

Bachelor of Science

High Energy Drink Consumption and its Associated Factors

Using the Prototype Willingness Model to analyze the Differences between Low, Mediate,
and High Sensation-Seekers in the Determinants of Energy Drink Consumption

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Abstract

Background: Consuming high energy drinks (HED) guarantee advantages like improvement of cognition, or physical performance. However, possible risks can be among other things hypertension and cardiac arrhythmia. Previous research has identified that typical consumers are young people and that the consumption has been associated with Sensation-Seeking. Not much research incorporating Sensation-Seeking in the Prototype Willingness Model (PWM) has been performed to examine the determinants of HED.

Aim: The aim is the (dis-)approval of the found connection between Sensation-Seeking and HED, and to investigate the PWM related to Sensation-Seeking.

Methods: A convenience sample (n=206) completed a questionnaire, which ascertained their Attitude, Subjective Norm, Prototype Perception, Intention, and Willingness regarding HED and Sensation-Seeking. The participants were categorized into (1) Low Sensation-Seekers, (2) Mediate Sensation-Seekers, and (3) High Sensation-Seekers and the study analyzed the differences and associations between the groups and variables with Pearson's Correlation, one-way ANOVA, and hierarchical multiple regression analysis.

Results: Significant differences with a higher mean score of the high sensation-seekers were ascertained, compared to low sensation-seekers on HED, Intention, and Willingness ($p=.018$; $p=.013$; $p=.018$ respectively). Correlations of the total group demonstrated that except Negative Prototype, all variables correlated with Intention, Willingness, and HED. Regarding the three Sensation-Seeking groups, Attitude had the highest significant association for high sensation-seekers, and Disadvantages and Negative Prototype had no or the weakest associations to the three dependent variables. Important determinants in explaining the variance were Direct Measure, Advantages, Subjective Norm, Positive Prototype, and Similarity. Conspicuous was the rather weak contribution in explaining the fluctuations and that the variable Sensation-Seeking was not a predictor in the three groups. Furthermore, Intention ($p=.000$) had a higher contribution in explaining the variance of HED than Willingness ($p=.019$).

Conclusion: The results can be used to refine the Prototype Willingness Model, or to develop an intervention to prevent and reduce high energy drinking.

Keywords: High Energy Drinks, Prototype Willingness Model, Sensation-Seeking

Introduction

In the last decade, the whole business of energy drinks have been flourishing with the release of approximately 500 new brands (Breda et al., 2014). This booming concept of ‘liquid Energy’ was developed in Japan in 1960, aimed at increasing the energy of the consumers with a remedial drink. (‘The History of Energy Drinks’, n.d.). The inventor Dietrich Mateschitz imported the idea to Europe and contributed to an economic upswing, which started with the introduction of the Red Bull energy drink in 1987 (Fürweger, 2016). Approximately 30 years later and through skillful marketing tactics, in 2018 the sales volume of the Austrian company amounted to revenues of about 5.54 billion euro with 6.8 billion cans in a year. Red Bull GmbH has the highest global market share in the energy beverage industry (‘Absatz von Red Bull weltweit in den Jahren 2004 bis 2018 (in Milliarden Dosen)’, 2019). In addition to Red Bull, Rockstar and Monster are two of the most popular energy drinks (ED) and exponentially expanding brands worldwide (Fürweger, 2016).

The term ‘energy drink’ is not precisely specified in scholarly research. However, it can be understood as a non-alcoholic drink which should excite the mind and body with functional ingredients. The principal ingredient is usually caffeine, and the minor components are amino acids like taurine, beta-complex vitamins, guarana, ginseng, other herbal extracts, and sugar derivatives such as ribose and glucuronolactone (Malinauskas, Aeby, Overton, Carpenter-Aeby, & Barber-Heidal, 2007; Zucconi et al., 2013). On the official Red Bull website, it is explicitly stated that one can Red Bull energy drink (250ml) contains 80mg caffeine (100ml - 32mg caffeine), which is approximately equivalent to one cup of coffee, which contains 69 - 127mg caffeine per 250 ml (Wussten Sie?, n.d.).

Whereas energy drink consumers often believe that these drinks ‘enliven your mind and body’ through the guarantee of the marketing departments for improvement of cognition, physical performance, and benefits like increased attention, perseverance, or weight loss, it may actually have negative consequences for consumers’ health (McLellan & Lieberman, 2012; Red Bull Energy Drink, n.d.). Recent scientific research ascertained these adverse effects, such as the research of Breda et al. (2014), who thoroughly reviewed the main health risks of consuming energy drinks, mostly occurring due to an overdose of caffeine in combination with the other ingredients mentioned above. In general, the influence of energy drinks on the body starts approximately after ten minutes when the substances are entering the blood circulation. Thereby, the main ingredient caffeine increases the blood pressure and the heart rate in the body and the component sugar stimulates the reward system in our brain with notably a release of the hormone dopamine. Collectively, it energizes the body for around one hour until the sugar

is partly degraded into fat, and the fatigue returns (Alford, Cox, & Wescott, 2001; Smallwood, 2012). Nevertheless, an overdose of this combination does not lead to increased energy; rather it can lead to hypertension or even cardiac arrhythmia. Consequential adverse effects or other consequences of too much energy drink consumption can impact the central nervous system, nausea, vomiting, convulsions, Type 2 diabetes, and for pregnant women even late miscarriages or stillbirths (Breda et al., 2014). Considerably more negative health risks are stated in the research including the indication that in rare cases, an overdose can also lead to death (Breda et al., 2014).

A not uncommon practice with even more health risks is it to combine high energy drinks with alcohol. In a study with a sample of 253 participants, 49% of the sample drank more than one energy drink in combination with alcohol (AmED) in the last month (Malinauskas et al., 2007). Conflicting effects can occur because caffeine and the component ingredients are stimulators for the body and alcohol is a depressant. The depressant can impair the brain and the physical activity resulting in an inhibition of the feeling of drunkenness because of the feeling of being more awake. Accordingly, possible risks are alcohol intoxication, alcohol and caffeine overdose, and a higher probability to undertake risk-taking behaviors ('The Dangers Of Mixing Alcohol and Energy Drinks', 2018). Based on these negative findings and the likely benefits of the 'liquid energy', the question arises: What are the characteristics of a typical energy drink consumer?

Whereas the consumption of high energy drinks increased in the last decade, it was figured out that it is particularly high among young adults and adolescents. The consumption of HED of young adults is demonstrated in the research of Oteri et al. (2007), who conducted a study in the University of Messina School of Medicine in which out of 450 filled questionnaires, a total of 56.9% of students pronounced that they drink energy drinks. A substantial part of the consumers (48.4%) affirmed that they frequently drank energy drinks and alcoholic beverages together or mixed (Oteri, Salvo, Caputi, & Calapai, 2007). Another study by Cotter et al. (2013) studied the patterns of consuming caffeinated drinks amongst adolescents (13 - 17 years old) and young adults (18 - 25 years old). It was ascertained that young adults drank more energy drinks in the past 30 days with a prevalence of 57.9% than adolescents with a prevalence of 34.9% (Cotter et al., 2013) Another study, drawing from a sample of 795 students, analyzed the connection among gender and manliness criteria, sport-related character, risk-taking performance, and HED with the result that men drank more 'liquid energy' than women in the last month (Miller, 2008).

Not merely the demographic factors of the typical energy drink consumer have been studied, but also associated behaviors and personality characteristics. For instance, the research of Azagba, Langille, and Asbridge (2014) observed, in particular, the prevalence and the patterns of ED consumption with 8210 pupils in Canada and the associations to their personality. The outcome demonstrated that 62% of the participants consumed caffeine-containing drinks in the last year and that 20% of these consumers drank it at least once a month. Moreover, a positive association was found between Sensation-Seeking, substance use, depression and energy drinks, which means that pupils who drink more energy drinks, had a higher value in Sensation-Seeking, depression and a higher level of substance use (Azagba, Langille, & Asbridge, 2014). Arria et al. (2011) found similar outcomes. The research also analyzed the prevalence of the consumption and potential relationships to drug use. The outcome of the investigation described that consumers have as well a higher rate of alcohol consumption and a higher value in the characteristic Sensation-Seeking (Arria et al., 2010).

To measure the personality characteristic Sensation-Seeking, a test was created by Zuckerman, also referred to as the 'Sensation-Seeking Scale'. He defined the characteristic Sensation-Seeking as 'seeking of varied, novel, complex, and intense sensations and experiences, and the willingness to take physical, social, legal, and financial risks for the sake of such experiences' (Zuckerman, 1994, p. 27). Investigations resulted in a division of the scale into four dimensions, which are thrill and adventure seeking, experience seeking, disinhibition, and boredom susceptibility (Zuckerman, 1971). In the study of Arria et al. (2010), it is not explicitly stated why the participants had a higher rate of alcohol, but related to the dimensions of scale and because Sensation-Seeking is also associated with high risk-taking and impulsivity in decision-making processes, a connection can be regarded between both factors (Zuckerman, 2007).

