

THE PSYCHOLOGY BEHIND DIET

ASSESSING THE IMPACT OF EMOTION REGULATION AND TYPE-D PERSONALITY
TRAITS ON DIETARY CHOICES



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The Psychology Behind Diet

Assessing the Impact of Emotion Regulation and Type-D Personality Traits on Dietary Choices

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In loving memory of my grandmother, Kausalya.

When I wrote my Statement of Purpose for TU Delft, I focused on the overall value of the course and the university. Everything has been a surprise so far. I would not say that everything was always wonderful. There were instances when I felt unsure about my decisions. Nonetheless, these challenges have made the journey more meaningful and rewarding. I have evolved academically and personally, and I would like to take this opportunity to recognize and appreciate everyone, who helped me along the way.

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For those who are reading this, I would like to go with my favorite saying,

“Never give up. Today is hard, tomorrow will be worse, but the day after tomorrow will be sunshine.”

Wishing you a healthy and wholesome read ahead.

Abstract

Dietary habits refer to the set of choices or decisions one makes regarding the foods consumed. They include choices and decisions on what to eat when to eat, how much to eat, and where to eat. Taste preferences, food diversity, frequency of meal consumption, portion sizes, snacking behavior, and meal skipping all have an impact on this. According to research, not only physiological but also psychological elements such as emotions, stress, and personality differences influence our dietary choices.

Many studies have been conducted to determine how to alter problematic eating choices by regulating emotions. Understanding one's personality type, on the other hand, can help someone to become more aware of the foods liked and disliked. This is the first study to look at the combined effect of emotion regulation strategies and, in particular, Type-D personality type on eating choices. This thesis focused on women from various ethnic origins. The study looked at which emotion control strategies, such as cognitive reappraisal and expressive suppression, were employed. Individuals were also assessed on the extent to which they were in the possession of a Type-D personality type by scoring on the two variables in this model, which are negative affectivity and social inhibition.

This study hypothesized that people with Type-D personality, or those who score high in Negative Affectivity and Social Inhibition, employ less emotion regulation strategies and make poor dietary choices. The main findings confirm the hypothesis. As per the findings, reappraisal strategies outperform suppression methods. It was discovered that when reappraisal methods were used, women preferred more healthy food items like vegetables. However, when suppression strategies were used, unhealthy food items such as snacks were favored. Furthermore, the study looked at how age, a control variable, affected the use of emotion regulation strategies in food choices. Younger women were found to apply more reappraisal strategies for healthier foods, whereas older women used suppressing methods. In conclusion, this study confirmed previous research on the independent influence of emotion regulation and personality type on diet, and it also added new insights to the research by examining the combined effect of these factors on diet choices.

Keywords - *Dietary choices, Emotion Regulation, Reappraisal strategy, Suppression strategy, Type-D personality, Negative Affectivity, Social Inhibition, Structural Equation Modelling(SEM), Partial Least Square Structural Equation Modelling (PLS-SEM)*

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1 Introduction

1.1 Background

Most people are picky over food. On some days, a chocolate cake seems to be preferable to an apple, while on other days, the opposite is true. Broccoli is often considered a tasteless vegetable and is usually ignored from meals by picky-eaters. Yet, preferences are most often overlooked while hungry. This raises two fundamental questions: how do these dietary decisions get made? Why do some people make healthier decisions than others?

These important questions have attracted much interest from economists, psychologists, and neuroscientists. Factors like mood, environment, mental stability can affect the way one chooses these meals. Moreover, food choices made are also a product of how people are. For example, a person who is depressed may binge on junk food to change the course of the feeling, or not to give any thought to what food does to their body. Still, another person who is not depressed may decide to watch what is fed to the body to have a sound mind.

People suffering from food disorders like obesity are often criticized for having a bad diet, whereas the interplay of affective and psychological factors also influence the individual's food habits. Psychological factors such as emotions can have a significant impact on food decisions. The emotions that individuals encounter daily can push them to act and affect large and minor decisions in both positive and negative ways. As a result, there should be a mechanism in place to assist an individual in making a rational decision that will be less harmful in the long run. Emotion regulation is a method that can aid with emotional instability. [24] hypothesized that exercising cognitive control over emotional responses would encourage more goal-directed decision-making, reducing risky decisions.

Another factor is the personality characteristics that an individual possesses. Personality traits serve as an initial judgment of an individual. People may recognize someone by personality traits rather than the given names. For example, that angry neighbor, the helpful coworker, and a cheerful stranger. Personality traits, like emotions, have an impact on decision-making. There are many types of personality models. The most well-known model is the Big-Five model, sometimes known as the Five-Factor Model. The Big-five personality traits are extraversion, agreeableness, conscientiousness, openness, and neuroticism. [32] showed that decision-makers with lower levels of extraversion and agreeableness and greater levels of conscientiousness and openness made better decisions. There are numerous personality types, such as Type-A, Type-B, and so on. However, research into the effects of Type D personality on clinical and psychological outcomes has exploded in the last decade. Type-D personality consists of two dimensions: Negative Affectivity (NA) and Social Inhibition (SI) [25]. Individuals with a high Negative Affectivity score have higher levels of distress, anxiety, sadness, irritability and when interacting with others, people with high Social Inhibition tend to feel restricted, uptight, and insecure [25].

Most studies concerning obesity concentrate on a single cause underlying unhealthy food habits. If a person suffering from food disorders, it is easier to help if the person has observable reasons such as malnutrition or overeating which can be cured just by having a nutritious meal or having supplements. But, if the person having food disorders is mainly suffering because of unobservable factors such as psychological factors, then it is difficult to help with the traditional methods. Unfortunately, the ways in which people decide on food consumption remain largely unclear. Previous studies reveal that the way feelings are managed affects eating habits [34]. Similarly, [12] showed the possibility of a link between eating disorders and Type D personality. All these studies took a single pathway towards dietary behavior. Considering the million complex pathways human beings possess, a study involving more predictors of unhealthy eating habits thus is necessary. Especially insight into how

feelings and personality traits authorize food consumption can help in revealing the minute symptoms which go unnoticed.

1.2 Research Objective and Research Question

The majority of studies on food consumption compare healthy and unhealthy food options. How significant are emotions and personality traits as factors that influence what, where and why we eat? Consider a survey in which participants are asked to choose between an apple and a chocolate cake: Knowing how sad or happy these participants are, may help in predicting what the outcome will be. For a proper understanding of food consumption, emotion regulation is a necessary tool. Many studies show that binge eating, snacking, and other eating disorders are the resultant actions of emotion dysregulation. Personality traits also shape an individual in conducting oneself under exposure to food. Type D personality traits, for instance, consist of individual differences in negative emotions and public avoidance. Negative emotions can to some extent be controlled by emotion regulation strategies, but the negative emotions that are already part of the personality model cast a doubt on how effective these strategies will be.

Therefore, the main research objective of this thesis is to *determine if personality characteristics and emotion regulation have different effects on dietary choice behavior.*

The present research will focus on the affective and personality factors that influence dietary choice behaviors. Thus far, researchers have carried out separate (exploratory and descriptive) studies on the impact of emotion regulation and Type-D personality on diet. Most of the studies involving the Type-D personality model mainly opted for a clinical group of people [12]. Studies on stress and emotion regulation mostly experimented on a single set of people in a contrived setting [82]. This research will explore the cross-cultural background and other demographic differences of people in relation to dietary choice behaviors. The following questions will be addressed in this study:

What is the impact of affective and personality factors on people's dietary choice behavior?

To understand the theories in depth, sub-questions(SQ) are framed.

- 1. Which factors play a major role in assisting people in making healthier food choices?*
- 2. Is there a link between Emotion regulation strategies and Type-D personality traits?*
- 3. How can Emotion regulation strategies and Type-D traits be specified?*

SQ1 will determine which of the factors has the greatest impact on dietary choices. This question will help to clarify whether emotion control has a bigger impact on dietary habits or Type-D personality traits. SQ2 will assess whether the factors interact if there is a positive or negative correlation between the two psychological elements(emotion regulation Type-D traits), the strength or weakness of the connection. SQ3 will define two main constructs of the study: emotion regulation strategies and Type-D personality traits.

1.3 Research Relevance

Several characteristics of human eating behavior could be useful in developing successful treatments or prevention strategies for diseases including obesity, diabetes, and metabolic syndrome, which have a strong nutritional component to their medical background. This research not only looks at individual food habits but also at consumer behavior (especially its psychological aspects) are taken

into account. The study could also aid in determining the emotional condition of the consumer, which influences the purchasing decisions. It could assist in determining which types of customers enjoy or detest meals depending on their personality attributes.

Understanding the relationship between emotion modulation and personality characteristics is critical for understanding healthy and/or unhealthy dietary habits. This interconnection can help in recognizing under what circumstances, which types of individuals are at risk of unhealthy dietary choice behaviors. This may contribute to *tailor – made health treatments*: Effective mood-related, mental health therapies and personalized interventions can be developed to enhance the frame of mind to ensure that an individual makes a healthier dietary choice, which may improve overall well-being.

1.4 Report Structure

Chapter 1 : The chapter provides an overview of the research. The research purpose is stated, as well as research questions that will be addressed in subsequent chapters.

Chapter 2: Introduces the study’s main topics. Provides thorough information about previous research on the topics and highlights gaps in the existing literature. Additionally, it assists in narrowing down the critical facts required for the current study, which will aid in proving or refuting the theories presented in the previous literature.

Chapter 3: This section illustrates the conceptual model that constitutes the hypothesis for the current study.

Chapter 4: The participants in the study, the procedures, the measurement of variables, and how the data is analyzed are all covered in this chapter.

Chapter 5: This section presents the findings of various analyses conducted for this present study.

Chapter 6: The key findings are expressed in this chapter with the help of the previous chapter, which helps in assessing whether the hypothesis is supported or not. Next, how the research will help in a theoretical and practical way is presented. The limitations and recommendations are discussed at the end of this chapter.

Chapter 7: This chapter summarizes the research and outlines the work to be done in the future.

2 Literature Review

This chapter will explore the literature surrounding emotion regulation, Type-D personality, and the impacts on dietary behavior to establish the relevance of my research question:

What is the impact of affective and personality factors on people's dietary choice behaviors?

This chapter begins by defining stress and diet choices made in day-to-day life. Then the literature focuses on emotion regulation, the strategies used, how gender and age affect these strategies. The next section of the literature review begins by defining Type-D personality, and discussing how gender and age influence these traits. The final section focuses on the existing research of both emotion regulation and Type-D personality and its impacts on dietary behavior. A summary is provided at the end of this literature review that sums up all the content to remind the readers about the essence of the research.

