week	25%
Twice a week	26%
Three to four times a week	28%
Five to six times a week	7%
Daily	2%

Source: own illustration

A major challenge of the study was to assign participants in equal shares randomly to the four conditions of the experiment. As outlined in section 4.4, the research procedure was sophisticated to ensure an optimal allocation. As the results of Table 19 indicate, the assignment was successful.

Table 19: Sample by Condition

Condition	Frequency	Percentage	Cumulative Percentage
A: Self-regulation strategy formed Financial incentive provided	44	25.0	25.0
B: Self-regulation strategy formed Financial incentive not provided	45	25.6	50.6
C: Self-regulation strategy not formed Financial incentive not provided	43	24.4	75.0
D: Self-regulation strategy not formed Financial incentive provided	44	25.0	100.0

Source: own illustration

5.4 Construct Measurement

5.4.1 Fit Indices of Measurements

To determine whether an indicator-based measurement gathers a theoretical construct, the literature recommends a systematic review of the measurement models in terms of their reliability and validity. Otherwise, interpretations and conclusions will not be accurate (Hair et al. 2003, p. 216). This section elaborates the fit indexes of indicator-based measurements. Section 4.5 presents all measurements applied in this study.

Thompson (2004, pp. 4) suggests using exploratory and confirmatory factor approaches. Exploratory analysis is employed as a theory-generating procedure, whereas confirmatory procedures are used as theory-testing measures. Statistical procedures that analyze exploratory research are known as first generation, and statistical analyses designed to confirm a theory are known as second generation (Stevens 2001, p. 5).

The decision as to which approach to use depends on the phenomenon being investigated. For the analyses under study, both exploratory and confirmatory analyses are relevant. This chapter elaborates the fit indexes of measurements followed to evaluate the indicator-based measurements.

The procedures of the first generation include the following:

- Exploratory factor analysis
- Cronbach's alpha
- Corrected item-to-total correlation.

In the social sciences it is common to attempt to measure things that cannot directly be measured (so-called latent variables). For example, habit cannot be measured directly. However, different aspects of habit – such as the history of repetition, automaticity, and expressing identity – can be measured (Verplanken and Orbell 2003, p. 1313). It is helpful to know whether these differences actually reflect the single variable habit.

Exploratory factor analysis is a technique for identifying groups of variables. In other words, the exploratory factor analysis searches for the fundamental constructs of dimensions assumed to underlie the original variables (Hair et al. 2006, p. 107). The investigator simply hunts for relationships among the variables without any a

priori hypothesis about them (Backhaus et al. 2006, p. 260). The measure of an exploratory factor analysis' quality is the reliability of the raw data. Therefore, measurements that allow assessing correlations of variables on their suitability for a factor analysis are helpful. According to Backhaus et al. (2006, pp. 269) the following prerequisites must be present to execute an exploratory factor analysis:

1. The *correlation coefficients* in the correlation matrix should have values of greater than or equal to .3.
2. The *Kaiser-Meyer-Olkin (KMO)* statistic of sampling adequacy should be greater than .5.
3. The *Bartlett's test of sphericity* examines whether a variance-covariance matrix is proportional to an identity matrix. In other words, it tests whether the diagonal elements of the variance-covariance matrix are equal (i.e., group variances are the same) and that the off-diagonal elements are approximately zero. Bartlett's test of sphericity should be significant (the value of significance should be less than .05).
4. The variables of the diagonal of the *anti-image matrix (MSA)* should be greater than .5.

In case these preliminary analyses show good results, it is possible to apply criteria to determine which factors to retain and which ones to discard. By default, the software program SPSS[10] uses Kaiser's criterion of retaining factors with eigenvalues greater than 1. The eigenvalue indicates the contribution of a factor to explain the total variance of all variables (Brosius 2008, p. 781). The eigenvalue is an absolute value; therefore, in general, researchers report the relative contribution. As a rule of thumb, the proportion of variance accounted for should be at least 50% (Peterson 2000, p. 263).

The proportion of common variance within a variable is called a communality of an indicator (Field 2009, p. 661). The literature defines the reference point at .5 (Litfin, Teichmann, and Clement 2000, p. 285).

After condensing the indicators into factors, it is possible to draw first statements about convergent and discriminant validity of the measurement construct. In doing so, the level of factor loadings is applied. A measurement construct shows sufficient

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[10] The data were analyzed using SPSS 18 (Statistical Product and Service Solutions) and AMOS 18 (Analysis of Moment Structures).

convergent validity if the indicators that form a factor show high factor loadings and correlate on a low level with other factors. In the latter case, discriminant validity is present. Although the literature does not clearly define the loading of a factor, according to Hair et al. (2006, p. 129), values greater than .5 are generally considered necessary for practical significance.

After the factors have been extracted, they are usually transformed by rotation. A rotated factor is simply a linear combination of the initial factors. The rotated factors explain the same total variance as the initial factors even though the variables will relate to the rotated factors differently from the way they relate to the initial factors. Rotated factors divide up the variance more usefully (Nunnally and Bernstein 1994, p. 451). There are two types of rotation to be distinguished. First, using the orthogonal (Varimax) method, the factors are rotated, keeping them independent, or unrelated. Before rotation, all factors are independent. The Varimax method ensures that the factors remain unrelated and that for each factor, a minimum number of variables with high factor loadings is obtained. Second, the oblique rotation allows factors to correlate (Field 2009, p. 642). According to Brosius (2008, p. 789), the Varimax method is the most common procedure; therefore, it is applied in this study.

Having determined an acceptable factor structure using C*ronbach's alpha*, next the reliability of the group of indicators that belong to one factor are validated. Cronbach's alpha measures internal consistency of the indicators of a factor (Nunnally and Bernstein 1994, p. 247) and represents the weighted average of all possible correlations between the indicators of a measurement construct (Carmines and Zeller 1979, p. 45). The range of values of the alpha coefficient lies between zero and one; high values indicate high reliability of the construct (Churchill 1979, p. 68). The adequate value remains controversial in the literature, particularly because it depends on the number of indicators taken into account (Peterson 1994, p. 384). The guidance for acceptance is that the coefficient should be .7 or higher (Nunnally and Bernstein 1994, p. 252).

The *item-to-total correlation* also reflects the internal consistency of a factor's indicators. The values of the corrected item-to-total correlation are the correlations between each item and the total score from the questionnaire. The data should have item-total correlations greater than .3. The items of the total correlation reflect the change in Cronbach's alpha that would happen if a particular item was deleted (Field 2009, p. 678).

Table 20 presents the requirements discussed here.

Table 20: Fit Indexes (First Generation)

Quality Criteria	Requirement	Validation	Source
Requirements for factor analysis			
Correlation coefficients	≥ .3		Backhaus et al. 2006
KMO	≥ .5		Backhaus et al. 2006
Bartlett's test of sphericity	$p < .05$		Backhaus et al. 2006
MSA criteria	≥ .5		Backhaus et al. 2006
Exploratory factor analysis			
Total variance explained	≥ 50%	Content validity	Peterson 2000
Communality	≥ .5	Reliability	Litfin et al. 2000
Factor loading	≥ .5	Convergent validity/ Discriminant validity	Hair et al. 2006
Cronbach's alpha	≥ .7	Internal consistency	Nunnally & Bernstein 1994
Corrected item-to-total correlation	≥ .5	Internal consistency	Field 2009

Source: own illustration

The exploratory factor analysis explores the data and provides the researcher with information about how many factors are needed to best represent the data. In contrast, the statistics of the confirmatory factor analysis indicate how well the specification of the factors matches reality (Hair et al. 2006, p. 774).

The following fit indexes of measurement are important when conducting confirmatory factor analysis:

- Indicator reliability (squared multiple correlations)
- Critical ratio
- Factor reliability
- Average explained variance (AVE)

The *squared multiple correlations* represent the extent to which a measured variable's variance is explained by a latent factor. From a measurement perspective, it represents how well an item measures a construct. Squared multiple correlations are also referred to as *indicator reliability*. A reliability coefficient close to 1 indicates a consistent operationalization. However, the level depends on the sample size. Simu-

lation studies show that a sample size of one hundred to four hundred requires values between .4 and .6. Following the prevailing literature, this work bases on a threshold of .4 (Boomsma 1982, pp. 156).

Furthermore, each factor can be tested on significance with a t-test. As a critical test statistic, Amos calculates a *critical ratio* out of the quotient of the estimated parameter value and its standard error. If the critical ratio falls outside the interval ± 1.96, the null hypotheses is rejected by a probability level of 5% (Arbuckle 2006, p. 34).

The size of the *factor loading* is an important consideration. In the case of high convergent validity, high loadings on a factor indicate that they converge on some common point. At a minimum, all factor loadings should be statistically significant. Because a significant loading could still be weak, a good rule of thumb is that standardized loading estimates should be .5 or greater, and ideally .7 or greater (Hair et al. 2006, p. 777).

The *factor reliability* indicates the amount of total information used to measure the construct. A large number of empirical studies have established a factor reliability of a minimum of .6 (Fritz 1995, p. 134).

With confirmatory factor analysis the *average explained variance (AVE)* among a set of construct items is a summary indicator of convergence. The AVE is the total of all squared standardized factor loadings divided by the number of items. In other words, it is the average squared factor loading. An AVE of .5 or greater is a good rule of thumb suggesting adequate convergence. An AVE of less than .5 indicates that on average, more error remains in the items than variance is being explained by the latent factor structure imposed on the measure (Hair et al. 2006, p. 777).

Neither the factor reliability nor the AVE can be calculated by the popular statistic software programs such as SPSS. However, both values can be derived easily.

The formula to calculate the factor reliability is as follows (Fornell and Larcker 1981, pp. 45):

$$R(\xi_j) = \frac{\left(\sum_{i=1}^{q} \lambda_{ij}\right)^2}{\left(\sum_{i=1}^{q} \lambda_{ij}\right)^2 + \sum_{i=1}^{q} \mathrm{var}\,(\delta_i)}$$

The formula to calculate the AVE is as follows (Fornell and Larcker 1981, pp. 45; Hair et al. 2006, p. 777):

$$DEV(\xi_j) = \frac{\sum_{i=1}^{q} \lambda_{ij}^{\ 2}}{\sum_{i=1}^{q} \lambda_{ij}^{\ 2} + \sum_{i=1}^{q} \mathrm{var}\,(\delta_i)}$$

Table 21 presents the requirements of the fit indexes of the second generation discussed in an overview.

Table 21: Fit Indexes (Second Generation)

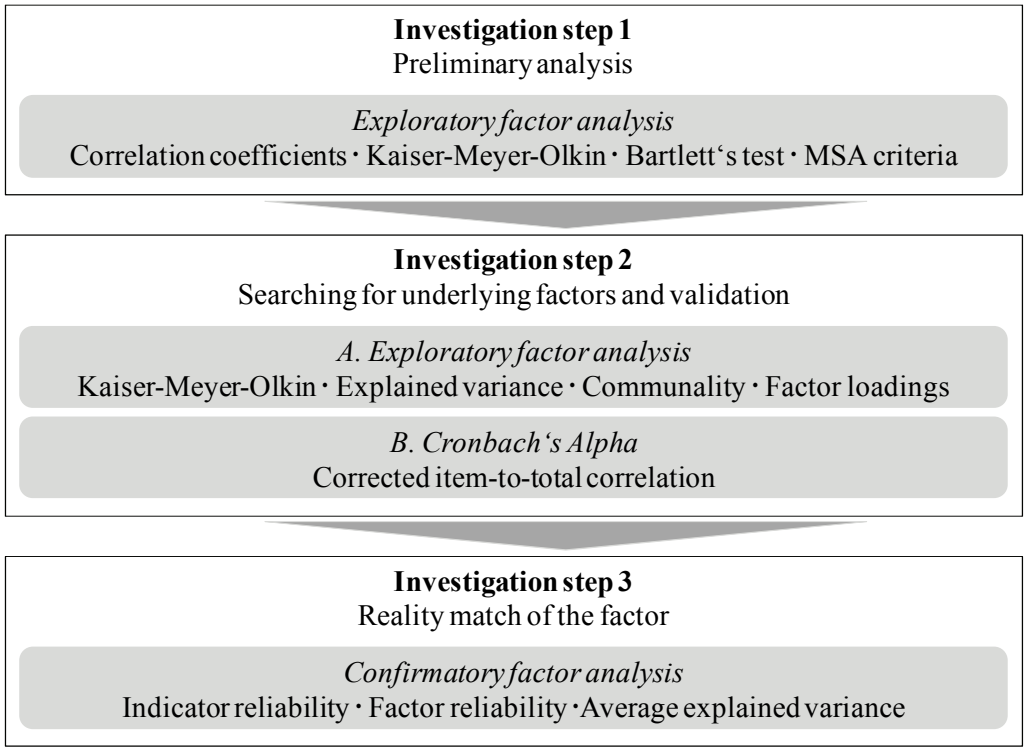
Quality Criteria	Requirement	Validation	Source
Confirmatory factor analysis			
Indicator reliability	≥ .4	Internal consistency	Boomsma 1982
Critical ratio	≥ 1.96	Internal consistency	Arbuckle 2006
Factor reliability	$p < .5$	Convergent validity	Fritz 1995
Average % of variance extracted	≥ .5	Convergent validity	Hair et al. 2006

Source: own illustration

To ensure reliable construct measurements, the indicators used in this work are empirically tested applying exploratory and confirmatory factor analyses as well as reliability checks according to the fit indexes introduced in this section.

Figure 17 summarizes each step to assess the indicator-based measurements.

Figure 17: Procedure to Assess the Indicator-Based Measurements



Source: own illustration

5.4.2 Independent Variables

Snacking Habit

Verplanken and Orbell's (2003) Self-Report Habit Index was used to measure participants' snacking habit. Some items had to be reworded in line with the behavior under study. 3 of the 12 items had dropped out because of the pretest, leaving 9 indicators in the final questionnaire.

In the first step, an exploratory factor analysis was conducted. The communality of the item A02.9 (see Table 22) was below the required index of .5; therefore, it is excluded from the analysis. Next, the measurement was calculated again using the remaining eight items. According to the Kaiser criteria, two factors were extracted: The items A02.2 and A02.4 are loaded on a different factor. Therefore, these items were also excluded from the analysis. Then, in the second step, the measurement was calculated a third time using the remaining six items. According to the Kaiser criteria, one factor was being extracted that gathered 71.98% of the total variance explained. The corrected item-to-total correlation covered a range of values between .702 and .868 and therefore fulfilled the aspiration level of .4. Also, all communalities exceed the critical level of .5. Finally, Cronbach's alpha was calculated, which shows a very good level ($\alpha = .922$).

In the third step, a confirmatory factor analysis was conducted. All indexes showed satisfying results. Along with the indicator reliability, there is indication that the critical ratios as well as the factor reliability and the average percentage of variance extracted show a reliable and valid measurement of the construct snacking habit (see Table 22).

Table 22: Indicators of the Construct Snacking Habit

Notation	Indicator
	Snacking is something…
A02.1	I do frequently.
A02.2	I do without having to consciously remember.
A02.3	that makes me feel weird if I would not do it.
A02.4	I do without thinking.
A02.5	that would require effort not to do it.
A02.6	that belongs to my (daily, weekly, monthly) routine.
A02.7	I would find hard not to do.
A02.8 (r)	I have no need to think about doing.
A02.9	I have been doing for a long time.

Seven-point response scale: 1 = strongly disagree; 7 = strongly agree
Items A02.2, A02.4, and A02.9 were eliminated to improve the fit indexes of the measurement.
The indicator marked with an (r) is measured reverse coded.

Source: Verplanken and Orbell (2003), p. 1329

Attitude

For the construct attitude, the exploratory factor analysis suggests to eliminate item A03.1 (see Table 23) because of an insufficient communality. The re-analysis corresponded to sufficient communality levels, but the indicators are loaded on two factors. The rotation matrix showed that item A03.3 did not load on a mutual factor; therefore, the item was deleted. A third exploratory factor analysis showed two more communalities that were slightly below .5. Both were eliminated. A re-analysis led to the extraction of one factor accounting for 72.668% of the total variance. The corrected item-to-total correlations and factor loadings certified adequate reliability and convergent validity. Given the small number of remaining indicators, a Cronbach's alpha coefficient of .802 seems acceptable (see Table 23).

Table 23: Indicators of the Construct Attitude

Notation	Indicator
	Reducing my snack consumption next week would be…
A03.1	unimportant – important
A03.2	negative – positive
A03.3	unpleasant – pleasant
A03.4	bad – good
A03.5	useless – useful
A03.6	unhealthy – healthy
A03.7	unsatisfying – satisfying

Seven-point bipolar response scale
Items A03.1, A03.3, A03.6, and A03.7 were eliminated to improve the fit indexes of the measurement.

Source: Verplanken and Faes (1999), p. 597; Achtziger et al. (2008), p. 383

Intention

For the construct intention, the exploratory and confirmatory factor analyses provided good results (see Table 24). The total variance explained accounts for 92.766%. Other indexes proved high reliability and validity of the measurement. The factor reliability and the average percentage of variance extracted showed values of .910 and .856, respectively.

Table 24: Indicators of the Construct Intention

Notation	Indicator
A04.1	I intend to eat fewer snacks in the next week.
A04.2	I will try to eat fewer snacks in the next week.

Seven-point response scale: 1 = strongly disagree; 7 = strongly agree

Source: Achtziger et al. (2008), p. 383

Perceived Behavioral Control

The three-item scale for the construct perceived behavioral control (see Table 25) reveals an explained variance of 67.995% and the Cronbach's alpha meets the statistical requirement ($\alpha = .764$). The average explained variance calculated with the confirmatory factor analysis (.526) falls a little short but still higher than the aspiration level; the factor reliability (.637) and individual indicator reliabilities are satisfactorily.

Table 25: Indicators of the Construct Perceived Behavioral Control	
Notation	**Indicator**
A04.3	For me it is easy to eat fewer snacks in the next week.
A04.4	I am confident I will eat fewer snacks in the next week.
A04.5	I am certain that I can reduce my snack consumption in the next week.
Seven-point response scale: 1 = strongly disagree; 7 = strongly agree	

Source: Achtziger et al. (2008), p. 383

Subjective Norm

A single item tested the variable and therefore, the fit indexes of the first and second generation were not applied. Table 26 presents the indicator for the construct subjective norm.

Table 26: Indicator of the Construct Subjective Norm	
Notation	**Indicator**
A04.6	Most people who are important to me think that I should eat fewer snacks in the next week.
Seven-point response scale: 1 = strongly disagree; 7 = strongly agree	

Source: Achtziger et al. (2008), p. 383

5.4.3 Dependent Variable

Perceived (Self-Reported) Snack Behavior

For the construct perceived (self-reported) snack behavior (in the following self-reported behavior), the fit indexes of the first generation showed acceptable results (see Table 27). The indicators achieve a total variance explained of 64.389% as well as an alpha coefficient of .815. In the third step (confirmatory factor analysis) two indicator reliabilities fall below the required minimum. However, the average explained variance and the factor reliability are higher than the aspiration level. Furthermore, eliminating items G02.3 and G02.4 did not lead to a significantly higher reliability. Because the other fit indexes showed good values, these two critical indicator reliabilities were tolerable.

Table 27: Indicators of the Construct Self-Reported Behavior

Notation	Indicator
G02.1	I tried to eat fewer snacks during the last week.
G02.2	I ate fewer snacks during the last week.
G02.3	I resisted alluring snack offerings during the last week.
G02.4	It was easy for me to eat fewer snacks during the last week.

Seven-point response scale: 1 = strongly disagree; 7 = strongly agree

Source: Luszczynska et al. 2004, p. 583

Table 28 summarizes all fit indexes of the independent variables and the self-reported dependent variable used for this study.

Table 28: Fit Indexes of Independent Variables and Dependent Variable

Variable	Item	Communality	Corrected ITC[1]	Factor Loading	C.R.[2]	IR[3]
Habit	A02.1	.693	.758	.776	13.603	.602
	A02.3	.684	.749	.788	14.017	.621
	A02.5	.836	.868	.919	*	.845
	A02.6	.754	.801	.821	15.204	.674
	A02.7	.731	.784	.840	15.959	.706
	A02.8	.621	.702	.738	12.428	.544
Total Variance Explained: 71.983%			Cronbachs Alpha: .922	FR[4]: .888		AVE[5]: .665
Attitude	A03.2	.648	.578	.645	7.695	.416
	A03.4	.830	.768	.969	*	.938
	A03.5	.701	.625	.705	8.219	.497
Total Variance Explained: 72.668%			Cronbach's Alpha: .802	FR: .749		AVE: .617
Perceived Control	A04.3	.674	.590	.704	6.944	.496
	A04.4	.633	.556	.649	6.784	.421
	A04.5	.733	.645	.814	*	.662
Total Variance Explained: 67.995%			Cronbach's Alpha: .764	FR: .637		AVE: .526
Intention	A04.1	.928	.855	.914	*	.836
	A04.2	.928	.855	.935	*	.875
Total Variance Explained: 92.766%			*Cronbach's Alpha: .922*	*FR: .910*		*AVE: .856*
Behavior (self-reported)	G04.1	.679	.667	.667	10.544	.635
	G04.2	.763	.737	.737	*	.787
	G04.3	.627	.620	.620	8.416	.398
	G04.4	.507	.529	.529	7.475	.322
Total Variance Explained: 64.389%			*Cronbach's Alpha: .815*	*FR: .712*		*AVE: .536*

[1] Corrected ITC = Corrected **i**tem-to-**t**otal **c**orrelation; [2] C.R. = Critical ratio; [3] IR = Indicator reliability; [4] FR = Factor reliability
[5] AVE = Average variance extracted
[*] For scaling reasons, in each factor loading of a construct one value is fixed to 1.0. For these indicators no C.R. can be calculated.

Source: own illustration

5.4.4 Control Variables

Health Knowledge

For the construct health knowledge, the communalities of the exploratory factor analysis showed good results except for item C03.4 C03.6; their communalities were less than the required index of .5 and therefore were excluded from the analysis. Using the remaining four items, the measurement was calculated again. According to the Kaiser criteria, one factor was being extracted that gathers 65.892% of the total variance explained. Also the other fit indexes such as the Cronbach's alpha (α = .824) showed good results.

Therefore, a confirmatory factor analysis was next conducted. The indicator reliabilities show values greater than .4 except for items C03.5, which had a value of .302 and was eliminated. Re-calculating the exploratory and confirmatory factor analyses delivered adequate results. Along with the indicator reliabilities, the critical ratios, factor reliability, and the average variance explained argue for a reliable and valid measurement of the construct health knowledge. See Table 29 for the indicators.

Table 29: Indicators of the Construct Health Knowledge

Notation	Indicator
C03.1	I know very much about nutrition compared to an average person.
C03.2	I am very knowledgeable about taking care of my general health compared to an average person.
C03.3	I am familiar with preventing minor and temporary problems such as a cold.
C03.4	I am familiar with preventing minor and chronic problems such as allergies.
C03.5	I am familiar with preventing major and temporary problems such as the flu.
C03.6	I am familiar with preventing major and chronic problems such as hypertension.

Seven-point response scale: 1 = strongly disagree; 7 = strongly agree
Items C03.4, C03.5, and C03.6 were eliminated to improve the fit indexes of the measurement.

Source: Jayanti and Burns et al. (1998), p. 14

Risk Perception

For the construct risk perception, the exploratory and confirmatory factor analyses delivered good results. The total variance explained accounted for 72.604% and the value of Cronbach's alpha was .872. All indicator reliabilities as well as the factor

reliability and the average variance explained confirmed good values (.820 and .640, respectively). Table 30 shows the indicators.

Table 30: Indicators of the Construct Risk Perception

Notation	Indicator
	If I compare myself with others of my age and gender, I estimate the likelihood of experiencing…
D01.1	Heart disease
D01.2	High blood pressure
D01.3	A stroke
D01.4	Diabetes

Seven-point bipolar response scale

Source: Schwarzer and Renner (2000), p. 489

Expected Outcome

The fit indexes of the exploratory and confirmatory factor analyses for the three item scale of the construct expected outcome revealed good values. The total variance explained was 69.706% and Cronbach's alpha was .783. One item showed an indicator reliability slightly below the minimum, however, eliminating the item did not lead to a much higher factor reliability and even impaired Cronbach's alpha. Therefore, the item was not eliminated. The average variance explained was .560 and the factor reliability was .681. Table 31 shows the indicators.

Table 31: Indicators of the Construct Expected Outcome

Notation	Indicator
	If I reduce my snack consumption, then
D01.1	I would feel physically more attractive.
D01.2	I would feel better mentally.
D01.3	I would have none (or fewer) body weight problems.

Seven-point bipolar response scale

Source: Schwarzer and Renner (2000), p. 489

Involvement

For the construct involvement, the exploratory and confirmatory factor analyses delivered good results. The total variance explained accounted for 81.261% and the

value of Cronbach's alpha was .884. All indicator reliabilities as well as the factor reliability and the average variance explained confirmed good values (.853 and .723, respectively). Table 32 shows the indicators.

Table 32: Indicators of the Construct Involvement

Notation	Indicator
	While filling out the questionnaire, I was…
D04.1	concentrating very little – concentrating very hard
D04.2	paying very little attention – paying a lot of attention
D04.3	very uninvolved – very involved

Seven-point bipolar response scale

Source: Miniard et. al. (1991), p. 97

5.4.5 Mediator Variable

Self-Esteem

For the construct self-esteem, the exploratory and confirmatory factor analyses showed good results. The total variance explained was 63.485%; Cronbach's alpha was at .850. Likewise, further fit indexes indicated high reliability and validity of the measurement. All indicator reliabilities as well as the factor reliability and the average variance explained showed good values (.765 and .545, respectively). Table 34 shows the indicators.

Table 33: Indicators of the Construct Self-Esteem

Notation	Indicator
C01.1	The way I look is extremely important to me.
C01.2	I am very concerned about my appearance.
C01.3	I would feel embarrassed if I was around people and did not look my best.
C01.4	Looking my best is worth the effort.
C01.5	It is important that I always look good.

7-point response scale: 1 = strongly disagree; 7 = strongly agree

Source: Netemeyer et al. (1995), p. 624

Table 34 gives an overview of the fit indexes of all control variables and the mediator variable used in this study.