The Theory of Planned Behavior and the Prototype Willingness Model. For getting more insights into the determinants of high energy drinking, models such as the Theory of Planned Behavior (TPB) and Prototype Willingness Model (PWM) are used. Ajzen (1991), and Zoellner, Estabrooks, Davy, Chen, and You (2012) examined the underlying factors of HED according to the TPB, with which it is possible to explain, predict, and find associations between the beliefs and the behavior of people in various settings. The factors of the model are Attitude, Subjective Norm, and Perceived Behavior Control which influence and affect the intention and behavior of a person. (Ajzen, 1991; Zoellner, Estabrooks, Davy, Chen, & You, 2012). Wang (2016) conducted a study with a sample of 539 participants and applied the Theory of Planned Behavior according to HED. For the factor Attitude and the appropriate questions

about the thoughts about benefits and healthiness of energy drink consumption, part of the outcome demonstrated that 68.7% of the sample disagreed and therefore stated that energy drink consumption is 'unhealthy'. Nevertheless, the majority of the sample indicated, that it also has benefits, for instance, improvement of the metabolic rate, attention, mood, physical and academic performances. The second determinant according to TPB is Subjective Norm, which can be understood as the possible influence of the social surrounding, for instance, of friends, health professionals, celebrities, or social media, on the behavior. Part of the outcome was that more than the majority (>50%) agreed that friends influence their behavior, but on the other side, more than the majority (>50%) indicated that they are not influenced by celebrities, like athletes or movie stars, their social media and other parts of their social surrounding.

Instead of the Theory of Planned Behavior, the Prototype Willingness Model (PWM) was used in this study. This model incorporates the findings and the factors Attitude and Subjective Norm of the TPB and the above-raised question: 'What are the characteristics of a typical energy drink consumer?' with the factor Prototype Perceptions. Moreover, the PWM by Gibbons and Gerrard (1995) is more appropriate for risk behavior because it is developed to explain judgments, human reasoning, and the decision-making process of individual.

The PWM, with the two distinct pathways, the 'reasoned pathway' and the 'social-reactive pathway' is displayed in Figure 1. The 'reasoned pathway' is deliberative and contains the appraisal of the likely consequences of risky behavior. Moreover, the potential influences of Attitude and Subjective Norm of an individual are incorporated into it. These factors can increase or decrease the intention of an individual to behave in a certain way. According to Ajzen (1991), Attitudes can be defined as beliefs of the outcome of behavior which can affect the risk behavior positively or negatively through an adjustment of the intention. However, in this research it is declared that instead of assessing how positive or negative the risk behavior is, it is more relevant to examine the individual's perception of the possibility of getting negative or positive outcomes of the performance (Morris, 2015). Subjective Norm can be described as the regulating influence of the social environment and whether the social surrounding's approve or disapprove of the behavior influence the individual performance.

In comparison to the 'reasoned pathway', is the 'social reactive pathway' less deliberative and more opportunistic, including Attitude, Subjective Norm, and Prototype Perceptions. The factors are influencing the proximate variable Willingness for exhibiting a behavior. Gibbons and Gerrard (1995) developed the second pathway due to the performance of a risk behavior without the awareness of the contingencies, adverse consequences, and no intention for the performance. (Gerrard, Gibbons, Houlihan, Stock, & Pomery, 2008; Morris,

2015). Besides Attitude and Subjective Norm, Prototype Perception can be related to a typical individual who performs a particular behavior. According to Morris (2015), an evaluation of similarity (self-enhancement) and favorability (categorization) to the Prototype of an energy drinker will take place, and a higher value in both factors of the evaluation will lead to a greater Willingness of the risk performance. The evaluation of self-enhancement and categorization consists of the in-group and out-group members and the preference of the characteristics of these groups according to the behavior. An in-group can be described as an identification of a person with people in the social surrounding according to factors and characteristics of them which lead to a feeling of membership; on the other side an out-group is a group of people with which no identification according to factors and characteristics takes place (Hogg, 2016; Simon, 1992). An example is that if the in-group members are consuming energy drinks, think it is healthy and that it has benefits like ‘being more awake during studying for an exam’ and the out-group members do not have these characteristics, the person is more willing to drink it as well (Morris, 2015). Not much research was exhibited regarding the factors Prototype Perception and Willingness related to HED and no research was found which incorporated the personality characteristic Sensation-Seeking into the model.

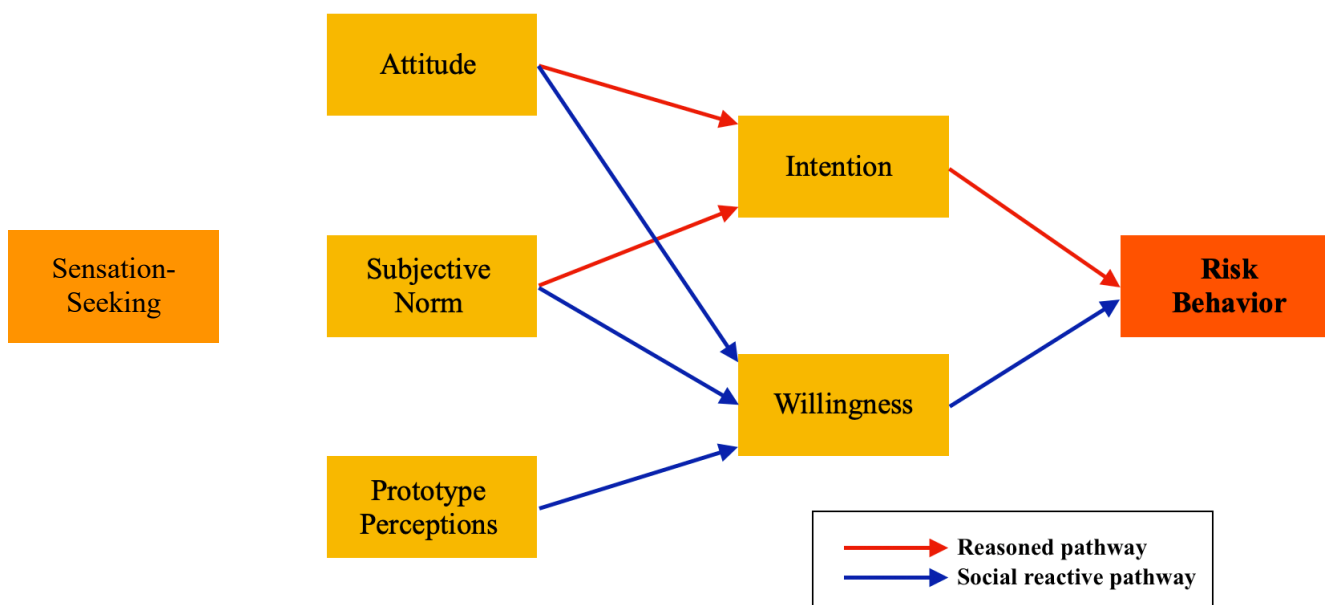


Figure 1. Illustration of the Prototype Willingness Model with Sensation-Seeking (Gibbons & Gerrard, 1995).

The aim of the study. The first aim of this study is the expansion of the previous work regarding possible associations between high energy drink consumption and the personality characteristic Sensation-Seeking. In previous research, it was discovered that individuals who drink more energy drinks have a higher value in Sensation-Seeking. The conducted research will be extended with a study to endorse or to oppose this outcome. The following research question can be formulated:

RQ1: ‘Do people who score high on the personality characteristic Sensation-Seeking consume more energy drinks than people who score low or mediate on Sensation-Seeking?’

Although much research was found according to the Theory of Planned Behavior, less research was ascertained about the factors Prototype Perception and Willingness, and the incorporation of the variable Sensation-Seeking into the Prototype Willingness Model. Therefore, the second aim of the study is to investigate the PWM including the variable Sensation-Seeking to examine potential associations between them. The following research questions can be formulated:

RQ2: ‘Is the personality characteristic Sensation-Seeking associated with the variables of the Prototype Willingness Model?’

Considering the multiple variables in the model, the research question is expanded into four sub research questions to get a deeper understanding of the components and whether Sensation-Seeking correlates with the determinants of the PWM and whether predictions take place. The research questions can be formulated as followed:

RQ2a: ‘Is Sensation-Seeking correlated to the variables of the reasoned pathway (Attitude, Subjective Norm, Intention, Risk Behavior) and social-reactive pathway (Attitude, Subjective Norm, Prototype Perception, Willingness, Risk Behavior)?’

RQ2b: ‘To what extent can Intention towards high energy drinking be predicted with the independent variables Sensation-Seeking, Attitude, and Subjective Norm?’

RQ2c: ‘To what extent can Willingness towards high energy drinking be predicted with the independent variables Sensation-Seeking, Attitude, Subjective Norm, and Prototype Perception?’

RQ2d: ‘Can Sensation-Seeking add to the prediction of high energy drink behavior over and above the variables of the Prototype Willingness Model?’

Methods

Design

A cross-sectional online survey was applied for this quantitative research to determine and measure the associations between the determinants of the Prototype Willingness Model and the personality characteristic Sensation-Seeking. Independent variables are Sensation-Seeking, Attitude (Direct Measure, Advantages, Disadvantages), Subjective Norm, and Prototype Perception (Positive Prototype, Negative Prototype, Prototype Similarity). The dependent variables are behavioral Intention, Willingness, and high energy drink consumption.

Study sample and Procedure

The Ethics Committee of the Faculty of Behavioral Management and Social Sciences of the University of Twente approved the conduction on 16th of April 2019 to ensure all mandatory requirements. For this study, inclusion criteria were being 12 years or older, and having adequate knowledge about the English language for participants with the age of 18 years of age or older because of the in English written questionnaire. For participants under 18 years old, the study was translated into Dutch to ensure comprehensive understanding. Appropriately, exclusion criteria were being younger than 12 years old or giving a refusal of the informed consent or parental consent.

