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Supervisor: dr. Chen Li

Second assessor: Xiao Yu

**The Theory of Planned Behaviour as a determinant of
sugar sweetened beverage consumption among
Dutch adolescents**

Jaimy Ong (430233)

Abstract

This study analyzes the relationship between intention and sugar consumption among Dutch adolescents using Ajzen's Theory of Planned Behaviour (TPB). According to the theory, one's intention consists of three components: attitude towards the behaviour, the subjective norms and the perceived behavioural control (Ajzen, 1991). The higher the components the higher one's intention to perform the behaviour. This study addresses the behaviour: consuming less sugar sweetened beverages (SSB). It was hypothesized that the more one's attitude, subjective norms and perceived behavioural control are in favour of the behaviour the lower one's sugar sweetened beverage consumption.

This study solely finds evidence for the effects of the indirect attitude and the indirect subjective norm components. The indirect attitude and the indirect subjective norm variables respectively represent the beliefs that adolescents have about the outcomes when they consume less SSB (e.g. losing weight) and the normative expectations of their parents and friends regarding consuming less SSB (e.g. stimulating to consume less sugar).

As partly hypothesized, it is found that the more the presumed beliefs are in favour of the behaviour, and therefore the higher indirect attitude score, the lower the final SSB consumption. In addition, the stricter the normative expectations of parents and friends, and therefore the higher the indirect subjective norm score, the higher the final SSB. The latter is in contrast with the hypothesis that higher subjective norms would lead to lower sugar consumption. However, not enough evidence is found to state that either the total attitude, the total subjective norms or the perceived behavioural control component affect the SSB consumption of Dutch adolescents.

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Chapter 1. Introduction

As the headline of a published news article two months ago revealed: "the Netherlands is European champion in consuming sugar sweetened beverages" (NCR, 2017). The article enlightens a research that was conducted by Foodwatch, a Dutch action group. They based this finding on an earlier study executed in 2015. The latter claimed that among all European countries, the consumption of sugar sweetened beverages (SSB) is the highest in Netherlands. That is, a yearly consumption of 93 liters (NRC, 2017). In addition, the daily intake of SSB among Dutch children contains on average 48 gram sugar.

The fact that the consumption of sugar-containing products positively contributes to the rates of overweight and even obesity is not new in the scientific field. The World Health Organization (WHO) states that the added sugars in SSB (i.e. sucrose or fructose) are the main contribution to the poor dietary quality of the substances. The calories of the added sugars increase one's total energy intake while they do not provide one with the same saturated feeling that food without added sugars provide. For this reason, unhealthy weight gain takes place since the total energy intake increases (WHO, 2017).

In addition to the harmful contribution sugar has on weight increase, the substance also appears to be highly addictive. Paul van der Velpen (2013) claims sugar currently to be "the most dangerous drug". He further states that "sugar is as addictive as heroine" and, "if sugar was invented today, it would have been illegal" (van der Velpen, 2013). Many authors address this topic of "sugar addiction" in their books of which the main goal is to provide self-help to its readers (Bennett, 2007; Rufus, 2004). However, according to professor Katan, nutritional science professor at the University of Amsterdam, there still exists an urge to implement policy measures that prevent our society from the consequences sugar-containing products. In the case of SSB specifically he says: "there exists a lack of policy measurements that prevent our society from the consumption of sugar sweetened beverages" (Katan, 2017).

In order to efficiently implement and improve on future policy measures, it is required to optimally understand people's motivation to exhibit certain behaviours (Prager, 2012). That is, to understand their motivation to consume

sugar-containing products. For this study, I focused on adolescents' motivation to limit their sugar sweetened beverages intake. By doing so, I aimed to verify whether their motivations to consume less sugar contributed to their final sugar consumption. In order to test this, I implemented the Theory of Planned Behaviour (Ajzen, 1991). This theory from social-psychology is often used in health-related research. The theory states that one's behaviour is a function of one's intention. In most literature the intention addresses positive lifestyle resolutions, such as quitting smoking, buying more biological products and kicking off drug addiction (Gollwitzer, 1999).

According to the TPB, the intention is constructed from three components: attitude towards the behaviour, the subjective norms of the social environment and the perceived behavioural control. The theory states that the three constructs are positively related to one's intention to perform the behaviour of interest. In the case of this study, the behaviour of interest is: consuming less sugar sweetened beverages. The TPB would therefore state that, the more positive one's attitude, subjective norms and perceived behavioural control are regarding consuming less SSB, the higher one's intention to consume less sugar sweetened beverages.

The thesis is divided into six chapters. The next chapter provides a literary framework of the determinants of sugar containing products. In addition, the Theory of Planned Behaviour is explained in more detail and the hypotheses are introduced. Chapter 3 describes the applied method and research strategy. The empirical results are presented in chapter 4 and the outcomes of the hypotheses are elaborated in the conclusion, chapter 5. Finally, the last chapter discusses insignificant results and provides suggestions for future research.

Chapter 2. Literature Review

2.1 Sugar addiction

Sugar addiction is investigated and confirmed by many researchers (Lustig, 2013; Avena, 2009; Hoebel et al., 1999; Claridge, 1998). Moreover, neuroscientific researches confirm the existence of sugar addiction by stating that the brain chemistry is affected differently by sugar than it is by other macronutrients such as carbohydrates, proteins and fats (Leibowitz and Hoebel, 2004). The main element of this statement is caused by the phenomenon of binge eating. Sugar has an effect on people's brains which causes them to overeat easily (Avena et al., 2009). Binge eating is, according to the Diagnostic and Statistical Manual of Mental Disorders (DSMMS), defined as a series of binge episodes in which one consumes a relatively large amount of food during a short period of time (DSMMD, 2000). Moreover, it is scientifically shown that excessive sugar intake, caused by binge eating, is involved in the epidemics of diabetes and obesity (Johnson et al., 2017).

In addition, laboratory animal studies have revealed similarities between sugar addiction and drug addiction. These lab researches indicate that the removal of sugar causes a decline in body temperature, and an increase in aggressive behaviour (Wideman, 2005; Galic and Persinger, 2002). Moreover, the characteristics observed in sugar binge behaviour appear to be comparable to the behaviour observed at drug dependent rats (Cottone et al., 2008). In addition, outcomes of brain imaging techniques show that the response of sugar craving is similar to the response of drug craving (Pelchat, 2004; Wang et al., 2004).

2.2 Predictors of sugar consumption

Straightforwardly, the fundamental determinant for the consumption of food in general is hunger. In order to survive, humans need energy and the feeling of hunger helps them to control this (EUFIC, 2005). However, what we actually choose to consume is not solely determined by our central nervous system, which is in charge of this feeling. This is especially applicable to sugar. The fact that this macronutrient provides the body with the lowest level of satiation power (the feeling of no hunger between two stages of food-intake) compared to

carbohydrates and proteins (Stubbs et al. 1996), while people still consume the substance on a daily basis, confirms this. In addition to the biological determinants, there exists other factors that influence sugar consumption. According to the European Food Information Council (EUFIC), these factors can best be categorized as: economic factors such as price and availability, physical factors such as education and knowledge, social factors such as culture, family and peers, and psychological factors such as attitude, mood, stress and guilt (EUFIC,2015).

Price

Price of food is one of the primary factors that affect one's food consumption in general. The strength of the relation, however, depends on the level of income and the socioeconomic status. The claim that low-income groups tend to consume more unhealthy alternatives than high-income groups is richly investigated. However, the relation between income and health is rather complex since it is influenced by multiple factors such as gender, age and culture (Acheson, 1998). Yet, one population study shows that their low-income group was observed to have a higher intake of sugar- and fat-rich food compared to their high-income group (De Irala-Estevez et al., 2000). This finding is, according to researchers of the Harvard School of Public Health (2013), caused by the pricing system of unhealthy products compared to healthy products. They found that healthy diets (i.e. diets that are based on fresh fruit and vegetables) are significantly more expensive than unhealthy diets (i.e. diets that are based on quick meals containing sugar and fat rich products).