Table 34: Fit Indexes of the Control and Mediator Variables

Variable	Item	Communality	Corrected ITC[1]	Factor Loading	C.R.[2]	IR[3]
Health Knowledge	C03.1	.760	.686	.884	9.627	.782
	C03.4	.837	.779	.975	*	.951
	C03.5	.628	.577	.791	8.034	.626
Total Variance Explained: 74.179%			Cronbach's Alpha: .821		FR[4]: .918	AVE[5]: .786
Risk Perception	D01.1	.821	.807	.919	*	.845
	D01.2	.708	.713	.751	12.005	.564
	D01.3	.761	.752	.847	14.370	.718
	D01.4	.615	.638	.657	9.877	.432
Total Variance Explained: 72.604%			Cronbach's Alpha: .872		FR: .820	AVE: .640
Expected Outcome	A05.1	.772	.693	.873	*	.762
	A05.2	.618	.552	.623	7.001	.388
	A05.3	.701	.624	.727	7.513	.529
Total Variance Explained: 69.706%			Cronbach's Alpha: .783		FR: .681	AVE: .560
Involvement	D04.1	.835	.796	.879	13.844	.773
	D04.2	.843	.806	.894	*	.800
	D04.3	.760	.724	.772	12.065	.596
Total Variance Explained: 81.261%			Cronbach's Alpha: .884		FR: .853	AVE: .723
Self-Esteem	C01.1	.641	.671	.726	9.897	.527
	C01.2	.568	.608	.650	8.712	.423
	C01.3	.597	.647	.698	9.459	.487
	C01.4	.661	.692	.781	10.757	.610
	C01.5	.709	.724	.823	*	.677
Total Variance Explained: 63.485%			Cronbach's Alpha: .850		FR: .765	AVE: .545

[1] Corrected ITC = Corrected **i**tem-to-**t**otal **c**orrelation; [2] C.R. = Critical ratio; [3] IR = Indicator reliability; [4] FR = Factor reliability

[5] AVE = Average variance extracted

[*] For scaling reasons, in each factor loading of a construct one value is fixed to 1.0. For these indicators no C.R. can be calculated.

Source: own illustration

5.5 Randomization and Descriptive Data

5.5.1 Randomization Check

To check the randomness of assignment to conditions, t-tests were conducted between participants in the experimental and control groups with respect to the variables measured previously to the manipulation (i.e., attitude, subjective norm, perceived behavioral control, intention, and habit). None of these variables differed significantly between the conditions ($p > .05$), which suggests that the randomization was successfully accomplished (see Table 35).

Table 35: Randomization Check

Conditions	Self-regulation formed	Self-regulation not formed	Financial incentive provided	Financial incentive not provided
Attitude	M = 5.02	4.85	4.87	5.00
	$p = .392$		$p = .525$	
Subjective norm	2.57	2.24	2.36	2.44
	$p = .167$		$p = .746$	
Perceived control	4.23	4.28	4.38	4.13
	$p = .811$		$p = .267$	
Intention	4.10	3.76	3.99	3.87
	$p = .225$		$p = .665$	
Habit	4.50	4.19	4.18	4.50
	$p = .175$		$p = .160$	

Source: own illustration

5.5.2 Descriptive Data

Means, standard deviations, and correlations were computed between attitude, subjective norm, perceived behavioral control, and intention toward healthy eating, unhealthy eating habits, and perceived healthy eating behavior. As depicted in Table 36, all antecedents of behavior, as postulated by the theory of planned behavior, were very favorable toward healthy eating. Healthiness of eating behavior correlated significantly with all variables. As expected, unhealthy habits correlated negatively with healthy behavior.

Table 36: Means, Standard Deviations, and Correlations

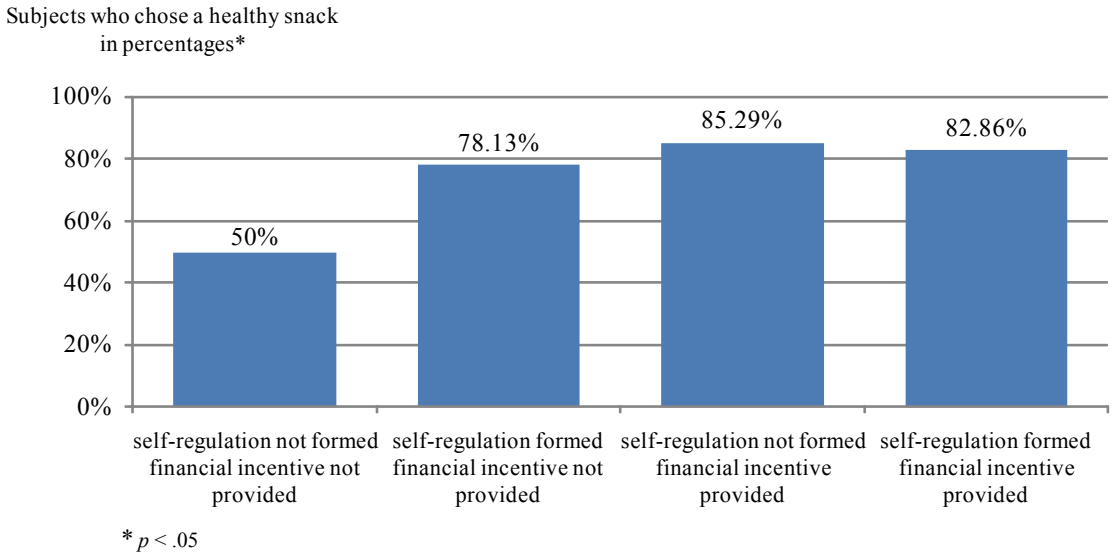
Variable	M	SD	2	3	4	5	6
Attitude	4.93	1.30	.213**	.263**	.549**	-.103	.269**
Subjective norm	2.40	1.62	-	.043	.314**	.158*	.184*
Perceived control	4.26	1.46		-	.286**	-.509**	.250**
Intention	3.93	1.82			-	-.015	.381**
Unhealthy snack habits	4.35	1.52				-	-.228**
Healthy snack behavior	3.57	1.47					-

* $p < 0.05$; ** $p < 0.01$

Source: own illustration

Overall, 131 of 176 participants redeemed their voucher in the in-house-cafeteria. Of the 131 subjects, 75 redeemed their voucher for a healthy snack, namely, a fruit such as mandarins or grapes. As expected, the percentage of participants redeeming their voucher for a healthy snack in the control group was low – only 50%. In the experimental group "self-regulation strategy," this percentage rose to 78.13%. In the experimental group "financial incentive," 85.29% chose a healthy snack, and in the combined experimental group this percentage is 82.82%. A chi-square-test shows high significance among the observed frequencies ($p < .05$).

Figure 18: Choice of a Healthy Snack



Source: own illustration

5.6 Manipulation and Confound Checks

Before the hypotheses were tested, manipulation checks were performed to determine whether the interventions were successful and differed as intended. According to Perdue and Summers (1986, p. 322), directional t-tests and/or one-way analysis of variance (ANOVAs)[11] followed by multiple contrasts are not sufficient for adequately analyzing the manipulation when multiple factors are involved. Therefore, the authors call for a full factorial model and advice researchers to be concerned with the statistical significance of all main and interaction effects.

Ideally, it is possible to demonstrate that (1) the treatment manipulation is related to the factor it is designed to alter and (2) the manipulation produces changes not in related but in different constructs. The first condition relates to Cook and Campell's (1979) idea of assessing the convergence of measures and manipulations of the same "factor". The latter condition incorporates the suggestion of Cook and Campell (1979) of testing for a divergence of measures and manipulations of related but distinct factors. This special type of manipulation check, which serves to assess discriminant validity, is referred to as a confounding check (Wetzel 1977). As Wetzel (1977, pp. 88) points out, the results ideally reveal that manipulation A (in this study: self-regulation strategy) is independent from manipulation B (in this study: financial incentive).

Consequently, a multivariate analysis of variance (MANOVA) was conducted to verify whether the manipulations worked as expected. Therefore, the manipulation variables were coded as 0/1 variables (self-regulation formed = 1 versus self-regulation not formed = 0 and financial incentive provided = 1 versus. financial incentive not provided = 0) and treated as independent variables. In contrast, the manipulation check variables were considered as dependent variables.

A significant main effect revealed that those participants who were manipulated with forming a self-regulation strategy indicated that they indeed had formed a self-regulation strategy ($M_{\text{self-regulation strategy formed}} = 3.6726$; $M_{\text{self-regulation strategy not formed}} = 2.8198$, $F_{(1, 176)} = 11.224$, $p < .001$). Furthermore, it was tested whether the other independent variable, financial incentive, or the interaction between the two independent variables had an effect on the manipulation check. As expected, neither the main effect of the financial incentive nor the interaction effect was significant ($p >$

[11] Details about the analysis of variance (ANOVA) are elaborated in Section 5.7.2.1 and 5.7.2.2.

.50). Thus, it can be concluded that the manipulation of the self-regulation assignment was successful.

The test of the second treatment (financial incentive) disclosed a significant main effect ($p < .05$, $F_{(1, 176)} = 3.965$, $p < .05$). Thus, participants exposed to a financial incentive indicated that they indeed were provided with a financial incentive compared with participants who were not exposed to a financial incentive ($M_{\text{financial incentive provided}} = 2.78$; $M_{\text{financial incentive not provided}} = 2.22$). Moreover, both, the main effect of self-regulation and the interaction effect were not significant ($p > .85$). This shows that the second manipulation was successful as well. Table 37 summarizes the results of the manipulation checks.

Table 37: Manipulation Checks

	Factor	$F_{(1,176)}$	p
Self-regulation	Check self-regulation	11.342	$p < .001$
	Check financial incentive	0.049	$p > .825$
Financial incentive	Check self-regulation	0.815	$p > .368$
	Check financial incentive	3.965	$p < .048$
Self-regulation x financial incentive	Check self-regulation	0.374	$p > .541$
	Check financial incentive	0.048	$p > .827$

Source: own illustration

5.7 Hypotheses Testing

5.7.1 Prediction of Behavioral Intentions and Behavior

As Table 36 indicates, the antecedents of the theory of planned behavior (attitude, subjective norm, and perceived behavioral control) were significantly related to intention toward reducing snack consumption. In this section, this relation will be analyzed in more detail using multiple regression analysis, a statistical technique that can be used to analyze the relationship between a single dependent variable and several independent variables (Hair et al. 2006).

5.7.1.1 Multiple Regression Analysis

The objective of the multiple regression analysis is to use the independent variables whose values are known to predict the single dependent value under study. Each independent variable is weighted by the procedure of the regression analysis to ensure maximal prediction from the set of independent variables. The regression weights

indicate the relative contribution of the independent variables to the overall prediction and assist the interpretation of the influence of each independent variable in making the prediction of the dependent variable. The set of weighted independent variables forms the so-called regression variate, a linear combination of the independent variables that best predicts the dependent variable (Hair et al. 2006, p. 176).

5.7.1.2 Results of Multiple Regression Analysis

Applying the multiple regression analysis (R^2 = .373) to predict behavioral intention, the beta weights of attitude (β = .464, p < .000), perceived behavioral control (β = .212, p < .004) and subjective norm (β = .189, p < .003) were highly significant, demonstrating that all three variables contributed uniquely to the prediction of intention (see Table 38). As the correlation analysis indicates (see Table 36), unhealthy eating habits did not correlate with intention (-.015). This result is confirmed by the result of the multiple regression analysis (β = .111, p < .125), thus indicating that unhealthy eating habits did not contribute to the prediction of the criterion.

Table 38: Prediction of Intention

	B	SE B	β	R^2
				.373
Attitude	.650	.090	.464***	
Subjective norm	.213	.071	.189**	
Perceived control	.265	.091	.212**	
Habit	.133	.086	.111	

** p < .05; *** p < .001

Source: own illustration

Furthermore, healthy eating behavior was regressed on intention, perceived behavioral control, and unhealthy eating habits again using a multiple regression analysis. All predictors correlated significantly with the criterion (see Table 36). In the multiple regression analysis (R^2 = .208) intention ($\beta_{Intention}$ = .310, p < .000) and unhealthy eating habits (β_{Habits} = -.219, p <.008) made a significant contribution to the prediction of healthy eating behavior in addition to the predictors of the model of planned behavior (see Table 39). As expected, unhealthy eating habits were negatively related to healthy eating behavior. The beta weight of perceived behavioral control was not significant ($\beta_{Perceived\ behavioral\ control}$ = .034).

Table 39: Prediction of Self-Reported Behavior				
Independent Variable	**B**	**SE B**	**β**	**R^2**
				.208
Intention	.250	.070	.310***	
Perceived control	.034	.085	.034	
Habit	-.213	.079	-.219**	

** $p < .05$; *** $p < .001$

Source: own illustration

The results indicate that the more positive the attitude and social normative pressure of a person toward reducing unhealthy snack consumption as well as the greater the perceived behavioral control toward reducing unhealthy snack consumption, the stronger the intention of a person to reduce unhealthy snack consumption. Therefore, hypotheses H_{1A}-H_{1C} are confirmed. Moreover, a strong intention toward reducing unhealthy snack consumption predicts healthier snack behavior (H_{2A} confirmed). However, perceived behavioral control to reduce snack consumption does not predict healthier snack behavior (H_{2B} not confirmed).

Furthermore, hypotheses H_{1D} cannot be confirmed. Strong unhealthy snack habits do not predict weaker intentions toward reducing unhealthy snack consumption. As the results of Table 36 already indicated, there is no correlation between habit and intention. On the contrary, hypothesis H_{2C} can be confirmed: The stronger the unhealthy snack habit, the weaker the healthy snack behavior of a person. Table 40 summarizes these results.

Table 40: Results of Hypotheses H_{1A-D}-H_{2A-C}

Hypotheses	Assumed relation			β	Effect	Result
H_{1A}	attitude	→ (+)	intention	.464***	direct	✓
H_{1B}	subjective norm	→ (+)	intention	.189**	direct	✓
H_{1C}	perceived control	→ (+)	intention	.212**	direct	✓
H_{1D}	habit	→ (-)	intention	$.111^{n.s.}$	direct	×
H_{2A}	intention	→ (+)	(s.r.) behavior	.310***	direct	✓
H_{2B}	perceived control	→ (+)	(s.r.) behavior	$.034^{n.s.}$	direct	×
H_{2C}	habit	→ (-)	(s.r.) behavior	-.219**	direct	✓

n.s. = $p > 0.1$; ** $p < .05$; *** $p < .001$
✓ = hypothesis confirmed; × = hypothesis not confirmed
* (s.r.) behavior = self-reported behavior

Source: own illustration

5.7.1.3 Discussion

In support of hypothesis H_{1A-C}, it was found that the more positive the attitude and social normative pressure of a person toward reducing unhealthy snack consumption as well as the greater the perceived behavioral control toward reducing unhealthy snack consumption, the stronger the person's intention to reduce unhealthy snack consumption. Attitude had the strongest effect ($p < .000$), subjective norm and behavioral control were also significant ($p < .003$ and $p < .004$, respectively). This finding is in line with the studies outlined in Section 2.2.4, revealing that attitude is the most effective predictor of intention. Although the antecedents of the TPB were favorable toward the intention, the construct habit was not significantly related to intention and thus did not contribute to the prediction of the criterion. Corresponding to Verplanken's (1999, p. 599) results, hypothesis H_{1D} could not be confirmed.

Moreover, a strong intention toward reducing unhealthy snack consumption was the strongest predictor of perceived healthy snack behavior ($p < .000$), followed by unhealthy snack habits ($p < .008$). The beta weight of perceived behavioral control was not significant. Thus, the results confirmed hypotheses H_{2A} and H_{2B} but did not support hypothesis H_{2C}. Looking at the variance in behavior (21%) and intention (37%), the results of this study demonstrate similarities with previous studies using antecedents of the TPB. For example, in a meta-analysis of 185 studies (Armitage and Conner 2001, p. 471), TPB accounted for 27% of the variance in behavior and

39% of the variance in intention. Thus, this study's results support the fact that TPB is more successful in predicting intentions than behavior.

5.7.2 Main and Interaction Effects

As hypothesized in Chapter 3, self-regulation strategies and financial incentives represent promising motivational approaches to induce and develop healthy snack behavior. First, it was predicted that forming a self-regulation strategy and/or being provided with a financial incentive would positively influence people's healthy snack behavior (i.e., eat fewer calories). In contrast, those subjects who do not form a self-regulation strategy and/or were not provided a financial incentive would eat less healthily (i.e., eat more calories). Thereto, a 2x2 factorial design has been set up. The characteristics of the two factors which act as independent variables are coded binary, namely 0 and 1. To test the influence of binary independent variables on a metric scaled dependent variable, an analysis of variance (ANOVA) is conducted. To identify how these two motivational approaches work best, several covariates have to be taken into account. In chapter 4.5.5, it has been defined that health knowledge, risk perception, outcome expectancies, involvement, exercise pattern, age, gender, body mass index (BMI), and waist circumference could be attributable to calorie intake. Thus, to analyze if other variables influence the outcome variable, an analysis of covariance (ANCOVA) is conducted. Both methods are elaborated in the next sections.

5.7.2.1 Factorial Analysis of Variance (ANOVA)

This study uses a two-factorial analysis of variance because the design of the experiment is a factorial between-subject design with two independent variables, each having two levels. According to Field (2009, p. 421) the two-factorial analysis of variance is a form of the General Linear Model (GLM). Compared with one way ANOVA, the factorial ANOVAs allow designing more complex models. The design of the factorial ANOVA yields two kinds of information. The first is information about the effect of each independent variable taken by itself: the main effect of an independent variable. This means for the design under study, that there are two main effects – one for each independent variable. The second type of information is called an interaction. If there is an interaction between two independent variables, the effect of one independent variable depends on the particular level of the other variable. In other words, the effect that an independent variable has on the dependent variable depends on the level of the other independent variable. Interactions are a source of information that cannot be obtained in a simple experimental design in which only one independent variable is manipulated (Cozby 2003, p. 180).

The two factorial analysis of variance can be explained according to Herrmann and Seilheimer (2000, p. 277) by the following equation:

$$Y_{ghk} = \mu + \alpha_g + \beta_{gh} + (\alpha\beta)_{gh} + (\varepsilon)_{ghk}$$

where

Y_{ghk}: observed variable

μ: mean of the sample

α_g, β_{gh}: main effects of factor x_1 (self-regulation), x_2 (financial incentive)

$(\varepsilon)_{ghk}$: residual.

According to this equation, hypotheses H_3, H_6 and H_9 are tested. The null hypothesis always postulates that there is no effect of the variables or their combination, i.e. the means of the different scenarios differ not significantly from each other (Bortz and Döring 2002, p. 494). Therefore, to identify an influence of the factors, the null hypothesis has to be rejected (Backhaus et al. 2006, p. 73).

The null hypotheses for each effect are the following:

Total effect:

$$H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4$$

where

μ_i: mean of scenarios i = 1, 2, 3, 4

If there is no effect of the two factors present, it appears to be no statistical differences in the mean values of the different scenarios. The alternative hypothesis states therefore, that at least one mean differs significantly from the means of the other scenarios. If no effect can be identified, there are no main and interaction effects available (Herrmann and Seilheimer 2000, p. 282).

The null hypotheses of the main factors postulate that the differences between the averages of the scenarios in which a specific stimulus was used is not different from those where the specific stimulus was not in place. Specifically, the following null hypotheses for the two main effects arise:

Main effect of factor 1 (self-regulation strategy):

$$H_0: \mu_1 + \mu_2 = \mu_3 + \mu_4$$

$$H_0: \mu_1 + \mu_2 - (\mu_3 + \mu_4) = 0$$

The null hypothesis conveys that the sum of the means of the conditions where a self-regulation strategy is formed (scenarios A and B)[12] does not differ from the sum of the means of the scenarios where no self-regulation strategy is formed (scenarios C and D). If the null hypothesis is rejected at a given confidence level, the alternative hypothesis is confirmed which states that when a self-regulation strategy is formed the effect on the dependent variable will be significantly different compared to when no self-regulation is formed.

[12] Recall: Scenario A: Self-regulation strategy formed, financial incentive provided
Scenario B: Self-regulation strategy formed, financial incentive not provided
Scenario C: Self-regulation strategy not formed, financial incentive not provided
Scenario D: Self-regulation strategy not formed, financial incentive provided.

The same applies to the financial incentive:

Main effect of factor 2 (financial incentive):

$$H_0: \mu_1 + \mu_4 = \mu_2 + \mu_3$$

$$H_0: \mu_1 + \mu_4 - (\mu_2 + \mu_3) = 0$$

The null hypothesis assumes that the sum of the means of the condition where a financial incentive is provided (scenarios A and D) does not differ from the sum of the means of the scenarios where no financial incentive is provided (scenarios B and C). If the null hypothesis is rejected, there is a significant influence of the factor financial incentive on the tested dependent variable.

Interaction effect of factor 1 and factor 2:

$$H_0: \mu_1 - \mu_3 = \mu_2 - \mu_4$$

$$H_0: \mu_1 - \mu_2 - (\mu_3 - \mu_4) = 0$$

If there is an interaction effect between the two factors self-regulation strategy and financial incentive, the means between the condition "self-regulation strategy formed" should differ significantly from the condition "self-regulation strategy not formed" depending on the level of the financial incentive (provided versus not provided). The null hypothesis postulates that the difference of the sum of the means of the condition where a self-regulation strategy is formed and the condition where no self-regulation strategy is formed (difference scenario A – scenario D and difference scenario B – scenario C) by the condition that a financial incentive is provided (scenario A – scenario D) and by the condition that a financial incentive is not provided (scenario B – scenario C) is the same.

To test the null hypotheses the F-ratio is of importance. The F-ratio is a measure of the ratio of systematic variation to unsystematic variation. As such, it is the ratio of the experimental effect to the individual differences in performance. If the value of the F-ratio is less than 1, then it represents a non-significant effect. A F-ratio greater than 1 indicates that the experimental manipulation had some effect above and beyond the effect of individual differences in performance. However, the effect can only be identified as statistically significant and not purely random, if the F-value exceeds the critical maximum value which is expected to get by chance alone in an F-distribution with a certain number of degrees of freedom and sample size (Field 2005, p. 323).

To ensure the validity of the significance in the context of a multifactorial analysis of variance, basically two assumptions must be met.

5.7.2.2 Assumption of ANOVA

The assumptions under which ANOVA is reliable are the same as for all parametric tests based on the normal distribution. That is, (1) data should be from a normally distributed population, (2) the variances in each experimental condition are fairly similar, (3) observations should be independent and (4) the dependent variable should be measured on at least an interval scale. At this point it is referred to chapter 5.3 where it was identified that the data under study are normally distributed.

To check whether homoscedasticity is in place, the Levene-test should be used. Levene's test is used to assess the tenability of the assumption of equal variances. The test looks at whether there are any significant differences between group variances. A non-significant result indicates that the assumptions are met. If Levene's test is significant and therefore the assumption of homogeneity of variance violated, there are various procedures to be taken to equalize the variances through data transformation (Field 2005, p. 404). However, the payoff of transformations in terms of more valid probability statements is low, and they are seldom considered to be worth the effort (Games and Lucas 1966). Thus transformations are useful in equalizing group variances in cases of unequal n's (Glass, Peckham, and Sanders 1972, pp. 241).

The F-test which is used in the ANOVA is relatively robust against violations of the assumptions (Glass et al. 1972, pp. 238). Thus, even if the condition of homogeneity of the variance is not met, the two-factorial analysis of variance reveals reliable results. This is especially true in the case of same sample sizes (Field 2005, pp. 324) as it is the case in this study (see Table 19).

5.7.2.3 Planned Contrasts

The F-ratio reveals only whether the model fitted to the data accounts for more variation than extraneous factors, but it does not indicate where the differences between groups lie. Thus, if the F-ratio is large enough to be statistically significant, it is only known that one or more of the differences between means are statistically significant. Therefore, after conducting an ANOVA, further analyses need to be carried out to find out which groups differ significantly from each other. In multiple regressions, each β-coefficient is tested individually using a t-test, which could be done also for ANOVA. However, two t-tests should be carried out in order to inflate

the family wise error rate. Therefore, a test is needed to contrast the different groups. There are two ways in which to achieve this goal. The first is to break down the variance accounted for by the model into component parts; the second is to compare every group (as if conducting several t-tests) but to use a stricter acceptance criterion such that the error rate does not rise above .05. The first option can be done using planned comparisons (also known as planned contrasts) whereas the latter option is done using post hoc comparisons. Planned comparisons are done when specific hypothesis are available to be tested, whereas post hoc tests are done when no specific hypotheses are defined (Field 2005, p. 325). Thus, for this study, planned contrasts are conducted.

5.7.2.4 Analysis of Covariance

The basic idea and approach of the two factorial analyses of variance were explained in chapter 5.7.2.1. The analysis of covariance has the advantage that in addition to categorical explanatory variables (factors) interval explanatory variables (so-called covariates) can be included into the model. Therefore, the procedure is also known as analysis of covariance (ANCOVA). Thereby not only can be determined whether the covariates have a significant influence on the dependent variable, but also their influence can be quantified in terms of direction and strength (Backhaus et al. 2006; Field 2005, p. 364).

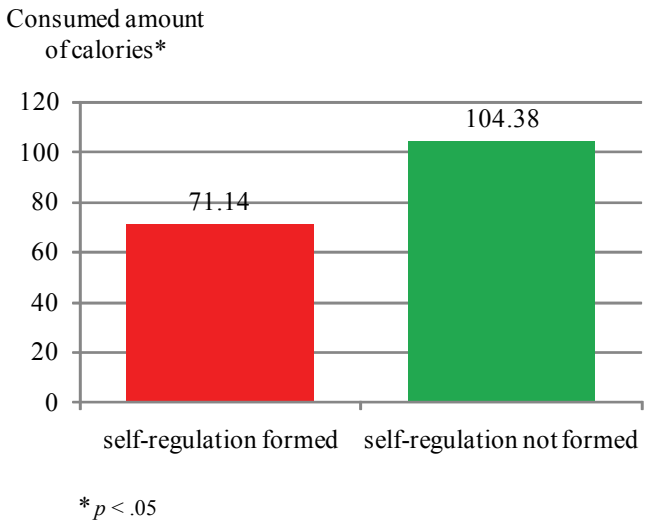
5.7.2.5 Results of Main and Interaction Effects

As a preliminary remark: the dependent variable used for all analyses in this section was the observed variable; in other words, the snack chosen right after the manipulations had taken place. Thus, as outlined in Section 4.5.4.1 participants could choose between butter croissants and fruits. The number of products chosen was converted into calories. The dependent variable is called "calorie intake".

To test the hypothesized relations a 2 (self-regulation strategy: formed versus not formed) x 2 (financial incentive: provided versus not provided) ANCOVA with calorie intake as the dependent variable and health knowledge, risk perception, outcome expectancies, involvement, exercise pattern, age, gender, BMI, and waist circumference as covariates was conducted.

The results revealed a significant main effect between self-regulation strategy and calorie intake ($F_{(1, 117)} = 5.330$, $p < .023$), in support of hypothesis H_3. This finding indicates that forming a self-regulation strategy leads to healthier snack behavior (lower calorie intake) compared with the condition "no self-regulation strategy is formed" ($M_{\text{self-regulation formed}} = 71.14$; $M_{\text{self-regulation not formed}} = 104.38$, $p < .05$).