The data gathering process of the research was accompanied by four researchers with the overall collective topic: ‘Energy Drink consumption according to the Prototype Willingness Model’ to increase the sample. Participants were able to find the study through a hyperlink in the SONA system (only for University of Twente students) or through dissemination on social media websites, for example, Facebook and WhatsApp. On these social media websites, some participants were asked to spread the questionnaire as well.

Besides the questionnaire, the study contained an information letter, informed consent, and parent consent, which informed the participants and parents about the content of the

questionnaire and the time required to take part in the study. Furthermore, it included a paragraph about anonymity and confidentiality, an explanation about the further progress of the data, and contact information of the responsible researchers. Both the informed consent and parental consent can be found in the Appendix of this study.

The data gathering process was finalized on 16th of May and in total 262 participants, mainly reached through the SONA system of the University of Twente, Football Equals Academy (FEA) in Enschede, and WhatsApp, participated in this research. Due to not finishing the questionnaire, 56 participants were excluded; overall, the study was analyzed with a convenience sample of 206 participants.

Each participant had to sign the informed consent to guarantee the approval of the participants. At least one parent or person in charge had to sign the parent consent of participants with the age of 12-17 years old. This parent consent was also given in an online form and had to be signed and sent back to one of the responsible researchers before taking part in the research.

For the conduction of the questionnaire, a web-enabled device with access to Qualtrics, with which the questionnaire was constructed, and a quiet place to ensure an uninterrupted study, was required. The expected duration of the study was approximately 20-25 minutes, and participants were given the possibility to leave an e-mail address at the end of the questionnaire for further questions, thoughts, suggestions or if interested in the result. If interested in the results, the participant received a summary via mail of the main results. Participants who are registered in the SONA system were offered a reward of .50 points after the conduction.

Materials

The questionnaire contained items concerning five overall topics: (1) Behavior of energy drink consumption, (2) Prototype Willingness Model, (3) Sensation-Seeking, (4) Demographic questions, and (5) Sport activity. Before disseminating the questionnaire, a pretest was done with five people to ascertain the clarity of the questions, to figure out mistakes and misconceptions. Based upon the results of these pilot-tests, some minor mistakes were corrected. The two principal improvements were changing the headline ‘Subjective Norm’ into ‘Opinions around you regarding energy drink consumption’ to make it more understandable for the participants, and adjusting the fourth question of this item into a more comprehensive one: ‘The people in my life whose opinion I value would 'completely disagree - completely agree' with my weekly consumption of energy drinks.’

(1) Behavior of Energy Drink Consumption. High energy drink consumption was measured with three items. First, participants were asked if they had ever drunk an energy drink, followed by a question if they had drunk it in the last months. This was followed by the question about how many days during the week they usually drink an energy drink (1 day – 7 days). Participants, who negated the first or the second question, were categorized into the first group: (1) No Energy Drinkers. Those, who affirmed the first and second question, and in addition responded to the third with one or two days, were categorized into the second group: (2) Low Energy Drinkers. Every participant who responded with three or more days was sorted into the third group: (3) High Energy Drinkers.

(2) Prototype Willingness Model. To gain insight into the Prototype Willingness Model, the survey comprised statements and questions about their Attitude, Subjective Norm, Prototype Perception, behavioral Intention, and Willingness of the participants according to HED. Each question had to be answered on a 5-point Likert scale.

Beginning with the *Attitude* of the participants, an evaluation was required concerning their opinions of energy drink consumption in general and regular according to given five opposite adjectives, for instance, 'harmful - beneficial' or 'pleasant - unpleasant.' These adjectives were chosen according to previous research measuring the opinions of people according to the Theory of Planned Behavior. The scores of both items were averaged into a 'Direct Measure' Attitude scale ranging from 1-5, where higher scores indicated a more positive Attitude (Cronbach's alpha = .93). Secondly, participants were asked to appraise various behavioral beliefs about the consumption of energy drinks, for instance: 'I believe that energy drink consumption could boost my energy and metabolic rate' (1= Fully disagree; 5=Fully agree). The five positive and ten negative beliefs were pulled from a survey with 15 participants about their beliefs of drinking ED. In each case, the beliefs were grouped with a Cronbach's alpha of 0.71 for the positive beliefs, and the negative beliefs .76.

To measure *Subjective Norm*, which refers to the perceived social pressure to perform or not to perform a specific behavior, participants had to appraise four items on a 5-point Likert scale, for instance: 'Friends important to me think that (1= I definitely should not; 5= I definitely should) consume energy drinks'. These normative beliefs had a Cronbach's alpha of .79 and were averaged into a 'Subjective Norm' scale.

Prototype Perception was assessed with six items which could be distributed into 'Favorability' and 'Similarity'. First, participants were asked to 'think one minute about the typical person your age who regularly consumes energy drinks', and evaluate how 'a typical

person your age who regularly consumes energy drinks is', according to 20 adjectives, for example cool, dynamic, or careless. These adjectives were collected according to another survey with the identical 15 participants and brainstorming among the researchers. The eleven positive items were classified into a 'positive Prototype Perception' scale and the nine negative items into a 'negative Prototype Perception' scale. The displayed Cronbach's alpha of the positive Prototype Perception was .90 and the negative Prototype Perception was .87. Then, for the second part, the participants had to evaluate on four items if they resemble a typical person their age who regularly consumes caffeinated drinks. These items were combined to a 'Similarity' scale of Prototype Perception with a Cronbach's alpha of 0.86.

For *behavioral Intention*, the participants had to evaluate the three statements: 'I intend to consume at least one energy drink in the next month, 'I intend to drink an energy drink in the next week.', and 'I intend to consume at least some energy drinks (3 or more) in the next month.' An 'Intention' scale could be figured out with the mean of each participant. Higher scores constitute a higher intention to consume energy drinks. Cronbach's alpha of the behavioral Intention scale was .94.

The similar answering method was given for the five items according to the *Willingness* of the participants regarding HED. An example question is: 'Suppose you have to drive home late at night, and you get tired. How willing are you to consume an energy drink?' As well as with the behavioral Intention scores, the scores of the Willingness were collected into a 'Willingness' scale, where higher scores indicate more willingness to drink energy drinks with a Cronbach's alpha of .90.

(3) Sensation-seeking. To measure the personality characteristic Sensation-Seeking of the participants, the 'Brief Sensation Seeking Scale' (BSSS-8), which is the short version of the Zuckerman Sensation-Seeking Scale-V (SSS-V), was applied (Stephenson, Velez, Chalela, Ramirez, & Hoyle, 2007; Zuckerman Sensation Seeking Scale, 2019)). The participants had to evaluate eight items according to a 5-point Likert scale (1=strongly disagree; 5= strongly agree). As well as the comprehensive questionnaire, the eight items of the brief version can be divided into the four topics: thrill and adventure seeking (I would like to explore strange places; I would like to take off on a trip with no pre-planned routes or timetables), experience seeking (I like to do frightening things; I would like to try parachute-jumping), disinhibition (I like wild parties; I like new and exciting experiences, even if I have to break the rules), boredom susceptibility (I get restless when I spend too much time at home; I prefer friends who are excitingly unpredictable), with which it is possible to measure the overall Sensation-Seeking of

the participants. The data of the Sensation-Seeking scale (Range = 1-5) was divided with a tertiary split into three groups: (1) Low Sensation-Seekers; (2) Mediate Sensation-Seekers; and (3) High Sensation-Seekers. The first group consists out of the people who scored between 1 - 2.88, the second group between 2.88 - 3.63 and the third group 3.63 - 5.00. The Cronbach's alpha of this scale lies at 0.82. The BSSS-8 is often used to examine the personality characteristic Sensation-Seeking and the Cronbach's alpha is sufficient, therefore, the Brief Sensation Seeking Scale (BSSS-8) can be considered as good in this study.

(4) Demographic questions. Four demographic questions were included at the end of the questionnaire regarding the gender, age, nationality, and ethnicity of the participants.

(5) Sport activity. For one experimenter, insights into the sports activities of the participants were relevant and accordingly, four questions were asked. To answer the research questions mentioned above, the results of the sports activities are not relevant; thus, the questions and outcomes will be only mentioned in the Appendix of this research.

Data Analysis

The data of the online-based survey design was analyzed through the program SPSS v. 24 (2017). To answer the research questions, the outcomes of the consumption of high energy drinks and the variables of the Prototype Willingness Model according to Sensation-Seeking were required. Initially, with the program SPSS, the descriptive statistics and frequencies calculated the means, standard deviations, and total numbers including percentages of the demographic characteristics, Sensation-Seeking group, and energy drink consumption group.

To examine if high sensation-seekers consume more energy drinks than people who score low or mediate on Sensation-Seeking, the means of both scales were analyzed. The one-way ANOVA test was used to compare the means of the three groups, and the Bonferroni post hoc test investigated in particular which groups display a significant difference ($p < .05$).

To gain insight as to whether the personality characteristic Sensation-Seeking is associated and correlated to the Prototype Willingness Model, a Pearson's correlation was conducted (RQ2a). Furthermore, to ascertain if the independent variables (Sensation-seeking, Direct Measure, Advantages, Disadvantages, Subjective Norm, Positive Prototype, Negative Prototype, Similarity) can predict the dependent variables (Intention, Willingness, high energy drink behavior), a hierarchical multiple regression analysis was applied. Therefore, the model was analyzed according to Intention towards HED (RQ2b) and Willingness towards HED

(RQ2c), and as the third regression analysis containing all variables of the Prototype Willingness Model according to the risk behavior (RQ2d).