Availability

In addition to price, the availability of sugar containing products also plays a primary role in the consumption. It has been shown that the ease of the access to for example shops, supermarkets and canteens positively correlates with food consumption in general (Donkin et al., 2000). Moreover, Hebden et al. (2013) show a positive relation between the availability and consumption of sugar-sweetened beverages. They distributed a questionnaire among 8,058 students aged 4-16. Among others, one outcome stated that limiting the availability of sugar-sweetened beverages in the home and school environment, decreased the consumption of these beverages among students (Hebden et al., 2013).

Education

Furthermore, the relation between education and general food choice is highly investigated. Kearney et al. (2000) finds that lower education leads to higher sugar consumption among children, teens and adults. Their results show that low educational status is a high risk factor regarding the intake of sugar-sweetened beverages and therefore causes SSB consumption to increase (Kearney et al., 2000).

Social environment

Social influences on nutritional intake refer to the direct or indirect effects that another person or group have on the conscious or unconscious eating behaviour of others. Sugar consumption is influenced by social factors because attitudes towards sugar consumption and habits of sugar consumption are solely formed by the interaction with others (Feunekes et al., 1998). Furthermore, Jansen and his colleagues found that the level of the total energy obtained from sugar intake of young children often corresponds to that of their parents. In addition, adolescents appear to show more similarities with their peers when it comes to sugar intake (Jansen et al., 2002). Even though the social environment is a crucial determinant of food choice, it remains difficult to measure the influence of the social environment on sugar consumption specifically (Devine et al., 2003). Since a large part of the influence happens unconsciously, people are not always aware of the influence that another person has on their eating behaviour (Feunekes et al. 1998). Therefore, self-report studies remain partly biased. As to why there exists limited scientific evidence about the exact role the social environment plays in the consumption of sugar. Let alone on the consumption of sugar sweetened beverages specifically.

2.3 Predictors of drug abuse

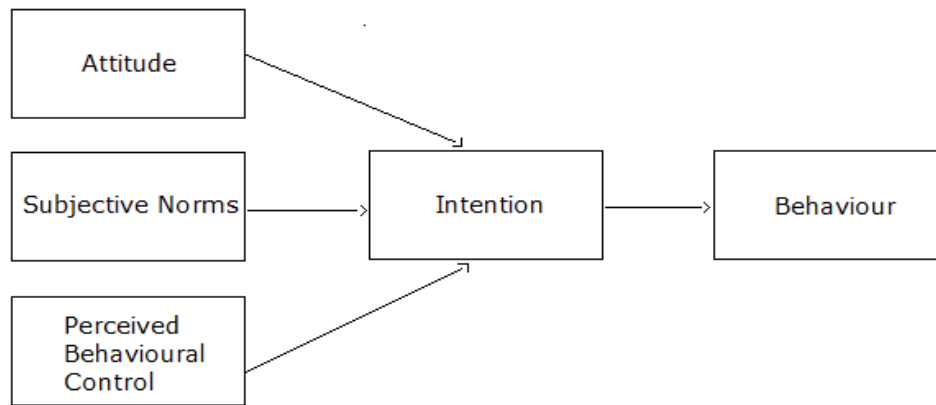
As described earlier, sugar can be compared to drugs when it comes to their level of addiction (Van der Velpen, 2013). Despite the fact that the consequences of drug abuse differ from sugar consumption, both phenomena are considered to be highly addictive. It is therefore of my great interest to pursue whether or not the predictors of sugar and drug consumption can be compared. According to the National Institute on Drug Abuse (NIDA), the main factors that affect one's drug usage take place on the individual level, as well as on the community level.

That is, factors that include individuals biology, social environment, and stage of development (NIDA, 2003). The institute further states that the more risk factors an individual has, the greater the chance that taking drugs can lead to addiction. Of these different factors, the NIDA claims the social environment (e.g. association with drug-abusing peers) to be the most immediate risk factor for drugs abuse. However, it is emphasized that drug addiction is mostly predicted by a combination of factors.

Drug related literature often uses the Theory of Planned Behaviour to explain drug usage. As I stated before, despite all the literature about behavioural predictors, it remains difficult to investigate the explicit reasons underlying the performed behaviour. However, the key condition of the TPB is that one must be completely conscious of his performed behaviour (Ajzen, 1991). And therefore, it must be one's own choice whether or not to perform the behaviour in question. Theory of Planned Behaviour is often used to understand health-related behaviour. In most literature the behaviours concern positive lifestyle changes, such as quit smoking, buy more biological products and kicking off a drug habit (Gollwitzer, 1999).

2.4 Theory of Planned Behaviour

The basic concept of the theory, purposed by Icek Ajzen in 1991, is that one's behaviour is a function of one's intention. The latter is executed from three constructs. That is, the attitude towards the behaviour, the subjective norms of the social environment, and the perceived behavioural control. According to the theory, one's intention can be obtained from three interacting variables and is the direct determinant of one's conscious behaviour. As the general rule states, the higher the degree of the components, the higher the intention and therefore the more likely the behaviour in question is performed (Ajzen, 1991). Figure 1 provides a schematic representation of the theory.



Figuur 1: Theory of Planned Behaviour

Attitude

Attitude refers to the degree to which someone is in favour of the behaviour in question. The concept is constructed from the beliefs about the behaviour and the evaluation of the outcomes (Ajzen, 1991). The beliefs about the behaviour can be both negative and positive. An example is smoking behaviour. One can have both negative and positive beliefs about smoking cigarettes. Whereas the negative beliefs are obvious and regard health related outcomes, one positive belief about smoking might be that one can think that it looks 'cool'. The positive and negative beliefs are controlled by the evaluation of the outcomes. By doing so, the final attitude of a person can be observed. For example, one can evaluate the fact that smoking is bad for your health relatively lower than he or she evaluates the 'cool' image obtained from smoking. As to why, the higher one values the outcomes of performing a behaviour, the stronger the attitude towards this behaviour (Aghenta, 2014).

Subjective norm

The subjective norm refers to the experienced social pressure in one's environment. This concept is established from the normative beliefs of others and the motivation to comply with them. While the normative beliefs refer to one's perception of the opinions of their social environment about the behaviour of interest, the motivation to comply refers to the degree to which one is willing to behave according to these normative beliefs (Ajzen, 1991). To continue with the smoking example, when the social environment expect the subject not to

smoke, and this subject finds it important to behave according the expectations of others, a positive subjective norm result can be observed.

Perceived behavioural control

The last component of the TPB refers to the ease or difficulty of performing the behaviour in question (Ajzen, 1991). Hence, perceived behavioural control refers to the degree of the feeling of being in control over the behaviour of interest. One feels fully in control when he or she does not experience any constraints regarding the adaptation of the behaviour. Whereas on the contrary, one feels complete lack of control when the behaviour of interest requires resources or skills that are currently lacking (Godin & Kok, 1996). The perceived behavioural control is constructed from control beliefs and perceived power (Glanz et al., 2008). The control beliefs refer to one's perception of his own ability to control the behaviour. The perceived power is one's perception of the possession of their skills, opportunities and recourses that are necessary to perform the behaviour (Aghenta, 2014). In contrast to the attitude and subjective norm constructs, the perceived behavioural control can affect the intention directly. That is, in extreme situations where one does simply not have the opportunities or resources that are necessary for the behaviour of interest, this person is not able to perform the behaviour even though this person desires to.