Figure 19: Main Effect: Self-Regulation

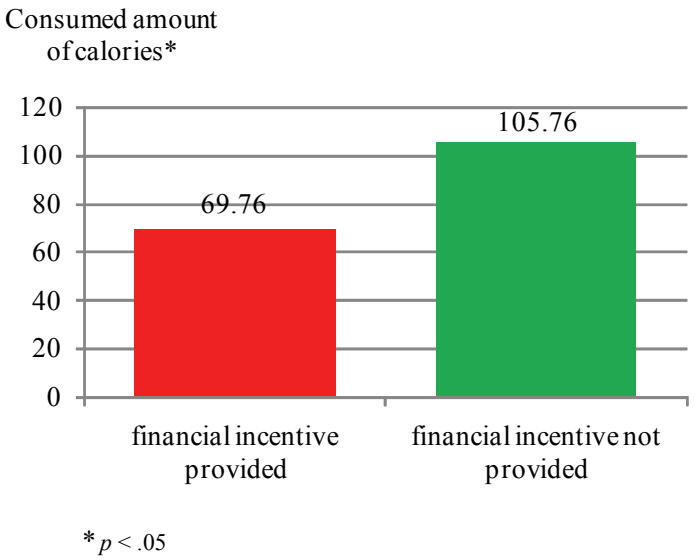


Source: own illustration

In the case of the financial incentive, the ANOVA shows an even more significant main effect ($F_{(1, 117)} = 5.266$, $p < .024$) compared with the main effect of the self-regulation strategy. This result supports hypothesis H_6: Providing a financial incen-

tive leads to healthier snack behavior (lower calorie intake) compared with when no financial incentive is provided ($M_{\text{financial incentive provided}} = 69.76$, $M_{\text{financial incentive not provided}} = 105.76$, $p < .05$).

Figure 20: Main Effect: Financial Incentive



Source: own illustration

Furthermore, the ANCOVA shows a significant two-way interaction between the independent variables self-regulation strategy and financial incentive on the dependent variable calorie intake ($F_{(1, 117)} = 4.919$, $p < .029$), in support of hypotheses H_9. The results revealed furthermore a significant covariate for exercise ($F_{(1, 117)} = 3.025$, $p < 0.085$). The other covariates which were included into the equation did not reveal any significant effects.

Table 41 summarizes the results of the variance analyses for the two main effects and the interaction effect.

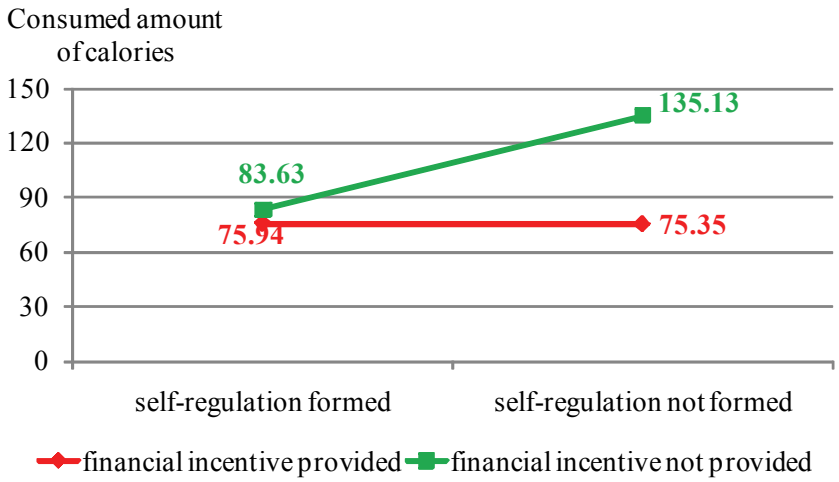
Table 41: Results of the Two Factorial Analysis of Variance

	Dependent variable	$F_{(1,117)}$	p
Self-regulation strategy	calorie intake	5.330	.023
Financial incentive	calorie intake	5.266	.024
Self-regulation x financial incentive	calorie intake	4.919	.029

Source: own illustration

A significant interaction effect does not mean that two factors simply sum; rather, what is important is the way these two factors collaborate (e.g., Do they intensify each other? Do they attenuate each other?) (Bortz and Döring 2002, p. 533). To further examine these effects, planned contrasts were performed within the different scenarios.

Figure 21: Interaction Diagram



Source: own illustration

As graphed in Figure 21, planned contrasts show that participants who formed a self-regulation strategy snacked healthier irrespective whether they were provided with a financial incentive compared with those subjects who did not form a self-regulation and were not provided with a financial incentive. Thus, if a self-regulation strategy is formed, an additional financial incentive does not significantly improve the calorie intake ($M_{\text{self-regulation formed/financial incentive provided}} = 75.94$, $M_{\text{self-regulation formed/financial incentive not provided}} = 83.63$, $p < .666$). A different pattern of results revealed when no self-regulation strategy was formed. In this case, if a financial incentive was provided, the calorie intake improved significantly compared with the condition when no financial incentive was provided ($M_{\text{self-regulation not formed/financial incentive provided}} = 75.35$, $M_{\text{self-regulation not formed/financial incentive not provided}} = 135.13$, $p < .007$.

To compare the effect of these two means in more detail Cohen's (1992) *d* and the effect size *r* are calculated. As outlined in Section 5.2, Cohen (1992, p. 157) defined *d* as the difference between two means (M_1-M_2) divided by the standard deviation, σ, of either group, and classifies effect sizes as "small, when *d* = .2", "medium, when *d* = .5", and "large, when *d* = .8".

Applying Cohens *d* and the effect size *r* to compare the two means M_1 = 75.35 and M_2 = 135.13, the effect size *r* = .327 and Cohens *d* = .693. Thus the effect size is medium-large, which indicates – compared to previous studies (Gollwitzer and Sheeran 2006) – a very good result.

Table 42 summarizes the results of the planned contrasts.

Table 42: Results of the Planned Contrasts in the Experiment

	Self-regulation formed		
	$M_{\text{financial incentive provided}}$	$M_{\text{financial incentive not provided}}$	***p***
Calorie intake	75.94	83.63	.666
	Self-regulation not formed		
	$M_{\text{financial incentive provided}}$	$M_{\text{financial incentive not provided}}$	***p***
Calorie intake	75.35	135.13	.007

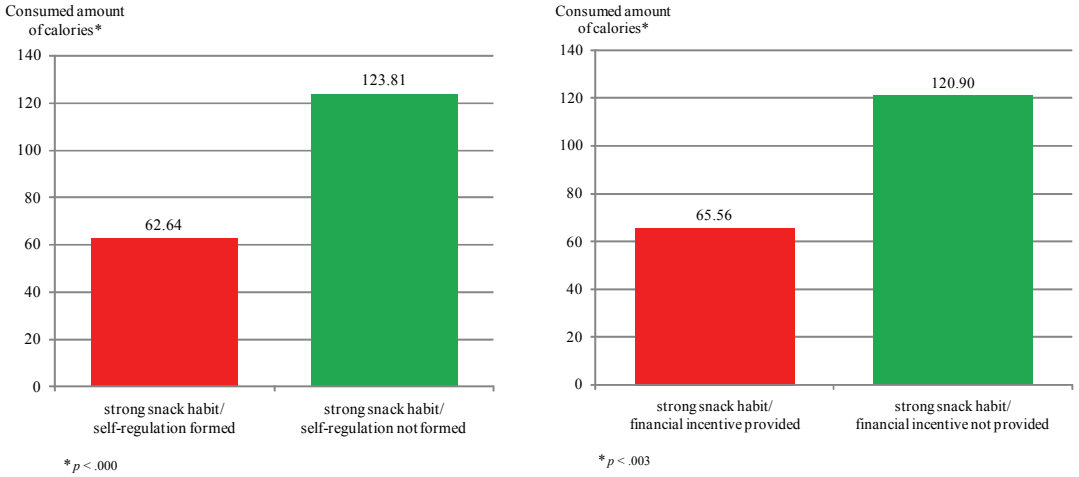
Source: own illustration

To further identify how self-regulation strategies and financial incentives influence participants with strong snacking habits, another ANCOVA was conducted. Thereto, a new factor was composed combining the characteristic strong habit with self-regulation strategy and financial incentive, respectively. Therefore, habit was recalculated, splitting the results of the seven-point scale into two groups: weak snacking habit (1-4.99) and strong snacking habit (5-7).

Subsequently the variable of "weak/strong snacking habit" was matched with the two intervention variables generating two new factors: strong habit/self-regulation and strong habit/financial incentive. This new variable entered the ANCOVA as factors while calorie intake was used as dependent variable. Again, health knowledge, risk perception, outcome expectancies, involvement, exercise pattern, age, gender, BMI, and waist circumference were included into the ANOVA as covariates.

The results reveal two significant main effects; between strong snacking habit/self-regulation strategy and calorie intake ($F_{(1, 117)} = 15.418$, $p < .000$), supporting hypothesis H_4, and between strong snacking habit/financial incentive and calorie intake ($F_{(1, 117)} = 9.418$, $p < .003$), supporting hypothesis H_7. These findings indicate the following results: (1) people with strong snacking habits pick more often a healthier snack (lower calorie intake) when they form a self-regulation strategy compared with when no self-regulation strategy is formed ($M_{\text{self-regulation formed}} = 62.64$; $M_{\text{self-regulation not formed}} = 123.81$), (2) people with strong snacking habits pick more often a healthier snack (lower calorie intake) when provided a financial incentive compared with when no financial incentive is provided ($M_{\text{financial incentive provided}} = 65.56$; $M_{\text{financial incentive not provided}} = 120.90$). Figure 22 depicts the main effects graphically.

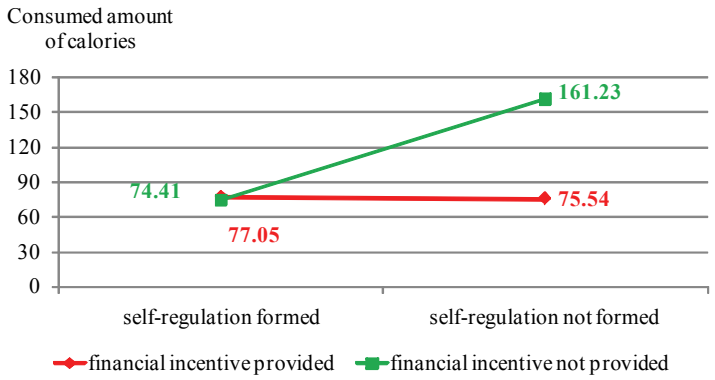
Figure 22: Main Effects: Habit/Self-Regulation and Habit/Financial Incentive



Source: own illustration

Moreover, the ANCOVA shows a significant two-way interaction between the independent variables habit/self-regulation and habit/financial incentive on the dependent variable calorie intake ($F_{(1, 117)} = 14.041$, $p < .000$). The results reveal significant covariates for health knowledge ($F_{(1, 117)} = 3.523$, $p < .066$), and gender ($F_{(1, 117)} = 3.662$, $p < .061$). The other covariates which were included into the equation reveal no significant effects. To further examine the effects, planned contrasts were performed within the different scenarios. Figure 23 illustrates the interaction effect.

Figure 23: Interaction Diagram



Source: own illustration

Planned contrasts show that participants with strong snacking habits and forming a self-regulation strategy snacked healthier irrespective whether they were provided with a financial incentive compared with those subjects – also characterized with strong snacking habits – who did not form a self-regulation. A different pattern of results revealed when no self-regulation strategy was formed. In this case, if a financial incentive was provided, the calorie intake improved significantly compared with the condition when no financial incentive was provided. Table 43 summarizes the planned contrasts.

The same procedure (ANOVA, planned contrasts) was done for the case weak snacking habits. It was assumed that there are no differences between the experimental conditions due to weak snacking habits. The results revealed that the assumption is true. For an overview, the bottom half of Table 43 summarizes the planned contrast results for the case “weak snacking habits”.

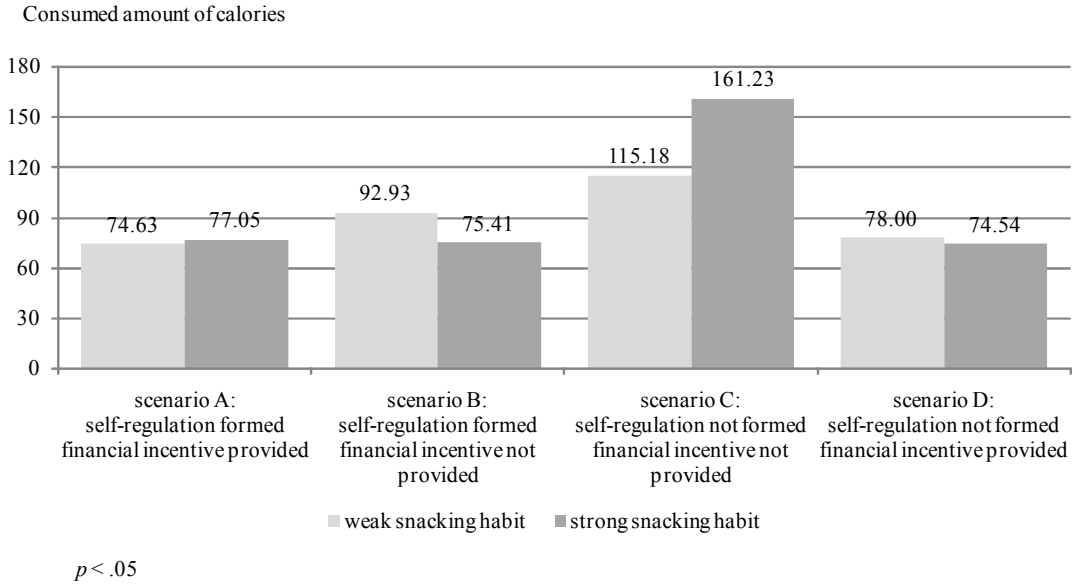
Table 43: Results of Planned Contrasts of Habit and Scenarios

	Strong snacking habits		
	$M_{scenario\ A}$	$M_{scenario\ C}$	***p***
Calorie intake	77.05	161.23	.003
	$M_{scenario\ B}$	$M_{scenario\ C}$	***p***
Calorie intake	75.41	161.23	.010
	$M_{scenario\ D}$	$M_{scenario\ C}$	***p***
Calorie intake	74.54	161.23	.001
	Weak snacking habits		
	$M_{scenario\ A}$	$M_{scenario\ C}$	***p***
Calorie intake	74.63	115.18	.235
	$M_{scenario\ B}$	$M_{scenario\ C}$	***p***
Calorie intake	92.93	161.23	.536
	$M_{scenario\ D}$	$M_{scenario\ C}$	***p***
Calorie intake	78.00	161.23	.536

Source: own illustration

The results for both, weak and strong snacking habits and its influence on calorie intake with respect to the different experimental conditions are graphed in Figure 24 and reveal that there are significant differences of calorie intake due to weak and strong habits as well as due to the different experimental conditions.

Figure 24: Influence of Habit on Calorie Intake per Experimental Condition



Source: own illustration

To summarize, the analyses of the main and interaction effects of this experiment show that both the two main effects (H_3 and H_6) and the interaction effect (H_9) can be confirmed. Furthermore the results support hypotheses H_4 and H_7 (see Table 44).

Table 44: Results Hypotheses H_3, H_4, H_6, H_7, H_9

hypotheses	assumed relation			F	effect	result
H_3	self-regulation	→ (+)	calorie intake	5.330**	direct	✓
H_4	strong habit/SR	→ (+)	calorie intake	15.418***	direct	✓
H_6	financial incentive	→ (+)	calorie intake	5.266**	direct	✓
H_7	strong habit/FI	→ (+)	calorie intake	9.418**	direct	✓
H_9	SR x FI	→ (+)	calorie intake	4.919**	interaction	✓

*p < .05; **p < .001
✓ = hypothesis confirmed

Source: own illustration

5.7.2.6 Discussion

In support of hypothesis H_3, it was found that participants were more likely to pick a healthy snack when they formed a self-regulation strategy than when they had not done so. That is, forming a self-regulation strategy is associated with a high motivation to pursue a goal; therefore, it is concluded that the likelihood of attaining beneficial outcomes is greater than if no self-regulation strategy is formed. Indeed, it seems likely that participants expect further salutary benefits from forming a self-regulation strategy compared with not forming a self-regulation strategy. Moreover, the study confirmed hypothesis H_5: Financial incentives have a positive effect on reducing calorie intake. The results demonstrate that when provided financial incentives, participants are more likely to pick a healthy snack than when not provided by a financial incentive compared to the condition when not provided a financial incentive, indicating that incentives could be used to reduce bad habits (unhealthy snack consumption) and increase good ones (healthy snack consumption). Participants who were not given a financial incentive more often chose the unhealthy snack. Therefore, it is concluded that self-regulation strategies and financial incentives positively reinforce healthy snack behavior.

Moreover, in this context, participants with strong snacking habits are analyzed in greater detail. Results revealed that participants with strong snacking habits made healthier choices when they formed a self-regulation strategy, they received a financial incentive, or both manipulations were in place compared with control group

participants. Thus, both manipulations overruled strong snacking habits and motivated participants to choose the healthy snack (eat fewer calories) over the habitual unhealthy snack (eat more calories), supporting hypotheses H_4 and H_7.

Furthermore, a subsequent interaction analysis provides support for hypothesis H_9, which suggests that the effect of a financial incentive on calorie intake is minimal when a self-regulation strategy is formed versus when no self-regulation strategy is formed. When participants made a snack choice with no self-regulation strategy formed, they were more sensitive regarding the provision of a financial incentive. In contrast, when they had formed a self-regulation strategy, a financial incentive in addition seemed to be internalized.

Thus, the results indicate that the combined effect seems to be overlapping rather than additive, supporting hypothesis H_9. The results suggest that financial incentives are possibly internalized by individuals, indicating that intrinsic and extrinsic interventions are interrelated.

5.7.3 Moderation Effects

The previous section demonstrates that the direct and interaction effects of the manipulations regarding the calorie intake (= actual eating behavior) worked out well. This chapter focuses how the two treatments influence the intention-behavior relationship.

Participants in the present study generally had weak goal intention to reduce their consumption of high-fat snacks (M = 3.93, SD = 1.82); in fact, 51.1% of the sample scored midpoint or below the midpoint (4) on the intention scale (7-point).

Strong self-regulation effects are expected to emerge when participants hold strong goal intentions (Sheeran et al. 2005b). In case of financial incentives, to the author's knowledge, only one study (Bamberg 2002a) thus far has analyzed the interaction term of financial incentives and intention. The results revealed no significant effects.

To check the postulated relations, moderated regression analyses were conducted.

5.7.3.1 Hierarchical Moderated Regression Analyses

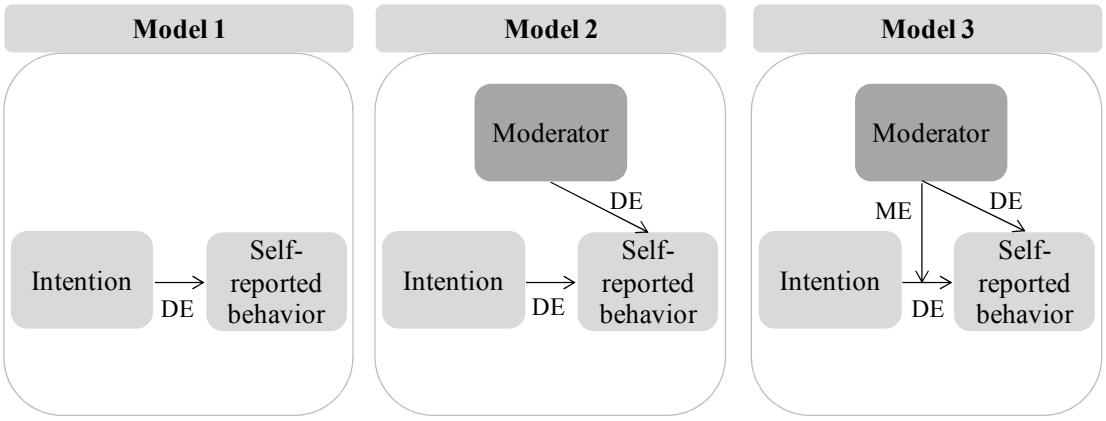
In statistics, moderation occurs when the relationship between two variables depends on a third variable. The third variable is referred to as the moderator variable or simply the moderator. The effect of the moderator variable is characterized statistically as an interaction. Moderation analysis in the behavioral sciences involves the use of linear multiple regression analysis. To quantify the effect of a moderated variable in a multiple regression analysis, regressing random variables Y on X, another term is added to the model, called the interaction between X and the proposed moderating variable (Sharma, Durand, and Oded 1981, pp. 293). Thus, a response Y and two variables x1 and moderating variable x2 would be quantified as follows:

$$Y = b_0 + b_1x_1 + b_2x_2 + b_3(x_1 + x_2) + \varepsilon \quad \text{or}$$

constant + direct effect x_1 + direct effect x_2 + interaction effect (x_1, x_2)

Sharma et al. (Sharma et al. 1981, p. 293) propose a procedure in four steps: First, a model containing only the direct effects is predicted (model 1); second, an extended model is calculated taking the moderator variable into consideration (model 2); third, the interaction term is incorporated as well (model 3); and fourth, the variance of the quality of the models is assessed using the partial F-test. Figure 25 depicts the approach of a hierarchical, moderated regression.

Figure 25: Hierarchical, Moderated Regression Analyses



DE = direct effect, ME = moderated effect

Source: own illustration

5.7.3.2 Results of the Hierarchical Regression Analyses

As a preliminary remark: for all analyses of this sub-chapter, the dependent variable used was the self-reported snacking behavior which was surveyed in the follow-up questionnaire one week after the manipulations had taken place. Participants were asked as to how they perceive their success in reducing their unhealthy snacking behavior during the past week. The dependent variable is called "self-reported behavior" and is in tables abbreviated with "(s.r.) behavior". S.R. stands for self-reported.

Applying the four steps outlined in section 5.7.3.1 to this study, intention and other antecedents of the theory of planned behavior were regressed on self-reported snacking behavior in step 1 and dummy-coded self-regulation *(not formed = 0, formed = 1)* in step 2. Intention scores were standardized before computing the intention × self-regulation interaction term (Aiken and West 1991, p. 133) and added this variable in step 3. Habit was included at step 4 and at step 5 the interaction term of habit × self-regulation entered the equation.

Table 45 shows the results of these analyses in the case of self-regulation. In step 1, intention and perceived control emerged as strong predictors of consumption. Including self-regulation in step 2 improved the fit of the model; this was shown by a significant increase in R^2. Thereto the partial f-value can be used (Chow 1960, pp. 594): F-change = 2.964, $p < .1$, β-intention = .290, $p < .001$, β-perceived control = .145, $p < .05$, β-self-regulation = .120, $p < .1$. In step 3, the intention × self-

regulation interaction was associated again with a significant increment in the variance explained in self-reported snacking behavior ($\triangle R^2$ = .013, p < .1). Also in step 4, when habit was included, a significant increase in R^2 could be observed, *F*-change = 5.430, $p < .05$. By adding habit to the equation, the effect of the self-regulation manipulation was not significant anymore, instead habit became significant and intention continued to be significant (β-habit = -.192, $p < .05$, β-intention = .223, $p < .05$). The results in step 5 showed that the effect of the self-regulation manipulation was not dependent on the strength of habits, as was shown by a non-significant *F*-change, when the respective interaction term was included in the regression equation. It thus appears that habits were not overruled by self-regulation strategy.

Possibly those with relatively strong unhealthy snacking habits may not have changed their habitual snacking behavior, whenever they were not directly confronted with the manipulation. Keep in mind, that the self-reported snack behavior was measured one week after the manipulations. Thus, the results indicate that whenever some time passes by (and apparently a week is already enough), consumers forget about their self-regulation strategy and fall back to their old habits. Table 45 summarizes the results of the moderated hierarchical regression analysis.

Table 45: Moderated Multiple Regression: Self-Regulation

Independent Variable	Step 1	Step 2	Step 3	Step 4	Step 5
Attitude	.058	.061	.049	.039	.031
Subjective norm	.076	.086	.078	.108	.119
Perceived control	.151**	.145*	.142**	.041	.041
Intention	.282***	.290***	.175	.223**	.236**
Self-regulation		.120*	.118*	.105	.105
Int x self-regulation			.170*	.133	.132
Habit				-.192**	-.287**
Habit x self-regulation					.123
Global Fit Indexes					
R	.418	.435	.450	.477	.483
R^2	.175	.189	.202	.227	.233
corrected R^2	.156	.165	.174	.195	.197
$\triangle R^2$	-	.014	.013	.025	.006
F	9.061***	7.925***	7.136***	7.053***	6.356***
$\triangle F$	-	2.964*	2.778*	5.430**	1.370

* $p < .1$; ** $p < .05$; *** $p < .001$
Int = Intention

Source: own illustration

Simple slopes for self-regulation were computed at two levels of goal intention: low (1-4.99), and high (5-7). Findings show that when participants had low intentions, forming self-regulation strategies was not associated with self-reported healthy snack consumption ($\beta = .059$, $p = .579$). However, when participants' intention to reduce their unhealthy snack consumption was high, then the formation of a self-regulation strategy was associated with self-reported healthy snack consumption ($\beta = .249$, $p < .05$). Thus, self-regulation formation especially benefited participants who strongly intended to reduce their consumption of high-fat snacks.

Table 46 shows the results of the moderated hierarchical regression analyses for the financial incentive manipulation. In step 1, intention and perceived control appear to be strong predictors of self-reported snacking behavior. Including financial incentives in step 2 slightly improved the fit of the model, although not significantly ($\triangle R^2 = .004$, $p = .372$). In step 3, adding the intention × financial incentive interaction was not associated with a significant increment in the variance explained in behavior ($\triangle R^2 = .004$, $p = .366$). In step 4, a significant increase in R^2 could be

observed when habit entered the equation, *F*-change = 6.288, $p < .05$. The interaction term in step 5 though did not significantly increase the variance.

Thus, the results in case of the financial incentive manipulation do not confirm hypothesis H_8, indicating that a financial incentive seems to be a very strong instrument in itself, and works independently. Moreover, the results confirm the results of the moderated regression analysis of the self-regulation manipulation; as soon as the manipulation is gone, consumers fall back to their old snacking habits. Table 46 summarizes the results of the moderated hierarchical regression analysis.