Results

Frequencies and Descriptive analysis of the demographic characteristics. The frequencies and descriptive statistics, with the total numbers, percentages, means, and standard deviations of the demographic characteristics, including gender, age, and nationality, are displayed in Table 1. Most of the participants were female (59.2%), between 17-24 years old (mean age = 28.63), and German (61.2%).

Table 1

Demographic Characteristics (gender, age, nationality) of the Total Sample (N=206)

Characteristics	N (%)	M (SD)
Gender		1.59 (0.49)
Male	84 (40.8)	
Female	122 (59.2)	
Other	0	
Age		28.63 (13.88) ¹
12-16	16 (7.8)	
17-24	118 (56.2)	
25-75	72 (36)	
Nationality		-
German	125 (61.2)	
Dutch	56 (27.2)	
Other	25 (11.6)	

¹ Means and Standard Deviations are computed out of the raw data.

In Table 2, the frequencies of drinking ED and the variable Sensation-Seeking are displayed. Of the total sample (N=206), nearly 73% were categorized into the first group (1) No Energy Drinkers, which is a bigger proportion than expected. Thirty-eight participants (18.4%) were classified into the second group ‘Low Energy Drinkers’, and 18 participants (8.7%) into the third group ‘High Energy Drinkers’. In the second part of Table 2, it is demonstrated that 67 out of the 206 participants were grouped into low sensation-seekers, 67 participants into mediate sensation-seekers, and 72 participants into high sensation-seekers, based on a tertiary split. Furthermore, as expected, it is demonstrated in the table, that the no energy drinkers were older than the low and high energy drinkers as well as the low sensation-seekers were older than the mediate and high sensation-seekers.

Table 2

Frequencies of Drinking High Energy Drinks and Sensation-Seeking of the Sample (N=206)

Groups and Items		Total N (%) (N=206)	Mean of Age
Items Energy Drink Consumption			
1 Have you ever drunk an Energy Drinks?	Yes	172 (83.5)	-
	No	34 (16.5)	-
2 Have you drunk an Energy Drink in the last month?	Yes	56 (27.2)	-
	No	116 (56.3)	-
3 Over the last few months, on how many days during the week did you usually drink Energy Drinks?	1-2 days	38 (18.4)	-
	3-7 days	18 (8.8)	-
Groups			
Energy Drink Consumption			
(1) No Energy Drinkers ¹		150 (72.8)	
(2) Low Energy Drinkers ²		38 (18.4)	30.93
(3) High Energy Drinkers ³		18 (8.7)	21.66
			22.17
Sensation-Seeking			
(1) Low Sensation-Seekers		67 (32.5)	38.62
(2) Mediate Sensation-Seekers		67 (32.5)	28.39
(3) High Sensation-Seekers		72 (35)	24.19

1 No Energy Drinkers categorization: participant who negated first and second question

2 Low Energy Drinkers categorization: participants who agreed first and second question, and usually drank an ED 1-2 days during the week

3 High Energy Drinkers categorization: participants who agreed first and second question, and usually drank an ED 3-7 days during the week

Descriptive analysis and one-way ANOVA of the data. In Table 3, the means, standard deviations, Cronbach's alpha, and p-values of the one-way ANOVA of the relevant variables of the PWM are presented including the division into the three groups of the personality characteristic Sensation-Seeking: (1) Low Sensation-Seekers, (2) Mediate Sensation-Seekers and (3) High Sensation-Seekers. The outcome displays as expected that the participants in group three had a significantly higher mean in their HED compared to group one and two, which indicates that they are drinking more energy drinks than the other groups. The one-way ANOVA confirmed this outcome, and the Bonferroni post hoc test revealed that the difference between high sensation-seekers and low sensation-seekers was significant (RQ1).

In Table 3, one can also notice that high sensation-seekers scored significantly higher in the mean of Intention and Willingness than low and mediate sensation-seekers, which was

confirmed with the one-way ANOVA. Once more, the Bonferroni post hoc test ascertained that a significant difference existed between group one and three. This difference means that the objective to drink energy drinks and the volition to drink ED without many thoughts about it before was higher for the high sensation-seekers. No significant differences were found regarding the means of Attitude, Subjective Norm, and Prototype Perception with their respective subscales of the three Sensation-Seeking groups.

Table 3

Means, Standard Deviations, and one-way ANOVA of Attitude, Subjective Norm, Prototype Perception, Intention, and Willingness for the Total Group and Low, Mediate, and High Sensation-Seekers (N=206)

Variables	Alpha of scales	Total (n=206)		(1) Low Sensation-Seekers (n= 67)		(2) Mediate Sensation-Seekers (n= 67)		(3) High Sensation-Seekers (n= 72)		P-value ¹
		M	SD	M	SD	M	SD	M	SD	
Attitude										
Direct Measure (1-5)	.93	2.2	0.9	2.0	0.8	2.2	0.9	2.3	0.9	1.000
Advantages (1-5)	.71	2.8	0.7	2.7	0.6	2.8	0.7	2.9	0.7	.216
Disadvantages (1-5)	.76	2.4	0.5	2.4	0.5	2.4	0.5	2.4	0.5	.969
Subjective norm (1-5)	.79	1.4	0.6	1.4	0.7	1.5	0.6	1.4	0.5	.617
Prototype perception										
Positive Prototype (1-5)	.90	2.4	0.7	2.4	0.7	2.4	0.7	2.5	0.8	.403
Negative Pro. (1-5)	.87	2.9	0.7	3.0	0.6	2.8	0.8	3.0	0.8	.526
Similarity (1-5)	.86	2.1	0.9	2.0	0.9	2.1	0.9	2.2	0.8	.709
Intention (1-5)	.94	1.7	1.1	1.5	0.8	1.6	0.9	2.0	1.3	.016* ²
Willingness (1-5)	.90	2.4	1.0	2.0	0.9	2.4	0.9	2.5	1.0	.009* ³
Energy Drink Consumption (1-3)	-	1.4	0.6	1.2	0.5	1.3	0.6	1.5	0.8	.005* ²

*. Difference of means significant at the 0.05 level.

¹ P-value of the one-way ANOVA.

² High Sensation-Seekers differ significantly from Low Sensation-Seekers with p=.018.

³ High Sensation-Seekers differ significantly from Low Sensation-Seekers with p=.013.

Pearson's Correlation of the data. In Table 4, a univariate correlation analysis of the variables Attitude, Subjective Norm, Prototype Perception, with their respective subscales, regarding Intention, Willingness, and high energy drink consumption was conducted. The

results are displayed of the total group, and the low, mediate, and high Sensation-Seeking group. According to the Prototype Willingness Model (Figure 1), Attitude, Subjective Norm, and Prototype Perception correlate with Intention and Willingness, which subsequently correlate with risk behavior. This theory did not entirely coincide with the outcomes of this study.

Considering the total group, it can be noticed from the table that all determinants except Negative Prototype of the PWM significantly correlated with Intention, Willingness, and HED. Negative Prototype only significantly correlated with risk behavior, but not with Intention and Willingness. Regarding the three Sensation-Seeking groups, Disadvantages, and Negative Prototype had no or the weakest associations to Intention, Willingness, and high energy drink consumption. Conspicuous for the mediate sensation-seekers was that Subjective Norm did not have a significant correlation to the three variables. It was also recognized that in the high Sensation-Seeking group, the subscale Direct Measure of Attitude had the highest significant correlations to Intention, Willingness, and HED, compared to the low and mediate sensation-seekers (RQ2a).

Table 4

Pearson's Correlations of High Energy Drink Consumption, Intention, and Willingness with the Determinants from the Reasoned Pathway and Social-Reactive Pathway for the Total Group, and Low, Mediate and High Sensation-Seekers (N=206)

Variable	Total group (n=206)			(1) Low Sensation- Seekers (n= 67)			(2) Mediate Sensation- Seekers (n= 67)			(3) High Sensation- Seekers (n= 72)		
	Beh.	Int.	Will ¹	Beh.	Int.	Will ¹	Beh.	Int.	Will ¹	Beh.	Int.	Will ¹
Attitude												
Direct Measure	.57**	.62*	.69**	.42**	.57**	.78**	.41**	.47**	.57**	.75**	.73**	.72**
Advantages	.32**	.31**	.35**	.17	.25*	.42**	.31**	.39**	.21	.37**	.26*	.36**
Disadvantages	.16*	.20**	.28**	.07	.19	.25*	.19	.14	.35**	.21	.27*	.24*
Subjective norm	.20**	.31**	.26**	.28*	.48**	.36**	.14	.22	.21	.27*	.33**	.22
Prototype perception												
Positive Prototype	.23**	.26**	.32**	.27*	.23	.31**	.16	.21	.23	.24*	.29*	.39**
Negative Prototype	-.16*	-.13	-.12	-.09	-.20	-.24	-.19	-.13	-.01	-.20	-.12	-.14
Similarity	.36**	.44**	.29**	.34**	.46**	.33**	.19	.43**	.05	.50**	.44**	.45**

¹ Abbreviation Beh., Int., Will. = High Energy Drink Behavior, Intention, Willingness

*. Correlation is significant at the 0.01 level.