2.5 Purpose and hypotheses

It is the final purpose of this study to investigate to what extend the components of the Theory of Planned Behaviour affect adolescents sugar sweetened beverage consumption. By means of the literature about each construct as well as the general rule about their influences on the intention of behaviours, three hypotheses are constructed. I expect each concept of the TPB to be negatively related to the behaviour of interest. That is, consuming less sugar sweetened beverages. More concrete,

1. More positive attitude towards consuming less sugar sweetened beverages leads to less sugar sweetened beverage consumption.
2. Stronger subjective norms regarding consuming less sugar sweetened beverages lead to less sugar sweetened beverage consumption.

3. Greater perceived behavioural control over consuming less sugar sweetened beverages leads to less sugar sweetened beverage consumption.

Although the implementation of the TPB is often used for the explanation of drug behaviour and other health-related behaviours, this is not often the case when explaining the consumption of sugar containing products specifically. However, the specific relation between the Theory of Planned Behaviour and sugar sweetened beverage consumption has been studied by Zoellner et al. (2012). By means of a cross-sectional survey among 119 participants, they found that attitude, subjective norm and perceived behavioural control were all three significant determinants of final sugar consumption. Yet, their research sample consisted of inhabitants of South Virginia of which it was stated that the annual household income in this region is considerably lower than the US average (US Census Bureau, 2009). As I described earlier, it is confirmed by Harvard School of Public Health (2013) that sugar-containing products are relatively less expensive than their healthy alternative. As to why one can discuss the sample choice of the latter study. In addition, their small sample consisted of both young and old subjects. This research examines the relation between the Theory of Planned Behaviour and the consumption of sugar sweetened beverages among adolescents only in an income-neutral environment.

To conclude, studies have shown that excessive intake of sugar contributes to the epidemics of diabetes and obesity (Johnson et al., 2017). Moreover, studies have revealed similarities between sugar addiction and drug addiction (Wideman, 2005; Galic and Persinger, 2002; cottone et al., 2008; Pelchat, 2004; Wang et al., 2004). As to why it is necessary to guide the society into a direction that protects them for the consequences of the overconsumption of sugar-containing products. Therefore, this study aims to provide insights into the motivations of Dutch adolescents to consume less sugar sweetened beverages. Once it becomes clear what drives adolescents in their choice to consume less sugar sweetened beverages, this information can play an important role in the establishment of future public health interventions.

Chapter 3. Methodology

3.1 Sample and procedure

Data were collected by administering an offline questionnaire among 197 high schools students. Prior to data collection, I contacted the head of multiple high schools in the Netherlands with the request of distributing my questionnaire. After this, I went to two schools in the environment of Utrecht. That is, to Christelijk Lyceum in Zeist and Niftalake College in Maarsssen.

At each school, the sample was obtained from four random classes with different levels (i.e. VMBO, HAVO, and VWO) and from both junior and senior classes. No prior selection was made beforehand. I randomly approached teachers present in the teacher room with my request to distribute my questionnaire.

Before I distributed the questionnaire, I introduced my study and its purpose. In addition, on the front page of the questionnaire a short instruction was written. Under supervision of their teachers and me, the adolescents were requested to fill out the questionnaire. Filling out took on average 20 minutes. The data obtained from the offline questionnaires were imported manually to Excel.

3.2 Reliability and validity

For optimal monitoring and transparency reasons, I was physically present during all sessions. In addition, subjects were not allowed to talk to each other while filling out the questionnaire. The assurance of confidentiality was emphasized by saying that all outcomes on the questionnaire were only accessible to me.

3.3 Measurements of variables

The purpose of the questionnaire is eliciting subjects' intention towards sugar consumption. According to the theory of planned behaviour, this intention stems from three components. That is, attitude towards the behaviour, the subjective norms, and the perceived control over the behaviour. And therefore, the three components of the TPB are discussed in the questionnaire. By doing so, it is aimed to derive an attitude, a subjective norm and a perceived behavioural control variable. In addition to these variables of interest, other variables are

taken into account. The questionnaire initially elicits demographic and health related variables of the adolescents: age, gender, weight, height, BMI, whether the subject currently follows a diet, and the financial status of the parents. I accurately used the document of Ajzen (2006) about constructing a TPB Questionnaire as a guidance for the questionnaire of this study. The complete questionnaire is included in the appendix.

3.3.1 measurement of the dependent variable

Sugar consumption is the main variable of interest of this research. To what extent the components of the TPB affect this variable is the overall question. Due to the span of products that are considered to be sugar-containing products (from candy to fruit and from juices to sauces), I solely focussed on the consumption of sugar sweetened beverages in this research. Hence, a continuous dependent variable that represents the amount of sugar-sweetened beverages consumed per month is examined.

Figure 2 shows the set-up of question 11 in the questionnaire which elicits the amount of sugar sweetened beverages consumed per month. The design of this question is retrieved from the beverage questionnaire of Hedrick et al. (2012) who investigated the habitual beverage intake among adolescents. Subjects first read a short instruction before they fill out the table. Here the term *glass* is specified in millilitres and an example is given. After that, they are exposed to a list consisting of ten daily beverages. The list represented in figure 2 consists respectively of: water, 100% fruit juices, prepacked fruit juices, (soy) milk, flavoured dairy drinks, regular sodas, diet sodas, thee/coffee with sugar, thee/coffee without sugar, energy/sport drinks. The six sugar sweetened beverages are marked with bold lines. For each beverage in the list, subjects were asked to indicate their using frequency of the past month. A seven-point frequency scale was used. That is, never, once a week, 2-3 times per week, 4-6 times per week, once a day, two times a day and three or more times a day. The total amount of sugar-sweetened beverages of one subject is calculated by taking the sum of the amount of glasses that are selected in the row of the bold lined boxes. By doing so, the most extreme scenario occurs when an adolescent

consumes the maximum of 504 glasses sugar sweetened beverages per month¹. On the contrary, the minimum amount is zero.

Figure 2: Question 11 of the questionnaire

11. Hoe vaak heb je de volgende dranken gedronken in de afgelopen maand?							
Je kan per drankje maar één box aankruisen.							
Soort drankje	Nooit of minder dan 1 glas per week	1 glas per week	2-3 glazen per week	4-6 glazen per week	1 glas per dag	2 glazen per dag	3 of meer glazen per dag
Water							
100% fruit sappen							
Fruitsappen (bijv. CoolBest en limonade)							
Naturel (soja) Melk							
Zuivel drankjes (chocomelk, Fristi)							
Normale frisdranken							
Light frisdranken							
Thee/ koffie met suiker							
Thee/ koffie zonder suiker							
Energie/ sport drankjes							

3.3.2 measurement of the TPB variables

Question 12 until 28 of the questionnaire measure the three components of the TPB. Every question elicited either an attitude, social norm or perceived behavioural control score. The behaviour of interest was kept constant for each question. According to Ajzen (2006), the behaviour of interest must be defined in terms of its target, action, context, and time (TACT). As he further claims, consistency in the questions of the questionnaire is inevitable when eliciting the TPB variables. Meaning, once the TACT instruments are defined, it is required that all questions about the different components (attitude, subjective norms,

¹ The last row indicates a consumption of 3 glasses per day. This is $3 \times 7 \text{ days} \times 4 \text{ weeks} = 84$ glasses per month. When this applies for all the sugar sweetened beverages in the list (which are the 6 beverages that are in the bold boxes), the total amount of SSB glasses is $84 \times 6 = 504$ per month.

and perceived behavioural control) contain the exact same instruments. Only by doing so, the principle of compatibility is met.