Table 46: Moderated Multiple Regression: Financial Incentive

Independent Variable	**Step 1**	**Step 2**	**Step 3**	**Step 4**	**Step 5**
Attitude	.058	.064	.067	.051	.051
Subjective norm	.076	.078	.082	.112	.109
Perceived control	.151**	.145**	.152**	.040	.043
Intention	.282***	.278**	.213*	.265**	.267**
Financial incentive		-.063	-.063	-.049	-.049
Int x financial incentive			.087	.053	.055
Habit				-.208**	-.241**
Habit x financial incentive					.050
Global Fit Indexes					
R	.418	.423	.427	.461	.462
R^2	.175	.179	.183	.212	.213
corrected R^2	.156	.155	.154	.179	.176
$\triangle R^2$	-	.004	.004	.029	.001
F	9.061***	7.401***	6.298***	6.465***	5.663***
$\triangle F$	-	.802	.821	6.288**	.251

* $p < .1$; ** $p < .05$; *** $p < .001$
Int = Intention

Source: own illustration

Also simple slopes for financial incentive were used at two levels of goal intention: low (1-4.99), and high (5-7). Findings show that it did not differ whether participants had low or high intentions; being provided with financial incentive was not associated with self-reported snack consumption with regard to their goal intentions.

For both hierarchical multiple regression analyses the Durbin-Watson statistic was requested. This statistic informs about whether the assumption of independent errors is tenable. Field (2005, p. 189) suggests that values less than 1 or greater than 3 should be interpreted carefully. The closer the value to 2, the better, and for the regression analysis in case of self-regulation, the value is 2.155 and in the case of financial incentive, the value is 2.144, which is so close to 2 that the assumption has almost certainly been met. Furthermore the results have been tested on multicollinearity. Multicollinearity is a statistical phenomenon in which two or more predictor variables in a multiple regression model are highly correlated. To check the assumption of no multicollinearity, the use of the variance inflation factor (VIF) can be used. There are according to Field (2005, p. 196) a few guidelines that can be applied:

- If the largest VIF is greater than 10, there is cause for concern
- If the average VIF is substantially greater than 1 then the regression may be biased
- Tolerance below .1 indicates a serious problem
- Tolerance below .2 indicates a potential problem

The values of both regression analyses do not indicate multicollinearity. As a final check the normal probability plot of the residuals are observed. To meet the assumptions, the graph should look like a random array of dots evenly dispersed around zero. If the graph funnels out, then the chances are that there is heteroscedasticity in the data (Field 2005, p. 202). In both regressions the dots are evenly dispersed around zero.

Thus, for both hierarchical multiple regression the assumptions of the model are met. There is no multicollinearity, the Durbin-Watson values are close to 2 and the dots of normal probability plot of the residuals evenly disperse around zero.

To further verify the results of the hierarchical regression analyses, the variable habit was investigated with regard to the self-reported snacking behavior across the four different conditions. Again an ANOVA was calculated using the variable of "weak/strong habits" which was matched with the four scenarios as a factor while self-reported snacking behavior entered the equation as dependent variable. The results yielded no significant differences of snacking behavior due to weak and strong habits $F_{(7, 176)} = 1.150$, $p < .334$. Thus, this result confirms that self-regulation strat-

egy and financial incentive are strong instruments whenever choosing the snack food right after the manipulations. But whenever the food choice is temporally laid off, the manipulations do not appeal anymore and habits overrule.

In conclusion, the hierarchical moderated regression analyses show that self-regulation moderates the intention-behavior relationship, and providing a financial incentive does not strengthen the relationship between intention and behavior. Thus, hypotheses H_5 can be confirmed, hypotheses H_8 cannot be confirmed (see Table 47).

Table 47: Results of Hypotheses H_6 and H_8

Hypotheses	Assumed relation			$\triangle F$	Effect	Result
H_5	Int x SR	→ (+)	behavior	2.778*	moderated	✓
H_8	Int x FI	→ (+)	behavior	$.821^{n.s.}$	moderated	×

n.s. > .1, *p < .1
✓ = hypothesis confirmed; × = hypothesis not confirmed
Int = Intention

Source: own illustration

5.7.3.3 Discussion

In support of hypotheses H_5, it was found that self-regulation moderates the intention-behavior gap. In contrast, providing a financial incentive does not strengthen the relationship between intention and snacking behavior, thus, H_8 is not supported. Thus, a financial incentive seems to be a very strong instrument in itself, and works independently. For self-regulation, the study demonstrates that when participants have a strong intention to reduce their unhealthy snack consumption, the formation of a self-regulation strategy was associated with healthy snack consumption. Therefore, forming a self-regulation strategy benefits participants who strongly intend to reduce their consumption of high-fat snacks. In the case of weak intentions, forming self-regulation strategies was not associated with healthy snack consumption.

Moreover, the results demonstrate that self-regulation strategies and financial incentives do not overrule unhealthy snacking habits in the long run. Possibly, those with relatively strong unhealthy snacking habits may not have changed their habitual snacking behavior due to the manipulations. In the case of the financial incentive, the study confirms the results of the self-regulation manipulation, demonstrating

that as soon as the manipulation is not in place, consumers return to their old snacking habits.

5.7.4 Mediation Analyses

Mediation is of interest to many social science researchers (Baron and Kenny 1986; Churchill and Iacobucci 2002). A theoretical premise posits that an intervening variable is an indicative measure of the process through which an independent variable is thought to affect a dependent variable (Iacobucci 2008, p. 2). For the researcher, it is of interest to assess the extent to which the effect of the independent variable on the dependent variable is direct or indirect using the mediator.

To explore the underlying processes that may shed light on the relationship between self-regulation and financial incentive and calorie intake, mediation analyses were conducted analyzing on whether self-esteem serves as a mediator to explain the occurrence of calorie intake further. To test the hypothesized relationship, a series of regression analyses were carried out.

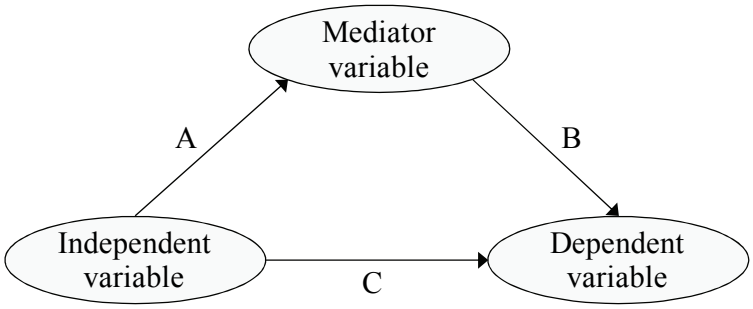
5.7.4.1 Series of Regression Analyses

According to Baron and Kenny (1986, p. 1176), a variable acts as a moderator to the extent that it accounts for the relationship between the predictor (in this study, self-regulation strategies and financial incentives) and the criterion (in this study, calorie intake). According to Baron and Kenny (1986, p. 1177), four criteria must be fulfilled to clarify whether self-esteem acts as a mediator on the relationship between self-regulation strategies and financial incentives and calorie intake:

1. Forming a self-regulation strategy and providing a financial incentive does not significantly account for variations in calorie intake.
2. Forming a self-regulation strategy and providing a financial incentive does not significantly account for variations in self-esteem.
3. Variations in self-esteem significantly account for variations in calorie intake.
4. The previously significant effect of (1.) is no longer significant when (2.) and (3.) are controlled.

Thus, when the direct effect between the independent variable and the dependent variable (path C in Figure 26) is no longer statistically different from zero – fixing the mediator variable – the mediation effect is said to be complete.

Figure 26: Mediation Model



Source: own illustration

The Sobel-test (Sobel 1982) checks whether a mediator variable significantly carries the influence of an independent variable to a dependent variable; i.e., whether the indirect effect of the independent variable on the dependent variable through the mediator variable is significant. To calculate this test, the regression weights and standard errors for both the relationship between the independent variable and the mediator as well as between the mediator and the dependent variable are used.

In the next section, this procedure is applied to the variables self-regulation strategy and financial incentive as independent variables, calorie intake as dependent variable and self-esteem as mediator variable. Using the procedure of Baron and Kenny, it is expected to explain the underlying psychological process of self-esteem.

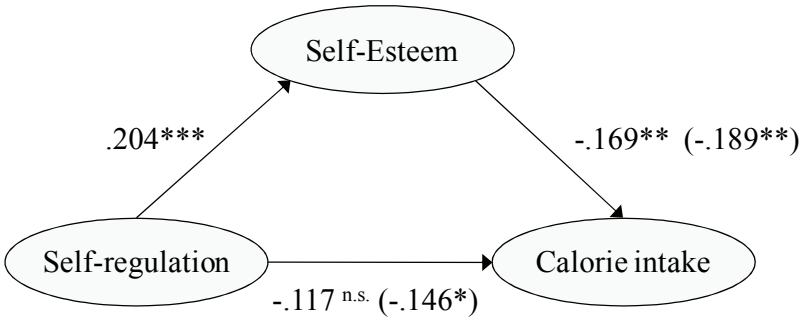
5.7.4.2 Results of Mediation Analyses

Following the procedure suggested by Baron and Kenny leads to the following results in case of self-regulation:

1. Self-regulation significantly predicts calorie intake ($\beta = -.146$, $p < 0.096$).
2. Self-regulation leads to self-esteem ($\beta = .204$, $p < .01$).
3. Self-esteem significantly affects calorie intake ($\beta = -.189$, $p < .030$)
4. Self-esteem remains significant ($\beta = -.169$, $p < 0.056$) and self-regulation is not significant anymore ($\beta = -.117$, $p > .185$).

Thus, the direct effect between self-regulation and calorie intake is no longer statistically different from zero, fixing self-esteem as the mediator variable. Therefore, the mediation effect is said to be complete. The Sobel-test verifies the result ($p < .086$). These results indicate that self-esteem fully mediates the impact of self-regulation on calorie intake (see Figure 27).

Figure 27: Testing the Mediation Effect of Self-Esteem (Self-Regulation)



n.s. = $p > 0.1$, *$p < 0.1$, **$p < 0.05$, ***$p < .001$

Source: own illustration

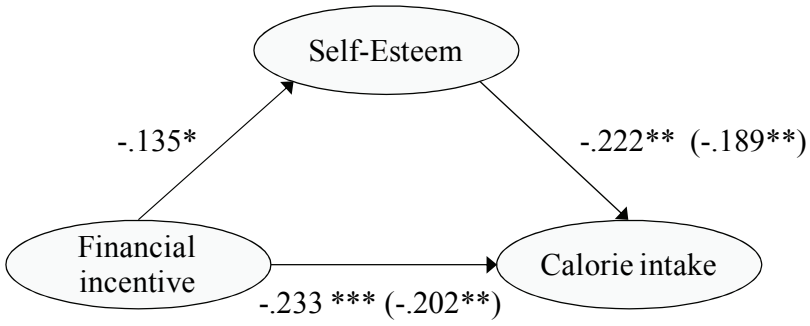
Next, Baron and Kenny's procedure was applied to the financial incentive condition:

1. Financial incentive significantly predicts behavior ($\beta = -.202$, $p < 0.021$).
2. Financial incentive leads to self-esteem ($\beta = -.135$, $p < .0075$).
3. Self-esteem significantly affects behavior ($\beta = -.189$, $p < .030$).
4. Self-esteem ($\beta = -.222$, $p < 0.010$) and financial incentive remain ($\beta = -.233$, $p > .007$) significant.

Because steps 1-3 are met but not step 4, partial mediation is indicated according to Baron and Kenny (1986) (see Figure 28.

Again the Sobel-test is applied to test whether self-esteem significantly carries the influence of the financial incentive to calorie intake. The p-value is 0.165. Therefore, the test indicates that self-esteem does not mediate financial incentive.

Figure 28: Testing the Mediation Effect of Self-Esteem (Incentive)



n.s. = $p > 0.1$, *$p < 0.1$, **$p < 0.05$, ***$p < .001$

Source: own illustration

In conclusion, whereas self-esteem fully mediates the impact of self-regulation on calorie intake, thereby supporting hypotheses H_{10}, self-esteem does not mediate the impact of financial incentive on calorie intake. Hypothesis H_{11} is not supported.

Table 48: Results Hypotheses H_{10} and H_{11}

Hypotheses	Assumed relation			β	Effect	Result
H_{10}	self-esteem/SR	→ (+)	calorie intake	-.117$^{n.s.}$	moderated	✓
H_{11}	self-esteem/FI	→ (+)	calorie intake	-.233**	moderated	×

n.s. > 0.1, **$p < .05$
✓ = hypothesis confirmed; × = hypothesis not confirmed
SR = Self-regulation; FI = Financial incentive

Source: own illustration

5.7.4.3 Discussion

In support of hypothesis H_{10}, the results reveal self-esteem as a mediator for self-regulation strategy, but not for financial incentives and thus hypothesis H_{11} is not supported. In other words, self-esteem is a facilitator of healthy snack behavior in the case of self-regulation strategies, but not financial incentives. This result leads to the conclusion that financial incentives significantly contribute to healthy snack behavior irrespective of the self-esteem of a person. In contrast, when people are motivated by self-regulation strategies, they tend to increase their healthy snack behavior with regard to their self-esteem.

6 Summary of Results and Theoretical Contribution

This chapter presents a final discussion of the results and the theoretical contribution of this dissertation. More specifically, this chapter is structured as follows: The first part of this chapter will briefly reiterate the results for each research question followed by an interpretation of the effects and closed by summarizing the hypotheses. Second, the general theoretical contributions of the results are reviewed.

6.1 Summary of Results

Recall that in Chapter 3, the research questions of this dissertation were formulated. To ascertain if and to what extent this dissertation provides satisfying answers to these research questions, this section discusses each question. The research questions are as follows:

1. *Why do consumers intend to stick to healthy snack behavior and fail to do so?*
2. *How do personal determinants and habit predict healthy snack behavior?*
3. *How do self-regulation strategies and financial incentives affect consumers' food choices?*
4. *Are there any interaction effects between self-regulation strategies and financial incentives?*
5. *How does self-esteem mediate the effect of self-regulation strategies and financial incentives on calorie intake?*

To answer these questions, a conceptual framework that is based on the theory of planned behavior (TPB), the theory of action phases, and the theory of incentives was developed.

Overall, the framework postulates that sometimes substituting an undesirable behavioral response is required to change existing behavioral patterns. The possibility of overcoming the intention-behavior gap, in turn, is governed by intrinsic and extrinsic motivational factors that are examined in the experimental study. The intrinsic approach was operationalized using self-regulation strategies and the extrinsic approach using financial incentives as manipulation.

The first research question relates to the current challenge of why consumers intend to eat healthy but fail to do so. On the basis of the literature review, a need for further investigation of intrinsic and extrinsic motivational concepts to aid the man-

agement processes of prevention policies for healthy eating was identified. Simply considering marketing as a tool to initiate a desire for healthy eating behavior does not reflect the potential this discipline holds for combating the overweight/obesity phenomena. Instead, it is maintained that marketing managers must look more thoroughly at the long-term consequences marketing strategies can unfold. This finding is in line with Stremersch (2008, p. 229), who calls for multiple affiliations across economics, psychology, and marketing to identify and foster approaches that can positively affect healthy food consumption. Moreover, considering that most people are aware of what constitutes an unhealthy diet, researchers note that changing existing eating patterns is a promising research stream. In this context, intrinsic and extrinsic motivation tools facilitate the efficiency of marketing communication activities to enhance healthier food choices.

The second research question investigates the personal determinants and habit that predict people's snack behavior. It was found that the more positive the attitude and social normative pressure of a person toward reducing unhealthy snack consumption as well as the greater the perceived behavioral control toward reducing unhealthy snack consumption, the stronger the person's intention to reduce unhealthy snack consumption.

Moreover, a strong intention toward reducing unhealthy snack consumption was the strongest predictor of perceived healthy snack behavior, followed by unhealthy snack habits.

To gain understanding of the increase in the variance of the intention-behavior relationship, the third research question examined how self-regulation strategies and financial incentives affect calorie intake, and the fourth question considers what kind of interplay between these two motivational approaches might accrue. It was found that participants were more likely to pick a healthy snack when they formed a self-regulation strategy than when they had not done so. That is, forming a self-regulation strategy is associated with a high motivation to pursue a goal; therefore, it is concluded that the likelihood of attaining beneficial outcomes is greater than if no self-regulation strategy is formed. Moreover, financial incentives have a positive effect on reducing calorie intake. The results demonstrate that when provided financial incentives, participants are more likely to pick a healthy snack than when not provided by a financial incentive indicating that incentives could be used to reduce bad habits (unhealthy snack consumption) and increase good ones (healthy snack consumption).

Moreover, participants with strong snacking habits made healthier choices when they formed a self-regulation strategy, when they received a financial incentive, or when both manipulations were in place compared with control group participants. Thus, both manipulations overruled strong snacking habits and motivated participants to choose the healthy snack (eat fewer calories) over the habitual unhealthy snack (eat more calories).

An interaction analysis reveals that the effect of a financial incentive on calorie intake is minimal when a self-regulation strategy is formed versus when no self-regulation strategy is formed. When participants made a snack choice with no self-regulation strategy formed, they were more sensitive regarding the provision of a financial incentive. In contrast, when they had formed a self-regulation strategy, a financial incentive in addition seemed to be internalized.

Thus far, the discussion covers direct and interaction effects of the manipulations with respect to calorie intake. It was further of interest to test how the two treatments (self-regulation and financial incentive) influence the intention-behavior relation. Hierarchical moderated regression analyses were conducted to test the postulated relationships. Furthermore, the regression analysis was intended to investigate if and to what extent habit moderates the intention-behavior relationship with regard to the treatment variables.

It was found that self-regulation moderates the intention-behavior gap. In contrast, providing a financial incentive does not strengthen the relationship between intention and snacking behavior. Thus, a financial incentive seems to be a very strong instrument in itself, and works independently. For self-regulation, the study demonstrates that when participants have a strong intention to reduce their unhealthy snack consumption, the formation of a self-regulation strategy was associated with healthy snack consumption. Therefore, forming a self-regulation strategy benefits participants who strongly intend to reduce their consumption of high-fat snacks. In the case of weak intentions, forming self-regulation strategies was not associated with healthy snack consumption.

Moreover, the results demonstrate that self-regulation strategies and financial incentives do not overrule unhealthy snacking habits in the long run. Possibly, those with relatively strong unhealthy snacking habits may not have changed their habitual snacking behavior due to the manipulations. In the case of the financial incentive, the study confirms the results of the self-regulation manipulation, demonstrating

that as soon as the manipulation is not in place, consumers return to their old snacking habits.

Thus, the results show the beneficial outcome of self-regulation strategies and financial incentives in the case of strong snacking habits in the short run; however, they also show the limit of these motivational approaches. It is important to note that intrinsic and extrinsic motivational approaches are tools that encourage the formation of good habits by motivating people to form self-regulation strategies and offering financial incentives, as doing so seems to move some people past the threshold needed to engage in healthy food behavior activity. Often, there is initial resistance to commencing a beneficial behavior, as the startup costs loom large. However, if people are "walked through" this process repeatedly, perhaps good habits will develop, especially for those people interested in healthy snacking behavior and willing to commit themselves to healthier food choices. In doing so, they affect not only their current well-being, but also their future utility, by making future healthy snacking behavior more beneficial. This type of self-enforcing mechanism may help people choose the more difficult plan, because it reduces the marginal cost of engaging in the behavior to zero, and people believe that this will encourage them to engage in healthy snacking behavior in the future.

The fifth research question seeks conditions that are likely to influence the relationship between self-regulation and financial incentives and calorie intake. To shed light on the underlying processes, mediation analyses were conducted. Recall that it was postulated that self-regulation strategies and financial incentives influence a person's calorie intake by virtue of their effects on his or her self-esteem, thus, suggesting that self-regulation strategies and financial incentives affect self-esteem with a subsequent impact on snack behavior.

The results reveal self-esteem as a mediator for self-regulation strategy, but not for financial incentives. In other words, self-esteem is a facilitator of healthy snack behavior in the case of self-regulation strategies, but not financial incentives. This result leads to the conclusion that financial incentives significantly contribute to healthy snack behavior irrespective of the self-esteem of a person. In contrast, when people are motivated by self-regulation strategies, they tend to increase their healthy snack behavior with regard to their self-esteem.

Table 49 is a summary of all hypotheses tested in this dissertation and the corresponding result.

Table 49: Summary of Hypotheses H_1-H_{11}

Hypothesis		Assumed relation		β/*F*/△*F*	Effect	Result
H_{1A}	attitude	→ (+)	Intention	.464***	direct	✓
H_{1B}	subjective norm	→ (+)	Intention	.189**	direct	✓
H_{1C}	perceived control	→ (+)	Intention	.212**	direct	✓
H_{1D}	habit	→ (-)	intention	$.111^{n.s.}$	direct	×
H_{2A}	intention	→ (+)	(s.r.) behavior	.310***	direct	✓
H_{2B}	perceived control	→ (+)	(s.r.) behavior	$.034^{n.s.}$	direct	×
H_{2C}	habit	→ (-)	(s.r.) behavior	-.219**	direct	✓
H_3	self-regulation	→ (+)	calorie intake	5.330**	direct	✓
H_4	strong habit/FI	→ (+)	calorie intake	15.418***	direct	✓
H_5	Int x SR	→ (+)	(s.r.) behavior	2.778**	moderated	✓
H_6	financial incentive	→ (+)	calorie intake	5.266**	direct	✓
H_7	strong habit/FI	→ (+)	calorie intake	9.418**	direct	✓
H_8	Int x FI	→ (+)	(s.r.) behavior	$.821^{n.s.}$	moderated	×
H_9	SR x FI	→ (+)	calorie intake	4.919**	interaction	✓
H_{10}	self-esteem/SR	→ (+)	calorie intake	$-.117^{n.s.}$	moderated	✓
H_{11}	self-esteem/FI	→ (+)	calorie intake	-.233**	moderated	×

n.s. = p > 0.1; * p < .1; ** p < 0.01; *** p < .001

✓ = hypothesis confirmed; × = hypothesis not confirmed

(s.r.) = self-reported; Int = Intention; SR = Self-regulation; FI = Financial incentive

Source: own illustration

6.2 Theoretical Contribution

This section outlines the general research streams to which this dissertation contributes. More specifically, this dissertation contributes to four different theoretical streams: motivation for healthy eating, self-regulation strategies, financial incentives, and crowding-in effect.

6.2.1 Contribution to Literature on Motivation for Healthy Eating

First, the results of this dissertation increase understanding of how motivational approaches may increase consumers' healthy eating behavior by increasing their motivation toward eating healthy snack products. Although consumers may initially intend to engage in healthy snacking behavior, many fail to attain this goal. Instead of following their intentions, they find themselves guided by deep-rooted habits. Motivation has been deemed a necessary component in any formula for achievement. Although some researchers are convinced that intrinsic motivation is the ideal way to initiate healthy eating, others believe that extrinsic forms of motivation are

realistic. However, both ways are often discussed unrelated to each other. This gap is astonishing, considering that the interplay of both ways might positively affect eating habits.

This dissertation explores the intention-behavior gap by analyzing, on the one hand, self-regulation strategies as an intrinsic motivational approach and, on the other hand, financial incentives as an extrinsic motivational approach. The results show that motivating consumers to eat more healthily is neither straightforward nor simple. The majority of previous conceptualizations have concentrated on the initiation of a desired eating behavior (e.g., eating more fruits or vegetables) rather than changing an existing eating pattern (e.g. eating an apple instead of a chocolate bar). Changing behavior is usually more difficult than initiating new ones, especially when the old one is habitual.

The results confirm that people are more successful in forming intentions than acting on them and indicate that more research is needed to understand fully why and how consumers make their food choices. In this respect, this dissertation contributes to the growing literature stream that examines the psychological and behavioral economic processes underlying the food choice decisions.

6.2.2 Contribution to Literature on Self-Regulation Strategies

Second, this dissertation makes a contribution to literature examining self-regulation strategies in changing health-risk behaviors. Literature has demonstrated that self-regulation strategies are an efficient way to increase health-protective behaviors. Although this line of reasoning seems plausible, there are some doubts as to the effectiveness of "one size fits all" strategy, especially for people with strong unhealthy snacking habits. They are driven by the strong automaticity of unhealthy snacking and therefore might require additional motivation compared with people with weak unhealthy snacking habits. The results contribute to this literature stream by showing that forming self-regulation strategies is a successful instrument for initiating changes in snacking behavior: People with strong unhealthy snacking habits were motivated to form a self-regulation strategy to choose a healthy snack instead of an unhealthy one. Furthermore, the results show that self-regulation must be taught. When the manipulation was not in place, people started to fall back to their deep-rooted habits and consumed unhealthy snack products. But the experiment showed that whenever there are strong intentions to reduce unhealthy snacking behavior, forming self-regulation strategies can overrule habit for a short period of time.

6.2.3 Contribution to Literature on Financial Incentive

Third, the results of this dissertation also make an important contribution to literature on incentives. Recall that Section 2.5 indicates that incentives are a successful instrument to foster people to engage in (or refrain from) various activities. Incentives are used to influence health behavior as powerful economic mechanisms (e.g., higher taxes for unhealthy food products). Previous studies show that the demand for sugar-sweetened beverages can be reduced significantly by increasing prices.

In contrast to taxation, far less attention has been given to the use of positive incentives, especially in the food decision field. There are increasing numbers of psychological studies indicating that positive incentives are effective in changing health behavior such as drug use and smoking. However, to date, positive incentives have not been applied to changing snack behavior. In this respect, this dissertation sheds light on positive economic incentives, by examining the influence of such a motivational approach to encourage people to change their habitual unhealthy snack consumption. The main idea of this approach is that a financial incentive may move some people past the threshold needed to engage in healthy snack consumption. The results show that financial incentives are a successful instrument, particularly, as postulated, to educate and encourage people to develop good snacking habits. This study does not demonstrate the long-term effect. As the results show, incentives are effective while present: after they are removed, people tend to fall back to their old snacking habits. Nevertheless, some recent evidence in education indicates that paying children to overcome initial resistance to engaging in a potentially beneficial activity can be successful. Thus, paying people to change their unhealthy snacking behavior positively reinforces healthy snacking behavior. Although there is slight evidence of attrition after removing the incentives, given the enormous sums of money spent on health care, even a modest improvement may yield large social benefits.

6.2.4 Contribution to Literature on Crowding In Effect

Fourth, this dissertation makes a contribution to literature examining crowding out and crowding in effects. In general, economic literature postulates that the more an individual is paid the higher his or her effort is. However, many studies showed that monetary incentives as extrinsic motivation form may crowd out intrinsic motivation. Recent research in economics look at the relationships between intrinsic and extrinsic motivation approaches in a more diversified form as not only explicit rewards and intrinsic motivations are studied, but rather also implicit rewards and in-

trinsic motivation. The absence of explicit incentives does not mean that material incentives are absent. In fact, implicit incentives which are based on reciprocity are – according to recent economic studies – in fact the most relevant and powerful incentives. Thus, a great interest applies to the knowhow of the interaction of material incentives and intrinsic motivation.

The results contribute to this literature stream by showing that providing a financial incentive in addition to forming a self-regulation strategy does not crowd out the intrinsic factor (self-regulation strategy). It rather seems that individuals internalize the value of the extrinsic motivation factor. Thus, the result provides empirical evidence that the combined effects of extrinsic and intrinsic interventions are interrelated.