2.1 Dietary behavior

Food choices and dietary patterns that meet critical nutrient requirements and safeguard against the development of chronic lifestyle-related disease are referred to as dietary behavior [90]. There is evidence that eating habits must change to minimize the risk of obesity-related illnesses all over the world [53]. Studies like [56] showed that a poor diet intake affected the health, well-being, and academic performance among university students. Environmental factors, societal factors, and individual factors including psychological ones influence the dietary intake [56].

In the case of obesity management in clinical practice, there is strong evidence that combining nutrition, physical activity, and behavioral support leads to more weight loss than single lifestyle therapies [94]. As these food disorders have increased tremendously, there is a growing interest in subjects of behavioral aspects such as stress and emotions, particularly negative emotions. According to new research, negative emotions induced by stress lead to uncontrollable eating [59]. Findings by [80] revealed brain pathways by which cognitive strategies diminish food cravings, and hence a potential method by which cognitive therapies can effectively reduce food cravings. An experiment by [86] revealed that participants who used emotion strategies such as expressive suppression ingested considerably more calories than participants who used cognitive reappraisal. However, the studies mainly focused on comfort food consumption and did not investigate if the reappraisal strategy acted as a shield against emotional eating [34].

Considering the psychological factors of obesity, it is very necessary to know which of these factors have a higher weightage. This is important to know, as early intervention on these factors can help in redirecting the diet choices.

2.2 Eating Behavioral Scales

Food behavior self-assessment questionnaires have been widely employed in the general population. These tools assess food-related attitudes or qualities. Some of the tools like the Food Choice Questionnaire (FCQ) were developed to assess the importance of a wide range of aspects connected to food choice to individuals [83]. The Food Choice Questionnaire (FCQ) was for instance developed to assess the importance of a variety of dietary choice aspects to individuals [83]. The findings by [83] showed that the strongest factors of food choice were identified as price, health, convenience, and sensory appeal.

The Dutch Eating Behaviour Questionnaire (DEBQ) and the Three-Factor Eating Questionnaire (TFEQ) were established to measure character traits other than food-related physical ones [97] [85].

The DEBQ comprises three scales (Restrained eating, Emotional Eating, and External eating) with two dimensions, one dealing with eating in reaction to diffuse emotions, and the other with eating in reaction to clearly identified emotions [97]. The TFEQ assesses the cognitive and behavioral aspects of eating in obese people with the help of three eating behavior scales (cognitive restraint of eating, disinhibition, and hunger) [85]. Only diffuse emotional states cause overeating, while precisely labeled emotions do not affect eating behavior [97]. The disinhibition scale predicts weight fluctuation during the depression: the higher the disinhibition score, the higher the weight gain, but not dietary restraint [85].

Because of the emphasis on obese persons, the DEBQ and TFEQ fail to measure features in the broader population [98]. For instance, in the literature on children's eating problems, "fussiness" emerged as one of the major problems contributing to under-eating behavior among toddlers and teenagers. The Child Eating Behaviour Questionnaire (CEBQ) was developed to measure many other food-approach traits that were not incorporated in TFEQ nor the DEBQ [98]. The CEBQ includes the major characteristics of eating style in body development and is intended to be completed by parents concerning their children's regular eating behavior [98]. According to [98], the CEBQ's theoretically based scales effectively catch individual differences in eating behavior that parents identify in their children [98].

Even though CEBQ is a validated questionnaire, it lacks comparable measurement for adults. The Adult Eating Behaviour Questionnaire (AEBQ) was created to see if the relationships between appetitive qualities and Body Mass Index (BMI) seen in children are also present in adults [51]. The AEBQ is a reliable self-report measure of adult appetite qualities that provides a complete, accessible, and easy-to-use measure of an adult's appetite [51]. Studies by [51] reveal that people with higher BMIs score higher on Food Responsiveness, Emotional Over-Eating and Food Enjoyment, and lower on Satiety Responsiveness, Emotional Under-Eating, and Slowness in Eating. These findings are in line with those in children using the CEBQ. Additionally, [103] found that the AEBQ is the only validated adult appetitive trait measure that additionally assesses various food avoidant qualities linked to inadequate dietary intake. The AEBQ has been verified in international samples. [52]. It is necessary to determine whether the AEBQ is a valid measure of appetitive qualities in adult populations from various nations, as well as from various socioeconomic and cultural groups [52].

According to the recent studies by [30], self-reported food preferences using Food Preference Questionnaire (FPQ) have been identified as one of the most powerful predictors of teenage eating choices. The research examined the relationship between adolescent dietary preferences FPQ and AEBQ. The study found that all food preference scores were related to AEBQ's food approach and food avoidance traits [30]. As a result, taking preferences and diet quality into account could aid in forecasting various characteristics such as appetitive qualities as well as extra elements encouraging food disorders in adolescents and adults.

2.3 Stress and dietary behavior

People make a (New Year's) resolution to follow a healthy lifestyle every year. Despite the best intentions, environmental factors, like work, vacation, or even watching images of the craving food subdue the willpower to continue the practice of having a nutritious meal [7]. Apart from environmental factors, mental health also plays a major role in our daily intake of food. One of the main causes of our well-being is stress. Stress is referred to as a sensation of mental or physical discomfort. Any event or thinking that makes a person upset, angry, or anxious may initiate stress. Stress can be beneficial in small doses, such as when it helps you escape danger or meet a deadline [79]. However, in this fast-moving generation, people tend to consume quick and easily accessible meals which are usually nutrition deficient. These food choices dictate our dietary behavior [102].

Several systematic reviews and meta-analyses have explored the correlation between diet and mental health. Findings by [34] show that people who eat more in response to stress have a hyperphagic-stress response, whereas people who eat less in response to stress have a hypophagic-stress response. Likewise, [82] suggests that constructive social interactions such as social inclusion, neutrality, and social exclusion should be taken into consideration in the study of stress-eating. The current research suggests that stress is to blame for increased food consumption during negative emotional experiences.

2.4 Emotion

Emotion is a multi-leveled behavioral process requiring brain and chemical interaction on many levels [67]. Different types of experiences stimulate distinct emotions, and each emotion is elicited by a different type of event [66]. Emotions are the carriers of cognitive information of how an individual is behaving in day-to-day life [66]. Given that emotion is viewed as information (i.e., conveying the importance of a situation to a person's well-being) and affect regulation is viewed as a crucial human motivator, emotion must be focused on, validated, and dealt with directly in therapy to induce emotional change.

Human beings make unconscious decisions for regulating positive and negative emotions. Recent evidence suggests that eating disorder symptoms such as bingeing, purging, or restricting are unhealthy actions performed to suppress negative emotions [35]. As stated by [82], 40 - 50 percent of the population increase their food intake while stressed. This condition is very often called emotion regulation. Emotion regulation refers to the process by which individuals influence the intensity, duration, or manifestation of a response.

2.4.1 Emotion Regulation

Emotion regulation can include increasing or decreasing both positive and negative emotions [16]. It is characterized by several extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions to achieve one's goals [9]. The process model of emotion regulation is a popular framework for exploring emotion regulation mechanisms. According to this model, there are five families of emotion regulation: selection, situation modification, attentional deployment, cognitive reappraisal, and expressive suppression [44].

Situation selection refers to acts that increase (or decrease) the likelihood of being in a situation that may elicit positive (or unfavorable) feelings. Meeting up with a friend with whom one can laugh after a difficult day is an example of situation selection [41]. Taking measures that directly alter a situation to influence its emotional impact is referred to as situation modification. When we drink a quick beer before a new date to calm our nerves, this is an example of situation modification [96]. The act of directing one's attention to influence one's emotional response is known as attentional deployment. For example, thinking about one's vacation plans while in a depressing meeting. Cognitive reappraisal is a process of changing one's perception of a circumstance to change how it affects one's emotions. An example of cognitive reappraisal would be if a person fails in an exam and thinks for himself that this is not the last exam of his life and continues trying. After an emotion has fully established, response modulation refers to directly modifying experiential, behavioral, or physiological components of the emotional reaction. Controlling one's anger to avoid confronting others is an example of response modulation or expressive suppression. The first four categories are termed "antecedent-focused", because they target modification of factors influencing the emergence of emotion before the emotion is elicited. The last category is termed "response-focused", because it entails modulating an emotion after it is elicited [43].

2.4.2 Emotion regulation strategies

In everyday life, people employ a wide range of strategies for emotion regulation. In situations of weak or strong emotional intensity, people can control their emotions. [43] argued that antecedent-focused emotional regulation is more effective than response-focused regulation. In an antecedent-focused strategy, the trajectory of an emotion is altered early in the emotion generation process. In a response-focused regulation strategy, unpleasant emotions are changed in ways linked to psychopathology, social dysfunction, and depression. The antecedent strategies such as situation selection, situation modification, attentional deployment behaviors lead to short-term relief [42].

There is currently a plethora of data to back up the premise that people may effectively manage their emotions by using attention deployment, cognitive shift, and response modulation [99]. [41] focused on the effects and correlates of expressive suppression and cognitive reappraisal, two emotion control methods that are indicative of these intervention points. Individual disparities exist in the application of these regulation techniques [55]. For example, one person may avoid circumstances that elicit unpleasant emotions, while another may divert attention away from distressing aspects of a scenario in attempt to reduce unpleasant emotions [77]. Individuals who typically regulate their emotions through use of reappraisal report more positive affect, less negative affect, and greater psychological well-being than others [55]. Individuals who typically regulate their emotions through use of suppression report less positive affect, more negative affect, less social support, and more depression [55].

Neither reappraisal nor suppression are used by everyone all of the time. One probable explanation is that people's goals for emotional control differ. Individual differences in emotion regulation goals are important to address since they influence how people behave in general. Among various factors, gender and age differences have been identified to be a few confounding factors involved in how a person regulates emotions [104]. In the following section, how gender and age significantly impact an individual's emotion control is discussed.

2.4.3 Emotion regulation: Gender and age effects

Gender differences in emotional functioning are well-documented, although they vary widely across personality, social, cultural, and environmental variables, as well as types of emotional processes, emotion quality, and task features. Recent research has focused on the intricacies of when and how gender differences change [66]. [70] looked at the possibility that differences in emotional responses are due to gender differences in emotion regulation rather than emotional reactivity. The studies also suggested that men have higher degrees of cognitive control than women. This was due to men's ability to employ regulation more efficiently, or with less effort, than women. Additionally, [89] found that women were more prone than males to use reappraisal and there were no gender variations in emotion suppression.

In addition to gender differences, age differences have been observed in previous studies where the focus is on emotion regulation [10]. [44] showed that older adults have stronger emotional regulation and control. In the same way, [10] discussed how older individuals, in contrast to middle-aged people, used more passive emotion-regulation strategies to manage emotions produced by stressful situations. Further, [75] found that older people prefer suppression over reappraisal more often than younger ones, and this preference suggested that they would experience less negative emotion. However, [68] contradicted the findings by [75] and showed that there were no age variations in affect in response to general emotion regulation instructions, cognitive reappraisal, or expressive suppression.