For this study, the behaviour of interest is consuming less sugar-sweetened beverages. However, asking subjects about their intention to consume less sugar sweetened beverages in general is too broad. Therefore, developing a TACT-specified behaviour is necessary in order to obtain consistency. Even though the action and target (i.e. consuming less and sugar beverages, respectively) were already determined, the context and the time frame of the TACT elements still needed to be defined. The context of this study is the average sugar consumption. Meaning, holiday and other extraordinary occasions are not taken into account. Lastly, a weekly timespan is used. Based on the four TACT elements, the constant behaviour in question 12 to 28 is defined as: consuming less sugar sweetened beverages during a regular workweek.

The concepts of the TPB model will be elicited both directly and indirectly from subjects. For the direct measurement, I used questions that directly examined subjects' overall evaluation towards the target behaviour. The indirect questions examined subjects' possible beliefs about the outcome of the behaviour and how they evaluated this belief. For both the attitude and the subjective norm variable the direct and the indirect questions are applied. The perceived behavioural control is only elicited by using direct questions.

Direct questions

Table 1 presents the set-up of the direct questions of all the three concepts. For all three concepts of the TPB, three direct questions were enquired. The average outcome of the three questions was calculated in order to maintain one direct attitude, one direct subjective norm and one direct perceived behavioural control score. The higher the score, the higher the concepts of the TPB and the more likely that the subject is in favour of the behaviour, consuming less sugar sweetened beverages.

Table 1: Measurements of the direct TPB variables

Concept	Question based on TACT	Measurement	Direct Score
Attitude	I think consuming less sugar sweetened beverages is	very harmful – completely harmless	Average of the outcomes on the three questions based on a 7 point Likert scale. Lowest score= 1 Highest score= 7
		very unpleasant – very pleasant	
		very worthless – very beneficial	
Subjective Norm	Most people think that I should consume less SSB	always - never	Average of the outcomes on the three questions based on a 5 point Likert scale. Lowest score= 1 Highest score= 5
	It is expected of me to consume less SSB		
	I feel social pressure to consume less SSB		
Perceived Behavioural Control	I am convinced that I am able to drink less SSB	totally agree – totally disagree	Average of the outcomes on the three questions based on a 7 point Likert scale. Lowest score= 1 Highest score= 7
	I have no control over my decisions to consume less SSB		
	Consuming less SSB for me is	very easy - very difficult	

Indirect questions

Table 2 presents the establishment of the indirect attitude and subjective norm scores.

According to the TPB, one’s attitude and social norms towards a certain behaviour partly depend on the beliefs about the likely outcomes and the normative expectations of others. Where the belief about the outcomes and the evaluation of these outcomes affect one’s attitude, the normative expectations and the motivation to comply with these expectations affect one’s subjective norm. And therefore,

$$\text{Indirect Attitude} = \text{Behavioural beliefs about outcomes} \times \text{evaluation of the outcomes}$$

$$\text{Indirect Subjective Norm} = \text{Normative expectation of others} \times \text{motivation to comply}$$

An example is the stimulation of friends. One can say that his friends are supportive towards consuming less sugar-sweetened beverages. However, if this person considers the opinion of his friends as little to not important, their support will not affect the final SSB consumption of this person. And therefore, the indirect subjective norm score is relatively low. For this reason, indirect questions regarding the beliefs about the behaviour and normative expectations are implemented in the questionnaire.

This study assumes three possible beliefs about the targeted behaviour. Beliefs are both positively and negatively framed. That is, consuming less sugar sweetened beverages makes subjects feel healthier (1), lose weight (2) and makes them feel less energetic (3). The last item is negatively framed and therefore the score attached to the answer options is reversed compared to the answer options of the positive beliefs.

The normative expectations arise from the social environment of the subject. Two factors are assumed to play a main role in subject's social environment. That is, their parents (1) and friends (2). And therefore two indirect questions are included concerning the opinion of the social environment.

The evaluation questions are used to examine the importance of the outcome on the indirect questions. By doing so, one indirect attitude and one indirect subjective norm score will be calculated. The scores are achieved by multiplying the indirect questions with their corresponding evaluation questions. Finally, the average of the outcomes is taken to arrive at one score value. The higher the scores, the more the subject is in favour of the behaviour (i.e. consuming less sugar sweetened beverages).

Concept	Indirect Question based on TACT	Measurement indirect questions	Evaluation question based on TACT	Measurement evaluation questions	Indirect Score
Attitude	By consuming less SSB, I feel healthier	Totally agree – totally disagree	I find it important to watch my health	Totally agree – totally disagree	Multiplication of the outcomes of the 7 point Likert scale of the corresponding indirect and evaluation questions. After that the average of the three values was calculated.
	By consuming less SSB, I feel less energetic		I find it important to feel energetic		
	By consuming less SSB, I will lose weight		I want to lose weight		
Subjective Norm	My parents say that I should drink less SSB	Always – never	I find the opinion of my parents important	Totally agree – totally disagree	Multiplication of the outcomes of the 5 and 7 point Likert scale of the corresponding indirect and evaluation questions. After that the average of the two values was calculated.
	My friends say that I should drink less SSB		I find the opinion of my friends important		

Table 2: Measurement of the indirect TPB variables

3.3.3 measurement of independent explanatory variables

The intention to consume less sugar is measured by means of the three variables of the theory of planned behaviour. In addition to the obtained variables attitude, social norms and perceived behavioural control, I controlled for other explanatory variables. That is, age, gender, weight, height, the current diet status and the financial status of the family. In addition, by using subjects' weight and height the BMI index is calculated².

The variables age, gender, BMI and current diet status are directly elicited by means of straightforward questions. However, due to inaccuracy that arises when adolescents report their parents income, the Family Affluence Scale (FAS) was used as a proxy for financial status of the family. The four FAS-questions I used are conceptually constructed according the study of Boyce et al (2006). Questions about car ownership, shared bedrooms, holiday frequency and dinners in restaurants were used to construct the FAS index. The answer options of the four questions were all attached to an equally distributed (between 0 and 1) score. By taking the sum of the answer options of the four questions, the total FAS index was calculated for each subject. The index for this model ranges from 0 to 4. More concrete, a higher FAS score corresponds to more prosperity.

3.4 Analysis

To test to what extent the variables of the TPB affect one's SSB consumption, five multiple linear models are regressed. That is, one base regression with the control variables only, three regressions where the three concepts of the TPB are implemented to the first regression separately, and one regression with all the variables. The outcomes of the different models are tabulated and the significant results are analysed. It is the final aim to test the hypotheses by executing a t-test for the separate variables of interest of regression 2 to 4. That is, the coefficient of the attitude variables, the subjective norm variables and the perceived behavioural control variable are tested separately.

² With the formula: $BMI = \text{weight} / (\text{height}^2)$.

The initial regression solely investigates the model without the TPB variables. That is,

$$1. \text{ Sugar Consumption} = \beta_0 + \beta_1\text{age} + \beta_2\text{male} + \beta_3\text{BMI} + \beta_4\text{diet} + \beta_5\text{FAS} + \varepsilon$$

After that, the TPB variables of interest are implemented separately. As a result, the following three models are regressed;

$$2. \text{ Sugar Consumption} = \beta_0 + \beta_1\text{age} + \beta_2\text{male} + \beta_3\text{BMI} + \beta_4\text{diet} + \beta_5\text{FAS} + \beta_6\text{A_direct} + \beta_7\text{A_indirect} + \varepsilon$$

$$3. \text{ Sugar Consumption} = \beta_0 + \beta_1\text{age} + \beta_2\text{male} + \beta_3\text{BMI} + \beta_4\text{diet} + \beta_5\text{FAS} + \beta_8\text{SN_direct} + \beta_9\text{SN_indirect} + \varepsilon$$

$$4. \text{ Sugar Consumption} = \beta_0 + \beta_1\text{age} + \beta_2\text{male} + \beta_3\text{BMI} + \beta_4\text{diet} + \beta_5\text{FAS} + \beta_{10}\text{PBC} + \varepsilon$$

Hence, the final regression includes both the control variables as well as all the variables of the TPB;

$$5. \text{ Sugar Consumption} = \beta_0 + \beta_1\text{age} + \beta_2\text{male} + \beta_3\text{BMI} + \beta_4\text{diet} + \beta_5\text{FAS} + \beta_6\text{A_direct} + \beta_7\text{A_indirect} + \beta_8\text{SN_direct} + \beta_9\text{SN_indirect} + \beta_{10}\text{PBC} + \varepsilon$$

Chapter 4. Empirical Results

4.1 Descriptive statistics

Dependent variable

Table 3 presents the summary statistics of the model, including the dependent variable. For the latter it shows that the adolescences of my sample consume on average 62 glasses of sugar sweetened beverages per month. This means that, on averages the adolescents consume two glasses of sugar sweetened beverages per day. The highest amount of sugar sweetened beverages reported is 430 glasses per month and the lowest amount reported is zero.