7 Managerial Implications

The work reported here represents a scientific enquiry to understand better how the motivational concepts of self-regulation and financial incentives enhance changes in snacking behavior.

On the basis of these results discussed in Chapter 6, there are three conclusions to be considered for managerial implications:

1. Forming self-regulation strategies and providing financial incentives are promising marketing instruments to motivate consumers toward healthy snacking behavior.

2. Although forming a self-regulation strategy has the power to moderate the intention-behavior gap – especially for those who strongly intend to reduce snacking behavior – financial incentives do not seem to have enough power to moderate this relationship. Thus, although the financial incentive strategy is a strong instrument in itself, it works independently.

3. Both instruments have strong effects at the moment implemented. However, as time passes and the instruments are not applied anymore, old habitual behavior overrules. Thus, the instruments must be applied continually to push people past the threshold needed to engage in healthy snacking behavior.

Besides the empirical investigation, this study also focuses on the implications of the analysis for practice. In this chapter, the sixth research question outlined in Section 3.1 is discussed:

> *What implications can be derived from the analyses aiming to foster efficiency of marketing communication efforts enhancing healthier food choices?*

To answer this question thoroughly, the first part of this chapter introduces some future trends for Switzerland regarding the prevalence of overweight and obesity and emphasizes the importance of a holistic approach to overcome this problem. The next section presents case studies of various actors in the food market to give an overview of the many activities being done so far in Switzerland to combat the phenomena overweight and obesity. Subsequently, along a road map a number of marketing tools are developed aiming to close the intention-behavior gap by conceptualizing possible activities for various actors on the food market.

7.1 Building a Sustainable Response

As outlined in Section 1.1.1, Switzerland saw a rapid and significant increase in overweight and obese (BMI ≥ 25) Swiss adults (aged > 15 years) by 7% to a total of 37.3% between 1992 and 2007, consisting predominantly of an increase in the proportion of overweight people (BMI 25-30) of 4.3%; the increase in the obese population was 2.7%.

According to the latest health survey, the overweight situation seems to have stabilized (Swiss Federal Statistical Office 2008). Because of this development, it is of interest to forecast the overweight trends in Switzerland for the future. On the basis of these data and using a logistic regression model, Schneider et al. (2010, p. 468) estimated that in 2022 there will be a minimal increase to 37.7% in the prevalence of the overweight and obesity segment of the Swiss population (BMI ≥ 25), indicating a stabilization at a plateau below 40%. This outlook is supported by a trend analysis of the youngest adult segment (aged 15-24 years) with BMI ≥ 25. The projection of the assumed prevalence in 2022 shows only a small increase of 1.1%.

According to Schneider et al. (2010, p. 468), with respect to the expected obesity prevalence in the entire Swiss population in 2022, the projected value is 8.4%, a slight increase of 0.3% compared with 2007, again indicating stabilization at a level of below 10%. In the case of the youngest population segment (aged 15-24 years), the projected value in 2022 increases to 4.3% from 1.8% in 2007.

In conclusion, after a rapid increase in the total overweight and obese population segments in Switzerland over the past 15 years, the prevalence rates may be expected to stabilize between 2007 and 2022 at about the 2007 level. Thus, with a historically “low” obesity level, Switzerland may not catch up to the countries with much higher obesity prevalence rates such as the United States and the United Kingdom, which are each expected to have more than 60% overweight people in the upcoming decades (Schneider et al. 2010, p. 470).

On the one hand, this is good news; on the other hand, the percentage of overweight adults in Switzerland (almost 40%) is high. And it seems that the proportion of overweight people in Switzerland will be the same in 2022. Moreover, it should not be underestimated that especially children who are overweight in childhood (one fifth of the Swiss children are overweight) are struggling with overweight in adulthood (Hoigné 2005). Taking the economic costs of these facts into account, there

are enormous burdens upcoming for Switzerland's health system. Therefore, it is important to devote full attention to the issue of overweight and obesity.

7.2 A Holistic Approach to Overcome Overweight and Obesity

As indicated in Section 1.1.3, the causes of obesity are complex and multifaceted, pointing to a range of different solutions. At the heart of this issue lies the biological system, which struggles to maintain an appropriate energy balance and thus body weight. This system is not well adapted to a changing world, where the pace of technological progress and lifestyle change has outstripped that of human evolution. Human biology, growth and development early in life, eating and physical activity behaviors, people's beliefs and attitudes, and broader economic and social drivers all have a role in determining obesity (Butland et al. 2006, p. 7).

Nutrition (i.e., the process of taking in and using food) strongly influences the state of each person's health and, in the long run accounts for whether he or she becomes overweight or even obese.

However, the food market as a whole is complex; it is difficult to act effectively in terms of growing, processing, and selling healthy food. Thus, the actions of a single player on the food market such as a retailer or a manufacturer are not likely to be effective. Because the topic of nutrition and health describes an interdisciplinary phenomenon, it is desirable that all players in the food market would cooperate with each other. According to the St. Gallen Management Model, stakeholders are embedded in a complex environment (Rüegg-Stürm 2002).

As illustrated in Figure 29, this environment can be divided into the following four domains: economy, technology, nature and society, whose challenges should be confronted by all actors of the food market together. Confronting obesity represents such a challenge, and all actors involved should do so in concert. The obesity map, as symbolized in Figure 29, contains seven key drivers, which are as follows:

1. *Physiology* contains biological variables, such as genetic predisposition to overweight and obesity, level of satiety, and metabolic aspects.
2. *Social influence* captures variables that have influence at the social level, such as "education", "availability of media", and "watching TV". Furthermore, social encompasses drivers related to social attitudes regarding "acceptability of fatness" and "ideal body-size image".

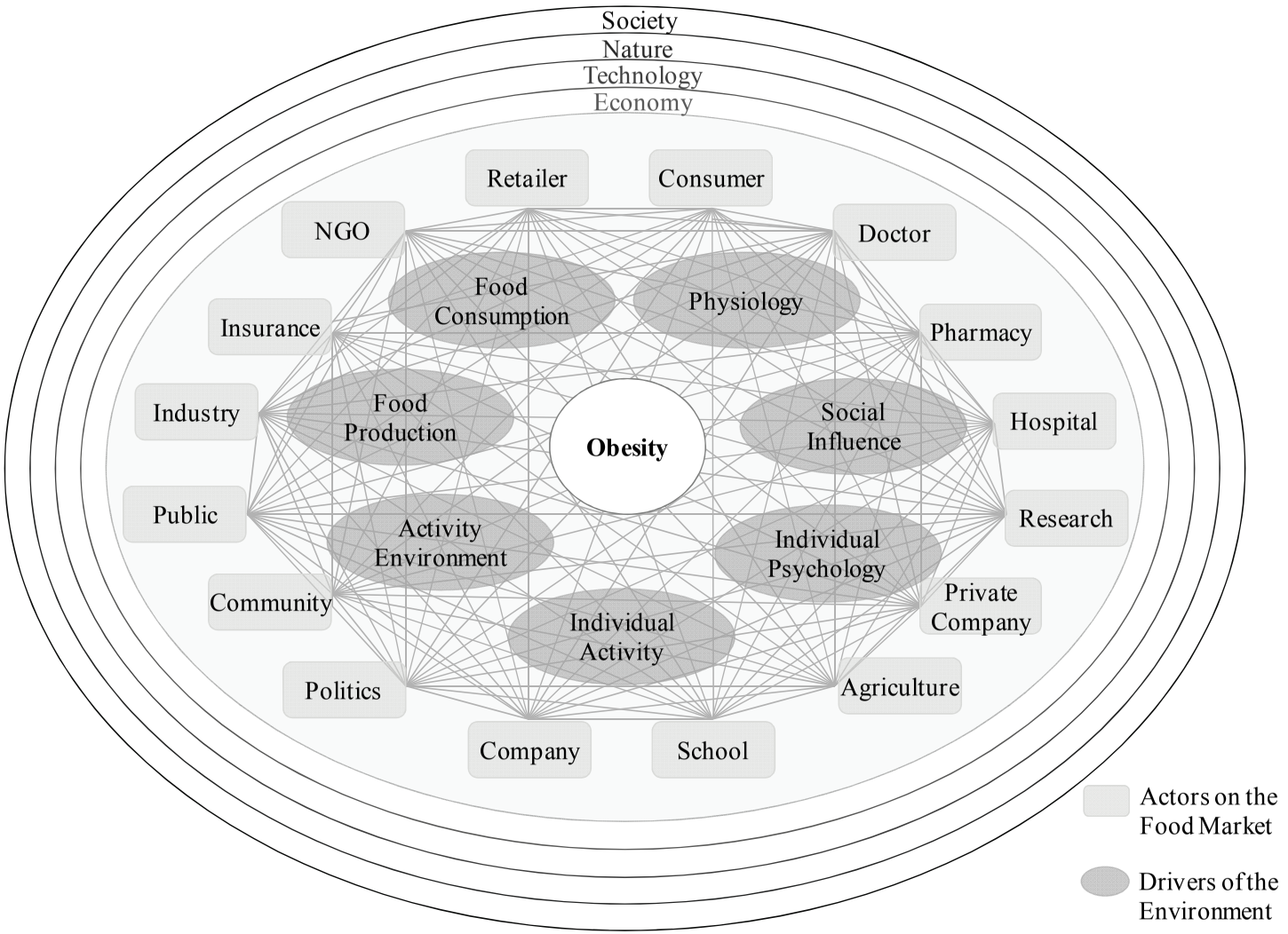
3. *Individual psychology* contains variables that describe several psychological attributes of a person, such as “self-esteem”, “attitude”, and “level of health knowledge”, among others.
4. *Individual activity* consists of variables such as a person’s level of recreational, domestic, occupational, and transport activity; parental modeling of activity; and learned activity patterns.
5. *Activity environment* includes variables that may facilitate or obstruct physical activity such as “perceived danger in the environment” and “walkability of the living environment”.
6. *Food production* includes many drivers of the food industry such as “pressure for growth and profitability”, “market price of food”, “cost of ingredients”, and “effort to increase efficiency of production”. Furthermore, this cluster includes the “purchasing power” of the Swiss consumers
7. *Food consumption* includes many characteristics of the food market in which consumers operate and reflects the health characteristics of food products, such as the level of food abundance and variety, the nutritional quality of food and drink, the energy density of food, and portion size

As Figure 29 illustrates, these key drivers, which determine the environment of the overweight/obesity phenomenon, are interrelated in a network that comprises various actors such as retailers, industries, schools, nongovernmental organizations (NGOs), and so on.

A network is defined as a set of actors e.g., individuals, departments in an organization, firms and the relational ties between them (Iacobucci and Zerrillo 1996, p. 392). The actors pictured in Figure 29 are not final; this network depicts those actors that are most important to the obesity phenomenon.

As pointed out at the beginning of this study, of the many factors associated with rising obesity, food industry marketing practices that are linked with increased consumption are among the most criticized factors. Much of marketing is relational. Marketers should take advantage of this. In the long run, marketing relationship aiming to enhance combating obesity by following consequently interrelated marketing strategies will provide competitive advantages for all involved actors.

Figure 29: Obesity Map with Environmental Drivers and Actors



Source: own illustration

7.3 Practice Examples

This section covers several short case studies of various actors from the food industry, retail business, convenience provider sector over public schools to federal health institutions. The purpose of this part of the chapter is to give an overview of activities being done so far in Switzerland from various actors within the food industry to combat the overweight problem.

Specifically, the aim of these case studies is to find answers to the following four questions:

1. Which concrete activities does your company/institution undertake with respect to "motivating consumers toward healthy eating behavior"? (name the four most important activities)
2. Which learning do you take out of the activities?
3. Are there any concerted activities (cooperations with other food actors) being done in your company/institution?
4. What should be done in the future to further motivate consumers toward healthy eating (activities of your company/institution, but also in general)?

It was possible to conduct telephone interviews (2 people sent the answers back by e-mail) with the following company representatives in July and August 2010. The listing below follows the alphabetical order of the companies.

Table 50: Experts from Practice

Company Name	Name of Interviewee	Position of Interviewee
Coop	Kathrin Rapp Schürmann	Head of Competence Brands Viva/ Department Nutrition
Educational Health Services Zurich	Dr. Daniel Frey	Director of School Health Services Zurich
Federal Office of Public Health FOPH	Nadine Stoffel-Kurt	Section Nutrition and Exercise
	Alberto Marcacci	Deputy Head Section Nutrition and Exercise
	Liliane Bruggmann	Head Section Nutrition and Exercise
	Michael Beer	Head Department Food Safety
Hilcona	Oliver Bank	Head of Marketing & Development/ Member of the Executive Management
McDonald's	Thomas Truttmann	Marketing & Communications Director
Migros	Christine Daeniker Roth	Nutrition and Health, Department Quality Management/Sustainability
Valora	Pierre-André Konzelmann	Director avec. and Tamoil

Source: own illustration

7.3.1 Coop

Coop is the second-largest retailer in Switzerland and operates almost 1800 stores including hypermarkets, supermarkets, convenience stores, and do-it-yourself stores. With this variety of outlets, Coop is present across the country, in cities as well as in rural areas and in the mountain valleys. Apart from its retailing business-Coop owns industrial companies that produce many of the group's own label products and also export their goods, as well as a small hotel chain, restaurants, travel agencies and, together with Rewe Group of Germany, the international Cash+Carry joint venture Transgourmet (Euromonitor International 2010a).

The interview was conducted with Kathrin Rapp Schürmann, Head of Sustainable Brands and Nutrition Unit of Coop on the 29th of July 2010.

Healthy Eating Activities

One of the main drivers to foster healthy eating behavior is the *assortment of products*. Coop offers a wide range of private labels to enable a healthy and varied diet and to meet individual needs of consumers. These include products from Coop Naturaplan, Weight Watchers, JaMaDu, Free From and Délicorn. Naturaplan offers organically produced food products and Weight Watchers stands for low-fat, low-

sugar and low-calorie products. People who eat vegetarian find natural, healthy alternatives to meat in the Délicorn product line. Free From-products are designed specifically for people with food allergies or intolerances. The children's product line JaMaDu offers healthy products for children between 4-9 years of age.

Enhancing the consumption of fruits and vegetables is another activity which builds an important pillar of Coop to motivate consumers toward healthier eating behavior. Coop applies as a licensee of the campaign "5 a day" the logo "5 a day" on any Coop private label products that meet the criteria of the campaign. In addition, the campaign is strongly supported by communication activities. Currently, Coop draws 130 products with the "5 a day" portion-logo. The logo provides information as to how many of the daily recommended five servings of vegetables and fruits a portion of this product contains.

Furthermore, Coop provides a clear and comprehensive *nutrition labeling system* on packaged food which is called "food profile". The food profile shows how much energy, sugar, fat, saturated fat, salt and other ingredients a portion of a particular product contains. It furthermore indicates the proportion of the daily requirement covering the nutritional values. The food profile follows thereby the "Guideline Daily Amounts" (GDA) which is a recommendation of the Confederation of the Food and Beverage Industries of the European Union. More than 2000 products are labeled with the food profile.

Finally, Coop encourages its consumers to a healthy lifestyle using various *communication platforms*. From allergic people via athletes through to a proper nutrition during pregnancy as well as nutrition tips for children, Coop offers on the internet and in numerous brochures various information for everyday life. Moreover, the company-owned newspaper "Coopzeitung" offers in its weekly appearing food section "good to know" valuable information for consumers. Furthermore, Coop offers a nutrition-coach on the internet to support people on their way to their desired weight. From a database of over 12,000 recipes Coop provides together with a personal diet plan and supplemented by a training plan individual fitness tips. The coaching is guided by a team of psychologists and researchers which respond to consumers' food and exercise related questions.

Coop supervises its activities frequently by its own market research.

Coop is cooperating with various professional organizations and governmental institutions to work out activities to improve the nutrition situation in Switzerland. In doing so, Coop is working together with the following institutions:

Federal Office of Public Health FOPH: Coop participates in "actionsanté"[13] and defines specific voluntary activities.

Swiss Society of Nutrition SSN: Coop conducts a study series "Dining Trends in Focus" with the technical support of the SSN.

Cancer Association Switzerland: Coop uses the "5 a day" logo, which is awarded by the Cancer Association Switzerland.

IG Celiac Disease: Coop offers a selected range of gluten-free specialty products.

Federation of the Swiss Food Industry: The Federation of the Swiss Food Industry is looking for solutions that take both the market and the concerns of a healthy lifestyle into account. Among other things, it is being discussed as to how marketing targets for example for sweets is compatible with an active combat of overweight and obesity. Coop is an active participant in this committee.

Swiss Diabetes Association: Coop is in regular exchange with the Swiss Diabetes Association. Thereby, projects are jointly developed and implemented such as the cookbook "Favorable Eating with Diabetes".

Furthermore, Coop is committed to sponsor numerous national projects aiming to promote healthy diet and exercise. Examples are the initiative "fit-4-future" and "Gorilla".

The initiative "fit-4-future" aims to overcome physical inactivity and obesity among school children. Under the scientific supervision of the Institute for Sports and Sport Sciences of the University of Basel, sport events, teacher training, and parents' evenings are organized to tackle the topics "exercise" and "nutrition" in various fun ways. Specifically targeted at adolescents, Coop supports the project "Gorilla", an initiative which coordinates freestyle professionals and young chefs to visit schools across Switzerland teaching them that exercise and cooking can be fun.

Where does the future go?

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[13] Details of the program are elaborated in Section 7.3.3.

For the future, Kathrin Rapp Schürmann points out that the cooking and food culture must be fostered in terms of quality awareness and balanced diet. Since people know that they should eat healthily, it is important that different actors of the food market are cooperating with each other implementing evidence-based actions supported by governmental institutions. Coop offers a huge assortment addressing many different target groups, but according to Kathrin Rapp Schürmann it is not in Coop's interest to intervene with consumers' life besides giving advice by offering relevant information.

7.3.2 Educational Health Services Zurich

The Educational Health Services are part of the School and Sports department of the city of Zurich in Switzerland. It provides four special services: medical, dental, psychological, and drug prevention services. The four services together form the center for health, prevention and psychological counseling in schools. They furthermore support and advise children, adolescents, parents, guardians, and teachers. The Educational Health Services Zurich are committed with several projects for healthy school children of which the four most important initiatives are elaborated subsequently (City of Zurich 2010).

The interview was conducted with Dr. Daniel Frey, Director of the Educational Health Services Zurich on the 11th of August 2010.

One of the main activities initiated and directed by the Educational Health Services Zurich is the project *"Ernährungsrichtlinien"*[14] which is in operation since one year. The entire food supply to schools and school care centers of Zurich has to comply with the guidelines.

The project "Ernährungsrichtlinien" includes:

- Guidelines for products that are offered or sold by schools (e.g., snacking food in the morning break)
- Guidelines for the meals in school care centers
- Implementation of the guidelines in schools
- Support activities of the Educational Health Services

[14] In English: nutrition guidelines.

The aim of the guidelines is to offer children a healthy meal and to demonstrate that healthy food goes along with pleasure and quality of life. The guidelines are mandatory for school care centers and for schools including snack vending machines on school sites. Currently, the pilot phase of implementing the guidelines is being evaluated. First results indicate that nutrition in schools and school care centers has changed positively due to the guidelines. A response rate of 85% (respondents are e.g., teachers, employees of the school care centers) reveals a high interest of the involved people.

Furthermore, *tips for a healthy mid-morning snack* are offered to parents and guardians of children at kindergarten and primary school. Based on the traffic light system, the flyer contains ideas for a healthy mid-morning snack on the green side (e.g., seasonal fruits, nuts, whole grain products). Products marked as yellow can be consumed from time to time (e.g., white bread, fruit juice). Parents are prompted to discuss with their child what he/she would like to eat as a morning-snack. The flyer also contains information about the products that should not be put in the morning-snack bag (e.g., sweets). These flyers are distributed on the first school day and also at parents' evenings (Health Education Services Zurich 2010).

Moreover, there is a project called *"Pausenernährung Plus!"*[15] This initiative is offered in cooperation with the Zurich University of Teacher Education and aims to build up a mid-morning break culture in schools. Thus, this initiative promotes mid-morning breaks as interactions of pedagogy, and school development.

In addition, the Educational Health Services Zurich has introduced *"Purzelbaum"*[16] in Zurich, a project for kindergarten aiming to foster exercise and healthy eating behavior. The initiative is based mainly on three pillars: (1) Re-designing the kindergarten to create landscapes that enable to move around and play, (2) information for parents on nutrition and exercise, and (3) training and support of kindergarten teachers. Currently, 65 kindergartens in Zurich are involved in the Purzelbaum project. By 2012 around one third of all kindergarten in Zurich should benefit from this project.

Finally, there is a project called *"zäme z'Nüni"*[17] which aims to continue the kindergarten mid-morning break culture in primary schools. The initiative fosters that once a week pupils eat a mid-morning snack together with their teacher. Parents are

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[15] In English: nutrition during breaks plus!
[16] In English: somersault.
[17] In English: mid-morning break together.

responsible for the purchase of the snacks by rotation. This procedure encourages involving everybody: children, parents, and teachers. The initiative is financially supported.

Where does the future go?

In general, the initiatives work quite well for pre-school children and primary school children. According to Dr. Daniel Frey, reaching adolescents is much more difficult and there is still room for improvement. All the presented projects and initiatives are based on cooperation mainly between community, schools, parents, children and politics. Furthermore, it is in the interest of the Educational Health Services Zurich to be active also on the media level, because it supports to foster awareness among people.

Concluding, the Educational Health Services sees itself as a provider of information, education, tools, and financial support to enhance healthy food behavior among school children and adolescents. To date, feedbacks of schools and parents are positive, encouraging the Educational Health Services Zurich to continue their endeavors.

7.3.3 Federal Office of Public Health FOPH

The Federal Office of Public Health FOPH is part of the Federal Department of Home Affairs. As the national authority in health matters, the FOPH represents Switzerland in international organizations and in dealings with other countries. Within Switzerland it is responsible – together with the cantons – for public health and the development of the national health policy.

This includes the management and development of the social healthcare and accident insurance system. Furthermore, the FOPH issues legal directives on consumer protection – particularly in terms of food, chemicals, therapeutic products, cosmetics, and utility goods – and supervises their implementations. Moreover, it is responsible for monitoring transmissible diseases in Switzerland and issues the necessary regulations (Federal Office of Public Health FOPH 2010a).

Also, the FOPH is responsible for national programs such as the HIV/AIDS programs, but also for programs designed to reduce substance dependence (tobacco, alcohol, illegal drugs) and promote healthy lifestyles (nutrition and exercise, health and the environment). The health section that deals with the latter – promoting healthy lifestyles – is called Nutrition and Physical Activity and aims to develop

strategies to counteract obesity and prevent people becoming overweight (Federal Office of Public Health FOPH 2010b).

The interview was conducted with four people of the FOPH to guarantee a thorough basis of the most important activities: Liliane Bruggmann, Head Section Nutrition and Exercise; Alberto Marccaci, Deputy Head Section Nutrition and Exercise and Head of the program actionsanté; Michael Beer, Head Department Food Safety and Head of the program salt strategy; Nadine Stoffel-Kurt, Section Nutrition and Exercise.

In general, the FOPH distinguishes between projects which intervene directly with the behavior of consumers and such that appeal to influence consumers' environment and thus, affect indirectly consumers' actions. The main projects of FOPH belong to the latter category. But before introducing those, just a few notes to the direct ones.

The FOPH offers together with the Health Promotion Switzerland the program Suisse Balance that aims to encourage children and adolescents to eat a balanced diet and to move enough. Thereby, Suisse Balance supports model-projects that combine exercise and nutrition, examines their implementation effects and prepares their multiplication. Another initiative that is supported by the FOPH is the already mentioned "five a day" initiative which is headed by the Cancer Association Switzerland (see Section 7.3.1). In this context, also the food pyramid – that has already been mentioned before – is supported by the FOPH (see Section 7.3.1).

Focusing on the indirect programs, the most important and comprehensive program is *actionsanté*, an instrument of the FOPH within the framework of the National Programme on Diet and Physical Activity 2008-2012. The program aims to respond to the environmental changes that affect people's way of life and in turn, affect people's health, through a common commitment. The approach is to bring potential partners from business and the institutional world in effective actions, creating conditions that encourage people individually to change their habits and to adopt a healthier lifestyle and more appropriate food choices. The program covers four areas of action: (1) consumers information (2) food composition (e.g., less salt and fat) and offer (including portioning), (3) marketing and advertising (e.g., influence positively advertisement of energy-dense food products toward children), and (4) promotion of an environment that is favorable to physical activity.

Another important project is the *salt strategy* which is part of the National Programme on Diet and Physical Activity 2008-2012 and of actionsanté that aims – in close collaboration with the food industry and researchers – to investigate how salt levels in processed foods and in the catering sector can be reduced in the long run without adversely affecting taste. The project covers five areas of action: (1) the necessary basic data are available, updated and improved, (2) the Swiss population is informed and sensitized for the topic salt, (3) encourage industry and catering to improve critical salt values in processed foods and menus, (4) the actions of Switzerland are in accordance with international developments, and (5) the basis for the monitoring and evaluation of the measures are in place.

Moreover, the FOPH initiated together with the University of Applied Sciences Bern the project *"good practice"* for communal caterings (e.g., in the educational, business and care sector). This project is launched due to the fact that in Switzerland – according to estimates – daily at least 1 million people eat lunch in communal caterings. The project good practice focuses on the establishment of evidence-based and practical quality standards for health-promoting communal caterings (Beer-Borst et al. 2009).

Finally, another project that indirectly obtains to motivate consumers toward healthier food choices is the project "*healthy choice label*". The FOPH commissioned the Swiss Society of Nutrition SSN to develop the foundations for the introduction of a uniform and easy understandable food label. The criteria by which the product of such a label is awarded include salt content, saturated fat, trans fatty acids, fat, and sugar. Furthermore, the portion size and the vitamin and mineral content are relevant. Thus far, the criteria for the label are elaborated. First results are expected to be presented in September 2010.

Since many projects are currently under development it is difficult to assess the impact yet. In case of the project actionsanté one measurement is the number of business partners deciding to commit themselves to be active in the program. The FOPH realizes that it is easier to convince big companies to enter the program. It looks differently for smaller companies. Due to economic reasons, many smaller companies flinch from joining such a program. For those companies, the FOPH is trying to develop arguments and solutions as to how small activities toward healthy food products add to the solution of the big problem.

The success (or failure) of the salt strategy will be evaluated in 2012. Currently, it can be said that the food industry addresses the issue of salt reduction positively and

in various products salt reductions have been tested and sometimes even already implemented.

Where does the future go?