All in all, there is, therefore, inconclusive evidence for universal effects of gender and age on emotion regulation. It may well be the case that such demographic effects are also dependent on

differences in a person's personality set-up. This will be discussed in greater detail in the following section.

2.5 Personality

Personality encompasses moods, behaviors, and thoughts. It is most evidently expressed in interactions with other people [36]. The notion that people are classified into personality types based on physical features has sparked the interest of many contemporary psychologists and other researchers. Over the years, many personality theories and models have been uncovered – usually with two, three, or five global characteristics or traits that apply to a wide range of circumstances [5]. Some are characterized by an elevation of tension, depression, anger, fatigue which are otherwise negative emotions [91]. Characteristics of mental disorders, global disability by mental distress, poor health status, and a low locus of health control are not only tied to the failure of emotion control, but also to personality traits such as the Type-D personality model [86].

2.5.1 Type-D personality

Type-D personality is also known as “*Distressed*” personality. It comprises two personality traits: Negative Affectivity (NA) and Social Inhibition (SI). Individuals scoring high in both Negative Affectivity and Social Inhibition are known to have Type-D personality. Initially, the Type-D personality model was studied to determine depression and psychological distress in coronary heart disease (CHD) patients [26, 71]. Not all patients with depression may be categorized as Type-D [25]. However, [101] indicated that Type-D people have a higher risk of depression, and are more likely to participate in harmful health behaviors [25]. Type D personality aims to identify people who are more likely to develop these psychosocial stress symptoms over time by identifying features like negative emotions and social isolation.[26].

Negative Affectivity is one of the key determinants of well-being among people. Individuals with a high Negative Affectivity (NA) score have higher sensations of distress, anxiety, and irritation throughout time, and in different situations [25]. The findings by [49] show that people with a high level of negative affectivity, who are exposed to shocks (or stressful events) at workplaces, are more likely to become disengaged and engage in counterproductive work behavior (CWB). Similarly, a study on workers by [58] showed that NA again impacted task performance and as well as increased negative outcomes. The study's strongest association was between NA and CWBs [58]. The significant relation between negative affective and counterproductive work behavior suggested that the detrimental effects of higher NA go further than its impact on task performance [58]. This indicated that organizations should pay special attention to the impact of negative affectivity on counterproductive behavior.

Social inhibition is a personality feature that ranges from natural responses to social situations to psycho-pathological levels of functioning. Individuals with high Social Inhibition (SI) people tend to feel inhibited, anxious, and insecure when surrounded by other people [25]. One of the most common symptoms of social inhibition is decreased conversational behavior [27]. [27] employed behavioral inhibition scale and showed that people with high behavior scores were less communicative and had difficulty making and keeping contact with others, indicating a decline in conversation. Further the research confirmed that social inhibition is more than a unitary construct, and comprises different facets such as inhibited behavior during interaction and a preference for social withdrawal [27]

Some scholars argue that NA and SI might be easily expressed in a comprehensive trait like the Five-Factor Model [22]. The NA characteristic scale is predominantly associated with Neuroticism, while the SI characteristic scale is most significantly correlated with Extraversion (negatively) but also with Neuroticism [22]. The key elements of Type D appear to be Neuroticism and Extraversion (reversed), implying that Type D could be best defined as a circumplex produced by the Neuroticism

and Extraversion dimensions [22]. [11] found that controlling NA reduced the relationship between social inhibition and anxiety among college students taking a stressful medical school entrance examination. This implies that NA accounts for much of the relationship between social support and anxiety.

Although Type D personality has been shown to predict cardiac diseases, Type D personality is based on normal personality features rather than on psychopathology. It is, therefore, expected to be common in the general population [25]. Several studies on the impact of Type D personality on various sub-groups of the general population have been published. The presence of Type-D personality in the general population has been linked to poor physical condition. For instance, Type D personality individuals have a reduced ability to cope with stressful life situations. Therefore, they may benefit from psychological interventions focused on improving their coping abilities to reduce acute and chronic stress [71].

2.5.2 Type- D personality: Gender and age effects

Gender and age have a mixed effect on Type D. While some research have shown that there is indeed an effect, others have found it to be contradictory. According to [18], females exhibited a larger Type D personality distribution than males among college freshmen, and among the Type D personality components, there was a significant gender difference in social inhibition rather than negative emotions. Similarly, studies like [69] showed that there was no significant difference in NA between genders, however, males reported a higher degree of SI than females. Previous research has found that anxiety and depression are connected to negative outcomes not just in adult populations, but also in adolescent and child populations, in addition to gender differences [72].

For instance, older adults high in negative affectivity report more medical complaints than those with low negative affectivity [28]. Similarly, [60] found that anxious and depressed children score considerably higher on a Negative Affectivity instrument than anxious participants. In the same way, social inhibition has been linked to social anxiety in adults from the general community [65]. Social inhibition is a particularly important worry for elderly people, as frequent life events may imperil existing support networks. [27] found that participants with higher levels of social inhibition were younger than those with lower levels.

As a result, when considering how negative affectivity, social inhibition, and emotion regulation affect health outcomes, these pieces of evidence provide an insight to consider gender and age differences for further research.

2.5.3 Mini-IPIP and Type-D personality model

Mini-IPIP or mini-International Personality Item Pool is a short measure of Big Five Personality model traits: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness. In both behavioral and clinical psychology, the Big Five serves as the primary model of personality [31]. The Big Five measuring models, such as the 60-item NEO Five-Factor Inventory (NEO-FFI) and the 50-item International Personality Item Pool – Five Factor Model (IPIP-FFM), were overly extensive, and participants took a long time when answering a questionnaire. The Big Five’s Ten-Item Personality Inventory (TIPI) was developed by Gosling et al. (2003). The TIPI’s design implied that the Big Five could be measured with only a few items. However, rather than relying on the TIPI, it was decided that a short Big Five measure would be created instead [31]. Therefore, a 20-item Mini IPIP was developed. All the traits in mini-IPIP are positively and negatively keyed [31]. This indicates that each of the five traits has four constructs. These constructions are grouped into two groups. The two groupings represent the positive and negative dimensions of these characteristics.

Since this thesis focuses on Type-D personality characteristics such as Negative Affectivity and Social Inhibition, it is important to see if other personality models have similar features that could influence food preferences in the same way that Type-D personality traits did. Considering the overlap of the Big Five traits of neuroticism (positively keyed) and extraversion (negatively keyed) with negative affectivity and social inhibition, the prediction of interaction effects between neuroticism and extraversion with Type-D traits may be right. There is essentially no evidence that traits like neuroticism and extraversion, as well as the two subscales of negative affectivity and social inhibition, have interacting effects in predicting health-related variables [50]. When the Big Five model, or Revised NEO Personality Inventory (NEO-PI-R), was compared to the Type-D personality model, negative affectivity and social inhibition had comparable predictive validity to neuroticism and extraversion [50]. There is, however, insufficient evidence that the Mini-IPIP subscales and Type-D personality traits are related. This encourages researchers to see if the two personality models are related, and if they are, mini-IPIP might be used for further research as it includes additional traits.

2.6 Present study

Previous research has found that emotion control strategies such as cognitive reappraisal and expressive suppression have an impact on eating behavior. It has been demonstrated that people who use reappraisal methods choose a healthy diet, whereas people who use suppression methods prefer an unhealthy diet. A separate line of research regarding Type-D personality traits indicates that people with high degrees of negative affectivity and social inhibition make poor dietary choices. Little is known, however, regarding the relationship between emotion regulation (ER) and Type-D personality – i.e., if, and how, they interact to generate an emotional disorder that leads to poor health. The mechanisms underpinning the link between negative affectivity and social inhibition in relation to emotion regulation have not been well studied, either jointly or separately. Therefore, the purpose of this research is to discover how Type-D personality traits influence the relationship between emotion control strategies and food preferences. The study looked to see if there is a moderating effect, or no impact at all, on food preferences (as shown in Figure 1).

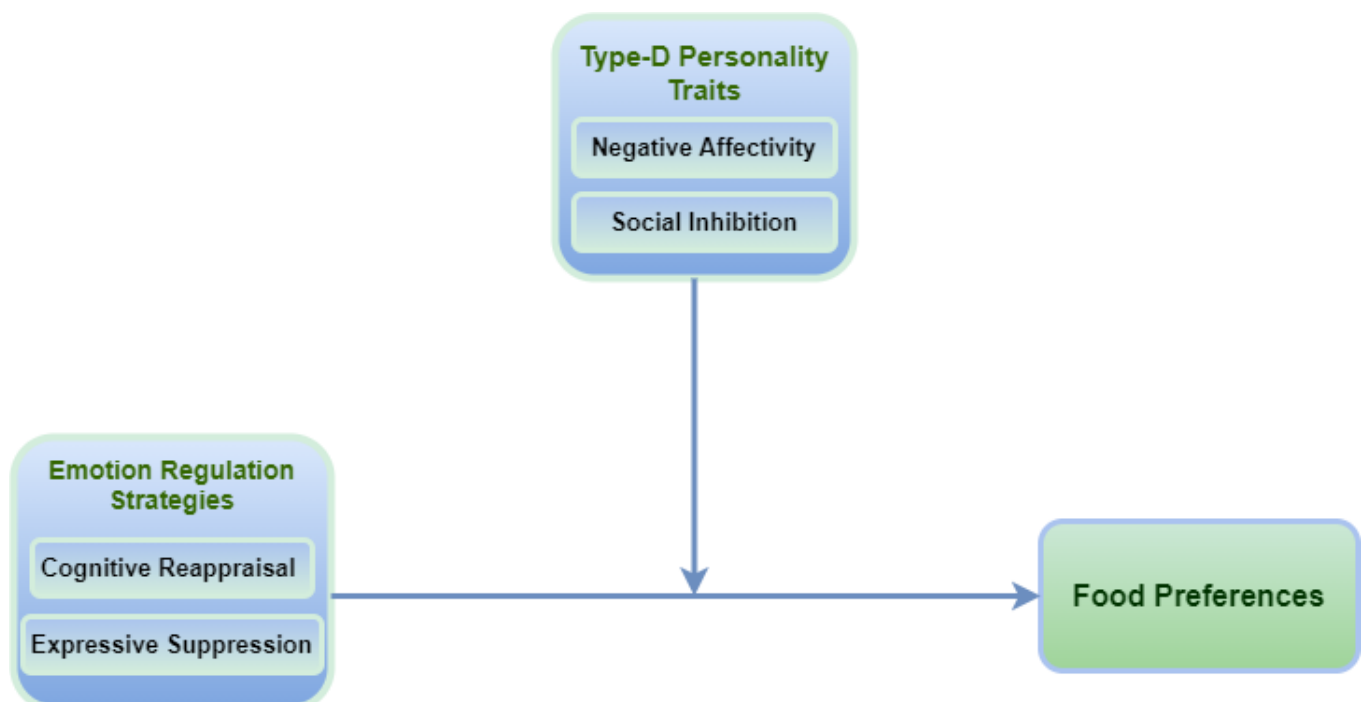


Figure 1: Conceptual Model

2.7 Summary

This chapter started by discussing what dietary behavior is, and why it is relevant to investigate the topic. Stress, emotions, and personality disorders were considered as psychological concerns with potential relevance to food preferences. The differences in gender and age with respect to emotional regulation, as well as the contribution of Type-D personality traits were also discussed. So far, no studies have given any attention to the combining effect of these factors on diet. A detailed analysis of these elements separately as well as in amalgamation can help in predicting if an individual is unable to cope up at an emotional level or personality sphere, especially individuals with food disorders.