Control variables

During this research I controlled for five variables: age, gender, BMI, whether someone was currently following a diet and the financial status of the parents. Again, table 3 shows the summary statistics of these variables. 58.5 percent of the sample is male and 41.5 percent is female. They are on average 15 years old. The BMI of girls displayed in parentheses. It appears that the average BMI of girls is 19, while boys have a slightly higher BMI of 20. The vast majority does not follow a diet (84% versus 14% who do). The financial status of the parents is elicited by using the family affluence scale index (FAS). As the FAS index varies from 0 to 4, 0 means relatively poor (i.e. family does not own a car, adolescent has to share bedrooms, no annual holidays and no dinners in restaurants) and 4 means relatively rich. The mean of the FAS indexes is 3. That is, on average the sampled adolescents are raised in a semi-rich family.

Table3: Summary Statistics of the dependent and control variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
Sugar consumption	197	61.97	61.81	0	430
Age	197	15.40	1.63	11	19
Male	195	0.58	0.49	0	1
BMI	106 (68)	20.32 (19.37)	3.92 (2.66)	14.65 (13.09)	46.88 (27.94)
Diet	195	0.14	0.35	0	1
FAS index	197	2.97	0.79	0	4

Variables of the theory of planned behaviour

As mentioned in the previous chapter, I distinguished between three types of questions in my questionnaire. That is, direct, indirect and evaluation questions. The purpose of the direct questions is to elicit subjects initial thought about the behaviour. The indirect questions are the belief-based constructs. That is, indirect elements that might affect the behaviour (i.e. norms, goals or beliefs). The evaluation questions evaluate the importance of the answer given on the indirect questions. Both the attitude and subjective norm variable are elicited by means of both measurements. The perceived behavioural control variable is elicited only my means of direct questions.

Attitude

Table 4 displays the summary statistics of the first component of the TPB - attitude. This variable is accumulated from both direct and indirect questions. Hence, the two variables are analysed separately.

Table 4: Summary Statistics of the Attitude variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
Direct Attitude	197	4.42	1.09	1.67	7
Indirect Attitude	195	20.83	6.76	4.67	42

The direct attitude towards consuming less sugar sweetened beverages is elicited by three questions. Here subjects are directly asked what their opinion is about consuming less sugar beverages during a regular workweek. Answer options varied from very worthless (1) to very beneficial (7) (see table 1 of the previous chapter). The average direct attitude is closest to the score of 4. The latter implies the answer option 'neutral'. Therefore, the adolescents initially have on average a neutral direct attitude towards consuming less sugar sweetened beverages.

The indirect motives of adolescents to consume less sugar sweetened beverages, are explored by using three questions. As is mentioned in the previous chapter, this study assumes three possible beliefs about the outcome of the target

behaviour. Beliefs are both positively and negatively framed. That is, one finds that consuming less sugar sweetened beverages makes them feel healthier, makes them feel less energetic and/or make them lose weight. The outcome of these questions are controlled by the evaluation questions. By doing so, the indirect attitude score ranges from a very low (1) to a very high (49) attitude towards the behaviour³. From table 4 we can read that 4.67 is the minimum and 42 is the maximum indirect attitude score reported and that the adolescents have a rounded average indirect attitude score of 21. And therefore, the adolescents of my sample have an overall average and neutral indirect attitude towards consuming less sugar sweetened beverages.

Subjective Norm

As with attitude, the subjective norm component of the TPB exist of two variables. That is, one direct and one indirect subjective norm variable. The summary statistics of both variables are displayed in table 5 and are described below. In addition, a graphical display of the indirect variable is provided.

Table 5: Summary Statistics of the Subjective Norm variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
Direct Sub. Norm	194	2.27	1.31	1	5
Indirect Sub. Norm	195	7.37	5.06	1	35

I elicited the direct subjective norm by directly asking the adolescents whether they experience a social pressure regarding the consumption of sugar sweetened beverages. Answer options varied from never (0) to always (5). The mean of the direct subjective norm score is 2. This score represents the answer option 'rarely'. Thus, the adolescents of my sample reported that they rarely experience social pressure when it comes drinking sugar sweetened beverages.

For the indirect subjective norm, I again used two main factors of which I assumed to play a role in the social environment of subjects. Subjects were asked whether their friends or parents expected from them to behave according to a certain manner. More concrete, whether they expected from them to

³ Lowest score on the indirect question is 1 and lowest score on corresponding evaluation question is 1. Thus, $1 \times 1 = 1$ is the lowest total indirect score possible. Highest score on the indirect question is 7 and highest score on corresponding evaluation question is 7. Thus, $7 \times 7 = 49$ is the highest total indirect score possible.

consume less sugar sweetened beverages. The outcomes of these questions were controlled by the corresponding evaluation questions. This results in a total indirect subjective norm score varying from very low (1) to very high (35)⁴. Table 5 indicates a mean indirect subjective norm score of 7. And therefore it seems that the adolescents of my sample rarely see the opinion of their friends and parents as something that affects their sugar drinking behaviour.

The frequency distribution of the indirect subjective norm score is graphically presented in figure 3. This figure shows that the lower scores correspond with higher frequencies and that the highest subjective norm scores are hardly available within this sample. The figure shows again that adolescents rarely experience social pressure from their social environment when it comes to consuming less sugar sweetened beverages.

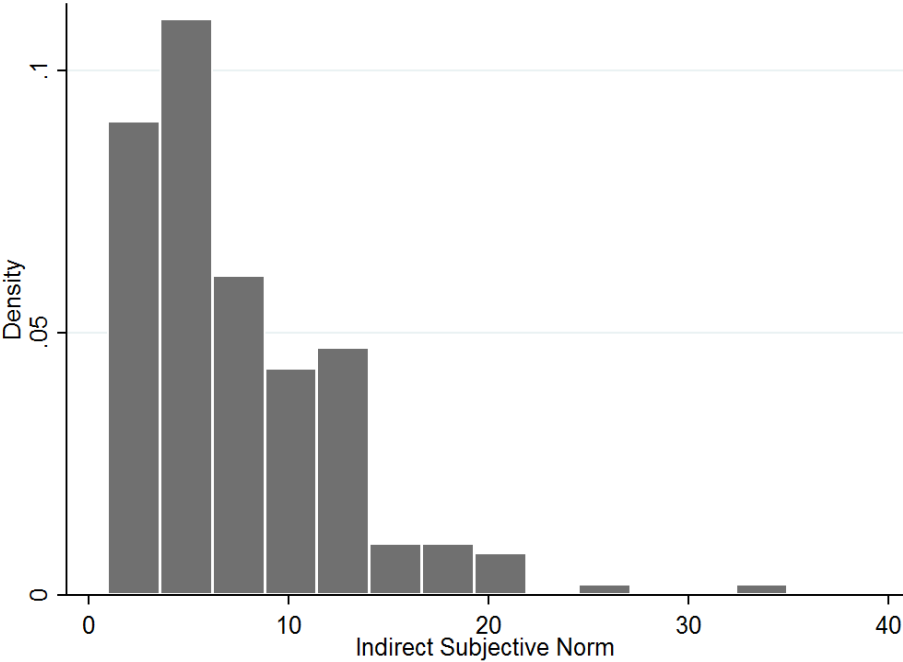


Figure 3: Histogram of the indirect Subjective Norm variable

⁴ The lowest score on the indirect questions is 1. The lowest score on the evaluation question is 1. Thus, 1×1=1 is the lowest score. The highest score on the indirect questions is 5. The highest score on the evaluation question is 7. Thus, 5×7=35 is the highest total indirect score.