The FOPH wishes that all involved actors are becoming more initiative. Thus far, many discussions are taking place, but implementation is missing. Health costs are exploding and against the background that in the future people are getting older, costs for chronic diseases will increase at an alarming rate. The FOPH claims that the point of time of these chronic diseases should be delayed for each person as far as possible. To overcome these costs, the FOPH calls for face-to-face initiatives, empowerment of the people, and also financial incentives. If healthy food would be affordable at lower prices (e.g., in communal caterings), people would rather choose the healthy menu.

7.3.4 Hilcona

Hilcona is a leading supplier of convenience products in its domestic market Switzerland/Lichtenstein. Hilcona started to expand in Europe in 1988 with a subsidiary in Germany, followed by a branch in France and aims to expand its presence further across Europe. It also focuses on maintaining its share in Switzerland as well as on making Hilcona the most popular brand when it comes to chilled processed food and ready meals (Euromonitor International 2010b).

The interview was conducted with Oliver Bank, Head of Marketing and Development of Hilcona on the 31st of August 2010.

Healthy Eating Activities

The key activity of Hilcona toward healthy eating is the "*Besseresser-Garantie*"[18]. In line with this guarantee, Hilcona stands for:

- Use of carefully produced and processed commodities
- Balanced and adequate diet
- Simple and convenient preparation

To fulfill this guarantee, Hilcona refrains from the following products:

- Artificial flavorings

[18] In English: Better eating guaranteed.

- Artificial dyes
- Flavor enhancers
- Hardened fats
- Preservatives

Furthermore, since two years, Hilcona provides a clear and easy to read *nutrition labeling system* on packaged food. It recommends the proportion of the daily requirement covering the nutritional values and thereby follows the "Guideline Daily Amounts" (GDA).

Hilcona encourages its consumers for healthy and fresh ready meals using various *communication platforms*. Thereby, Hilcona works together with testimonials such as television chef Andreas C. Studer to convey the image of unconventional cooking.

Moreover, Hilcona uses *public relation activities* to enhance healthy eating behavior among consumers. For example, a publication with recipes is in progress aiming to bring products of Hilcona closer to the customer and at the same time demonstrating how healthy menus can be cooked in an easy and convenient way using fresh Hilcona products.

Finally, Hilcona collaborates with a nutritionist to develop an own *Hilcona position* regarding health, healthy nutrition, diet, ingredients, and so on, aiming on the one hand to integrate this position into communication activities and on the other hand to set-up a call-center that acts as an advisor for customers regarding product and nutrition questions. To acquire knowledge of consumers and the environment and thereupon to develop a realistic position, Hilcona currently performs several workshops together with the nutritionist.

Hilcona tests regularly the awareness of its products by the customers using telephone interviews. Moreover, the taste of the products is being blind-tested. Also, Hilcona uses various consumer communities such as www.dooyoo.de and www.ciao.de to gather the basic attitude of product experts.

As outlined in the various activities, Hilcona is cooperating with a number of professionals such as celebrity chef Christian Henze. Together with Christian Henze Hilcona will publish a cookery book. The call-center will be another cooperation partner to guarantee the direct contact with customers. Also, Hilcona works closely

together with various consumer researchers and nutritionists as well as advertising agencies and the specialized press.

Where does the future go?

According to Oliver Bank, compared to the 1960s and 1970s, nutrition education has increased strongly, especially through magazines. Many studies show that consumers are aware of nutrition and health. Thus, the public discussion about the "traffic light nutrition labeling system" and GDAs seems to have reached the consumer. Oliver Bank questions if it is even possible to do more? He argues that the industry and all other actor such as the public institutions (e.g., SGE and FOPH) and retailers are doing a lot. It is rather an individual psychological problem which can hardly be tackled by the industry. He thinks that it should be feasible to foster healthy eating behavior even more in schools, since child obesity is mostly responsible for adult obesity. Thus, starting to raise awareness in childhood might foster a positive psychological attitude toward healthy eating already in early and hopefully in later years.

7.3.5 McDonald's

McDonald's is the fast food leader in Switzerland with 148 restaurants by March 2010. Fast food has a relatively young tradition in Switzerland and has been driven by McDonald's since its arrival in 1976. In Switzerland, the fast food chain is currently expanding its in-shop McCafé network to attract new customers into its restaurants. Moreover, McDonald's introduced its first outlet with a Gym & Fun facility in October 2008, and a fitness track for children. Meanwhile McDonald's owns three Gym Clubs (Euromonitor International 2009).

The interview was conducted with Thomas Truttmann, Marketing & Communications Director of McDonald's Switzerland on the 4th of August 2010.

Healthy Eating Activities

Key activity to motivate consumers to eat healthily is the offering of a *range and variety of menus*. The aim of McDonald's is to step by step expand and develop the menus in such a way that healthier food choices are available. For example, McDonald's offers customers to choose a small garden salad instead of French fries as a menu side dish at no extra charge (keep in mind that preparation and food costs for salad are much higher than for French fries). To persuade people to choose more often salad instead of French fries as a side dish, McDonald's has placed the salad option on the menu board succinctly.

Providing relevant health information at the point of sale is another activity that McDonald's pursues in enhancing people to behave healthier. Thereby, McDonald's prints nutrition information on most of its packaging, on placemats, and in brochures. A nutritional calculator is also available on the internet. This nutrition information is assigned for women between 20-25 years of age with weak physical activity.

Moreover, McDonald's encourages a *balanced lifestyle* which is defined as a perfect combination of a conscious diet and adequate exercise by engaging in various sponsoring activities. For example, since 2005, McDonald's is the lead sponsor of the initiative "Schweiz rollt"[19]. From May to October, people who would like to be active can rent bikes, electric bikes, scooters, and skateboards for free. This initiative is offered in different cities across Switzerland. Furthermore, McDonald's sponsors sport events such as the UEFA European Football Championship, the Fifa World Cup as well as the Olympic Winter and Summer Games. McDonald's reason to engage in these kinds of sponsorship is the fact that role models are important for young people. Many children identify themselves with athletes and start following their routes.

Finally, McDonald's offers *health programs for their employees*. Together with "Vicsystem"[20], McDonald's offers its employees the possibility to assemble an individual training plan that is built up on the basis of world top runners' experiences. For example, a person who would like to participate in the New York City Marathon can use Vicystem to prepare him- or herself professionally for this event. McDonald's also financially participates on inscription fees for events such as city runs and marathons.

Another initiative of McDonald's – that is linked to the first activity – is *to encourage people to choose light (low calorie) beverages* such as Coca-Cola Zero, Fanta Zero, and Sprite Zero. In fact, McDonald's Switzerland does not carry anymore the normal Fanta or the normal Sprite, though still the normal Coca-Cola, but tries to convince people at the time of order to choose Coca-Cola Zero by pointing out specifically to Coca-Cola Zero. Sales figures show that the percentage of calorie soft drinks could be reduced by 10% since the start of this initiative. Furthermore, McDonald's notices a slight increase of sales for salad. Interestingly, the sale of salad increases especially when McDonald's runs promotions that are linked to incen-

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[19] In Enlish: Switzerland rolls.
[20] A website following the slogan „run to victory" offered by a cooperation of the worlds' top runners.

tives such as receiving an original Coca-Cola glass by the purchase of a salad menu or a menu medium in general.

McDonald's is working with various institutions to offer menu combinations that enhance healthy eating including the Swiss Society of Nutrition SSN and the Federal Office of Public Health FOPH. Furthermore, McDonald's International currently discusses options to reduce sodium. Since the unique selling proposition of McDonald's best-selling products (e.g., French fries (=MacFries), McNuggets) is the taste, it will take a while until there are ways to reduce salt content without losing the unique taste.

80% of the ingredients of McDonald's products are of Swiss origin. Together with its supply partners, McDonald's holds conversations in terms of optimizing products toward healthier ingredients. Moreover, in response to the movie "Super Size Me", McDonald's removed worldwide the largest portion size that was offered in each of the individual markets. Therefore, in Switzerland, there is no "large" menu available, only small and medium portion sizes.

Where does the future go?

For the future, Thomas Truttmann would like to intensify the healthy menu range (e.g., medium salad and small burger versions). Moreover, Thomas Truttmann is participating in an international task force that analyzes as to how McDonald's core products can be prepared healthier. Furthermore, McDonald's is convinced that in schools, nutrition education is important – for example combined with cooking classes. According to Thomas Truttmann it is not in McDonald's interest to intervene with the self-responsibility of people.

7.3.6 Migros

Migros is the largest retailer in Switzerland and is organized into 10 regional cooperatives. Migros was founded by Gottlieb Duttweiler whose aim was to improve the quality of life of the customers and therefore set up some principles such as no selling alcohol or cigarettes. Migros holds a wide portfolio of retailing activities as well as operations outside retailing. Its subsidiaries include both other retailers and non-retailing companies such as Migrol (petrol), Migros Bank and Hotelplan (travel), as well as industrial companies which produce many of the group's private label products but also export these goods. Migros also owns Sitzerland's largest internet grocery retailer LeShop and has a franchising partnership in Switzerland with the

German DIY giant Obi. Other activities include sports, restaurants, wellness and education which are partly non-profit operations (Euromonitor International 2010b).

The information of Migros are based on an e-mail conversation with Christine Roth Daeniker, Nutrition and Health, Department Quality Management/Sustainability of Migros on the 29th of July 2010 and internet research.

Healthy Eating Activities

A key driver of Migros to support a healthy lifestyle is a comprehensive nutrition labeling system, called *Migros food facts* which contribute to a balanced diet. Migros food facts are based on recommendations of the Confederation of the Food and Drink Industries of the EU and follow the "Guideline Daily Amounts" (GDA) that is a guide to how much energy and nutrients are present in a portion of food or beverage and what each amount represents as a percentage of a person's daily dietary needs. By the end of 2011 all prepackaged food products of Migros will carry such nutritional information.

Furthermore, since May 2009, Migros joined as a partner the initiative *actionsanté* and has since taken care of the salt reduction in bread. In total, Jowa as the bakery of Migros, produces 582 types of bread of which 95% (so far 78%) of the bread has a maximum of 1.8% (1.8 g per 100g) of salt. Thus, by the end of 2009, the average salinity of Migros bread could be reduced to 1.5%.

Moreover, Migros encourages its consumers to live a healthy lifestyle using various *communication platforms*. Since September 2009, Migros issues the magazine Vivai aiming to inform consumers on the topics of nutrition, exercise, wellness and sustainability. Vivai is therefore a magazine for all who want to live healthy and who are interested in eating tips, new sport trends and becoming inspired by relaxed moments.

Migros offers a product and service line *actilife* to enable a healthy and varied diet and to meet individual needs of consumers. Actilife is based on three pillars: Healthy diet, exercise and active recreation. On these principles, actilife offers various products which always have a health or functional added value, such as vitamins or dissolved coenzyme Q10 in a health drink. The particular added value is communicated to the customer on the product.

In addition, the Migros Culture Percentage – a voluntary commitment of Migros in the fields of culture, society, education, leisure and the economy – leads two projects such as *Tavolata and Kebab+* that encourage collectively eating and exer-

cising. Tavolata facilitates self-help for older people by organizing communal meals in their familiar environment; they will get acquainted with each other as conversation evolves during the mutual cooking and dining experience. The goal of Tavolata is to create a familiar environment among peers. The goal of Kebab+, launched in 2008, is to encourage youth to be more active in choosing a balanced nutrition and a healthy lifestyle. Therefore, Kebab+ supports projects that focus on cooking, eating, meeting, relaxing. Participants must be any local youth agency which develops its own Kebab+ project. For the first time, at the end of March 2010, the Migros Culture Percentage honored several exceptional projects.

Furthermore, Migros engages *as sponsor* in a variety of major running sport events in all parts of Switzerland. This sponsoring supports amateur as well as ambitious runners to follow their passion for running under the best conditions. With numerous activities (e.g., catering), Migros increases the attractiveness of the event. Within this context, Migros issues for free the "Running Guide" in collaboration with Swiss-Athletics which covers 500 Swiss community runs. Moreover, Migros offers the student project "I'M fit" as part of the Lucerne city run targeted at school classes. The school children who participate in the Lucerne city run will receive a special city-run T-shirt. Moreover, I'M fit issues a booklet with valuable information about the topic of training and nutrition which can be integrated into classes to prepare students for the city run.

Furthermore, Migros is involved as a major national sponsor for "*slow up*", an event series taking place every year since the start in 2000. In 2010, there are 16 slow-up events throughout the year. 25 to 35 km traffic-free roads in the most attractive regions of Switzerland are offered to visitors during a day to visit on foot, by bike or on roller-blades. Along the route there are many attractions that make the event a unique festival including rest areas with organic food, fun games and other attractive activities inviting to linger and relax.

Finally, for those who would like to do more than reading, Migros offers its own *fitness parks* and *Migros club schools* – the latter being a further education institution providing courses including nutrition, cooking and movement. These courses can be for fun, but there are also in-service trainings, such as a course to become a qualified nutrition coach.

7.3.7 Valora – avec.

Valora is a consumer goods retailing company based in Switzerland and focuses on European niche markets. Valora operates in three business areas – Valora Retail Group, Valora Media and Valora Trade – all of which involve the supply of consumer goods categories with high potential turnover. Valora Retail Group is present in Switzerland, Germany, Luxembourg, Scandinavia, France and in the United States. In Switzerland, Valora has a presence in all regions (Euromonitor International 2010c).

The convenience store format of Valora - avec. - belongs to the Valora Retail Group and provides on 365 days from early in the morning to late at night fresh food, interesting reading material, and a corner bistro. After Valora and Migros ended their joint-venture for convenience stores under the avec. brand in 2008, Valora kept the avec. brand and rapidly expanded it throughout Switzerland, operating now about 60 outlets. A number of these stores were former k kiosk outlets restructured to the more successful avec. format. Valora plans to further expand avec. in Switzerland and has entered Germany in 2010 (Euromonitor International 2010c).

The interview was conducted with Pierre-André Konzelmann, Director avec. and Tamoil on the 12th of August 2010.

Healthy Eating Activities

Key activity to motivate consumers to eat healthily is the *range and variety of fresh seasonable vegetables and fruits* which are presented in the entry area of the store. The aim of avec. is to present these fresh products in such a way that healthy food choices are available right from the beginning of the shop-tour and look attractive to consumers.

Furthermore, avec. provides *ready-to-eat and ready-to-cook menus without preservatives*. Also, the assortment *of dark bread containing valuable minerals* is considerable. The multivitamin products of Abtei has been introduced by avec., but the products were not successful and therefore were taken out of the range. Pierre-André Konzelmann assumes that a convenience retailer has not the confidence of consumers to advise them in nutritional details.

Therefore, motivating people to eat more healthily has to take place at the point of sale by an attractive presentation of fresh products, seasonal vegetables, and fruits. This leads to another important activity of avec. to promote healthy eating behavior. *Communication efforts at the point of sale* are essential, especially in the conveni-

ence sector because customers of avec. stores are people on-the-go, singles, as well as people who quickly stop by after work.

Seasonal products obtains avec. from regional suppliers, its healthy mineral water Active O2 from Nestlé and cooperates for ready-to-eat and ready-to-cook menu with Hilcona. Thus, avec. itself is not influencing in any form the way the products are prepared, but, avec. selects against the background of healthy eating its suppliers.

Where does the future go?

For the future, Pierre-André Konzelmann would like to intensify the image of convenience store in a way that people who would like to eat healthily and are on a run, will stop by at avec. Pierre-André Konzelmann has some ideas as to how he would like to increase this image, for example, by introducing an apple-day, such that on a certain day, each customer receives an apple for free. Furthermore, he would like to push the industry to tag products that are healthy for example with a green sticker to communicate the added value of health. There are several more ideas in the pipeline, but first of all, avec.'s aim is to establish a broad network of outlets throughout Switzerland and in a second step, Pierre-André Konzelmann wishes to think about more possibilities how to motivate people to choose healthy food products.

7.3.8 Conclusion

The case studies show, that there is a lot being done in practice to foster healthier food choices. It seems that the great majority of the activities focus on information rather than on implementation. Thus, many of the communication, advertising and PR activities are about awareness building. Is that the key to behavior change? People are very smart when it comes to making judgments about their own lives. So perhaps there is plenty of awareness. But if that is the case, why is there so little personal change? What if the real obstacles to behavioral change are other things than ignorance?

7.4 The Power of Marketing to Manage Healthy Eating

The prevalence of overweight and obesity is a social challenge. To make social change happening, someone – or rather many someones – must bring the issue to society's attention. To make change happen, bigger and smaller courses of actions must be set up, evaluated, implemented, modified, and redirected if necessary. In all

of these actions, people must be motivated and empowered to push changes ahead (Andreasen 2006).

Current public health behavior management relies heavily on education, law, community mobilization, and personal persuasion; the underlying philosophy of marketing has not been exploited to its full potential. This is also true for the developing opportunities to change people's eating behavior (Rothschild 1999, p. 24).

Education refers to messages aimed at informing and/or persuading a target group of people to behave in a particular manner (e.g. "eat five fruits and vegetables per day") (Rothschild 1999, p. 25). In the health domain, there have been repeated attempts to persuade people to refrain from unhealthy behaviors. Campaigns have been influential and have made a contribution to behavior change. For example, they provide insights into the behavioral challenges posed by the obesogenic environment (Butland et al. 2006, p. 10). However, although education can teach and create awareness about benefits, it cannot deliver them, even though the knowledge gained may have value for long-term behavior (Rothschild 1999, p. 25).

Law involves using coercion to threaten punishment for inappropriate behavior (e.g., penalties for littering). Law can also be used to increase (with price subsidies) or decrease (with taxes, which effectively raise prices) the probability of transactions, although these might not develop as desired through free-market mechanism (Rothschild 1999, p. 25).

Although public information campaigns and enforcement of laws urge people to avoid certain foods and exercise more frequently, according to research, they are inadequate to address the problem of obesity (Rothschild 1999, p. 25).

Activities that go beyond information campaigns and laws to inform, shift motivation, and provide the necessary skills simultaneously are more likely to lead to behavior change. However, achieving behavior change is not straightforward. For example, those who do not want to drink and drive must plan other means of transportation, designate drivers, or even overnight accommodations. These decisions necessarily entail more planning. Similarly, tackling overweight and obesity involves a variety of short- and long-term goals, including what may be challenging alterations to diet, changes in shopping behavior, increases in exercise, different choices of transportation, reductions in alcohol consumption, and so on (Butland et al. 2006, p. 64).

According to Rothschild (1999, p. 24) marketing offers reinforcing incentives in an environment that invites voluntary exchange. The environment is made favorable for appropriate behavior through the development of choices with comparative advantage (products and services), favorable cost-benefit relationships (pricing), and time and place utility enhancement (channels of distribution). Lindblom (1977, p. 136) argues that exchange is the basic relationship on which market systems are built up: One party gives up something in exchange to get something from another party. Kotler and Roberts (1989, p. 24) define this type of exchange as "social marketing", which comprises in its basic element the following: "a process that promotes the voluntary behavior of target audiences by offering benefits they want, reducing barriers they are concerned about, and using persuasion to motivate their participation in activities." Thus, marketing offers a direct and timely exchange for a desired behavior (Rothschild 1999, p. 25).

Social marketing has existed since the 1960s. It had only modest growth in the next two and a half decades but blossomed in the 1990s. However, today, it is in danger of becoming a downstream approach. At present, social marketing is seen mostly as an approach to influence people with bad behavior such as smoking, not recycling, eating fast food, and so on. However, this view is far too narrow and underestimates the potential of social marketing. In its basic definition, it is simply about influencing the behavior of a target audience. The audiences of behavior are not only "problem people"; there are many more audiences that have social problems, such as unhealthy snacking behavior (Andreasen 2006, p. 3).

In the future, preventing obesity will require significant behavior change at all levels, from organizations that have an influence on individual behavior to individual people themselves.

Using the theoretical and empirical results, I develop a roadmap aiming to overcome the intention-behavior gap in healthy snacking behavior giving managers important practical assistance for enhancing sustainable marketing communication activities. It is a concrete guideline rather than an abstract discussion, which allows for modifications and direct usability in practice.

7.5 Road Map to Close the Intention-Behavior Gap

As outlined in Chapter 2.1, this study follows the mindset of explanatory and change theories. In the previous chapters the research questions under study were analyzed using explanatory theories to explore the problem and identify possibilities to change snack behavior. Next, a road map – which belongs as a participatory model to the family of change theories – is applied to develop tools and strategies as to how people can be motivated to stick to healthy snack behavior. The road map provides a framework to conceptualize the activities based on the project oriented process management (Gomez and Probst 1999, pp. 27; Rudolph 1999, p. 363) and the social marketing framework (Andreasen 2006, pp. 120). It can be divided into four steps (see Figure 30):

1. *Problem identification:* This step lays the foundation for all subsequent activities along the roadmap and is therefore pivotal to the success of the project. In addition to a precise analysis of the existing problem of the current status, this phase needs to define the target market and intervention levels.

2. *Developing a solution to the problem:* In coordination with all involved actors, various solutions are developed and evaluated regarding the potential for success, feasibility, and cost. This step involves identifying an effective marketing mix of product, price, place, and promotion. The optimal mix produces a timely exchange that heightens benefits, reduces barriers, and offers a better choice then the competition.

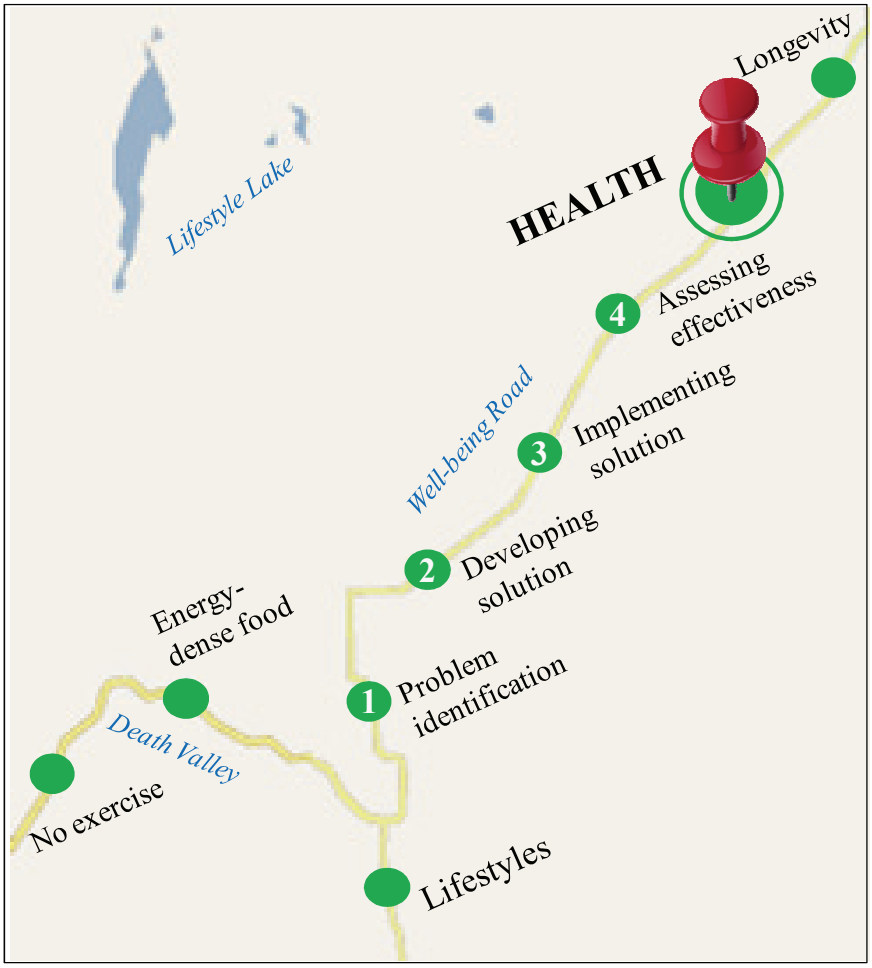
3. *Implementing the solution:* The selected solution of step 2 is implemented into practice. Key figures are collected throughout the implementation phase to compare regularly with the targeted results set in the previous steps.

4. *Assessing effectiveness and making refinements:* Evaluation is a critical and ongoing component after a solution has been implemented to ensure its effectiveness and to identify potential for optimization.

I now apply these four general steps to the intention-behavior gap in healthy snacking fostering relevant marketing communication activities. The following remarks illustrate possible content, tools and goals of each step.

Figure 30 depicts the roadmap.

Figure 30: Roadmap to Implement Healthy Snacking Behavior



Source: own illustration

7.5.1 Step 1: Identifying the Problem

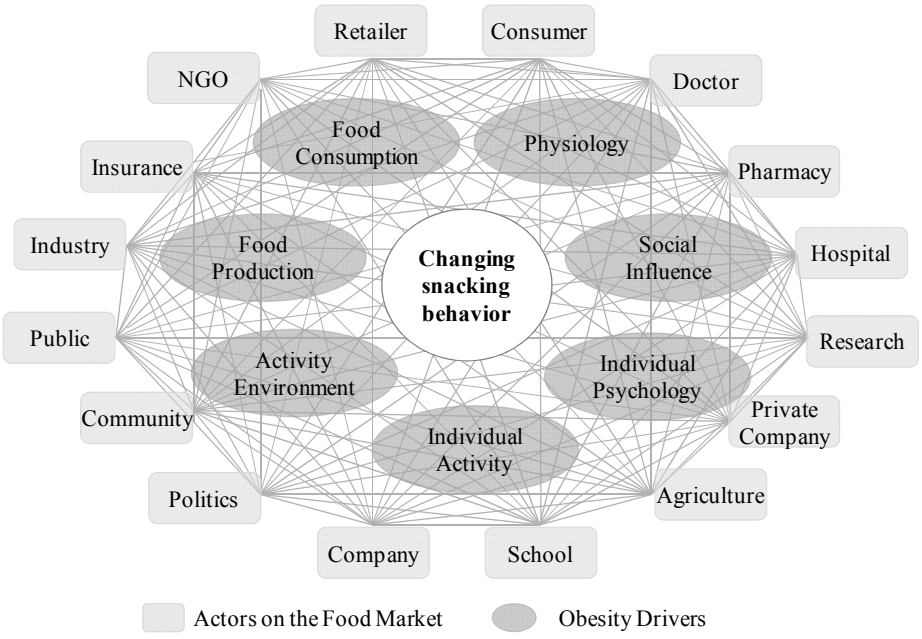
Identifying the problem of "changing snacking behavior" clearly is the most critical step in following the road map, because it significantly determines the success or failure of the project. To evaluate the problem situation effectively, researchers must incorporate the perception of the environment, which depends on previous experience, and the position of each involved actor in the food market. Every actor in the food market views the obesity problem differently and also positions itself in a certain way into the obesity phenomenon. To grasp the problem of "changing snacking behavior" holistically, it is therefore important to understand the different views of all relevant actors in the whole process. This can be done in smaller groups in workshops.