3 Methodology

3.1 Ethics Approval

This research obtained ethical approval from the Human Research and Ethics Committee (HREC) of the Technical University Delft.

3.2 Procedure

This research was conducted using a survey built using Qualtrics™. The participants were provided with a Qualtrics™ facilitated URL link. When the users opened the link, they were presented with an opening statement and a brief summary of the experiment. Each participant's rights and guidelines for taking the survey were provided. A confidentiality agreement was included at the end of the statement, which stated that no personal information will be collected or disclosed. A demographic survey questionnaire was first administered, followed by an emotion regulation and personality evaluation, and finally a diet choice questionnaire, all with the participants' consent.

Platform	No. of Participants
Inner Circle	50
Reddit and Facebook	130
Survey Circle	8
Total	188

Table 1: Platforms Used

The survey was carried out on various platforms. The survey was first circulated to the inner circle to ensure readability and that responses were also being recorded. The inner-circle included friends and coworkers. The survey was, next, shared on social media platforms Facebook, Reddit, and Survey Circle once it had gathered traction. Reddit is a website, where users can vote on a variety of subjects and debate them. Subreddits are Reddit groups that address certain topics with only the members of the group. The survey was posted in groups like “Scientific Nutrition”, “Eating Disorder Support Group”, “Obesity”, “Diet and Health” and “Women’s Health” – all topical health forums relevant to the present topic. Third, Survey Circle is a platform where surveys are exchanged to acquire a large number of respondents. Table 1 displays the total number of participants across various platforms. The bulk of participants were found on Reddit and Facebook.

3.3 Participants

The original sample included 188 people (8 men and 165 women; $M = 29.98$ years, $SD = 10.05$). Participation was entirely voluntary, and the information gathered was used for educational reasons. Due to the study's emphasis on women, eight male responses were discarded. Furthermore, 15 responses were deleted, as some of the data found was incomplete. Finally, there were 165 complete responses, all of which were from women; see Table 2. Participants were given a field to fill in their nationality at the end of the survey. These nationalities were then grouped together to make it easier to sort by continent. The majority of the participants were Asian (36.3%) and European including British (27%), with others hailing from North America, South America, Africa, and Australia. Many participants, however, decided not to reveal their nationality. The frequency and standard deviation of participants by age and nationality are shown in Table 3.

Responses	No. of Participants
Male responses	8
Incomplete responses	15
Complete responses	165

Table 2: Responses and Participants

3.4 Measurement

3.4.1 Independent Variable

The Emotion Regulation Questionnaire (ERQ), derived from [43], was used for assessing the emotion regulatory process. The ten-item scale of ERQ has six reappraisal items and four suppression items. The items are rated on a scale of 1 (strongly disagree) to 7 (strongly agree) (strongly agree). Alpha reliabilities averaged 0.79 (for Reappraisal), and 0.73 (for Suppression), while test-retest reliability was 0.69 for both scales.

3.4.2 Moderating Variable

The Type-D Scale-14 (DS14) was specifically developed to assess negative affectivity (NA) and social inhibition (SI) in the general population [25]. The scale has seven NA items and seven SI items. The participants are asked to rate their personality on a five-point Likert scale ranging from 0 being false to 4 being true. Cronbach's coefficients (0.88 and 0.86) and item-total correlations (between 0.52 and 0.75) show that these sub-dimensions had a good level of internal consistency.

3.4.3 Control Variable

To analyze the correlation between the Big-Five and Type-D Personality traits, the mini-International Personality Item Pool (mini-IPIP) was used [31]. The full scale consists of 20 items. The responses are tabulated on a 5-point Likert scale ranging from 1 (strongly agree) to 5 (strongly disagree), with 3 serving as the neutral midway (neither agree nor disagree). This scale has demonstrated strong test-retest correlations and criterion validity. Only two components of the Mini-IPIP scale were used in this study: Extraversion (E) and Neuroticism (N), as these sub-scales were theoretically assumed to associate with the Type-D personality model. There were both positively and negatively keyed questions on these scales. Items like "Am the life of the party," "Do not talk a lot," "Talk to a number of different people at parties," "Keep in the background" were used to assess Extraversion. Items like "Have frequent mood swings," "Am relaxed most of the time," "Get upset easily," and "Seldom feel blue" were used to assess Neuroticism. These sub-scales had acceptable reliability (an alpha value of 0.77 for Extraversion, and an alpha value of 0.68 for Neuroticism).

3.4.4 Food Restrictions

[81] developed two extra sections of questions about type of dietary followed and important food allergies that might influence habitual intake and love of certain foods. As a result, [81] instructions were followed in the current investigation. The diet followed, and food items that participants reported to be allergic to, are summarized in Table 3. The majority of women (67.9%) did not follow any diet, while many women (27.9%) followed a vegetarian diet. According to the data, the majority of women (6.1%) were allergic to dairy. However, the majority of women (82.4%) said they were not allergic to any of the typical allergy foods. This choice also included women who said they were allergic to foods that were not on the list.

Sample N = 165	
Sex, n %	
Female	165 (100)
Age, n %	
18-24	67(40.6)
25-34	54(32.7)
35-44	29(17.6)
45-55	9(5.5)
55 or above	6(3.6)
Nationality, n%	
Asian	60(36.3)
North American	28(16.8)
South American	2(1.2)
European (British Included)	45(27)
Australian	4(2.4)
African	4(2.4)
Others (Mixed Nationality & Eurasia)	8(4.8)
Prefer not to say	14(8.4)
Diet Type, n %	
Vegan	4(2.4)
Vegetarian	46(27.9)
Pescatarian	3(1.8)
None of the above	112(67.9)
Allergic Food, n %	
Peanuts	0(0)
Tree nuts	3(1.8)
Sesame	0(0)
Dairy	10(6.1)
Shellfish	5(3.0)
Fish	7(4.2)
Egg	0(0)
Wheat/Gluten	1(0.6)
Soya	2(1.2)
Celery	1(0.6)
Mustard	0(0)
Others	136(82.4)

Table 3: Demographics of the sample

3.4.5 Dependent Variable

The Adult version of the Food Preference Questionnaire (Adult-FPQ) was used to examine food preferences [81]. The food preference questionnaire was based on the "Children's Eating Behavior Questionnaire (CEBQ)", a parent-rated instrument that assesses eight variables of eating style among children [98]. This initial questionnaire was modified to remove age-old food items (e.g., blancmange), eliminate composite dishes (e.g., pizza), and add more contemporary foods typically consumed by late teens and young adults (e.g., hummus). The Adult-FPQ includes a list of 62 different food item that must be characterized based on how much the respondent likes the individual item on average, with the following potential answers: (1) dislike a lot, (2) dislike a little, (3) neither like nor dislike, (4) like a little, (5) like a lot (for any food item they have ever tasted, regardless of actual intake),

and (6) not applicable (for any food item they don't know, or don't remember ever having eaten) [3]. The food preference questionnaire's reliability was assessed in prior study over 2 weeks in a sample of the twins' siblings test-retest [81]. The general food preferences in the sample under study are shown in Table 4.

4 Results

4.1 Statistical Approach

Structural Equation Modelling (SEM) is a technique that involves confirmatory factor analysis (CFA). This method in general consists of two parts: (a) a measurement model, and (b) a structural model, with increases in the number of possible correlations between latent variables [76]. Observed variables (also known as observable variables or measurable variables) are variables that the researcher measures using a specific data set [61]. A latent variable, also known as a factor or construct, is the opposite of an observed variable. It is hidden, and hence cannot be seen. Latent variables cannot be directly assessed; they can be indirectly measured using observed variables [61]. SEM depicts observed variables as rectangular nodes, while latent variables are depicted as circles or ellipses. Exogenous (independent variables) and endogenous (dependent variables) are two other terminologies associated with SEM. A factor in causal modeling or a causal system whose value is independent of the states of other variables in the system is called an exogenous variable, whereas an endogenous variable is a variable in a statistical model whose value is changed or determined by its relationship with other variables in the model [45]. Food Preference is an endogenous variable, while the rest of the variables in the model are exogenous variables. Exogenous and endogenous variables might be observable or unobservable, depending on the model examined [76]. In this investigation, the variables were unobserved.

The most common type of SEM analysis in the past was covariance-based SEM (CB-SEM), but researchers nowadays are increasingly using Partial Least Square (PLS-SEM) [47]. This allows them to estimate complex models with numerous constructs, indicator variables, and structural routes, without imposing distributional assumptions on the data [46]. SmartPLS 3TM was used to perform the PLS-SEM analysis in the present study. The analysis included assessment of the measurement model (validity and reliability of the measurements) and of the structural model (testing the hypothesized link), as advised by [2]. In addition, a bootstrapping procedure (5000 resamples) was employed to test the importance of the path coefficients and factor loadings [47].

4.2 Measurement Model

The test of the observed variables' reliability is an important part of a CFA. The interrelationships and covariation among the latent constructs are then investigated using the measurement model [76]. In reflective measurement models, outer loadings are the estimated relationships (i.e., arrows from the latent variable to its indicators). They determine an item's absolute contribution to the construct to which it is assigned. Loadings are important, as they measure the validity of the measurement. Loadings greater than 0.6 or higher are considered highly satisfactory, and loadings above 0.5 are considered acceptable [17].

As shown in Table 4, many of the constructs in the data set had an outer loading above 0.7 – especially, Age, Diet Type, Allergic Food, Negative Affectivity, Reappraisal, Social Inhibition, and Suppression [17]. In general, when a construct has low outer loadings, [17] suggests three potential reasons: (a) the variable is unreliable, (b) the variable is influenced by extra factors such as another concept, or (c) the construct is multidimensional. Table 4 clearly shows that the Food Preferences variables all have low outer loadings. Because there are so many other variables in this model, it is possible that they are causing the loadings to decline. Constructs with an outer loading of 0.6 or higher, on the other hand, suggested high correlations among the same constructs and better measurement quality.