** . Correlation is significant at the 0.05 level.

Hierarchical Multiple Regression analysis predicting Intention towards HED. To predict high energy drink consumption, a set of hierarchical multiple regression analyses was administered (Tables 5-7). First, conduction to predict Intention corresponding to the Prototype Willingness Model was done (Figure 1), in which it is expected that if Sensation-Seeking, Attitude, Subjective Norm predict Intention, it can influence the risk behavior. In step 1, the predictor variable Sensation-Seeking was entered as the independent variable. Sensation-Seeking was able to significantly explain 2.2 percent of the variance in Intention ($F(1,202)=5.518, p=0.020$). In the subsequent step, Attitude, and Subjective Norm were entered. This significantly led to an increase of the proportion of variance, accounting collectively 40.4 percent of the variance, $F(5,198)=28.523, p=0.000$. Sensation-Seeking ($\beta=0.217$), Direct Measure of Attitude ($\beta=0.662$), and Subjective Norm ($\beta=0.269$) were significant predictors of the high energy drink consumption, and Direct Measure had the highest Beta value, which implies that between Intention and Direct Measure is the greatest relation.

Comparing these results to the three Sensation-Seeking groups, three things were discerned. Firstly, the variable Sensation-Seeking alone did not explain Intention in all three groups. Moreover, the total explained variance was much lower for the mediate sensation-seekers ($R^2=27\%$) ($F(5,50)=5.116, p=0.001$) than the low and high sensation-seekers (approximately $R^2=40\%$). These results indicate that the fluctuations of the variable Intention can be more explained by the low and high Sensation-Seeking group. Predictors for group one and two were Direct Measure and Subjective Norm, and only Direct Measure for group three. This indicates that the Intention of the participants to consume energy drinks mainly were resulted according to their personal opinion in general and regular ED consumption. Furthermore, for the low and mediate Sensation-Seekers, Subjective norm was a predictor of Intention (R^2b).

Table 5

Hierarchical Multiple Regression Predicting Intention towards High Energy Drink Consumption with Sensation-Seeking, Attitude, and Subjective Norm for the Total Group, and for the Low, Mediate and High Sensation-Seekers (N=206)

Predictions	Total (n=206)			(1) Low Sensation- Seekers (n=67)			(2) Mediate Sensation- Seekers (n=67)			(3) High Sensation- Seekers (n=72)		
	Adjusted R ²	Beta	Sig.	Adjusted R ²	Beta	Sig.	Adjusted R ²	Beta	Sig.	Adjusted R ²	Beta	Sig.
Step 1	.022			-.011			-.018			-.005		
Sensation-Seeking		.16	.020*		.11	.482		.03	.857		-.07	.027
Step 2	.404			.419			.272			.405		
Attitude												
Direct Measure		.55	.000***		.54	.001**		.31	.021*		.63	.000***
Advantages		.03	.602		-.10	.462		.03	.794		.08	.383
Disadvantages		.01	.873		-.10	.972		.15	.266		-.01	.909
Subjective Norm		.16	.005**		.38	.003**		.32	.014**		.03	.757

*p < 0.05; **p < 0.01; ***p < 0.001.

Hierarchical Multiple Regression analysis predicting Willingness towards HED. In a second, comparable multiple hierarchical analysis, we examined the relative contribution of the variables Sensation-Seeking, Attitude, Subjective Norm, and Prototype Perception predicting the dependent variable Willingness. In step 1, Sensation-Seeking accounted for 3.4 percent of the variance, $F(1,203)=8.166$, $p=0.005$. In step 2, the PWM variables Attitude including Direct Measure, Advantages, and Disadvantages, Subjective Norm and Prototype Perception including Positive and Negative Prototype and Prototype Similarity considered as the outcome with 50.9 percent of the variance in the prediction of Willingness ($F(8,196)=27.452$, $p=0.000$). The variables Sensation-Seeking ($\beta=0.251$), and Direct Measure of Attitude ($\beta=0.707$) were the most important significant predictors. Direct measure had the highest Beta value again, meaning the highest strengths to the dependent variable Willingness.

The table shows once more that Sensation-Seeking alone again did not explain the dependent variable Willingness if divided into low, mediate and high sensation-seekers. Furthermore, the outcomes of the mediate sensation-seekers explained the least variance of the dependent variable. Only for the Low sensation-seekers, Subjective Norm was a predictor for Willingness, meaning that the perceived social pressure of performance influenced the

Willingness of consuming an energy drink. Conspicuous also was that for the mediate and high sensation-seekers only Direct Measure predicted the Willingness towards HED (R2c).

Table 6

Hierarchical Multiple Regression Analysis Predicting Willingness towards High Energy Drink Consumption Including Sensation-Seeking, Attitude, Subjective Norm, and Prototype Perception for the Total Group, and for the Low, Mediate and High Sensation-Seekers (N=206)

Predictions	Total (n=206)			(1) Low Sensation- Seekers (n=67)			(2) Mediate Sensation- Seekers (n=67)			(3) High Sensation-Seekers (n=72)		
	Adjusted R ²	Beta	Sig.	Adjusted R ²	Beta	Sig.	Adjusted R ²	Beta	Sig.	Adjusted R ²	Beta	Sig.
Step 1	.034			.001			-.018			-.007		
Sensation-Seeking		.20	.005**		.15	.308		-.03	.828		-.05	.588
Step 2	.509			.553			.393			.477		
Attitude												
Direct Measure		.61	.000***		.64	.000***		.51	.000***		.64	.000***
Advantages		.02	.765		-.04	.775		-.07	.570		.08	.357
Disadvantages		.08	.135		.08	.578		.24	.060		.02	.818
Subjective Norm		.09	.084		.26	.028*		.15	.220		-.02	.788
Prototype Perception												
Positive Prototype		.05	.360		.07	.582		.01	.936		.04	.652
Negative Prototype		.09	.142		-.07	.656		.26	.055		.06	.500
Similarity		.08	.166		-.02	.867		.10	.397		.11	.203

*p < 0.05; **p < 0.01; ***p < 0.001.

Hierarchical Multiple Regression analysis predicting High Energy Drink Consumption. In Table 7, regression analysis was conducted for predicting the risk behavior high energy consumption. In step 1, it is shown that the independent variable Sensation-Seeking can account 3.6 percent of the variance in risk behavior ($F(1,202)=8.578$, $p=0.004$). Attitude, Subjective norm, and Prototype Perception including their subscales were added in the following step, and it collectively raised the proportion significantly by 33.5% percent of the variance, $F(8,195)=15.978$, $p=0.000$. Adding the independent variables Intention and Willingness in predicting the Risk Behavior, the final outcome again significantly increased the proportion to 64.1% of the variance, $F(10,193)=37.277$, $p=0.000$. Containing all variables, Intention had the most substantial strength to the risk behavior, and only the variables Sensation-Seeking, Direct Measure, Prototype Similarity, Intention, and Willingness significantly predict for the dependent variable. The contribution of Intention on the risk behavior was higher than of Willingness, meaning that the own plan, purpose, or aim to drink energy drinks was more important than the state of being willing to drink something in diverse situations, for example, if someone offers a person an energy drink .

Differences to the outcomes divided by the Sensation-Seeking groups are that Sensation-Seeking was again for all groups, not a significant predictor variable for the dependent variable high energy drink consumption. Moreover, for group low and mediate sensation-seekers only Intention was a significant predictor, and for the high sensation-seekers only Direct Measure, Prototype Similarity, Intention, and Willingness. This outcome indicates that if changing the energy drink consumption behavior of group one and two, one has to try to change the personal aim or plan to consume energy drinks of the participants, and for group three the personal opinions, the feeling of Similarity, the Intention, and the state of performing the behavior without prior thoughts about it (RQ2d).

Table 7

Hierarchical Multiple Regression Analysis Predicting High Energy Drink Consumption including Sensation-Seeking, Attitude, Subjective Norm, Prototype Perception, Intention, and Willingness for the Total Group, and for the Low, Mediate and High Sensation-Seekers (N=206)

Predictions	Total (n=206)			(1) Low Sensation- Seekers (n=67)			(2) Mediate Sensation- Seekers (n=67)			(3) High Sensation-Seekers (n=72)		
	Adjusted R ²	Beta	Sig.	Adjusted R ²	Beta	Sig.	Adjusted R ²	Beta	Sig.	Adjusted R ²	Beta	Sig.
Step 1	.036			-.010			-.014			-.008		
Sensation-Seeking		.20	.004**		.11	.467		.07	.618		-.04	.696
Step 2	.371			.182			.054			.464		
Attitude												
Direct Measure		.48	.000***		.36	.051		.32	.052		.59	.000***
Advantages		.03	.639		-.15	.431		-.05	.725		.09	.313
Disadvantages		-.04	.589		-.22	.262		.06	.700		-.01	.924
Subjective Norm		.06	.285		.11	.472		-.21	.166		.06	.494
Prototype Perception												
Positive Prototype		.00	.961		.24	.178		.10	.564		-.09	.321
Negative Prototype		.00	.953		-.04	.857		-.12	.483		.04	.666
Similarity		.20	.002**		-.33	.050		.12	.418		.24	.006**
Step 3	.641			.579			.357			.692		
Intention		.66	.000***		.88	.000***		.61	.000***		.59	.000***
Willingness		.15	.019**		.04	.820		.27	.088		.18	.038*

*p < 0.05; **p < 0.01; ***p < 0.001.