In this step, workshops are a key component, enabling to understand the existing problem of "changing snacking behavior" in all facets (Gomez and Probst 1999, p. 52). Because the phenomenon obesity is multidimensional and incorporates many different stakeholders, it is hardly possible to include all actors and develop a "one-and-only-solution" to the problem. But for all problems being identified among different groups of actors, the following four aspects must be discussed in the workshops:

1. Obesity drivers taken on,
2. Actors involved,
3. Target market/target groups, and
4. Three dimensions of the intervention funnel.

The problem "changing snacking behavior" must be assigned to one or several obesity drivers (introduced in Section 7.2). Also, it must be defined which actors of the food market must be involved into the project to handle the problem "changing snacking behavior" fully. Figure 31 depicts the drivers of the obesity environment and the actors on the food market.

Figure 31: Obesity Drivers and Actors on the Food Market



Source: own illustration

For the problem "changing snacking behavior" probably the most important drivers are individual psychology, food consumption, production, and social influence. And the main actors are most likely consumers, retailers, industry, schools, politics, and private companies.

When defining the drivers and the actors, it is also important to define the target market and target groups. The problem "changing snacking behavior" is one small piece of the problem "obesity"; even so, it still covers so many different facets that it would be unrealistic to confront it in detail if the target groups are not clearly defined, because each target group cannot be addressed with the same instruments to change snacking behavior. Individualization on a group level is important.

Following the social marketing approach, it is important to remember that the problem to be solved must be consumer-driven, not expert-driven. As Rudolph and Schweizer (2004, p. 486) pointed out, customer orientation is proclaimed since the fifties. Thus, customer focus is not new, but what has changed within marketing literature is that it is not only about making business that suits the interests of the customer, but rather looking at the customer as a value on the basis of a long-term relationship (McKitterick 1956, p. 464; 1957, p. 78; Rudolph and Schweizer 2003).

Thus, to avoid delineating the target market in an overly broad manner, segmenting a larger, heterogeneous target market into smaller subgroups is necessary. *Market segmentation* is the process of splitting a target audience into more homogenous subgroups with distinct characteristics and needs. Factors such as gender, snacking habits, readiness for change, and media habits could be applied to divide the larger audience of "unhealthy snackers." To take on the problem "changing snacking behavior" adequately, it is important to identify patterns that distinguish one target group from another to develop target marketing strategies effectively (Glanz et al. 2005, p. 37).

Customer surveys are an effective tool for gathering more information about the differences between the target groups (Johnson et al. 2007, p. 65). Listening to consumers makes it possible to understand the target market's perceptions, needs, and wants regarding the health behavior (in this case, snacking behavior). Besides consumer research, it is also necessary to learn about the environment in which members of the target market are making their behavioral decisions (in this case, snacking decisions). This analysis also examines competing behaviors that are promoted to the target audience (e.g., messages encouraging people to eat fast foods compete with messages about eating five fruits and vegetables a day) (Glanz et al.

2005, p. 37). Many institutions survey consumer behavior; therefore, such surveys do not need to be executed repeatedly. But taking existing results into account in this step of the process is important.

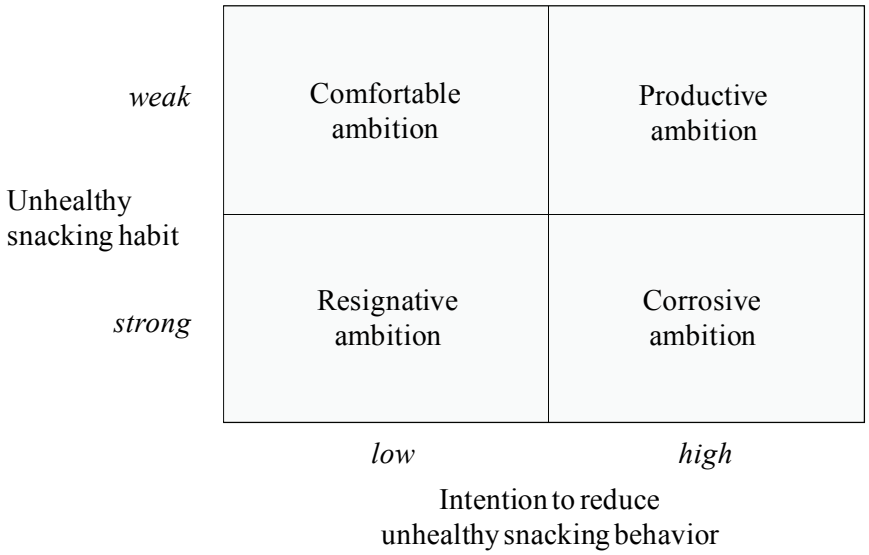
Research shows that much of behavior change is coupled with a person's habitual characteristics and intentions (Verplanken and Orbell 2003).

To distinguish one target group from another, I developed the habit-intention matrix using the results of this study (see Figure 32). I set it up following the Boston-Consulting matrix, a strategy tool used to analyze business units or product lines with the goal of helping companies allocate resources (Porter 2004). The results of this study show that habit and intention are important determinants of snacking behavior and that consumers react differently to motivational treatments due to their habit and intention characteristics.

The respondent's answers as to how strong their snacking habits are and the extent to which they intend to reduce unhealthy snacking behavior are depicted graphically in the habit-intention matrix. Using short questions, it was possible to capture the two dimensions (habit and intention) (see Appendix 3 for questions). These questions can easily be employed for other behaviors, though some may need rewording to reflect the behavior under study. The seven-point scales of habit and intention are computed at two levels: weak (1-4.99) and strong (5-7) and low (1-4.99) and high (5-7), respectively.

Consequently, I defined four ambition states for consumers regarding their healthy snacking behavior; intention is on the abscissa, and habit is on the ordinate, as depicted in Figure 32.

Figure 32: Habit-Intention Matrix



Source: own illustration

Each quadrant characterizes a person's intention and habit strength, which reveals his or her ambition to engage in a certain behavior (in this case: snacking behavior). The four ambition states are as follows[21]:

Comfortable ambition:
- Satisfaction with status quo of snaking behavior
- Low level of activity, effort, and tension
- Reduced alertness and awareness

Productive ambition:
- High alertness
- High level of activity and effort for healthy snacking behavior

Corrosive ambition:
- High level of intention, awareness for healthy snacking behavior
- Internal fights, struggling with self

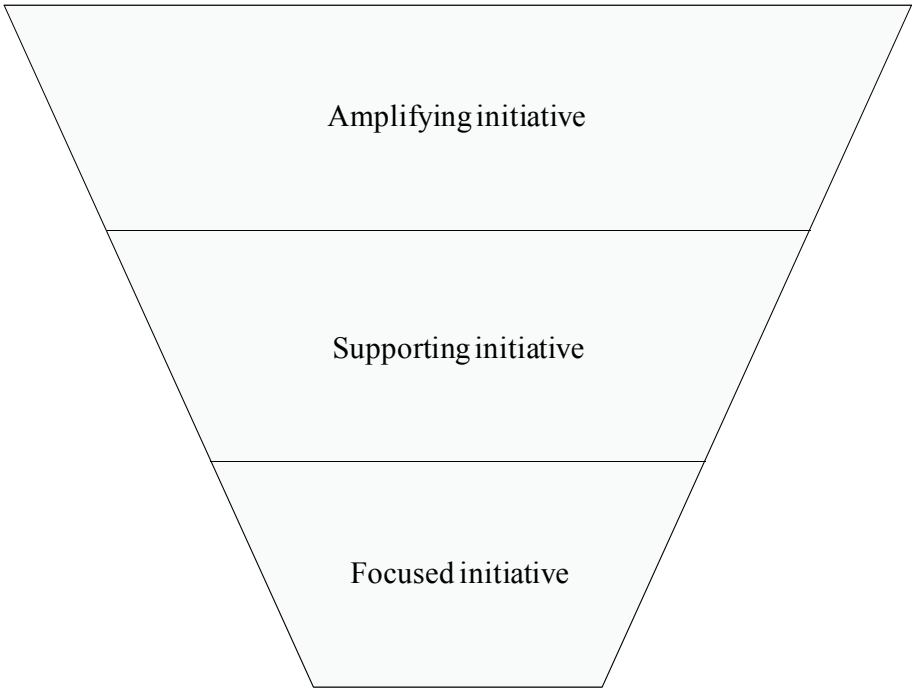
Resignative ambition:
- Indifference, inner withdrawal
- Frustration about snacking behavior
- Reduced activity level

[21] The description of the quadrants was inspired by the organizational energy matrix of Bruch, Heike and Bernd Vogel (2009), *Organisationale Energie*, Wiesbaden: Gabler.

The habit-intention matrix is a helpful tool in the process of identifying the various target groups. The tool is simple to use, because it does not require much effort, is self-explanatory and can easily be applied to behaviors other than snacking. The next step picks this tool again.

When the target groups are roughly defined, it is important to look at the three dimensions of interventions to get the big picture of the problem "changing snacking behavior." The impact of individual interventions in isolation is likely to be small. Therefore, it is important to ensure that new interventions form synergies with other policy issues. Thus, it is important in this phase to check which synergies exist, are possible, and are missing. A good tool to accomplish this is the intervention funnel, which is based partly on United Kingdom government studies (Butland et al. 2006) (see Figure 33).

Figure 33: Intervention Funnel to Overcome Overweight and Obesity



Source: own illustration

The three levels of the intervention funnel complement one another and have the greatest impact if all levels are coordinated with each other. The funnel indicates these initiatives, which are defined and illustrated with examples in Table 51.

Table 51: Definitions and Examples of the Three Levels of Interventions

Type of intervention	*Definition*	*Examples*
Focused initiative	Focused initiatives are interventions aimed directly at tackling obesity on an individual level (e.g. address a specific risk group)	• Schools provide healthy meals • Institutions provide healthy working environment for employees from healthy food to gyms to promotion of flexible working practices
Supporting initiative	Supporting initiatives are interventions intended to underpin the effectiveness of focused interventions (necessary but not sufficient in isolation)	• Engage in efforts to improve knowledge and education about food and activity • Raise employers' awareness of productivity benefits of promoting a healthy lifestyle to staff
Amplifying initiative	Amplifying initiatives are interventions aimed at shifting the system and population profile as a whole (ineffective if the other two elements of the intervention funnel are not in place)	• Control advertising high-fat, salt, and sugar foods • Provide incentives to organizations to report on and consider healthy outcomes as part of the bottom line

Source: own illustration/Butland et al. 2006

For example, the activities outlined in 7.3 (practice examples) could be matched to the three intervention levels introduced above with respect to snacking behavior.

7.5.2 Step 2: Developing Solutions to the Identified Problem

After the problem "changing snacking behavior" is identified, the next step is about developing specific solutions aiming to change snacking behavior.

There are several instruments that can be used to develop possible solutions. A good guiding tool is the synergy gearwheel depicted in Figure 34 which implies that interventions must be linked and coordinated with each other such as gearwheels do.

Figure 34: Synergy Gearwheel

Source: own illustration

The synergy gearwheel from both the obesity drivers (see Figure 31 in step 1) and the intervention funnel (see Figure 33 in step 1) is developed; in addition, it includes three levels of health practice, described subsequently. For the synergy gearwheel, the seven obesity drivers are summarized into four main drivers to avoid overlapping and to make it more convenient and easier to use:

1. *Psychosocial* focuses on social influences and individual psychological aspects.
2. *Activity* addresses individual activity and the activity environment.
3. *Physiological* refers to biological aspects.
4. *Food* combines food production and food consumption.

Each obesity driver in turn is divided into three different kinds of initiatives following the intervention funnel:

1. *Focused initiative* aims to take on snacking behavior on an individual level.
2. *Supporting initiative* is intended to underpin focused initiatives.
3. *Amplifying initiative* aims to shift the population profile as a whole toward healthy snacking behavior.

Due to the complexity and interrelationships of the obesity phenomenon, the impact of a single initiative is likely to be small. Focusing on one element of the obesity phenomenon is unlikely to bring about the scale of change required to enhance healthy snack behavior. Thus, as much as possible, various initiatives should be applied simultaneously on individual, intrapersonal, and community levels (Glanz et al. 2005, p. 45):

1. *Individual level:* This level tries to explain and influence the behavior of individuals such as knowledge, attitudes, beliefs, and personality traits.
2. *Intrapersonal level:* This level includes family, friends, and peers that provide social identity, support, and role definition.
3. *Community level:* This level contains social networks and norms, or standards which exist as formal or informal among individuals, groups, and organizations as well as local, state, and federal policies and laws that regulate or support healthy actions and practices for disease prevention, control, and management.

The synergy gearwheel is a perfect tool to incorporate the relevant topics with the relevant interventions on the relevant practice levels.

Going one step deeper into detail, the planning process takes the consumer focus into account by addressing the elements of the "marketing mix": product, price, place, promotion (Kotler and Roberto 1989).

The *product* is not necessarily a physical offering. In the understanding of social marketing, a continuum of products exists, ranging from tangible, physical products (e.g., fruits) to services (e.g., information leaflets), and practices (e.g., eating healthy snacks) and finally, to more intangible ideas (e.g., reducing the number of obese people in Switzerland) (Weinreich 2006). Different from the definition of *product* in the commercial marketing mix, in the social marketing mix it includes

not only the product or behavior being promoted (e.g., healthy snacking behavior) but also the benefits that go along with it (e.g., reduced health risks).

Price refers to what the consumer must do to obtain the social marketing product. This cost may be monetary, or it may require the consumer to give up intangibles, such as time or effort, or to risk disapproval. If the costs outweigh the benefits for a person, the perceived value of the offered product will be low, and it will not likely be adopted. However, if the benefits are perceived as greater than their costs, chances of trial and adoption of the product is much greater.

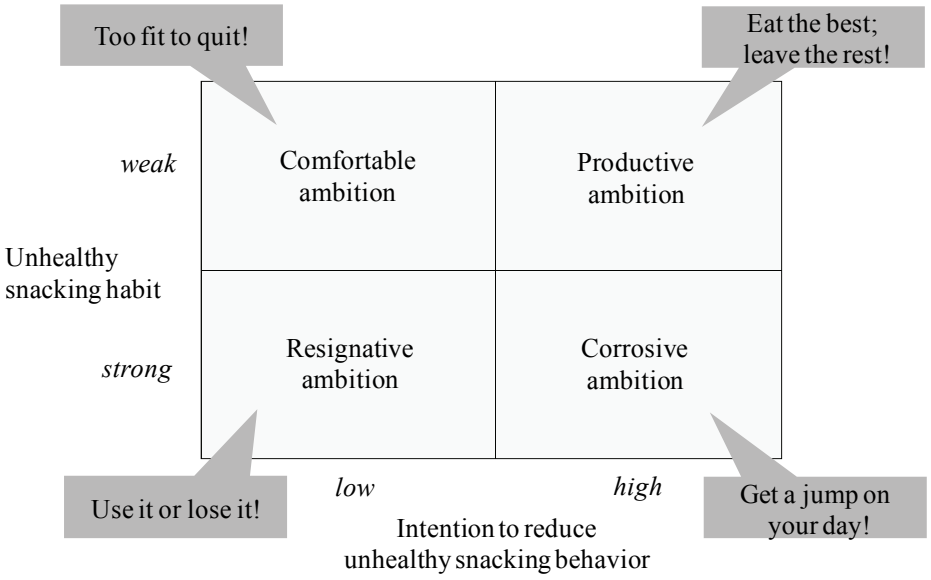
Place is about making the product accessible and convenient. It means delivering benefits in the right place at the right time. Thus, *place* describes the way the product reaches the consumer. For a tangible product, this refers to the distribution system – including the warehouse, trucks, sales force, and retail outlets. For an intangible product, *place* is less clear; it refers to decisions about the channels through which consumers are reached with information, training or practices. This may include shopping malls, doctors' offices, mass media vehicles, and organizations. Another element of place is deciding how to ensure the offering's accessibility and quality of the service delivery. By determining the activities and habits of the target audience, as well as their experience and satisfaction with the existing delivery system, it is possible to pinpoint the most ideal means of distribution for the offering.

Promotion is about how the marketer notifies the target market group of the product, as well as its benefits, reasonable cost, and convenience. *Promotion* consists of the integrated use of advertising, public relations, promotions, media, personal selling, and entertainment. The focus is on creating and sustaining demand for the product.

These "Four Ps" can be used to develop a marketing mix strategy for "changing snacking behavior". To do this, I now return to the habit-intention matrix. As described in step 1, the habit-intention matrix identifies the ambition state of a group of people with respect to changing snacking behavior. Each ambition state reflects how snacking habits (weak vs. strong) and intention towards reducing snacking behavior (low vs. high) affect a person's future performance of changing snacking behavior. All four quadrants contain challenges, but the challenges must be taken on differently. It is the marketer's challenge to develop strategies to boost and sustain changing snacking behavior with respect to the appropriate habit and intention characteristics of the target groups. The goal is to move people into the *productive am-*

bition state. Therefore, for example, the strategy for that group could be as follows: "*Eat the best; leave the rest!"* (see Figure 35). If people fall into this quadrant, they are probably using self-control and are quite happy following a balanced diet and doing exercise.

Figure 35: Suggestions for Improving Snacking Behavior



Source: own illustration

The most difficult group of people to motivate are most likely those who are in the *resignative ambition state*. They have strong unhealthy snacking habits and also low intentions to change their snacking behavior. To move this target group to the productive ambition state, the marketing strategy *"Use it or lose it!"* should be applied. An example of the marketing mix for this strategy might include the following elements:

The *product* could be: raising the intention for increasing healthy snack behavior and overruling existing snacking habits with unexpected activities.

The *price* of engaging in this behavior includes time and the possibility of raising awareness for healthy snacks.

Different *places* should be used for various promotion activities. On the one hand, these consumers must be informed or "educated" about the benefits of healthy snacks, and on the other hand, there must be concrete situations in which these people have the chance to choose healthy snacks.

The following example is a suggestion for a holistic approach. If only a few elements were implemented, it would be a step forward.

A retailer[22] could organize a "wellness week", during this week offering various services, products, and information about healthy snacking, exercising, resting, and so on. For this group of consumers (resignative ambition), it is probably important to avoid reactance; thus, calling it a "health week" could discourage them from participating. The language and communication must be used carefully. Here, professional advertising agency should be involved to define an attractive name for this initiative.

The results of this study showed that self-regulation strategies and financial incentives worked well for people with strong snacking habits when the behavior takes place right after the treatment is given.

Retailer

Thus, here a retailer could make use of these two motivational instruments in various ways:

- Offer appealing healthy snacks (e.g., small cups with peeled and sliced fruits or fruit smoothies) at the store entrance for free
- Have a nutritionist on site who gives free personal assistance (maybe in combination with the possibility to do a health check)
- Offer fivefold loyalty points to be collected by the purchase of fruits and vegetables (communicate this campaign obviously in the fruit and vegetable area of the store)
- Distribute one-page flyers with self-tests to assess current snacking behavior to classify participants into the habit-intention-matrix. If there is interest, the flyer could be dropped into a box in the shop with the consumer's contact details so they can receive more information about self-regulation activities.
- Link the above flyer with a contest for a wellness-weekend or a cooking course in a nice hotel

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[22] I start with the retailer because the retailer is an actor on the food market which is in contact with the consumer likely once or even more times a week. Thus, retailers have a broad platform to easily interact with consumers and empower them to engage in healthy eating activities.

- Offer children's niche where children for example can draw something in the context of health and give them a small healthy snack along

Important for all activities is the need to consider not only the platform to be created, but where and how there is room left for the consumer to contribute and interact.

In line with the proposed holistic approach, the effect of such a wellness week would be increasing if several partners, such as big private firms (e.g., banks, insurance companies, telecommunication firms) – whose employees are probably customers of a nation-wide acting retailer – public schools, catering, and public institutions would simultaneously offer activities complementing the wellness-week of the nation-wide acting retailer.

Private firms

Thus, private firms could simultaneously offer in their company cafeteria a wellness-week by pointing specifically to healthy meals for the same price as other meals and offering incentives for healthy snacks. For example, in a public hospital in Switzerland, it is common during summer months to receive an ice-cream card which enables to collect points each time an ice-cream is bought. The tenth scoop is for free. Why not offering such a card for a healthy product? Also, firms could offer their employees a special screensaver that could be installed by a simple click to be reminded of eating five fruits and vegetables per day. This screensaver could of course continue to be used when the wellness-week is over. Furthermore, to enhance motivation, consumers who surpass certain target scores (e.g., eating during the whole wellness-week 5 fruits and vegetables per day) enter into a lottery with attractive prizes, all associated with well-being or physical activity, e.g., wellness weekends or memberships in fitness clubs. In some cases, small incentives for signing up, e.g., pedometer or T-shirts, could be combined.

Public Institution

A public institution could deliver information material (e.g., report about salt content of products) and be present during the whole wellness-week as an amplifier. The industry could support with specific promotion ads on the product itself during this particular week.

Public Schools

Public schools could participate by coordinating parents' evenings to take place when the big retailers have the wellness-week and point out to specific activities being done in schools to support healthy snack behavior.

Restaurants

Fast food chains could offer during the wellness-week special health menus with incentives (e.g., a big salad as a side order with a small hamburger combined with an attractive gadget as being done already with the coca cola glass). Also, for the wellness-week, napkins and placemats could be printed with the self-test to assess current snacking behavior to classify participants into the habit-intention-matrix. Leaflets containing information about self-regulation activities could be distributed at the same time.

Government

An even broader effect could be achieved if the wellness-week is supported by the government of a big city such as Zurich in Switzerland.

Media

After the wellness-week thorough media coverage of the whole event would be necessary. Furthermore, it would be a great benefit to ask customers for feedbacks and organize a media conference reporting about the results.

Although the wellness-week example is especially geared toward the target group in the resignative ambition state, the instruments addresses of course every consumer. This week could be repeated yearly.

For those people who fall into the *corrosive ambition state*, in addition to the wellness-week, more individualized activities should be applied. The corrosive ambition state indicates that this target group has a strong intention but fails due to strong snacking habits. Their strategy could be called *"Get a jump on your day!"*

The goal for this group is to strengthen their self-control. This could be done by offering them specific activities involving self-regulation training. Self-regulation works well, as the results of this study show, especially for those people who have strong intentions to change their snacking behavior. Thus, for example, private firms could support their employees by offering to have face-to-face in-house meetings with a nutritionist to train self-regulation. This would lower the barriers of

finding an adequate nutritionist, taking time off from work to visit the nutritionist, and so on. These people do not necessarily need incentivized, because their intention is high; rather, they need to develop self-control over time. A retailer could support this group of people by offering self-regulation activities, for example on the company website, pointing out special healthy food offerings, and so on.

The last target group comprises those people in the *comfortable ambition state*. They have weak snacking habits and low intention to change their snacking habit. Of course, if they do not have unhealthy habits why should they change their behavior? The strategy for this group is called *"Too fit to quit!"* This means, that at present, they are feeling great because they do not snack unhealthily. But this may not be true two years from now. They could start unhealthy snacking because something has changed in their lives. Changes in private life can often cause changes in daily routine, including eating behavior (Rudolph and Becker 2003, 2005). Therefore, it would be important to trigger passion for healthy eating and strengthen people's confidence to stay healthy. Also, this strategy should focus particularly on self-regulation activities. They could be similar to the ones proposed to the corrosive ambition state group (see Figure 35).

Coordination

Having the synergy gearwheel explained in detail it remains unsolved who is responsible for the coordination. Since various actors are involved it is important to coordinate the initiatives. From an ethical point of view players on the food market should act mutually. This requires integrated approaches and includes an attractive incentive structure for the actors involved. With a common, cross-industry mind, single initiatives of actors can lead to sustainable approaches driven by a group of different actors (making use of the snowball effect). Furthermore, to a certain extent, the voluntary commitment of the actors is necessary in order to change the course of healthy eating.

Whenever solutions are developed, they must be assessed and checked for their suitability before being implemented. Step 3 explains this in more detail.

7.5.3 Step 3: Implementing Solutions to the Problem

In the third step, the activities are implemented. This implementation process in itself is a process and realistically will not succeed perfectly on the first time because of unpredictable influences. Nevertheless, this process must be carefully planned, including milestones, goals, and responsibilities. Such a project action plan can un-

cover timely information for necessary changes or adjustments. Through observation and feedback loops, cost, capacity, and the degree of achievement can be monitored. Also, it is important to communicate thoroughly to all involved actors regularly about the progress of the project.

7.5.4 Step 4: Assessing Effectiveness and Making Refinements

Evaluation is a critical and ongoing component of the roadmap. Process evaluation methods are effective in tracking activity outputs and processes during implementation. Marketers could also conduct summative research, in form of outcomes monitoring, for example. This analysis compares the objectives of the project with its immediate and long-term outcomes to determine what worked, what did not, and whether the activities were effective.

8 Limitations and Further Research

Although this study provides some promising results, it also has a number of limitations, one being that it included a surplus of women (61% women and 39% men). Furthermore, the characteristics of the participants reveal a rather well-educated (43% vocational education and 46% university degree) good income sample (on average 7000-9500 Swiss francs). In addition, even though this study included rather normal weight people about 10% of women and 29% of men were at risk for developing overweight as they reported their BMI > 24.99. These figures demonstrate that even in this well-educated rather high-income sample changing snacking habits is a relevant problem. Thus, even though this study could benefit from a high quality sample of average consumers which positively affects the external validity compared to other experimental studies that often use student sample, it must be acknowledged that the same study could reveal slightly different results if consumers with lower income and lower education would be surveyed. Thus, this leads to certain restrictions on the generalizability of the results. Future research should therefore clarify whether the effect of self-regulation strategies and financial incentives can also be observed for other consumer groups in the same or similar form (e.g., with lower income and lower educational level).

A further limitation concerns the short period of time – one week – in which snacking behavior was reported. Holland and colleagues (2006p. 782) argue that two requirements must be met before concluding that self-regulation strategies can break habits: (1) The change in behavior must be lasting and stable, and (2) the relation between past and future behavior is consistently reduced. Furthermore, this study applies only once a self-regulation strategy and a financial incentive. Both interventions were very favorable in the short-term, but as the self-reported snack behavior results revealed, not in the long run (1 week after the interventions, people felt back to their normal snacking habits). Charness and Gneezy's (2009, p. 927) study show that paying people regularly to engage in a health-beneficial behavior results in creating a positive habit. Future research should hence measure snacking behavior for a longer period of time and with more than one intervention in order to further insight into the effectiveness of the presently used approaches in changing snacking habits.

Furthermore, this study used for the manipulation of the financial incentive a voucher with a value of 5 Swiss francs. This amount worked very well in this study.

For further insight, it would be necessary to test various levels of values to find out the boundary value of a financial incentive.

This study used objective measurement of eating behavior in addition to self-reported snacking behavior – the latter commonly being used in social psychology studies. While self-reported behavior always misses out situational factors, the approach used in this study allows that the results reflect actual behavior. The measurement of actual snacking behavior due to extrinsic and intrinsic motivational interventions requires further consideration in future studies and should try to address the self-regulation strategy structure and the one of financial incentives in a more straightforward manner.