	Items	FL	Mean	SD	CR	AVE	α	rho_A
Age		1	1.99	1.065	1.000	1.000	1.000	1.000
Allergic Food		1	10.79	2.744	1.000	1.000	1.000	1.000
Diet Type		1	3.35	0.968	1.000	1.000	1.000	1.000
Food Preference->Vegetables	Beetroot	0.439	258.8121	30.17643	0.826	0.169	0.813	0.779
	Broccoli	0.42						
	Brussels sprouts	0.304						
	Carrots	0.586						
	Celery	0.489						
	Cucumber	0.507						
	Green Beans	0.614						
	Peas	0.379						
	Potatoes	0.363						
	Red Peppers	0.506						
	Salad Leaves	0.478						
	Spinach	0.569						
	Sweetcorn	0.302						
	Tomatoes	0.363						
Food Preference->Snacks	Cake	0.488						
	Chips	0.462						
	Chocolate Biscuits	0.452						
	Chocolate	0.46						
	Chewy Gummies	0.204						
	Crisps	0.578						
	Icecream	0.332						
	Plain Biscuit	0.36						
	Sugared Cereal	0.217						
Negative Affectivity	C_5	0.796	13.6606	6.37879	0.881	0.714	0.840	1.976
	C_9	0.742						
	C_13	0.979						
Reappraisal	B_1	0.613	27.0788	6.97818	0.904	0.660	0.893	0.991
	B_3	0.661						
	B_7	0.924						
	B_8	0.896						
	B_10	0.911						
Social Inhibitions	C_6	0.445	13.6424	4.14663	0.810	0.553	0.830	1.031
	C_8	0.751						
	C_10	0.651						
	C_14	0.972						
Suppression	B_2	0.873	15.2606	5.22062	0.848	0.595	0.776	0.931
	B_4	0.463						
	B_6	0.903						
	B_9	0.766						

Table 4: Factor Loadings

FL- Factor Loadings,SD- Standard Deviation, CR-Composite Reliability,AVE- Average Variance Extracted, α – Cronbach/salpa

	Age	Allergic Food	Diet Type	Food Preference	Negative Affectivity	Reappraisal	Social Inhibition	Suppression
Age	0.158							
Allergic Food	0.093	0.099						
Diet Type	0.232	0.166	0.332					
Food Preference	0.053	0.116	0.097	0.308				
Negative Affectivity	0.110	0.024	0.101	0.284	0.450			
Reappraisal	0.092	0.162	0.059	0.354	0.518	0.191		
Social Inhibition	0.178	0.263	0.110	0.303	0.262	0.099	0.624	
Suppression								

Table 5: Discriminant Validity

4.2.1 Convergent Validity

Convergent and discriminant validity are two important features of construct validity. Convergent validity is a term used in sociology, psychology, and other behavioral sciences to describe the degree to which two measures of constructs that should be connected theoretically are really related [19]. Along with the factor loadings, other measures like “mean, standard deviation, composite reliability (CR) and average variance extracted (AVE)” were calculated. The composite reliability of all components was then examined using PLS, showing that each construct’s reliability was more than 0.70, as shown in Table 4 (Chin, 1998). The convergent validity of the measurement model was investigated by measuring the Average Variance Extracted (AVE). Most of the constructs had AVE greater than 0.5, which is adequate for convergent validity.

4.2.2 Discriminant Validity

The discriminant validity tests whether or not concepts or measurements that are not supposed to be related are in fact related. The discriminant validity of the measurement model was investigated, as shown in Table 5, where the square roots of Average Variance Extracted (AVE) are represented by a diagonal number, and correlations are represented by off-diagonal numbers. The square roots of AVE were bigger than the correlations, indicating that the measurement model’s discriminant validity was appropriate [48]. This is shown in Table 5.

4.2.3 Internal Consistency

Cronbach alpha and rho_A, which evaluates the reliability based on the interplay of the observed item variables, are the most commonly used internal consistency measurements. Cronbach alpha and rho_A values between 0.60 and 0.70 are acceptable in exploratory research, but values higher than 0.70 are required in more advanced stages, according to [48]. Looking at Table 4, the values for Cronbach’s Alpha and rho_A for all the constructs are higher than 0.7 – except the Cronbach’s value for Social Inhibition, which is very close to 0.7. Overall, these values confirm the internal consistency of the model.

Food Items	Mean(S.D)	Food Items	Mean(S.D)
Vegetables		Fruits	
Spinach	4.36(0.962)	Orange	4.44(0.836)
Carrots	4.54(0.737)	Grapes	4.41(0.917)
Green Beans	4.30(0.983)	Apples	4.42(0.834)
Cucumbers	4.28(1.063)	Melon	4.31(0.954)
Celery	3.65(1.355)	Peaches	4.45(1.044)
Mushrooms	4.38(1.479)	Apricots	4.19(1.184)
Brussels sprouts	3.61(1.599)	Avocados	4.27(1.154)
Parsnips	4.38(1.479)	Strawberries	4.56(0.990)
Peas	4.20(0.977)	Protein	
Sweet Corn	4.52(0.966)	Beef	4.32(1.781)
Broccoli	4.32(1.103)	Beef Burgers	4.44(1.643)
Salad leaves(e.g. lettuce)	4.43(0.878)	Lamb	3.82(1.872)
Red peppers	4.13(1.190)	Chicken	4.62(1.257)
Raw Tomatoes	4.21(1.219)	Bacon	4.38(1.602)
Potatoes (boiled or mashed)	4.38(0.952)	Ham	4.02(1.826)
Baked beans	3.76(1.371)	Sausages	3.93(1.684)
Beetroot	3.93(1.442)	White Fish(e.g cod, haddock)	4.39(1.622)
Dairy		Tinned fish	4.33(1.769)
Soft cheese (e.g Brie)	4.06(1.484)	Oily fish(e.g mackerel fish)	4.05(1.757)
Hard cheese(e.g Cheddar)	4.44(0.983)	Smoked salmon	4.45(1.556)
Butter	4.21(0.974)	Eggs	4.65(1.125)
Cream	4.02(1.292)	Snacks	
Plain low fat yogurt	4.09(1.324)	Chips	4.27(1.020)
Cottage cheese	4.07(1.492)	Plain Biscuits	4.12(1.101)
Butter like spread	3.84(1.634)	Chocolate Biscuits	4.35(1.022)
Mayonnaise	3.83(1.386)	Cake	4.43(0.878)
Custard	4.12(1.2760)	Ice cream	4.42(0.989)
Starch		Chocolate	4.57(0.718)
Bread or Bread rolls	4.37(0.8850)	Crisps	4.33(0.951)
Bran cereal	3.67(1.298)	Chewy Gummy sweets	3.28(1.540)
Porridge	3.78(1.563)	Sugared cereal	3.23(1.484)
Plain Boiled rice	3.91(1.383)	Hummus	4.30(1.236)
Wheat cereal	3.91(1.383)		
Rice or corn cereal	3.72(1.239)		

Table 6: Food Preferences

Food Category	Mean(S.D)
Vegetables	62.8788(9.00934)
Fruits	35.0606(4.64954)
Protein	51.4121(14.83691)
Dairy	36.6848(6.93067)
Snacks	41.2909(6.27132)
Starch	23.3515(3.92118)

Table 7: Food Category

4.3 Food Preference Scores

Table 6 shows the mean preference scores of 62 food items. Vegetables, fruits, protein, dairy, snacks, and starch were divided into 6 food categories. The first three groups belong to the healthy food category, while the later three groups belong to the unhealthy category. The mean preference scores and standard deviation was calculated for all the food items. Carrots were favoured in the vegetables category, with a score of 4.54, while Brussels sprouts were least preferred with a score of 3.61. In the fruits category, strawberries came out on top with a score of 4.56, while apricots came in last with a score of 4.19. Eggs received the greatest score of 4.65 in the protein segment, while lamb received the lowest score of 3.82. Women favoured hard cheese with a score of 4.44 and mayonnaise with a score of 3.83 in the dairy segment. Chocolate was the most popular snack, with a score of 4.57, while sugared cereal was the least popular, with a score of 3.23. Finally, with a score of 4.37, bread or bread rolls were favoured in the starch segment, followed by bran cereal.

The mean preference scores for each category are shown in Table 7. Vegetables had the highest preference score (62.87), followed by protein (51.41), snacks (41.29), dairy (36.68), fruits (35.06), and starch (23.35). As previously discussed, these food categories are divided into two main groups: healthy and unhealthy. As a result, two categories could be chosen to investigate the moderating influence of constructs given in the model on the food classes – i.e., healthy and unhealthy. Because vegetables had the greatest score in the healthy food category, and snacks had the highest score in the unhealthy food category, hypothesis tests were applied to these two food categories, specifically.

4.4 Moderation Analysis

The path models 2 and 3 created using SmartPLS3™ are illustrated below, with a focus on vegetables and snacks. The latent variables are represented by various colored circles. The blue circles represent independent variables, the green circles are moderators, the orange circles represent control variables, and the dark blue circles represent the food items, which are the dependent variable. The yellow rectangle depicts the food items with in category of vegetables and snacks. In order to test for moderation, the moderating effect on Food Preferences between Type-D variables (Negative Affectivity, Social Inhibition) and Emotional Regulation Strategies (Reappraisal, Suppression) was established. Along with these independent variables, the moderating role of Age on Food Preferences was investigated. As explained previously, only Food Categories (Vegetables and Snacks) were picked to determine the choice between healthy and unhealthy food groups under the effect of moderators. Table 8 and 9 displays the path coefficients of vegetables and snacks, demonstrating the significance of the models analyzed. The interaction effect is shown in green.