Discussion

Research Question 1. The first purpose of this study was to explore if people who score high on Sensation-Seeking consume more energy drinks compared to people who score lower. The outcomes indicate that high sensation-seekers consumed significantly more energy drinks than low sensation-seekers. This finding are in line with the studies of Azagba et al. (2014) and Arria et al. (2011), who ascertained a positive association between Sensation-Seeking concerning energy drink consumption, indicating that a connection consists among having a higher value in Sensation-Seeking and drinking more energy drinks. The outcome can be explained by the higher value of the variables Intention and Willingness of high sensation-seekers compared to low sensation-seekers. High sensation-seekers have, therefore, a more straightforward plan or aim to drink energy drinks and are more willing to drink them in various circumstances without predetermination. A possible reason can be that they have higher intense reward effects, signifying that the advantages of drinking energy drinks outweigh the risks of drinking them (Horvath & Zuckerman, 1993). Additionally, another reason can be having a higher optimistic bias, indicating that the consideration of having a negative outcome is rather small. Concerning Willingness, it is known that high sensation-seekers are more impulsive, which means they think less about the planning and outcomes and act more quickly in a risky situation (Horvath & Zuckerman, 1993).

A recommendation for practice is to further examine the HED because it has possible substantial adverse health effects, like hypertension, or cardiac arrhythmia, therefore, the outcomes can be used to prevent people from exhibiting the performance (Breda et al., 2014). Since it was figured out that Intention and Willingness were higher for high sensation-seekers, one could try to examine precisely for a vulnerable individual which specific factors have an influence on the dependent variables according to the PWM. Furthermore, one could include in the analysis the factors age, gender, and sport to find possible associations to HED to develop an individual program or intervention to change the risk behavior.

It is well-known that high sensation-seekers not solely drink more energy drinks but also take part in other risk behaviors, for instance, smoking, drinking alcohol, or performing imprudent and spontaneous actions (Arria et al., 2010; Malinauskas et al., 2007). Appropriate education in schools and universities could be a possibility to reduce and prevent these risk behaviors, as it is also known that high sensation-seekers are most often adolescents and adults (Prinstein, Boergers, & Spirito, 2001). It could influence the still-developing personality traits, beliefs, and opinions of the students and therefore, the intention, and willingness to exhibit a risk behavior. If it is figured out that a person needs further help, one could refer the adolescents

with parents or the young adult to qualified experts in this area for additional examination and practical measures regarding the potential risk factors.

Research Question 2a. The second objective was to acquire insight into the correlation between Sensation-Seeking and the variables of the PWM. For the total group, all variables except Negative Prototype, which only correlated with the risk behavior, were associated with the dependent variables Intention, Willingness, and HED. Considering the three Sensation-Seeking groups, Disadvantages, and Negative Prototype had no or the weakest association to the three dependent variables. The Subjective Norm of the mediate sensation-seekers did not correlate to the variables, and for the high sensation-seekers, Direct Measure and Attitude had the highest correlation compared to the low and mediate sensation-seekers.

These different correlations are not completely coincided to the above-depicted theory of the PWM. Applying the PWM related to energy drink consumption and Sensation-Seeking has not been studied before; therefore, it gives new insights into this field and can be applied for further research to get a deeper understanding of the factors. Due to the non-conformity to the model, one could examine how to change or improve the Model regarding risk behavior such as energy drinking or smoking as it is also found out in a study by Gerrard, Gibbons, Stock, Lune, and Cleveland (2005) that other correlations exists between the determinants.

A recommendation is it to invent a program to prevent or reduce the energy drink behavior. Related to the PWM and alcohol consumption an intervention by Gerrard, Brody, Murry, Cleveland, and Wills (2006) was done, trying to delay the onset of alcohol consumption and to reduce it. The outcome demonstrated, that both the intention and willingness could be best changed according to both pathways alone. A potential program will be explained according to the vulnerable high sensation-seekers because they consumed more HED. Related to Intention and Willingness, one could educate vulnerable people more about the possible disadvantages of drinking HED and clarify that not all beliefs of the advantages are true or rather also having disadvantages and risks. Especially noteworthy are the combination of high energy drinks and alcohol, which has more possible risks than HED alone. This information could also have a direct influence on the opinions about general and regular energy drink consumption. It is also essential, primarily for younger people, to mention that it is their own decision to consume ED and that they should not feel high social pressure to perform a particular behavior that they do not want to engage in. In the study of Litt and Stock (2011) it was demonstrated that changing the Subjective Norm of adolescents' alcohol risk-behavior can positively influence the willingness of drinking alcohol. It is also necessary to clarify how much ED can lead to disadvantages and adverse health effects. Calling the attention can also be

possible on the product itself or in advertisements, and every information can lead to a more conscious approach to not underestimate the regular consumption.

Research Questions 2b, 2c, 2d. The three following research questions contained the goals to obtain a more in-depth understanding into the Prototype Willingness Model and to investigate whether Sensation-Seeking and the determinants of the model are predictors of the reasoned pathway (RQ2b), social-reactive pathway (RQ2c), and the entire model (RQ2d). Commencing with RQ2b and RQ2c, the results of the total group indicate that the independent variables were rather weak in explaining the variance of Intention and Willingness. However, for the reasoned pathway, Sensation-Seeking, Direct Measure, and Subjective Norm were significant predictors of Intention, and for the social-reactive pathway, Sensation-Seeking and Direct Measure predicted Willingness. Regarding the three groups, the model can be better used for the low and high sensation-seekers for both pathways, with the difference to group three in the prediction of Intention that Subjective Norm was not a significant predictor of the model, and for Willingness that Subjective Norm was a predictor in group two. Related to the PWM by Gibbons and Gerrard (1995) this outcome was not expected, because important variables did not seem to predict the dependent variables.

It is demonstrated that for all groups only the beliefs about the general and regular ED and the perceived social pressure are worth of consideration, and therefore the reasoned pathway seemed to be more important than the social-reactive pathway. A reason for this outcome could be that consumers know less about the advantages and disadvantages or are not be influenced of them, rather personal opinions seem to be more important. For Willingness, additional findings are that Prototype Perception does not account for the people's openness to an opportunity. An explanation for this difference to the PWM is that many participants in this conducted study are either no energy drinkers or older than 23 years, which does not coincide with a typical energy drinker. Feeling similar to a typical person in the same age or being influenced by peer behaviors, especially in risk behaviors, is more relevant for adolescents than adults (Francis et al., 2017; Prinstein et al., 2001).

Results demonstrate for RQ2d that Sensation-Seeking, Direct Measure, Prototype Similarity, Intention, and Willingness are significant predictors of high energy drink consumption although the contribution of explaining the variance of the dependent variable is again rather small. In regard to the three Sensation-Seeking groups, these outcomes change that Sensation-Seeking is not a predictor, and for group one and two only Intention, and for group three Direct Measure, Prototype Similarity, Intention, and Willingness are predictors. Having included all variables, it can be recognized that the variable Intention contributes more to risk

behavior than Willingness. An explanation for this outcome could again be the age of the participants because adolescents are more inclined to take risks per se and also to agree to specific circumstances with fewer deliberations than people who are older and think more about potential consequences (Steinberg, 2008; Tymula et al., 2012) Taking this into account, practical implications are again to refine the Prototype Willingness Model by Gibbons and Gerrard (1995) and perhaps according to different age groups, Sensation-Seeking groups related to energy drink consumption for a more in-depth understanding.

Strengths and limitations

The first strong point of this study is, as demonstrated in Table 3, the Cronbach's Alpha of all relevant variables of the Prototype Willingness Model, which lies between .71 and .94. This outcome displays a high internal consistency and good reliability of the developed questionnaire. Secondly, combining the personality characteristic Sensation-Seeking with the Prototype Willingness Model according to the risk behavior energy drink consumption is a less researched field. Therefore, the gained knowledge contributes to new insights into research as well as practical applications to reduce or prevent the risk behavior.

On the other side, the study also has three limitations. Firstly, the questionnaire of this study was conducted with four researchers, investigating Sensation-Seeking, age, gender, and sport related to the PWM. According to the factor age, it was attempted to get a wider age range to make specific investigations possible. Nevertheless, it led to a sample including many people who do not consume energy drinks and people who are in a non-vulnerable age range. As found in the studies of Oteri (2007) and Bradford (2013), pupils and young adults drink more energy drinks than older people and having a sample without excluding those people could influence the generalizability and comparability of this work. In accordance to this limitation, it is recommended for future steps to repeat this study with a previously determined age range, for instance between 12-25 years old, to receive more comparable and relevant data.

A second limitation of this study are the scores of the Sensation-Seeking scale, which were categorized into three groups according to a tertiary split. In a prospective study, it is advised to use official cut-off scores or scores of a comparable study, especially between the mediate and high energy drinker, to get a deeper understanding of the differences between those groups. Subsequently, it is recommended to compare the outcomes with the results of this study and to discern possible discrepancies.

Thirdly, the analysis was done by dividing the energy drink consumers into three groups: (1) No Energy Drinkers, (2) Low Energy Drinkers, and (3) High Energy Drinkers.