Perceived behavioural control

The last variable of the TPB takes into account how much control subjects think they have regarding the behaviour in question, drinking less sugar sweetened beverages. In contrast to the other variables, the Perceived Behavioural Control component of the TPB is solely measured by direct questions. Meaning, I directly asked subjects to what extent they thought they were in control of their own (non-alcoholic) drinking behaviour. Answer options varied from not in control at all (1) to fully in control (7). On average, subjects indicated a score of 5, which is shown in table 6. Hence, the adolescents in my sample reported to find it slightly easy to drink less sweetened beverages during a regular workweek.

Table 6: Summary Statistic of the PBC variable

Variable	Obs.	Mean	Std. Dev.	Min	Max
Perceived Behavioural Control	197	5	1.44	1	7

4.2 Regression results

Table 7 presents regression results. Five multiple linear regression (model 1 to model 5) are executed. The table shows the coefficients of the variables and their corresponding standard errors in parenthesis. The significance levels are indicated with asterisks.

The basic regression, model 1 regresses sugar consumption on all control variables. First, the outcomes of this regressions are analysed. Afterwards, the three variables of the TPB are implemented into the latter regression one by one (model 2 to 4, respectively). Each regression is supported by an intermediary analysis. Lastly, model 5 includes all variables. The purpose of the separate regressions is to understand the effect of the components of the TPB individually. In addition, by means of the aforementioned regressions, the previously stated hypotheses are desired to be confirmed. That is,

1. More positive attitude towards consuming less sugar sweetened beverages leads to less sugar sweetened beverage consumption.
2. Stronger subjective norms regarding consuming less sugar sweetened beverages lead to less sugar sweetened beverage consumption.

3. Greater perceived behavioural control over consuming less sugar sweetened beverages leads to less sugar sweetened beverage consumption.

The first regression initially expresses sugar consumption on the control variables. Table 7 shows that, except BMI, all the variables seem to have a positive relationship with sugar consumption. However, this relationship is solely significant (at the 10% level) for the Family Affluence Scale: an increase in the FAS index by one unit, causes an adolescent to consume 11.06 more glasses of sugar sweetened beverages per month, *ceteris paribus*. That is, an increase of 2.77 glasses of SSB per week. As to why, the financial status of the parents has a positive relationship with the consumption of sugary beverages of adolescents.

For the second regression, the direct attitude and the indirect attitude variables are implemented into the basic regression. The regression outcomes are displayed as model 2 in table 7. As with the previous regression, except for age, the sign and significance of the coefficients of the control variables are unchanged. The positive relation of Family Affluence Scale on sugar consumption remains significant in model 2. In addition, Attitude shows to have a negative relationship with SSB consumption. However, only the indirect attitude appears to be significant at the 1% level. For the latter it indicates that a one-point increase of the indirect attitude score (ranging from 0 to 49), leads to a decrease of 2 sugar sweetened beverages per month, *ceteris paribus*. More specifically, a stronger positive attitude towards the beliefs (i.e. feeling healthy and energetic and losing weight) about the behaviour leads to a decline in monthly SSB consumption.

The third regression replaces the attitude variables for the subjective norm variables. By doing so, SSB consumption is expressed in terms of the control variables as well as the experienced pressure from the social environment of adolescents. Model 3 of table 7 shows the regression results. As the table shows, the signs of the Subjective Norm coefficients are positive. Therefore, a positive relation between subjective norm and sugar consumption is observed. However, only the indirect variable appears to be significant at the 5% significance level. Meaning, a one-point increase on the indirect subjective norm score scale leads

to an increase of 2 glasses of SSB per month, *ceteris paribus*. More specifically, adolescents significantly consume more SSB when their social environment expects them to consume less SSB.

Model 4 represents the outcomes of the regression of SSB consumption on the control variables and the Perceived Behavioural Control of adolescents. As with model 1, only the FAS index can significantly be interpreted (on the 10% significance level). That is, an increase on the index scale by one unit causes the consumption of SSB to increase by an amount of 11.5 glasses per month, *ceteris paribus*. However, the negative relationship between SSB consumption and Perceived Behavioural Control appears insignificant ($p=0.184$).

The last model of table 7 represents the final regression. That is, in addition to the control variables, all the variables of the TPB are implemented. While attitude and perceived behavioural control appear to be negatively related to sugar sweetened beverage consumption, subjective norms have a positive relation with the dependent variable. However, the effect of the TPB components on SSB consumption can only be interpreted for two variables. That is, for the indirect attitude and the indirect subjective norm variable. Both are significant on the 5% significance level. Therefore, the belief that adolescents have about consuming less sugar-sweetened beverages significantly affect the final SSB drinking behaviour. Moreover, adolescents' normative expectations of parents and friends also significantly affect this behaviour. Specifically this means, a one-point increase on the indirect attitude scale leads to a decrease in SSB consumption by 2 glasses per month and a one-point increase on the indirect subjective norm leads to the opposite, an increase of 2 glasses of SSB per month. These effects are observed while keeping all other variables equal.

Table7: Regression Results

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Age	0.116 (3.343)	-0.103 (3.305)	0.306 (3.410)	0.386 (3.342)	0.446 (3.360)
Male	10.589 (9.970)	5.830 (10.161)	7.106 (10.284)	10.614 (9.947)	2.281 (10.414)
BMI	-0.256 (1.490)	-0.232 (1.468)	-0.0954 (1.500)	-0.505 (1.499)	-0.056 (1.485)
Diet	13.222 (14.456)	11.572 (14.647)	14.942 (14.731)	13.229 (14.423)	11.747 (14.619)
FAS	11.055* (6.705)	10.996* (6.559)	10.320 (6.752)	11.469* (6.696)	10.069 (6.620)
Direct Attitude		-4.476 (4.524)			-4.893 (4.578)
Indirect Attitude		-2.127*** (0.747)			-1.962** (0.763)
Direct Sub. Norm			0.191 (4.064)		-0.433 (4.023)
Indirect Sub. Norm			2.154** (1.073)		2.110** (1.063)
PBC				-4.783 (3.585)	-0.815 (3.700)
Constant	24.368 (57.623)	94.472 (60.262)	5.999 (58.913)	48.424 (60.250)	75.226 (63.205)
R-sqr	0.0274	0.0916	0.0615	0.0377	0.1183
Obs.	173	171	170	173	170
* P<0.10, ** P<0.05, *** P<0.01					

Chapter 5. Conclusion

5.1 Summary

This study uses the Ajzen's Theory of Planned Behaviour (TPB) as a framework to understand the intention adolescents have towards consuming less sugar sweetened beverages. The theory states that one's behaviour is a function of one's intention. Whereas the intention is a function of three components: attitude towards the behaviour, the subjective norms and the perceived behavioural control (Ajzen, 1991). As the general rule follows, the higher the components the more likely it is that a person will have the intention to behave according the behaviour of interest. More specifically, the higher the attitude, subjective norms and the perceived behavioural control of the adolescents, the more likely they are to consume less sugar sweetened beverages. Hence, this study tested three hypotheses (i.e. alternatives to the null-hypotheses) with regards to the three components. In addition, five multiple regression models were executed to test the significance of the TPB variables in the models.