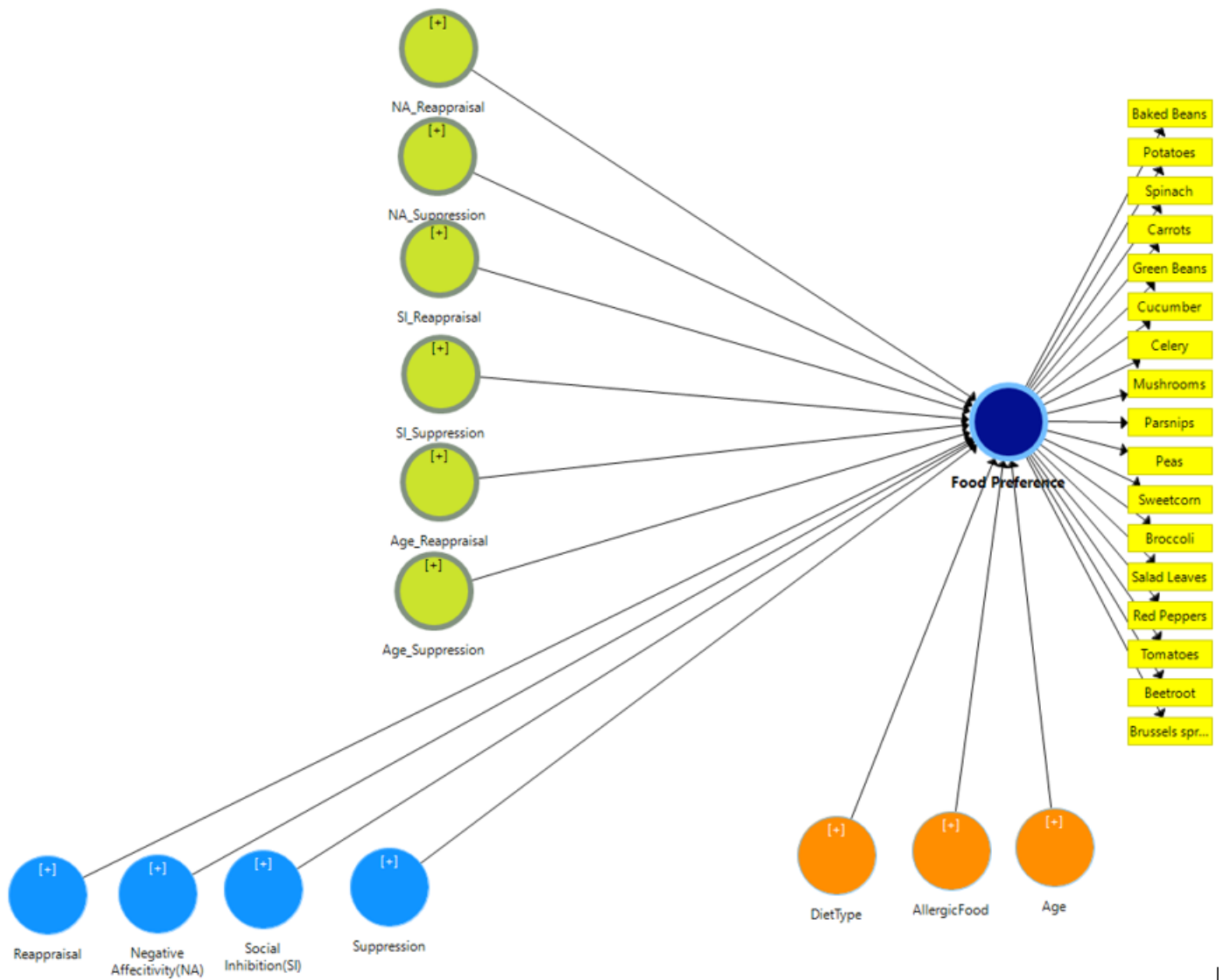


Figure 2: Path Model of Vegetables

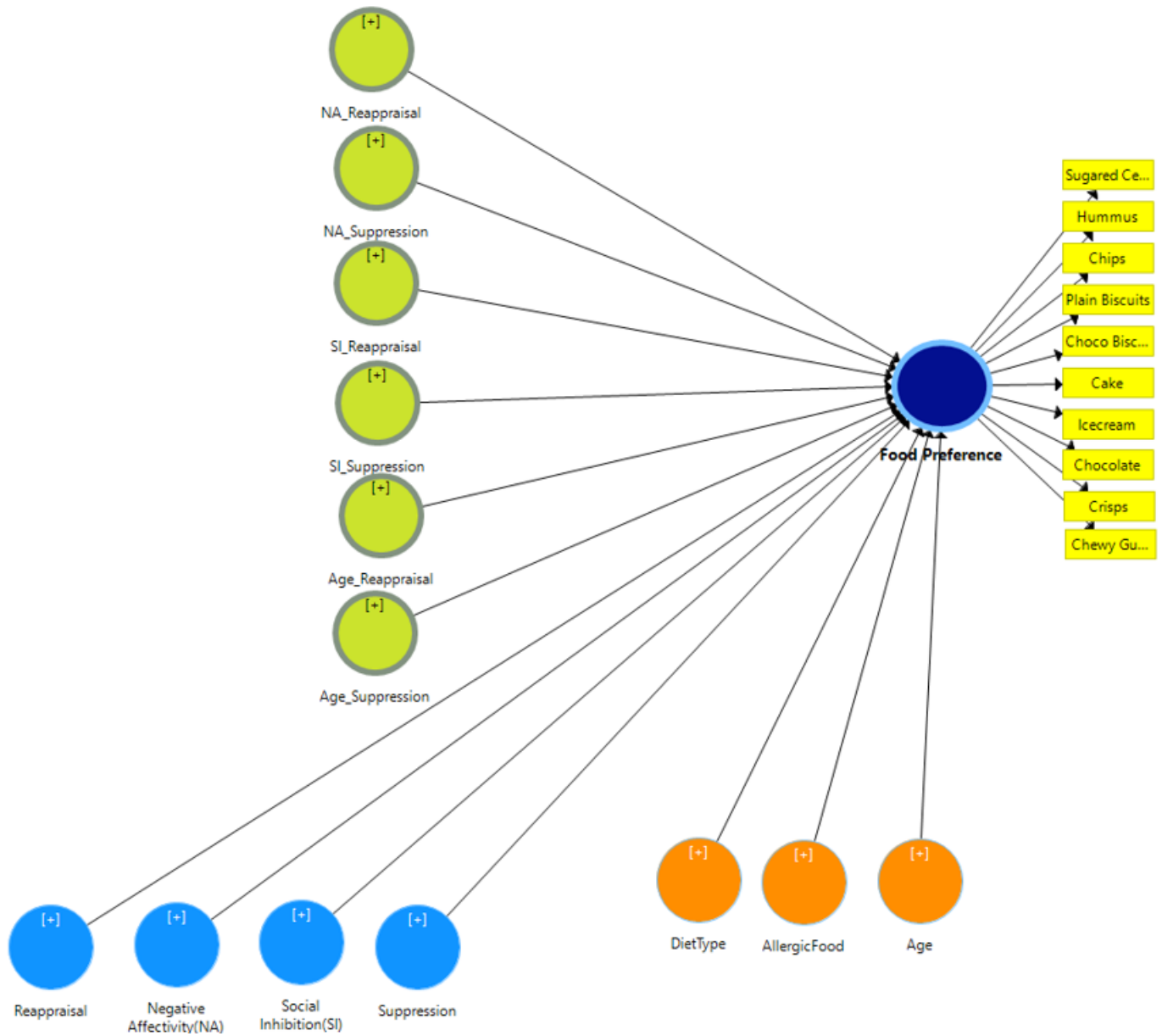


Figure 3: Path Model of Snacks

4.4.1 Vegetable Preferences

Figure 4 depicts how Age influences the relationship between Reappraisal and Food Preference (Vegetables). The blue line depicts Age at its average level, whereas the red and green lines indicate Age at lower and higher levels, respectively. The analysis showed that younger women who used more (vs. less) Reappraisal Strategies displayed a higher preference towards eating Vegetables than older women ($\beta = 0.161, t = 1.731, p < 0.05$). This demonstrates that the association between Reappraisal Strategies and healthy foods, such as Vegetables, is moderated by Age.

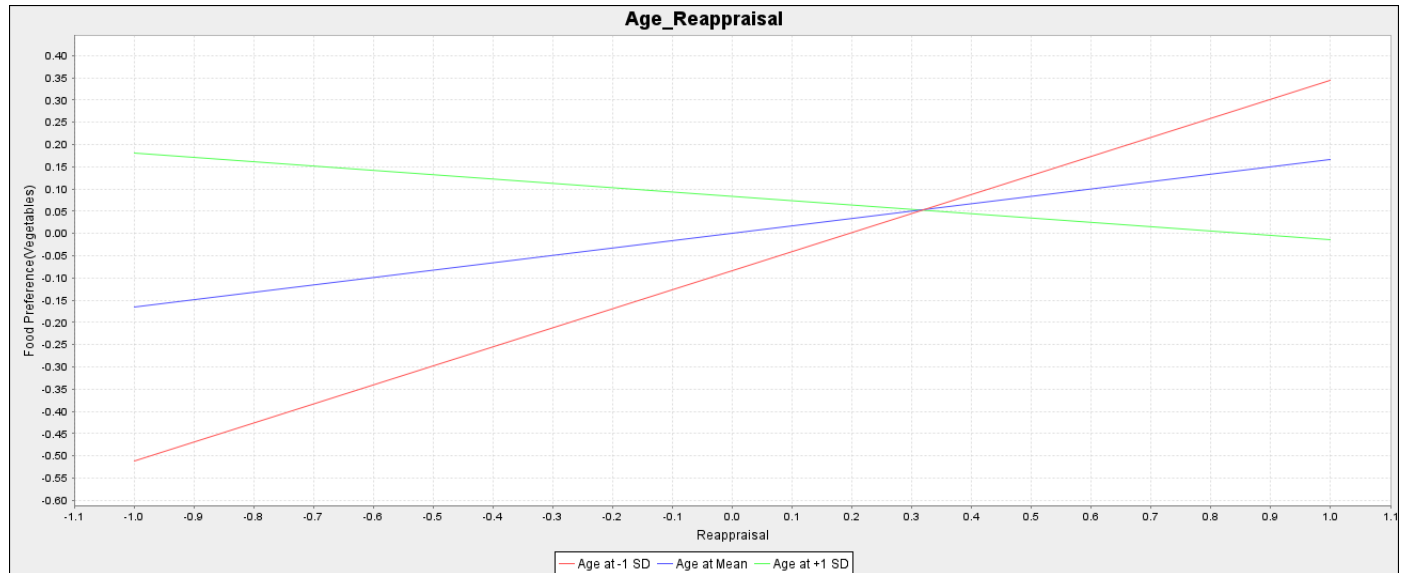


Figure 4: Age x Reappraisal on vegetables

	Original Sample	Sample Mean	Standard Deviation	T-statistics	P values
Age->Vegetables	0.084	0.076	0.094	0.892	0.373
Age_Reappraisal->Vegetables	-0.263	-0.275	0.087	3.014	0.003
Age_Suppression->Vegetables	0.086	0.088	0.119	0.724	0.469
Allergic Food->Vegetables	0.007	0.023	0.077	0.091	0.928
DietType->Vegetables	-0.236	-0.210	0.070	3.367	0.001
Negative Affectivity_Reappraisal->Vegetables	-0.117	-0.052	0.117	0.998	0.319
Negative Affectivity_Suppression->Vegetables	0.291	0.128	0.230	1.265	0.206
Negative Affectivity->Vegetables	0.098	0.084	0.129	0.757	0.449
Reappraisal->Vegetables	0.166	0.206	0.134	1.235	0.217
Social Inhibition_Reappraisal->Vegetables	0.175	0.137	0.104	1.688	0.092
Social Inhibition_Suppression->Vegetables	0.010	0.032	0.151	0.068	0.946
Social Inhibition->Vegetables	-0.115	-0.042	0.161	0.712	0.477
Suppression->Vegetables	-0.012	-0.086	0.100	0.123	0.902

Table 8: Path Coefficients of Vegetables

4.4.2 Snack Preferences

Next, the unhealthy food category of snacks was analysed. Figure 5 shows that women displayed a stronger preference for Snacks when they had a low (vs. high) level of Social Inhibition and a high (vs. low) tendency to using Suppression Strategies ($\beta = 0.317, t = 3.331, p < 0.005$). Analysis of the simple main effects indicated that socially inhibited women employ more suppression methods to prevent themselves from bingeing on unhealthy foods.