Participants who drank energy drinks approximately 1-2 days in the last months were categorized into group two and participants who drank approximate 3-7 days in the last months were classified into group three. This classification was decided by the researchers because little research was found with an official score of how many days and especially how many energy drinks is unhealthy. To create a more generalizable outcome, it is recommended to figure out for different age groups and gender what amount of consumption can be categorized into different groups and to repeat the study.

Conclusion

This study investigated the associations between the personality characteristic Sensation-Seeking and the Prototype Willingness Model related to high energy drink consumption. The main conclusions are that high sensation-seekers are more vulnerable in drinking more energy drinks because, among other things, their stronger personal purposes and openness towards drinking them in various settings. Although all determinants of the PWM had a rather small contribution of explaining the fluctuations of drinking energy drinks, one can say that prevention and reduction of the consumption could be possible with applying appropriate education for adolescents and young adults in schools and universities on the determinants Direct Measure, Advantages, Subjective Norm, Positive Prototype, and Similarity. Important to mention is that it could be more useful to address the intention and willingness to drink HED alone with their corresponding associated variables. Educations and interventions are conceivable solutions to countermeasures against slogans like ‘Energy Drinks will enliven your mind and body’ (Red Bull Energy Drink, n.d.). Since consuming too much high energy drinks can have negative impacts on the body and the mind, it is necessary to alert people of the associated factors that they can acquire a greater awareness of the consumption and do not underestimate it.

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Appendix

Questionnaire

Energy Drink Consumption

Information letter

This research aims to get an insight into the attitudes and considerations of adolescents and adults regarding the consumption of High Energy Drinks. The questionnaire contains questions about the consumption of these drinks, and about the beliefs, you and your environment have about these drinks. In addition, there will be some general questions about the type of person that you are e.g., if you are engaged in sports and if you like to do exciting things.

Participation in this study is based on a voluntary basis. Before being able to participate in this study, agreeing on the terms mentioned in the informed consent is required. Especially, for the participants between 12 and 16 years of age, thus who are underage, there is a need to obtain informed consent from you and your parents or your legal representative(s) before taking part. When agreeing on these terms, you can start with the online survey, which takes approximately 25 minutes. You have the right to decline to participate and withdraw from this research at any time. Withdrawing from the study does not have any negative consequences, and there is no need to provide any reasons for that. The data collection and the use of the data are meant only for this study. Besides this, anonymity and confidentiality are given during and after the data gathering.

If you are interested in the main findings of the study, you have the opportunity to get a summary of these. For this, you can write down your email address at the end of the questionnaire. Your email address will be saved separately from the data of the study. If you have any questions, feel free to contact us.

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Jacob Heinze (j.heinze@student.utwente.nl) Janina Deiters (j.deiters-1@student.utwente.nl)

Informed Consent

As already stated, there are more aspects that need to be acknowledged before taking part in this study. There are no physical, legal or economic risks associated with participating in this study. Moreover, there are no guaranteed benefits for you by taking part in this study. Your privacy will be protected to the maximum extent allowable by law. No personally identifiable information will be reported in any research product. Moreover, only trained research staff will have access to your responses. Within these restrictions, the results of this study will be made available to you upon request. Moreover, the gathered data will only be used for the bachelor thesis and are not shown to third parties. Therefore, only the researchers Dilara Kocol, Nina Bergner, Jacob Heinze, and Janina Deiters plus their supervisors Dr. Marcel Pieterse, Dr. Stans Drossaert and Nienke Peeters, MSc, have access to the data. By clicking on 'Yes, I agree', it indicates that you are at least 16 years of age or that you are the legal guardian of the participant and allow him or her to take part in this research; you have read this consent form or have had

it read to you; your questions have been answered to your satisfaction and you voluntarily agree that you will participate in this research study.

' I hereby declare that

- I agree to participate in a research project led by Dilara Kocol, Nina Bergner, Jacob Heinze, Janina Deiters.
- I have been given sufficient information about this research project. The purpose of my participation in this project has been explained to me and is clear.
- My participation in this project is voluntary. There is no explicit or implicit coercion whatsoever to participate.
- It is clear to me that in case I do not want to continue the questionnaire, I am at any point of time fully entitled to withdraw from participation.
- I have been given the explicit guarantees that, the researcher will not identify me by name or function in any reports using information obtained from this interview, and that my confidentiality as a participant in this study will remain secure.
- I have been given the guarantee that this research project has been reviewed and approved by Dr. Marcel Pieterse, Dr. Stans Drossaert and Nienke Peeters, MSc and by the BMS Ethics Committee. For research problems or any other question regarding the research project, the Secretary of the Ethics Commission of the faculty Behavioural, Management and Social Sciences at University Twente may be contacted through ethicscommittee-bms@utwente.nl I have read and understood the points and statements of this form and I have had all my Questions answer to my satisfaction.'

Do you agree?

Yes, I agree (1)

No, I do not agree (2)

Parent consent

Purpose of the Study

This research is being conducted by Dilara Kocol, Nina Bergner, Jacob Heinze and Janina Deiters, four bachelor students of the Health Technology Psychology track. We are inviting you to participate in this research project about energy drink consumption. The purpose of this research project is to investigate the energy drink consumption among children, adolescence, young adults and adults.

Procedures

You will be asked questions about your Energy Drink consumption, but also about your attitudes and beliefs about these drinks and about the attitudes and behavior of the people in your environment regarding these drinks. In addition, there will be some questions about your

sports behavior, and about the kind of person that you are. You must be at least 16 years old or one of the legal guardians have to be present during the questionnaire, to participate in this research.

Potential Risks and Discomforts

There are no obvious physical, legal or economic risks associated with participating in this study. You do not have to answer any questions you do not wish to answer. Your participation is voluntary, and you are free to discontinue your participation at any time.

Potential Benefits

Participation in this study does not guarantee any beneficial results to you.

The broader goal of this research is to gain insights into the (attitudes about) energy drink consumption in different age groups, and which factors are related to energy drink consumption.

Confidentiality

Your privacy will be protected to the maximum extent allowable by law. No personally identifiable information will be reported in any research product. Moreover, only trained research staff will have access to your responses. Within these restrictions, results of this study will be made available to you upon request. Moreover, the gathered data will only be used for the bachelor thesis and are not shown to third parties. Therefore, only the researchers Dilara Kocol, Nina Bergner, Jacob Heinze and Janina Deiters plus their supervisors Dr. Marcel Pieterse, Dr. Stans Drossaert and and Nienke Peeters, MSc, have access to the data

Compensation

Right to Withdraw and Questions

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify. Because your answers will be anonymized, you can withdraw your consent till 5 working days (respite time) after the interview. The data you provided before you stopped participating however will be processed in this research; no new data will be collected or used.

If you decide to stop taking part in the study, if you have questions, concerns, or complaints, or if you need to report an injury related to the research, please contact the primary investigators:

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Jacob Heinze (j.heinze@student.utwente.nl)

Janina Deiters (j.deiters@student.utwente.nl)

Statement of Consent

By clicking on 'Yes, I agree', it indicates that you are at least 16 years of age or that you are the legal guardian of the participant and allow him or her to take part in this research; you have read this consent form or have had it read to you; your questions have been answered to your

satisfaction and you voluntarily agree that you will participate in this research study. You will receive a copy of this signed consent form.

I agree to participate in a research project led by Dilara Kocol, Nina Bergner, Jacob Heinze, Janina Deiters. The purpose of this document is to specify the terms of my participation in the project through being interviewed.

1. I have been given sufficient information about this research project. The purpose of my participation as an interviewee in this project has been explained to me and is clear.
2. My participation in this project is voluntary. There is no explicit or implicit coercion whatsoever to participate.
3. Participation involves filling in a questionnaire. The questionnaire will last approximately 20-25 minutes. It is clear to me that in case I do not want to continue the questionnaire, I am at any point of time fully entitled to withdraw from participation.
4. I have the right not to answer any of the questions. If I feel uncomfortable in any way during completion of the questionnaire, I have the right to withdraw from the interview.
5. I have been given the explicit guarantees that, if I wish so, the researcher will not identify me by name or function in any reports using information obtained from this interview, and that my confidentiality as a participant in this study will remain secure.
6. I have been given the guarantee that this research project has been reviewed and approved by Dr. Marcel Pieterse, Dr. Stans Drossaert and Nienke Peeters, MSc and by the BMS Ethics Committee. For research problems or any other question regarding the research project, the Secretary of the Ethics Commission of the faculty Behavioural, Management and Social Sciences at University Twente may be contacted through ethicscommittee-bms@utwente.nl
7. I have read and understood the points and statements of this form. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study.
8. I have been given a copy of this consent form co-signed by the interviewer.
9. If you would like to receive the main findings of the research you can write down your e-mail address at the end of the questionnaire. This e-mail address will be saved separately than the stored data to maintain anonymity.

Name participant

Signature

Date

Name legal guardian

Signature

Date

Start of Questionnaire

Description

In the following, you will be asked some questions about your behavior and consumption in relation to Energy Drinks. Before answering the next questions, it is important that you are aware of what an Energy Drink is. An Energy Drink usually contains sugar and stimulants like caffeine. Further, they may contain taurine, sweeteners, herbal extracts and amino acids. Its ingredients, mostly caffeine, are marked to provide the consumer with the benefits like alertness and enhancement of physical and mental activity. One Energy Drink unit is considered as 250ml. Typically, Energy Drinks are for example Rockstar, Red Bull or Monster, but other Energy Drinks do count as well.