5.2 Results

Hypothesis 1: More positive attitude towards consuming less sugar sweetened beverages leads to less sugar sweetened beverage consumption.

Model 2 of table 7 represents the regression that expressed SSB consumption as a function of all the control variables as well as the direct Attitude variable and the indirect Attitude variable. As the outcomes of this model show, both attitude variables appear to have a negative coefficient. That is, the higher one's attitude towards consuming less sugar sweetened beverages, the lower this person's intention is to consume less SSB and therefore the lower its actual SSB consumption is. However, this relationship only holds for the indirect Attitude. The indirect attitude variable is statistically significant at the 1% significance level ($P=0.005$). This also implies when we look at model 5 of table 7, the model where all the control and all the TPB variables are implemented. The outcomes show that for attitude, only the indirect variable is significant at the 5% level ($p=0.011$).

The significant variable is constructed from three beliefs that indirectly affect one's attitude towards the behaviour. That is, weight loss, energy loss and healthy feeling. Therefore, the results of model 2 and 5 indicate that the more these beliefs about the outcomes are in favour of the behaviour, and therefore the higher the indirect attitude score, the lower one's sugar sweetened beverages consumption. However, this study is not able to fully reject the null hypothesis in favour of the alternative hypothesis that states that there exist a negative relationship between total Attitude and SSB consumption.

Hypothesis 2: Stronger subjective norms regarding consuming less sugar sweetened beverages lead to less sugar sweetened beverage consumption.

The third regression expressed SSB consumption as a function of all the control variables as well as the direct Subjective Norm variable and the indirect Subjective Norm variable. In contrast with the hypothesis, both subjective norm variables have a positive relation with SSB consumption. That is, the higher one's experienced pressure from the social environment to consume less SSB, the more SSB they consume. However, the positive relation only holds for the indirect Subjective Norm variable. The latter is significant at the 5% significance level ($p=0.046$). The same relation is observed from the regression with all the variable of the model. In this regression the indirect subjective norm is positively related to SSB consumption at the 5% significance level ($P=0.049$). This means that the stricter the normative expectations of parents and friends, and therefore the higher the indirect subjective norm score, the higher the final sugar sweetened beverage consumption of adolescents. As the alternative hypothesis assumed a negative relationship between Subjective Norms and SSB consumption, this study is not able to reject the null hypothesis in favour of the alternative hypothesis.

Hypothesis 3: Greater perceived behavioural control over consuming less sugar sweetened beverages leads to less sugar sweetened beverage consumption.

As with Attitude and Subjective Norms, the Perceived Behavioural Control is regressed separately (i.e. with only the control variables) and in the whole model (i.e. with all the other TPB variables). The outcomes of both regression show that the higher one's feeling of having control over consuming less SSB, the lower one's actual SSB consumption. However, this relationship is not statistically

significant in both regressions. And therefore this study is not able to reject the null hypothesis in favour of the alternative hypothesis that states that there exist a negative relationship between Perceived Behavioural Control and SSB consumption.

Chapter 6. Discussion

Of all European countries, The Netherlands consumes the highest amount of sugar sweetened beverages. Consequences of overconsumption of this substance are frequently investigated. In particular the frightful effect it has regarding overweight and even obesity. It is claimed by many experts that there exists an urge to implement policy measures that prevent our society from the consequences of consuming too much sugar sweetened beverages. This study contributes to the advance to understanding adolescents' motivation to consume less sugar. The outcomes serve as insights that are applicable to government SSB intervention strategies, such as campaigns targeting the youth of society.

6.1 Contradicting outcomes

This study finds evidence for the effect of two elements of the TPB. That is, the indirect attitude and indirect subjective norm. In contrast with the indirect attitude, the hypothesized direction of the effect of the indirect subjective norm on SSB consumption is not observed. Meaning, the subjective norm appears to be positively related to the consumption of SSB while it was expected to be negative. And therefore it was found that the higher one's indirect social pressure from parents and friends to consume less SSB, the higher this persons final SSB consumption.

This actual effect of the subjective norm on sugar consumption is initially observed in section 4.1 where both the direct and indirect subjective norm scores were projected. The descriptive statistics show that on a scale of 1 to 35 the indirect subjective score is 7. As to why it was stated that the adolescents of the sample rarely experience the opinion of their friends and parents as an influence on their SSB behaviour.

Followed by the literature about the subjective norm, it was expected that the higher one's experienced pressure from the social environment, the higher this person's intention would be to behave according to the norms of this environment. However, this study shows that social pressure works counterproductive among adolescents. One can imagine that too much social pressure and too high expectations to behave according social norms, can reach the opposite goal. However, existing literature does not provide scientific evidence for this assumption yet.

In addition, I constructed the indirect subjective norm variable by taking the average of the outcomes of the questions regarding the feeling of pressure experienced from both parents and friends. As to why no final distinction was made between the two influencers. Yet, one can imagine that parents and friends differ in their norms and expectations towards the subjects' SSB consumption. Moreover, the study of Jansen et al. (2002) stated that adolescents appear to show more similarities with their peers when it comes to sugar intake than they do with their parents. The choice of putting friends and parents under one umbrella could therefore have caused an unreliable indirect subjective norm effect.

Lastly, all the direct variables of the TPB were observed to be insignificant. Since the perceived behavioural control solely exists of a direct variable, this study did not find (partial) evidence for the hypothesized relationship between perceived behavioural control and the intention to consume less sugar. In addition, the relationship between attitude and SSB consumption, appeared to be partial reliable since the hypothesized relationships were only accountable for the indirect variable. Although the study executed by Zoellner and his colleagues (2012) did find significant effects of the components of the TPB on SSB consumption, this study is not able to verify their findings.

6.2 Measurement constraints

Dependent variable

I elicited the monthly amount of SSB by means of a frequency table used by another research about SSB (Hedrick et al, 2012). Adolescents used the table (figure 2 in section 3.3.1) to cross their drinking frequency in terms of glasses in

a list with different beverages. As the figure shows, the drinking frequency reaches the maximum amount of "three glasses per day or more". However, from the analysis of the descriptive data it follows that the sampled adolescents consume on average 62 glasses SSB per month, which is 2 glasses per day. This amount represents the penultimate frequency option. In the current situation, no distinction is made between subjects who consume three, four or five SSB glasses per day. Therefore, in order to obtain more concrete results about the total amount of SSB glasses per month, it would be suggested for future similar research to rescale the frequency table. That is, a middle positioning of the frequency "two glasses per day" as well as using higher frequencies in the last columns.

Control variables

Based on a list with the strongest determinants of sugar consumption of the European Food Information Council (EUFIC, 2015), I decided to control for age, gender, BMI, current diet status and the financial status of the parents for the study of sugar sweetened beverages. However, due to the divergent factors that affect SSB consumption, the list of control variables in the model remained incomplete. For example, due to complexity, I did not control for the availability of advertisements and commercials that promote to consume either more or less SSB. In particular in the case of young children, the exposure to TV commercials about sugar-containing products is positively correlated with their final preference for sugar-containing products (Borzekowski & Robinson, 2001).

Another concern about the control variables arises from their measurement method. That is, all variables were elicited from self-reported questions. Especially in the case of height, weight and family-wealth questions, this measurement can lead to biased results. Meaning, one can imagine that when adolescents are asked to fill out questions about their own weight and their parent's income, this can lead to under and over report of the outcomes. This phenomenon of unreliability of self-reported height and weight is among others studied by Rowland and colleagues (1990). They found that self-reported weight and height are unreliable in important population subgroups. In addition, errors in self-reported weight were found to be the largest for overweight women (Rowland, 1990). Therefore, a direct measure of height and weight would lead to a more accurate calculation of the BMI index of adolescents.