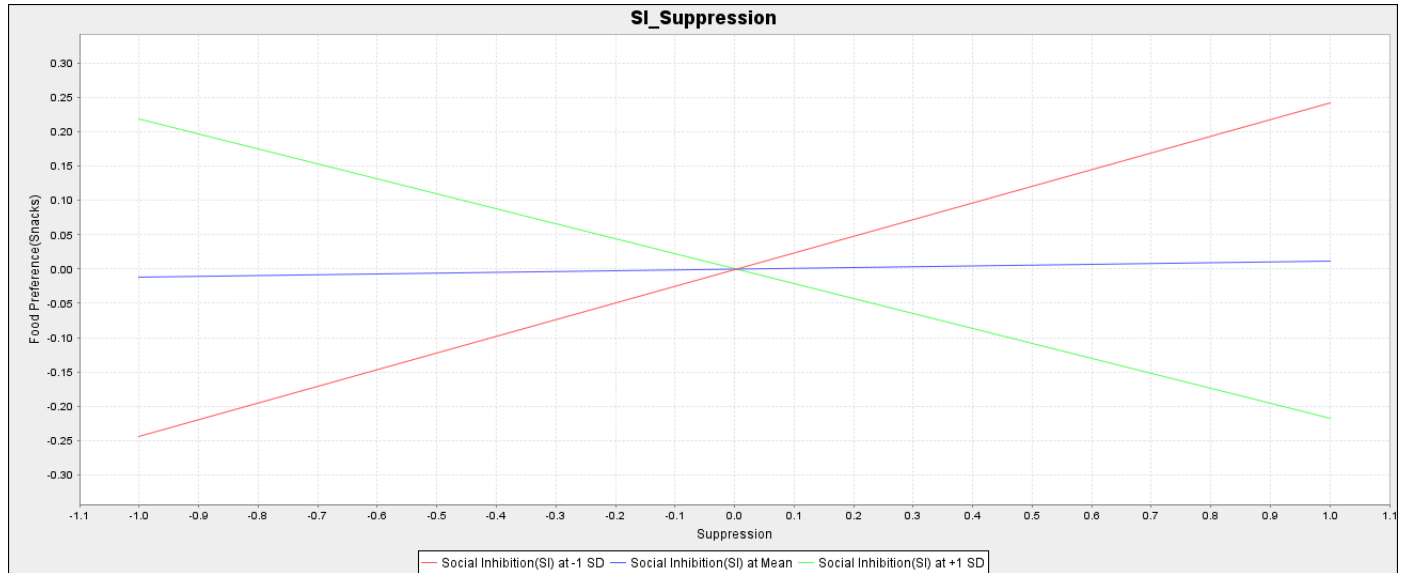


Figure 5: Social Inhibition x Suppression on snacks

	Original Sample	Sample Mean	Standard Deviation	T-statistics	P values
Age->Snacks	-0.142	-0.143	0.107	1.321	0.187
Age_Reappraisal->Snacks	0.153	0.150	0.113	1.362	0.174
Age_Suppression-> Snacks	0.114	0.108	0.155	0.738	0.461
Allergic Food->Snacks	0.001	-0.029	0.077	0.011	0.991
DietType->Snacks	-0.108	-0.097	0.071	1.528	0.127
Negative Affectivity_Reappraisal->Snacks	-0.056	0.004	0.150	0.370	0.711
Negative Affectivity_Suppression->Snacks	0.107	-0.006	0.178	0.602	0.547
Negative Affectivity->Snacks	0.066	0.087	0.131	0.508	0.612
Reappraisal->Snacks	-0.004	0.018	0.110	0.040	0.968
Social Inhibition_Reappraisal->Snacks	-0.131	-0.163	0.102	1.279	0.201
Social Inhibition_Suppression->Snacks	-0.230	-0.181	0.101	2.285	0.023
Social Inhibition->Snacks	0.001	0.029	0.097	0.010	0.992
Suppression->Snacks	0.012	-0.004	0.109	0.110	0.913

Table 9: Path Coefficients of Snacks

4.5 Supplementary Analyses

The current study examined numerous assumptions associated with Type-D personality in the context of food preferences. However, the Big Five personality model features characteristics that are quite similar to those of the Type-D personality model. There are some methodological debates over whether or not both model characteristics correlate [50]. Specifically, Type-D Personality, which consists of negative affectivity and social inhibition, is regarded to be similar to well-known Big-Five characteristics (such as neuroticism and extraversion) [50]. Some researchers, therefore, suggest to use the Big Five personality types rather than Type-D personality types, since the Big Five model also includes conscientiousness, which is important in health-related activities, and which may be applied to a larger population [50].

		Mean	Standard Deviation	R	S	NA	SI	E	N
Emotion Regulation Strategies	Reappraisal(R)	27.0788	6.97818	1	0.084	-.477**	-.007	.178*	-.539**
	Suppression(S)	15.2606	5.22062	.084	1	.161*	.472**	-.362**	-.011
Type-D traits	Negative Affectivity(NA)	13.06606	6.37879	-.477**	.161*	1	.488**	-.368**	.641**
	Social Inhibition(SI)	13.6424	4.14663	-.007	0.472**	.488**	1	-.546**	.245**
mini-IPIP traits	Extraversion(E)	2.8939	0.91071	.178*	-.362**	-.368**	-.546**	1	-.099**
	Neuroticism(N)	3.2667	0.70123	.539*	-.011	.641*	.245**	-.099	1

Table 10: Supplementary analysis

** -Correlation is significant at the 0.01 level(2-tailed), * -Correlation is significant at the 0.05 level(2-tailed)

		R	R ²	Adjusted R ²	RMSE
A.	Vegetables with Type-D traits	0.657	0.432	0.383	0.168
B.	Snacks with Type-D traits	0.492	0.242	0.176	0.153
C.	Vegetables with mini-IPIP	0.687	0.472	0.427	0.166
D.	Snacks with mini- IPIP	0.503	0.253	0.189	0.150

Table 11: Supplementary analysis-Regression

As a result, it is required to demonstrate whether or not the Type-D personality model can be utilized in the general population to predict health-related behaviors, such as eating behavior – as well as to determine whether or not the Big-Five and Type-D sub-dimensions are associated. To perform this analysis, the original path model of healthy and unhealthy food preferences consisting of the Type-D traits (Negative Affectivity and Social Inhibition) was substituted with the Extraversion and Neuroticism dimensions from the mini-IPIP model.

For the two alternative models, the path coefficients, composite reliability, and discriminant validity are determined. The p-value for the path coefficients is $p < 0.05$, which is highly significant. The Cronbach's alpha and rho_A are both greater than 0.7, and the average variance retrieved is greater than 0.5, indicating that the model is reliable. The square root of Average Variance Extracted(AVE), which displays the association between two constructs, is used to calculate discriminant validity. The value is negative in this case (-0.824). This suggests that Social Inhibition is inversely related to Extraversion, which is also supported by [50].

In a similar fashion, the relationship between Neuroticism and Negative Affectivity is investigated. The path coefficient is $p < 0.05$ in this case, which is highly significant. The Cronbach's alpha and rho_A are both greater than 0.7, and the AVE is greater than 0.5, indicating that the model is valid. Discriminant validity, which has the square root values of AVE, is utilized to show the association between Neuroticism and Negative Affectivity. The number is positive (0.654), indicating that the association is direct, as stated in the [50].

5 Discussion

The focus of this research was to see how emotional and personality characteristics influenced people's eating choices. This research explored if emotion control mechanisms and Type-D personality traits had an impact on food preferences. When paired with emotion regulation strategies, age (a control variable) was found to have an impact on food preferences. The scientific implications of the experiment's findings, their practical relevance, study limitations, and recommendations for further research are presented in the following paragraphs.

5.1 Scientific Relevance

The significance of the current study is demonstrated below using crucial variables such as Emotion Regulation methods and Type-D features, as well as the effect of Age on Food Choices, which has confirmed and added value to previous discoveries while also refuting a few previous beliefs.

5.1.1 Emotion Regulation Strategies

Research like [44] and [73] stated that antecedent methods like reappraisal strategies were more favorable than response-focused methods like suppression. Such studies indicated the success of reappraisal strategy by up-regulating cravings for low-calorie food. Additionally, the findings by [34] showed that individuals, who followed suppression often in their daily lives, ate especially more comfort food like snacks when they were emotional, than those who did not. [73] also suggested that cognitive reappraisal processes can be used to modulate craving and change eating patterns downstream. When reappraisal strategies are utilized, the healthy options are chosen more than the unhealthy options, as shown in research. These earlier findings were supported by the current study, which found that women who employed more reappraisal tactics favored vegetables over snacks, indicating a preference for a healthy diet over an unhealthy diet. The current study also refutes the findings by [23], which claim that maladaptive emotion management has no effect on junk food or snacking. The current study also extends the work of [34] and [82]

5.1.2 Type-D personality traits

[38], [87] and other researchers have urged to explore the link between Type-D personality and an unhealthy lifestyle. According to [38], research on Type-D personality traits, those with high levels of negative affectivity and social inhibition make poor dietary decisions, exercise less, and smoke more. The study was conducted on an Icelandic population, and the NA by SI interaction term was linked to decreasing fish consumption and also confirmed on possible mediation mechanism between Type D personality and unhealthy diet choices.

The current study took the Type-D personality as a moderating variable. The study showed that people with high social inhibition levels preferred snacks. This supports the theory of [74], wherein it was showed that people, who have less social support are more tempted to use emotional eating as a coping mechanism. Furthermore, [38] revealed that additional assistance was required to change these behaviors. Emotion regulation strategies were applied in this situation. Reappraisal was seen as more favourable to women with high Negative Affectivity. Women with high social inhibition used more suppression strategies which led to the choice of unhealthy food items such as snacks. The earlier research on related to Type-D is associated with health-related behaviors, particularly among socially inhibited people who are less likely to engage in health-promoting behavior [12]. The current study adds to the growing body of knowledge about the behavioral processes via which Type-D can affect health outcomes, and, further, emphasises that emotion regulation strategies must be employed in order to make healthy food choices.