Energy Drinks? Have you ever drunk Energy Drinks?

- Yes (1)
- No (2)

Skip To: Intro Attitude If Have you ever drunk Energy Drinks? = No

Last Month? Have you drunk an Energy Drink in the last month?

- Yes (1)
- No (2)

Skip To: Intro Attitude If Have you drunk an Energy Drink in the last month? = No

Days Over the last few months, on how many days during the week did you usually drink Energy Drinks?

- Never (1)
- 1 day (2)
- 2 days (3)
- 3 days (4)
- 4 days (5)
- 5 days (6)
- 6 days (7)

Every day (8)

Skip To: Intro Attitude If Over the last few months, on how many days during the week did you usually drink Energy Drinks? = Never

How many On a day on which you drink an Energy Drink, how many Energy Drinks (one drink = 250ml) do you usually have?

1 drink (1)

2 drinks (2)

3 drinks (3)

4 drinks (4)

5 or more drinks (5)

Attitude

The next few questions are about your attitude according to Energy Drink consumption. (Please tick and answer each of the following questions, also if you do not drink Energy Drinks). In the following two adjectives are opposed. Please indicate on the scale which adjective represent more your attitude towards Energy Drink consumption the more you.

Consumption is.. For me, Energy Drink consumption is...

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	
harmful						beneficial
unpleasant						pleasant
bad						good
worthless						valuable
unenjoyable						enjoyable

Beneficial, pleasant, good, valuable, enjoyable

For me, REGULAR Energy Drink consumption is...

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)
harmful					beneficial
unpleasant					pleasant
bad					good
worthless					valuable
unenjoyable					enjoyable

Beliefs

Now, you will be presented with several statements which you have to evaluate by determining either your level of agreement or disagreement towards the specific statement. (Please tick and answer each of the following questions, also if you do not drink Energy Drinks).

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
1. Drinking Energy Drinks boosts one's energy. (1)					
2. Drinking Energy Drinks increases one's heart rate. (2)					
3. Drinking Energy Drinks improves one's attention span. (3)					
4. Drinking Energy Drinks improves one's athletic performances. (4)					
5. Drinking Energy Drinks regularly leads to an increased blood pressure. (5)					
6. Drinking Energy Drinks regularly leads to overweight. (6)					
7. Drinking Energy Drinks deteriorates one's mood. (7)					
8. Drinking Energy Drinks deteriorates one's academic performances. (8)					
9. Drinking Energy Drinks regularly deteriorates one's teeth's. (9)					
10. Drinking Energy Drinks impairs one's athletic performances. (10)					
11. Drinking Energy Drinks improves one's mood. (11)					
12. Over time, you will have to drink more Energy Drinks to feel the effect. (12)					

13. Frequently drinking Energy Drinks could finally lead to addiction to these drinks. (13)

14. Drinking Energy Drinks leads to sleeplessness. (14)

15. Drinking Energy Drinks improves one's mental abilities, for example memory, imagination and thinking. (15)

Beliefs In how far do you agree to the following statements:

Opinions around you regarding Energy Drink consumption

This part of the questionnaire is about statements related to the 'subjective norm', which is about 'the perceived social pressure to perform or not to perform the behavior' (Ajzen, 1991). (Please tick and answer each of the following questions, also if you do not drink Energy Drinks).

Expectations **Please indicate what you think your friends/family expect you to do:**

	Strongly disagree (1)	Disagree (2)	neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
Friends important to me think that I should consume Energy Drinks. (1)					
My family thinks that I should consume Energy Drinks. (2)					

Please indicate on the scale in how far you agree with the following statements.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
1. It is expected from me that I consume Energy Drinks when I am surrounded by my friends. (1)					
2. The people in my life whose opinion I value would agree with my weekly consumption of Energy Drinks. (2)					
3. When it comes to Energy Drinks, I comply to the opinion of my friends. (3)					
4. When it comes to Energy Drinks, I comply to the opinion of my family. (4)					

Prototype A typical person consuming Energy Drinks

The next few questions are dealing with how you perceive a typical person your age, who is regularly drinking Energy Drinks. Therefore, think one minute about the typical person your age who regularly consume Energy Drinks. (Please tick and answer each of the following questions, also if you do not drink Energy Drinks).

Please indicate how far you think the following attributes represent a typical person who consumes Energy Drinks.

A typical person at your age who regularly consume Energy Drinks is...

	Not at all (1)	Not really (2)	Neutral (3)	A little bit (4)	Very much (5)
Cool (1)					
Dynamic (2)					
Confident (3)					
Independent (4)					
Popular (5)					
Careful (6)					
Smart (7)					
Athletic (8)					
Extrovert (9)					
Adventurous (10)					
Hard Working (11)					
Careless (12)					
Childish (13)					
Boring (14)					
Not attractive (15)					
Immature (16)					
Selfish (17)					
Lazy (18)					
Unreliable (19)					
Chaotic (20)					

Similarity

A typical Energy Drink consumer compared to you

The questions below are related in how far you think a typical Energy Drink consumers is similar to yourself. (Please tick and answer each of the following questions, also if you do not drink Energy Drinks).

Do you resemble the typical person your age that regularly consumes Energy Drinks?

- Definitely not (1)
- Probably not (2)
- Might or might not (3)
- Probably yes (4)
- Definitely yes (5)

Similarity

How similar or different are you to the type of person your age that regularly consumes Energy Drinks ?

- Not at all similar (1)
- Not similar (2)
- Neutral (3)
- Similar (4)
- Very Similar (5)

I am comparable to the typical person my age that regularly consumes Energy Drinks.

- Strongly disagree (1)
- Disagree (2)
- Neither agree nor disagree (3)
- Agree (4)
- Strongly agree (5)

To what extent are you like the typical person your age that regularly consumes Energy Drinks?

- To no extent at all (1)
- To almost no extent (2)
- Neutral (3)
- To some extent (4)
- To a great extent (5)

Behavioral Intention

The questions you will be presented in the following refer to your behavioral intention to consume an Energy Drink. (Please tick and answer each of the following questions, also if you do not drink Energy Drinks).

Please indicate how strongly you agree with the following statements.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
I intend to consume at least one Energy Drink in the next month. (1)					
I intend to drink an Energy Drink in the next week. (2)					
I intend to consume at least some Energy Drinks (3 or more) in the next month. (3)					
I intend to consume at least some Energy Drinks (3 or more) in the next week. (4)					

Willingness

In this part, you will be presented with questions regarding your level of willingness to execute the behavior of drinking Energy Drinks in certain situations. (Please tick and answer each of the following questions, also if you do not drink Energy Drinks).

	Definitely not willing (1)	Probably not willing (2)	Might or might not willing (3)	Probably willing (4)	Definitely willing (5)
Suppose you have to drive home late at night and you get tired. Your co-driver offers you an Energy Drink. How willing are you to consume that drink? (1)					
Suppose you are at a party where everybody is drinking Energy Drinks. How willing are you to join them and take an Energy Drink yourself? (2)					
Imagine you need to study a lot for an exam. A fellow student offers you an Energy Drink. How willing are you to consume the Energy Drink? (3)					
When someone offers an Energy Drink to you at a party, how willing are you to consume it? (4)					
Imagine you did not sleep a lot last night and you are tired. A friend offers you an Energy Drink. Would you consume the Energy Drink? (5)					
Suppose someone offers you an Energy Drink when you want to do sports. How willing are you to consume it? (6)					

Imagine a friend of
you offers you an
Energy Drink. How
willing are you to
consume it? (7)

Sensation-seeking

In this part of the questionnaire, the questions are about your personal characteristics related to your tendency to engage in sensory excitement and pleasure.

Please indicate in how far you agree to the following statements.

	Strongly Disagree (1)	Disagree (2)	Neither disagree nor agree (3)	Agree (4)	Strongly agree (5)
1. I would like to explore strange places.					
2. I would like to take off on a trip with no pre-planned routes or timetables.					
3. I like to do frightening things.					
4. I would like to try parachute-jumping.					
5. I like wild parties.					
6. I like new and exciting experiences, even if I have to break the rules.					
7. I get restless when I spend too much time at home.					
8. I prefer friends who are excitingly unpredictable.					

Sport questions

Do you do sport?

- Yes (1)
- Maybe (2)
- No (3)

Skip To: Intro demographics If Do you do sport? = No

Now, four questions regarding participation in sports activities will be asked.

Amount sport 1. How many days during one week, on average, do you do sport?

Hours sport 2. How many hours during one week, on average, do you do sport?

What sport 3. What is the sport you do the most?

Level sport 4. On what level do you do the sport, mentioned in the question before?

- Recreational (1)
- Competitive (amateur) but not too fanatically (2)
- Competitive (amateur) fanatically (3)
- Competitive professional (not paid) (4)
- Competitive professional (paid) (5)

Demographic Data

What is your gender?

- Male (1)
- Female (2)
- Other (3)

Age How old are you? Please fill in your age:

Nationality What is your nationality?

Education What highest level of education do you have?

- Student (1)

- High School Diploma (2)
- College Diploma (3)
- Bachelor's degree (4)
- Master's degree (5)
- Other (6) _____

Email for findings There is the opportunity offered to get a summary of the main findings. Please enter your email address in the box, if you are interested to receive the main results.

If you have any comments or recommendations, please indicate them in the box below.

Thank you for taking part in our survey. If you have any further questions or recommendations, please feel free to contact the researchers.

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