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Appendix

1. The questionnaire

Hallo!

Fijn dat jij mij wilt helpen met mijn master scriptie!

In deze enquête worden een aantal vragen over suiker-gezoete drankjes gesteld.

Voorbeelden van suiker-gezoete drankjes zijn:

- Frisdranken, zoals Coca Cola
- Fruitsappen, zoals Coolbest
- Zuivel, zoals Chocomel

De Enquête bestaat uit 28 vragen. Vul alles zo eerlijk mogelijk in. Alles wat je invult, blijft volledig anoniem.

Bedankt!

Jaimy Ong



Op deze bladzijde worden eerst een aantal standaard vragen gesteld.

1. Naam van de school:

2. Leeftijd:

3. Geslacht:

- Man
 Vrouw

4. Gewicht in kg:

5. Lengte in cm:

6. Volg je op dit moment een diët?

- Ja
 Nee

7. Bezit jouw gezin een auto?

- Nee
 Ja, één auto
 Ja, twee of meerdere auto's

8. Heb je een eigen slaapkamer thuis?

- Ja, ik heb een eigen slaapkamer
 Nee, ik deel een slaapkamer

9. Hoe vaak ben je met jouw gezin op vakantie naar het buitenland geweest in de afgelopen 12 maanden?

- Geen één keer
 Één keer
 Twee keer
 Meer dan twee keer

10. Hoe vaak ben je met jouw gezin uiteten geweest in de afgelopen twee maanden?

- Geen één keer
- Één keer
- Twee keer
- Meer dan twee keer

Kruis in de onderstaande tabel aan hoe vaak per week je de volgende drankjes hebt gedronken in de afgelopen maand. Het woord "glas" in deze tabel staat voor een normaal drinkglas van 250 milliliter.

Voorbeeld:

Je hebt de afgelopen maand vijf glazen water per week gedronken, dan zet je een kruisje in het hokje van de "4-6 glazen er week"-kolom in de "Water"-rij.

11. Hoe vaak heb je de volgende dranken gedronken in de afgelopen maand?							
Je kan per drankje maar één box aankruisen.							
Soort drankje	Nooit of minder dan 1 glas per week	1 glas per week	2-3 glazen per week	4-6 glazen per week	1 glas per dag	2 glazen per dag	3 of meer glazen per dag
Water							
100% fruit sappen							
Fruitsappen (bijv. CoolBest en limonade)							
Naturel (soja) Melk							
Zuivel drankjes (chocomelk, Fristi)							
Normale frisdranken							
Light frisdranken							
Thee/ koffie met suiker							
Thee/ koffie zonder suiker							
Energie/ sport drankjes							

Kruis in alle drie de boxen één vakje aan dat het best jouw mening weergeeft over de volgende uitspraak:

12. Minder suiker gezoete drankjes drinken gedurende een normale werkweek vind ik,

<input type="checkbox"/> Heel erg schadelijk	<input type="checkbox"/> Heel erg onaangenaam	<input type="checkbox"/> Heel erg waardeloos
<input type="checkbox"/> Schadelijk	<input type="checkbox"/> Onaangenaam	<input type="checkbox"/> Waardeloos
<input type="checkbox"/> Een beetje schadelijk	<input type="checkbox"/> Een beetje onaangenaam	<input type="checkbox"/> Een beetje waardeloos
<input type="checkbox"/> Neutraal	<input type="checkbox"/> Neutraal	<input type="checkbox"/> Neutraal
<input type="checkbox"/> Een beetje gunstig	<input type="checkbox"/> Een beetje prettig	<input type="checkbox"/> Een beetje waardevol
<input type="checkbox"/> Gunstig	<input type="checkbox"/> Prettig	<input type="checkbox"/> Waardevol
<input type="checkbox"/> Heel erg gunstig	<input type="checkbox"/> Heel erg prettig	<input type="checkbox"/> Heel erg waardevol

13. Door minder suiker gezoete drankjes te drinken gedurende een normale werkweek voel ik me gezonder

- Helemaal mee eens
- Mee eens
- Een beetje mee eens
- Neutraal
- Een beetje mee oneens
- Oneens
- Helemaal mee oneens

14. Door minder suiker gezoete drankjes te drinken gedurende een normale werkweek voel ik me minder energiek

- Helemaal mee eens
- Mee eens
- Een beetje mee eens
- Neutraal
- Een beetje mee oneens
- Oneens
- Helemaal mee oneens

15. Door minder suiker gezoete drankjes te drinken gedurende een normale werkweek zal ik afvallen

- Helemaal mee eens
- Mee eens
- Een beetje mee eens
- Neutraal
- Een beetje mee oneens
- Oneens
- Helemaal mee oneens

16. Ik vind het belangrijk om op mijn gezondheid te letten

- Helemaal mee eens
- Mee eens
- Een beetje mee eens
- Neutraal
- Een beetje mee oneens
- Oneens
- Helemaal mee oneens

17. Ik vind het belangrijk om me energiek te voelen

- Helemaal mee eens
- Mee eens
- Een beetje mee eens
- Neutraal
- Een beetje mee oneens
- Oneens
- Helemaal mee oneens

18. Ik zou graag willen afvallen

- Helemaal mee eens
- Mee eens
- Een beetje mee eens
- Neutraal
- Een beetje mee oneens
- Oneens
- Helemaal mee oneens

19. De meeste mensen vinden dat ik minder suiker gezoete drankjes moet drinken gedurende een normale werkweek

- Altijd
- Vaak
- Soms
- Zelden
- Nooit

20. Het wordt van mij verwacht dat ik minder suiker gezoete drankjes drink gedurende een normale werkweek

- Altijd
- Vaak
- Soms
- Zelden
- Nooit

21. Ik voel sociale druk om minder suiker gezoete drankjes te drinken gedurende een normale werkweek

- Altijd
- Vaak
- Soms
- Zelden
- Nooit

22. Mijn ouders zeggen dat ik minder suiker gezoete drankjes moet drinken

- Altijd
- Vaak
- Soms
- Zelden
- Nooit

23. Mijn vrienden zeggen dat ik minder suiker gezoete drankjes moet drinken

- Altijd
- Vaak
- Soms
- Zelden
- Nooit

24. Ik vind de mening van mijn ouders over mijn (niet-alcoholische) drinkgedrag erg belangrijk

- Helemaal mee eens
- Mee eens
- Een beetje mee eens
- Neutraal
- Een beetje mee oneens
- Oneens
- Helemaal mee oneens

25. Ik vind de mening van mijn vrienden over mijn (niet-alcoholische) drinkgedrag erg belangrijk

- Helemaal mee eens
- Mee eens
- Een beetje mee eens
- Neutraal
- Een beetje mee oneens
- Oneens
- Helemaal mee oneens

26. Ik ben overtuigd dat ik minder suiker gezoete drankjes kan drinken gedurende een normale werkweek als ik dat zou willen

- Helemaal mee eens
- Mee eens
- Lichtelijk mee eens
- Neutraal
- Een beetje mee oneens
- Oneens
- Helemaal mee oneens

27. Minder suiker gezoete drankjes drinken gedurende een normale werkweek is voor mij

- Heel erg makkelijk
- Makkelijk
- Best makkelijk
- Neutraal
- Best lastig
- Lastig
- Heel erg lastig

28. Ik heb geen controle over mijn beslissing om minder suiker gezoete drankjes te drinken gedurende een normale werkweek

- Helemaal mee eens
- Mee eens
- Een beetje mee eens
- Neutraal
- Een beetje mee oneens
- Oneens
- Helemaal mee oneens