Moreover, this study sheds light on the interaction between intrinsic and extrinsic motivation approaches. The results reveal that the effect of the combined two interventions is not stronger than that of the single intervention alone. This finding raises the question as to how independent extrinsic and intrinsic processes are. It could be argued that strong motivational incentives stimulate people to plan more precisely how to attain a desired goal. More studies are needed that analyze the relationship between extrinsic and intrinsic approaches in pursuing healthy eating behavior.

9 Conclusion

Some people have too many bad habits, such as unhealthy snacking, and too few good ones, such as eating daily fruits and vegetables. Could self-regulation strategies and financial incentives be used to change one's snacking behavior – reducing the unhealthy ones and increasing the healthy ones? Whereas economists promote extrinsic incentives as preferred form of motivation (Bénabou and Tirole 2003, p. 489), psychologists argue that rewards may actually impair performance and call for intrinsic motivation approaches (Deci et al. 1999, p. 639).

This thesis tests the effect of such intrinsic and extrinsic motivational approaches on snacking behavior and their interaction to foster healthy eating behavior. Thus, comparing the two interventions provides insight into the interplay between intrinsic and extrinsic motivational processes underlying healthy eating behavior.

The present study reveals the following main results.

1. Both self-regulation strategies and financial incentives as intrinsic and extrinsic motivational approaches positively reinforce consumers' choice of healthy snacks.

2. Both manipulations seem to overrule strong snacking habits and motivate participants with strong snacking habits to choose the healthy over the unhealthy snack.

3. Self-regulation strategies and financial incentives do not act additively; instead they interact with each other. When a healthy snack choice must be made and no self-regulation strategy is formed, consumers are more sensitive regarding the provision of a financial incentive. In contrast, when a self-regulation strategy regarding the choice of a healthy snack is formed, financial incentives seem to be internalized.

4. Self-regulation strategies moderate the intention-behavior gap positively whereas providing a financial incentive does not strengthen the relationship between intention and snacking behavior. Furthermore, in the case of self-regulation, the study demonstrates that when participants have a high intention to reduce their unhealthy snack consumption, forming a self-regulation strategy is associated with healthy snack behavior.

5. Moreover, the results demonstrate that self-regulation strategies and financial incentives do not overrule unhealthy snacking habits in the long run. Thus, self-regulation strategies and financial incentives are strong motivational instruments in the short term, however, if not applied repeatedly to move people past the threshold needed to engage in healthy food behavior activities, the treatments do not last long enough to change habitual snacking behavior.

The implications of these findings for actors on the food market are straightforward. Self-regulation strategies and financial incentives work, particularly for people with strong unhealthy snacking habits. It is found that merely providing one intervention does not have much of a long-term effect.

This study clearly does not exhaust the agenda on habit formation and self-regulation strategy and financial incentives, respectively, to improve snacking behavior. The study focused on short-term rather than on long-term effects. Since both interventions and especially their interplay show promising results, it would be interesting for future research to apply self-regulation strategies and financial incentives in long-term settings. In general, there is still much room left for research in the area of incentives, and especially regarding food choices and eating behavior.

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Appendices

Appendix 1: Body Mass Index and Waist Circumference

The Body Mass Index (BMI) is an index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in meters (kg/m^2).

$$BMI = \frac{mass\ (kg)}{\left(height\ (m)\right)^2}$$

BMI values are age-independent and the same for both sexes. The international classification of adult underweight, oberweight and obesity according to BMI is as follows:

Table 52: International Body Mass Index Classification

Classification	BMI (kg/m^2) Principal cut-off points
Underweight	< 18.5
Normal Weight	18.50-24.99
Overweight	≥ 25.00
Obese	≥ 30.00

Source: Adpated from WHO 2006

According to recent studies, however, the waist circumference plays a much bigger role to identify health status of people than the BMI. A study by the Munich based Ludwig-Maximilians-University shows that not the quantity but the distribution of body fat is crucial for heart disease and other diseases (Schneider et al. 2010). The waist circumference provides information about the belly fat which is associated with fatty degeneration of internal organs and is therefore a risk factor for atherosclerosis, heart attack, stroke, hypertension, and diabetes.

The following classification applies:

Table 53: International Waist Circumference Classification

Women	Men	Health Risk
waist ≤ 80 cm	waist ≤ 94 cm	low
waist > 80 cm	waist > 94 cm	high

Source: Adpated from Swiss Society of Nutrition

Appendix 2: Invitation E-Mail – Baseline Questionnaire

Dear Madam, dear Sir

Nowadays much money is being put into the marketing of new products – but many times the usefulness for the companies and the consumers alike are disappointing. Within the scope of my Ph. D. thesis at the Gottlieb Duttweiler Chair of the University of St.Gallen of Prof. Dr. Thomas Rudolph I am carrying out research on how measures taken by food suppliers in the context of snacks are being perceived by the consumers. Suppliers aim to be even more responsive to the needs and wishes of their customers.

Migros is supporting my research study by allowing me, together with you as Migros employee, to conduct this survey. Do you like snacks? I would be very glad if you would participate in my **survey on „Marketing Snacks“.**

The survey takes place on the following two dates:
Date 1: Thursday, November 19, 2009, 13.00-15.00 PM, room 2, MGB
Date 2: Friday, November 20, 2009, 09.00-11.00 PM, room 2, MGB

The survey for each participant won't take longer than approx. **15 mins**. Please inform me for organizational reasons on which of the two dates you will be attending (alexandra.glas@unisg.ch; 071 224 71 86).

As a little **Thank You** each participant will receive a **morning snack voucher** redeemable in your in-house cafeteria. In addition we will draw among all participants a weekend stay for two people at Waldhotel Arosa, including a cookery course with Gault-Millau chef Gerd Reber.

Your participation would be of great help, since quality and success of the research study depend to a considerable extent on the number of participants.
For your commitment I cordially thank you in advance!

With kind regards from St.Gallen
Alexandra Glas

Kindly approved by Mr. Andreas Allenspach, Migros, Head Category Management “Fruit/Vegetables”

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Appendix 3: Baseline Questionnaire

Ph.D. thesis: Marketing snacks

Dear participant

Thank you very much for your willingness to take part in my survey. Within the scope of my **Ph.D. thesis at the University of St.Gallen** I am interested in your opinion on **"the marketing of snacks".** Migros is supporting me by allowing me, together with you, to conduct the survey.

General information on the questionnaire

- The survey takes **approx. 15 mins**.
- Please **answer all questions**. There are **neither correct nor wrong answers**, we are interested in your personal opinion.
- Your answers will be handled **very confidentially.** The **anonymous data analysis makes drawing conclusions** about a single participant impossible**.** The survey happens for **research purposes**.
- Most questions can be marked on a **scale from 1 to 7,** indicating your degree of approval/disapproval with the statements. Number 1 indicates "**I totally disagree** with the statement", whereas number 7 indicates **"I fully agree** with the statement". The numbers 2 - 6 allow you to differentiate your opinion.

Thank you

As a „thank you" for your participation you will receive **a coffee-break voucher** (drink and snack), redeemable during next week in your in-house cafeteria..

In addition we will draw among all participants **a weekend stay for two people** in Waldhotel Arosa including a cookery course with Gault-Millau chef Gerd Reber-.

For your commitment I cordially thank you in advance!

Alexandra Glas, University of St.Gallen

Kindly approved by Mr. Andreas Allenspach, Migros,
Head Category Management "Fruit/Vegetables"

What do you consider a snack?

The present survey is about marketing of snacks. We kindly ask you at first to read the following definition of snack on which this survey is based.

Definition of „a snack“:

If in the present questionnaire the word „snack” is mentioned, then sugary and fatty snacks are meant, as be shown in the following illustration.

Examples of snacks:

Chocolate

Biscuits

Sweets

Salty Snacks

Pastries

Ice Cream

<u>Not falling into these categories are products such as fruits, salads, yogurt, milk and sweetened drinks.</u>

A. Snack-Habits

Please specify on a scale anchored by „strongly disagree“ (1) and „strongly agree“ (7), to what extent you would agree to the following statements.

(1) How many times have you eaten snack food items during the previous seven days?

☐ 0 (not at all)	☐ 4 (four times)	☐ 8 (eight times)	☐ 12 (twelve times)
☐ 1 (once)	☐ 5 (five times)	☐ 9 (nine times)	☐ 13 (thirteen times)
☐ 2 (twice)	☐ 6 (six times)	☐ 10 (ten times)	☐ 14 (fourteen times)
☐ 3 (three times)	☐ 7 (seven times)	☐ 11 (eleven times)	☐ more than 14 (fourteen times)

(2) Please specify to what extent you would agree to the following statements.

Snacking is something…		strongly disagree						strongly agree
a)	I do frequently.	1	2	3	4	5	6	7
b)	I do without having to consciously remember.	1	2	3	4	5	6	7
c)	That makes me feel weird if I would not do it.	1	2	3	4	5	6	7
d)	I do without thinking.	1	2	3	4	5	6	7
e)	That would require effort not to do it.	1	2	3	4	5	6	7
f)	That belongs to my (daily, weekly, monthly) routine.	1	2	3	4	5	6	7
g)	I would find hard not to do.	1	2	3	4	5	6	7
h)	I have no need to think about doing.	1	2	3	4	5	6	7
i)	I have been doing for a long time.	1	2	3	4	5	6	7

Please imagine that you would want to reduce your snack consumption (e.g., croissants or chocolate) next week.

Against this background, please answer questions 3-5.

(3) Reducing my snack consumption next week would be…

a)	unimportant	1	2	3	4	5	6	7	important
b)	negative	1	2	3	4	5	6	7	positive
c)	unpleasant	1	2	3	4	5	6	7	pleasant
d)	bad	1	2	3	4	5	6	7	good
e)	useless	1	2	3	4	5	6	7	useful
f)	unhealthy	1	2	3	4	5	6	7	healthy
g)	unsatisfying	1	2	3	4	5	6	7	satisfying

(4) Please specify to what extent you would agree to the following statements.

		strongly disagree						strongly agree
a)	I intend to eat fewer snacks next week.	1	2	3	4	5	6	7
b)	I will try to eat fewer snacks in the next week.	1	2	3	4	5	6	7
c)	For me it is easy to eat fewer snacks in the next week.	1	2	3	4	5	6	7
d)	I am confident I will eat fewer snacks in the next week.	1	2	3	4	5	6	7
e)	I am certain that I can reduce my snack consumption in the next week.	1	2	3	4	5	6	7
f)	Most people who are important to me think that I should eat fewer snacks in the next week.	1	2	3	4	5	6	7

(5) What do you think would be your personal benefit if you would reduce your snack consumption?

	If I reduce my snack consumption, then …	strongly disagree						strongly agree
a)	… I would feel physically more attractive.	1	2	3	4	5	6	7
b)	… I would feel better mentally.	1	2	3	4	5	6	7
c)	… I would have non (or fewer) body weight problems.	1	2	3	4	5	6	7

Please refer to your eating behavior in general when answering questions 6-9.

(6) Please specify to what extent you would agree to the following statements.

		strongly disagree						strongly agree
a)	I intend to eat healthier in the future.	1	2	3	4	5	6	7
b)	I intend to live a healthier life.	1	2	3	4	5	6	7
c)	I intend to invest more into my health.	1	2	3	4	5	6	7

(7)	Please specify to what extent you would agree to the following statements.							
		strongly disagree						strongly agree
a)	I usually make an attempt to eat a well-balanced diet.	1	2	3	4	5	6	7
b)	I usually make an attempt to exercise regularly.	1	2	3	4	5	6	7
c)	In the long run, people who take care of themselves stay healthy.	1	2	3	4	5	6	7
d)	People's ill health results from their own carelessness.	1	2	3	4	5	6	7
e)	In general, I can do things that make me healthy.	1	2	3	4	5	6	7

(8)	Please specify to what extent you would agree to the following statements.							
		strongly disagree						strongly agree
a)	I can always manage to solve difficult problems if I try hard enough.	1	2	3	4	5	6	7
b)	If someone opposes me, I can find the means and ways to get what I want.	1	2	3	4	5	6	7
c)	It is easy for me to stick to my aims and accomplish my goals.	1	2	3	4	5	6	7
d)	I am confident that I could deal efficiently with unexpected events.	1	2	3	4	5	6	7
e)	Thanks to my resourcefulness, I know how to handle unforeseen situations.	1	2	3	4	5	6	7
f)	I can solve most problems if I invest the necessary effort.	1	2	3	4	5	6	7
g)	I can remain calm when facing difficulties because I can rely on my coping abilities.	1	2	3	4	5	6	7
h)	When I am confronted with a problem, I can usually find several solutions.	1	2	3	4	5	6	7
i)	If I am in trouble, I can usually think of a solution.	1	2	3	4	5	6	7
j)	I can usually handle whatever comes my way.	1	2	3	4	5	6	7

(9)	Please specify to what extent you would agree to the following statements.							
		strongly disagree						strongly agree
a)	My parents lived an exemplified healthy diet.	1	2	3	4	5	6	7
b)	My social environment pays much on the diet.	1	2	3	4	5	6	7
c)	My social environment encourages me to follow a healthy diet.	1	2	3	4	5	6	7
d)	At work, much is done to follow a healthy diet.	1	2	3	4	5	6	7

B. Self-Control Assignment

We kindly ask you now to read the following information about the health of the Swiss population and about the phenomenon self-control. Afterwards, please work through the two assignments.

Information about the health of the Swiss population:

Did you know, that:

- **2.3 million Swiss** are overweight (i.e. body mass index ≥25) or even obese (i.e. body mass index ≥30)? This corresponds to **37% of the Swiss population**.
- **2.7 billion Swiss francs** need to be financed **yearly** in Switzerland for diseases resulting from overweight? This corresponds to **6% of the Swiss health costs.**
- **Coronary heart diseases** are a chronically consequence of overweight and represent worldwide the **most frequent cause of death?** Yearly **17 million people** die due to heart disease.

Research proves that nutrition based on fruits and vegetables influences health positively.

(Source: Swiss Health Survey, Swiss Federal Statistical Office, 2007; World Health Organization 2006)

Phenomenon self-control:

A representative Swiss study emphasizes that the main reason for unhealthy eating habits is the **lack of self-control of consumers**. In other word, consumers would like to eat healthy, but fail to do so, because their self-control is not endless. For example, if a person withholds him-/herself all day long to eat a chocolate bar, he/she cannot resist temptations anymore in the evening.

Research results show that concrete planning can help to steer our behavior. The intention to overcome unhealthy eating habits can be followed through if you concretely implement the intention of eating healthily. Commit yourself to:

"Whenever I feel like eating an unhealthy snack such as a croissant or a chocolate bar, I suppress the impulse to eat those snack products!"

Your assignment:

1. Please read the sentence in the green box again and note 2-3 keywords, which come into your mind.

   _____

2. Take the opportunity and put your plan into action. In the enclosed envelope you find a voucher for a morning snack and coffee. Define now for yourself, when you will redeem this voucher for a healthy snack (e.g. grapes or mandarins). Think about the weekday and mark it below. On this particular day, you are going to eat a healthy snack.

   ☐ Mon, 23.11.09 ☐ Tue, 24.11.09 ☐ Wed, 25.11.09 ☐ Thu, 26.11.09 ☐ Fri, 27.11.09

C. Information about participants' mindset

Please specify on a scale anchored by „strongly disagree" (1) and „strongly agree" (7), to what extent you would agree to the following statements.

(10) Please specify to what extent you would agree to the following statements.

		strongly disagree						strongly agree
a)	The way I look is extremely important to me.	1	2	3	4	5	6	7
b)	I am very concerned about my appearance.	1	2	3	4	5	6	7
c)	I would feel embarrassed if I was around people and did not look my best.	1	2	3	4	5	6	7
d)	Looking my best is worth the effort.	1	2	3	4	5	6	7
e)	It is important that I always look good.	1	2	3	4	5	6	7

(11) Read each of the following adjectives carefully and indicate how well they would describe.

I am…		seldom would describe me						usually would describe me
a)	…impulsive	1	2	3	4	5	6	7
b)	…careless	1	2	3	4	5	6	7
c)	…self-controlled	1	2	3	4	5	6	7
d)	…extravagant	1	2	3	4	5	6	7
e)	…farsighted	1	2	3	4	5	6	7
f)	…responsible	1	2	3	4	5	6	7
g)	…restrained	1	2	3	4	5	6	7
h)	…easily tempted	1	2	3	4	5	6	7
i)	…rational	1	2	3	4	5	6	7
j)	…methodical	1	2	3	4	5	6	7
k)	…enjoying spending	1	2	3	4	5	6	7
l)	…a planner	1	2	3	4	5	6	7

(12) Please specify to what extent you would agree to the following statements.

		strongly disagree						strongly agree
f)	I am very knowledgeable about taking care of my general health compared to an average person.	1	2	3	4	5	6	7
g)	I am familiar with preventing minor and temporary problems such as a cold.	1	2	3	4	5	6	7
h)	I am familiar with preventing minor and chronic problems such as allergies.	1	2	3	4	5	6	7
i)	I am familiar with preventing major and temporary problems such as the flu.	1	2	3	4	5	6	7
j)	I am familiar with preventing major and chronic problems such as hypertension.	1	2	3	4	5	6	7

D. Personal Details

Finally, we ask you for some information about yourself.
All information is anonymous and will only used for the data analysis.

(13) If I compare myself with other of my age and gender, I estimate the likelihood of experiencing…

		much below average							much above average
a)	Heart Disease	1	2	3	4	5	6	7	
b)	High blood pressure	1	2	3	4	5	6	7	
c)	A stroke	1	2	3	4	5	6	7	
d)	Diabetes								

(14) How often do you exercise per week?	**(15) How old are you?**
I do exercise _____times per week.	I am _____years old.

(16) While filling out the questionnaire, I was…

a)	concentrating very little	1	2	3	4	5	6	7	concentrating very hard
b)	paying very little attention	1	2	3	4	5	6	7	paying a lot of attention
c)	very uninvolved	1	2	3	4	5	6	7	very involved

(17) Please indicate your gender.

☐ female ☐ male

(18) Please indicate your highest level of education. (Please mark only one answer)

☐ Middle school ☐ Vocational education ☐ University
☐ High School ☐ Gymnasium ☐ Doctorate

(19) How many people live in your household?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 und mehr

(20) What is the monthly net income of all persons in your household?

☐ ≤ CHF 2499 ☐ CHF 5500 - CHF 6999 ☐ CHF 11,000 - CHF 12,499
☐ CHF 2500 - CHF 3999 ☐ CHF 7000 - CHF 9499 ☐ ≥ CHF 12,500
☐ CHF 4000 - CHF 5499 ☐ CHF 9500 - CHF 10,999

Please recall the day when you want to redeem your morning-break voucher for a healthy snack.

E. Interested in a Health Check-up?

- Height: _____ (e.g.: 1,72 Meter)
- Weight: _____ (e.g.: 75 kg)
- Waist Circumference: _____ (e.g. 98 cm)

User notes:

In case you know your height and weight, please enter them into the appropriate spaces. If you do not know your height and/or weight please come and see us—in a separate room we will measure your height and weight.

You can also your waist circumference yourself, with the measure tape from your envelope. The widest circumference is usually at the belly-button. Please do not hesitate to come to the separate room for your waist circumference.

After you have written down your figures you will receive a table on which you can read your overall risk factor.

I like to thank you once more for your support!

Appendix 4: Cover Letter – Follow-up Questionnaire

30. November 2009

Ph. D. Thesis: Marketing Snacks

Dear participant

Thank you very much for your support in the first part of my research project on „Marketing snacks“. As I already told you after the first questionnaire, I allow myself to send you hereby a few additional questions. This follow-up questionnaire will take you only a couple of minutes. It is very important for the research project and due to scientific reasons it has to be carried out temporally staggered to the first questionnaire. I would be very pleased if you would be of help in this case as well.

Your answers will be handled very confidentially. The anonymous data analysis makes drawing conclusions about a single participant impossible.

Please return to me your questionnaire in the enclosed envelope.

Results and background information on this research study will be sent to you together with the announcement about the winner of the weekend stay for two people in Waldhotel Arosa in December 2009.

Once more I wish to thank you very much for your support. I am well aware of the high value of your time.

I wish you a Merry Christmas.

Kind regards

Alexandra Glas
University of St.Gallen

Appendix 5: Follow-Up Questionnaire

PhD: Marketing of Snack Articles – Follow-Up Questions

(1) How many times have you eaten snack food items during the previous seven days?

☐ 0 (not at all)	☐ 4 (four times)	☐ 8 (eight times)	☐ 12 (twelve times)
☐ 1 (once)	☐ 5 (five times)	☐ 9 (nine times)	☐ 13 (thirteen times)
☐ 2 (twice)	☐ 6 (six times)	☐ 10 (ten times)	☐ 14 (fourteen times)
☐ 3 (three times)	☐ 7 (seven times)	☐ 11 (eleven times)	☐ more than 14 (fourteen times)

(2) Last week, you were invited to reduce your snack consumption. Against this background, please
answer question 2. Please specify to what extent you would agree to the following statements.

		strongly disagree						strongly agree
a)	I tried to eat fewer snacks during the last week.	1	2	3	4	5	6	7
b)	I ate fewer snacks during the last week.	1	2	3	4	5	6	7
c)	I resisted alluring snack offerings during the last week.	1	2	3	4	5	6	7
d)	It was easy for me to eat fewer snacks during the last week.	1	2	3	4	5	6	7
e)	Ich habe meinen Snack-Konsum letzte Woche nicht kontrolliert.	1	2	3	4	5	6	7
f)	I myself am responsible for my snack consumption during last week.	1	2	3	4	5	6	7
g)	During last week I have minded more consciously than usual to eat fruits instead of fatty snacks like croissants.	1	2	3	4	5	6	7

Please recall the first questionnaire which took place the week before last and answer questions 3-5.

(3) Please specify to what extent you would agree to the following statements.

		strongly disagree						strongly agree
a)	At the first survey I was expected not to feel tempted by snacks.	1	2	3	4	5	6	7
b)	At the first survey I had the strong intention to resist snacks the next time.	1	2	3	4	5	6	7
c)	At the first survey I had the intention to resist snacks the next time, by committing myself to redeem the morning break voucher on a particular day.	1	2	3	4	5	6	7
d)	At the first survey I had the intention to resist snacks the next time, by redeeming my morning break voucher for a healthy snack (e.g. grapes, mandarin)	1	2	3	4	5	6	7
e)	I felt myself committed to redeem my morning break voucher for a healthy snack.	1	2	3	4	5	6	7

(4) Please indicate to what extent you would agree to the following statements							
	strongly disagree						strongly agree
a) The morning break voucher which I received at the first survey has given me a financial incentive to decide myself in favor for a healthy snack.	1	2	3	4	5	6	7

(5) Have you been aware that you received a financial incentive?	☐ yes	☐ no

Now we would like you to give your personal opinion on two different approaches, which could motivate people to eat healthy snacks (e.g. fruits).

(6) Do you think that specific intentions regarding a healthy diet would be helpful for you to eat more healthily?

Tip: In this specific case we understand that you will decide in favour for a particular eating situation how you could feed yourself more healthily. **Example:** At your next visit to the movies you plan to drink just a mineral water instead of consuming popcorn and CocaCola.

	strongly disagree						strongly agree
a) Specific intentions support in the short term to eat more healthily.	1	2	3	4	5	6	7
b) I believe that specific intentions are helpful to eat more healthily myself in the short term.	1	2	3	4	5	6	7
c) In the future I will try to plan (again and again) specific intentions regarding a healthy diet.	1	2	3	4	5	6	7
d) Specific intentions are an efficient way to avoid spontaneous eating behaviour.	1	2	3	4	5	6	7

(7) Do you think that financial incentives regarding a healthy diet would help you to eat more healthily?

Tip: Financial incentives can be vouchers, price reductions/discounts, Cumulus-points. **Example:** You re ceive more Cumulus-points or a voucher by buying/eating healthy products.

	strongly disagree						strongly agree
a) Financial incentives are helpful in the short term to eat more healthily.	1	2	3	4	5	6	7
b) I believe that financial incentives are helpful in the short term to eat more healthily myself.	1	2	3	4	5	6	7
c) Financial incentives are an efficient means to overcome at least die threshold to change one's eating habits.	1	2	3	4	5	6	7

(8) Please indicate to what extent you would agree to the following statements.							
	strongly disagree						strongly agree
a) I intend to eat even fewer snacks (e.g. chocolate, chips) in the future.	1	2	3	4	5	6	7
b) I intend to eat even more fruits in the future.	1	2	3	4	5	6	7
c) I think that a healthy diet will have a positive influence on my well-being.	1	2	3	4	5	6	7
d) I think that a healthy diet will challenge me.	1	2	3	4	5	6	7
e) I am able to identify myself with a healthy diet.	1	2	3	4	5	6	7
f) I am satisfied with my diet.	1	2	3	4	5	6	7

(9) Do you like …?			(11) Are you allergic to one of the products …?		
Croissants	☐ Yes	☐ No	Croissants	☐ Yes	☐ No
Grapes	☐Yes	☐ No	Grapes	☐ Yes	☐ No
Mandarins	☐Yes	☐ No	Mandarins	☐ Yes	☐ No

Thank you very much once more for your great help!

Appendix 6: Research Experts

With the following experts – in addition to advisor and co-advisor of this thesis – research specifications – namely, scales and experiment design – were discussed either personally, by e-mail or telephone:

Table 54: Experts Contacted for the Experiment

Name	University	Position
PD Dr. Anja Achtziger	University of Konstanz	Assistant Professor Department of Social Psychology and Motivation
Prof. Dr. Stephan Meier	Columbia University Columbia Business School	Assistant Professor Management Department
Raj Raghunathan, PhD	The University of Texas at Austin McCombs School of Business	Assistant Professor Department of Marketing
Dr. Jan-Benedict Steenkamp	University of North Carolina Kenan-Fleglar Business School	Professor Department of Marketing
Bas Verplanken, PhD	University of Bath	Professor Department of Psychology
Dr. Daniel Wentzel	University of St.Gallen	Assistant Professor Department of Marketing

Source: own illustration

Curriculum Vitae

Name	Alexandra Glas
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Education

2006-2010	*University of St.Gallen, Switzerland* Doctoral Candidate in Business Administration
2003-2005	*University of Southern Queensland, Australia* MBA
2000-2003	*University of Applied Sciences Northwestern Switzerland* B.Sc. in Business Administration

Career History

2006-2010	*University of St.Gallen* Research Assistant and Project Manager
2003-2006	*Universities of Applied Sciences Northwestern Switzerland / Lucerne* Research Assistant
2001	*Swiss Re* Trainee in Quality Management
2000	*Jefferies (Switzerland) Ltd.* Senior Associate Sales & Client Relationship