5.1.3 Age

Previous research indicated that age influenced food choices, but it did not specify which emotion strategy had to be utilized more frequently to choose a healthy diet. [44] and [10] showed that older adults have stronger emotional regulation and control. Further, [75] found that older people prefer suppression over reappraisal more often than younger ones, and this preference suggested that they would experience less negative emotion.

The findings confirmed prior results, showing that elderly women who used strong suppression strategies ate more veggies and snacks. Younger women, on the other hand, were compelled to eat fewer veggies and snacks as a result of the high suppression methods. This shows that strong suppression strategies make it difficult for younger women to make healthier decisions, but also encourage older women to eat more unhealthy meals. Higher reappraisal approaches aided younger women more in adopting healthier dietary choices than older women. Besides, the theory that older women more likely use suppression strategies was confirmed in this study. This research contradicted the finding of [68], which found no age differences in affect in response to general emotion regulation. In addition, the study revealed which emotion regulation method was more effective for younger and older women when it came to choosing a healthy diet.

5.2 Practical Relevance

For a long time, eating disorders have been a challenging issue. When it comes to effectively assessing diet and nutrition, researchers are confronted with several obstacles, including deciding on the best dietary assessment approach for their study. Many foods and drinks have been developed specifically to provide an enriched diet that can help people overcome their eating disorders and live a better lifestyle. However, it is not only our nutrition that contributes to eating disorders, but also our mental health. As a result, this research may aid in the treatment of eating disorders or the understanding of why people make poor dietary choices. These findings can also be used to create and guide preventative medicine programs.

End-users can use online toolkits like [29] and [21] to improve their ability to use and analyze existing data, as well as to make informed decisions about which methodologies are most suited to their needs when designing new studies. It is well established that using a personality profile to treat eating disorders can help to improve functioning and reduce risk exposure to health-threatening behaviors. Integrating personality traits into public health strategy provides numerous benefits at a low cost [100].

The significant flaw with many diet applications is the assumption that calorie tracking is the sole way to to be healthy. There are other elements that can influence one's health like factors including sleep, stress, hormones, and nutrient deficits. Currently, a number of applications can measure emotions, propose healthy meals, and fitness apps that can help recommend specific diets. As described in this study, personality can also be a predictor among people to choose a nutritious diet. Personality tests are mostly used for interviews, jobs, and predicting the favourite superhero character [63] [54]. Therefore, more emphasis should be paid to how personality affects our mood, which in turn controls our nutrition.

Most of the diet or health applications are not tailored to the individual rather, they are designed for the masses. This research has ramifications for app developers and practitioners, who can use this information to target users who are most likely to succeed. The current research can assist app developers in a variety of ways. Some apps may only use food databases that are not applicable in other countries. The study recognized the need of including regional food items as well as regional language in order to better understand the users. Inclusion of regional food products could aid in determining the diet type and dietary limits unique to that location. Next, the apps could be built

in such a way that they can detect whether or not the users are suffering from eating disorders. The study's concepts can be evaluated to predict the type of eating disorder. For example, if a person of a given age has high Social Inhibition and uses the suppression approach, they choose to eat more snacks, as indicated in the study, which also suggests obesity as a result of increased indulging in unhealthy foods and also Social Inhibition. Developers could also utilize digital interventions on food apps to help individuals with Type-D personalities make healthier decisions, such as inducing more reappraisal strategies. Findings by [84] suggested successful down-regulation of negative emotion was related to various patterns of visual attention and distraction (for instance, showing pictures and checking). Subsequent eye tracking experiments have confirmed similar findings, demonstrating that negative affect can be reduced by reappraisal as well [6]. Thus, by implementing these ideas, such as distraction by presenting images or observing eye movement, one might determine if the person is experiencing emotional problems as a result of a failure to down regulate or the personality itself, and then recommend a meal.

5.3 Limitations

This study could have been influenced by some limitations. An online survey was used to conduct the study. The assessments of emotion regulation strategies, personality traits, and dietary habits were based on their own judgements, which may have biased the results. Survey procedures limit the researcher's ability to clarify doubts, which could lessen bias in responses. According to [78], experiments developed in a lab are more reliable due to the capacity to control any external variable that may influence the results. Another limitation of this study is that the foods items listed in the survey are mostly from the United Kingdom. The British food goods are particularly understood by Commonwealth countries or countries that import these food items, but this may not be applicable to the rest of the world. As a result, generalizability remains a constraint, because food products would have to be tweaked based on the individual region in order to have a more accurate and genuine response [95] [57]. Further, the weight of participants was not included in the study. This metric may have shown how many of the women in the research were overweight, healthy, or underweight [92] [88]. Furthermore, this information could aid in determining whether obesity was caused by a failure to apply emotion control skills or if the person was Type-D. As people's mental states differ, so does the functionality of their bodies. Metabolism differs from person to person. Even if a person consumes unhealthy foods, due to their high metabolic rate, the individual cannot be labeled as obese, but may be classed as malnourished because there is no weight gain even after ingesting high calorific foods [1]. The metabolism was not taken into account in the current study, which is another limitation. As a result, while measuring height and weight for obesity, metabolism should also be taken into account.

5.4 Future Research

As the study has explored which of the emotion regulation strategies is more beneficial for women, future work could seek to incorporate these findings in introducing new interventions in the form of apps or games. These could test in a controlled setting the exact reactions and response to avoid the bias in the results. Second, this study is among the first to look into the impact of emotion regulation strategies and the Type-D personality model on food preferences, particularly among women. To begin with, future research may focus on men in order to better understand and see if the findings can be generalized to that part of the general population. Follow-up research could, further, include weight and height measurements to acquire a better understanding of obese people's emotional stability and personality [15] [93]. Additionally, future work could try to also incorporate other food scales such as General Nutrition Knowledge Questionnaire (GNKQ) [62], that consists of food items that focus on the issue of obesity, and as well as explore other diseases (Bulimia nervosa, Binge eating disorder or BED, Anorexia nervosa) associated with food.

There are numerous permutations and combinations of the present study. The moderating variable in this study was Type-D personality. Because emotion regulation has mediating effects as shown by [13], the moderating impact may be investigated, but this time with a different gender, men, and a different population region-wise, where different – regional – food questionnaires like the 14-Item Mediterranean Diet Assessment Tool [33] or IRON Intake Calculation-Food Frequency Questionnaire (IRONIC-FFQ) [39] could be used to help the locals comprehend it better.

The survey method was used in this study. Despite assessing emotion regulation strategies and the Type-D personality, the study did not investigate the emotional states that may have influenced these food preferences. The current study solely looked at which emotion regulation strategies, specifically cognitive reappraisal and expressive suppression, were most commonly utilized to change one's state of mind. The study, however, did not look into the changing emotional states. It would be beneficial to also examine a person's emotional state. Future research should explore how these altering emotions effect dietary choices. This can be accomplished by conducting a laboratory experiment in which subjects are first identified as having a Type-D personality and then the instantaneous emotion is recorded before participants are given the choice between healthy and unhealthy food. This will also allow us to learn about the emotional changes that women experience during their menstrual cycle, which prompts them to choose high calorific foods during that time – an aspect that could not be captured in the current study.

Humans respond to visual and sensory cues, which reveal their reactions and responses [20]. Studies like [8] have shown that the influence of negative visual stimulus had no effect on children's snack choices, whereas the positive stimulus increased the likelihood of choosing a healthy snack especially among girls. The current study showed that tweaking emotion regulation strategies could help women in choosing a healthier diet. Future research might incorporate this information, as well as positive visual stimuli, to see if the unhealthy diet was replaced with a healthy diet, if the healthy diet became healthier, or if it remained the same.

An individual's personality cannot easily be altered, but the methods (emotion management strategies) used by an individual can be manipulated. This study proved that, of the two emotion control strategies, the reappraisal strategy is more advantageous, since women chose healthy food items when this strategy was utilized. On the other hand, they preferred snacks when the suppression method was used. As an extension of this research, the next study could look into how different forms of reappraisal can be used to improve decision making in healthy diet, or how suppression strategies can be adopted to keep oneself from indulging in unhealthy food choices. This would answer [14], who revealed that cognitive strategy training could someday benefit clinical treatment and public health initiatives targeted at preventing and lowering obesity.

Many individuals believe that nutritious eating in general is bland and unpalatable. It has been found that many people avoid nutritious food because they are unappealing [40]. It is quite tough to fool the human brain. However, cognitive tactics such as putting effort into presentation while choosing healthy food alternatives can surely encourage people to include or opt for a healthier diet [64]. Another cognitive strategy is "Thinking about the long-term repercussions of the eating behaviour" [14]. People can simply switch to a healthy diet if they keep this in mind. Future research could also evaluate whether providing information about the serious health risks associated with unhealthy food items changes people's dietary decisions.

Cognitive therapies focus on identifying and correcting particular maladaptive ways of thinking, but do not explicitly address how to cope with preoccupying food thoughts. As a result, suppression strategies are employed. "Food thought suppression" is a suppression strategy used by several researchers to measure how participants with various eating disorders switched to healthier dietary choices [4] [37]. Another suppression strategy is to encourage people to self-monitor their food

intake. This has also demonstrated to boost the success of weight loss initiatives and the long-term maintenance of dietary changes. These strategies have been shown in some situations to lower cravings, hence assisting obese patients in losing weight, while in others, high levels of these strategies have resulted in bingeing. The next study might include self-monitoring in addition to cognitive techniques to see, if it really works for people with Type-D personality in limiting the temptation or craving for unhealthy foods like snacks, as well as examine for weight loss.

To summarize, future research should examine the reappraisal and suppression techniques in greater detail in a real-world or laboratory scenario, as an extension to the current thesis, especially given the influence of continuously changing emotions and gender differences on dietary choices.

5.5 Conclusion

The present research focused on the affective and personality factors that influence dietary choice behaviors. Thus far, researchers carried out separate (exploratory and descriptive) studies on the impact of emotion regulation and Type-D personality on diet. Most of the studies involving Type-D personality model mainly opted for a clinical group of people [12]. Studies on stress and emotion regulation mostly experimented on a single set of people in a contrived setting [82]. The current research adds to our understanding of emotional eating. Indicating that the term "emotional eating" may not just relate to eating when someone is feeling negative, but rather to eating when one's negative emotions are regulated in an unhealthy manner. The research explored the cross-cultural background and other demographic differences of people in relation to dietary choice behaviors.

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Appendices

A Survey Questionnaire

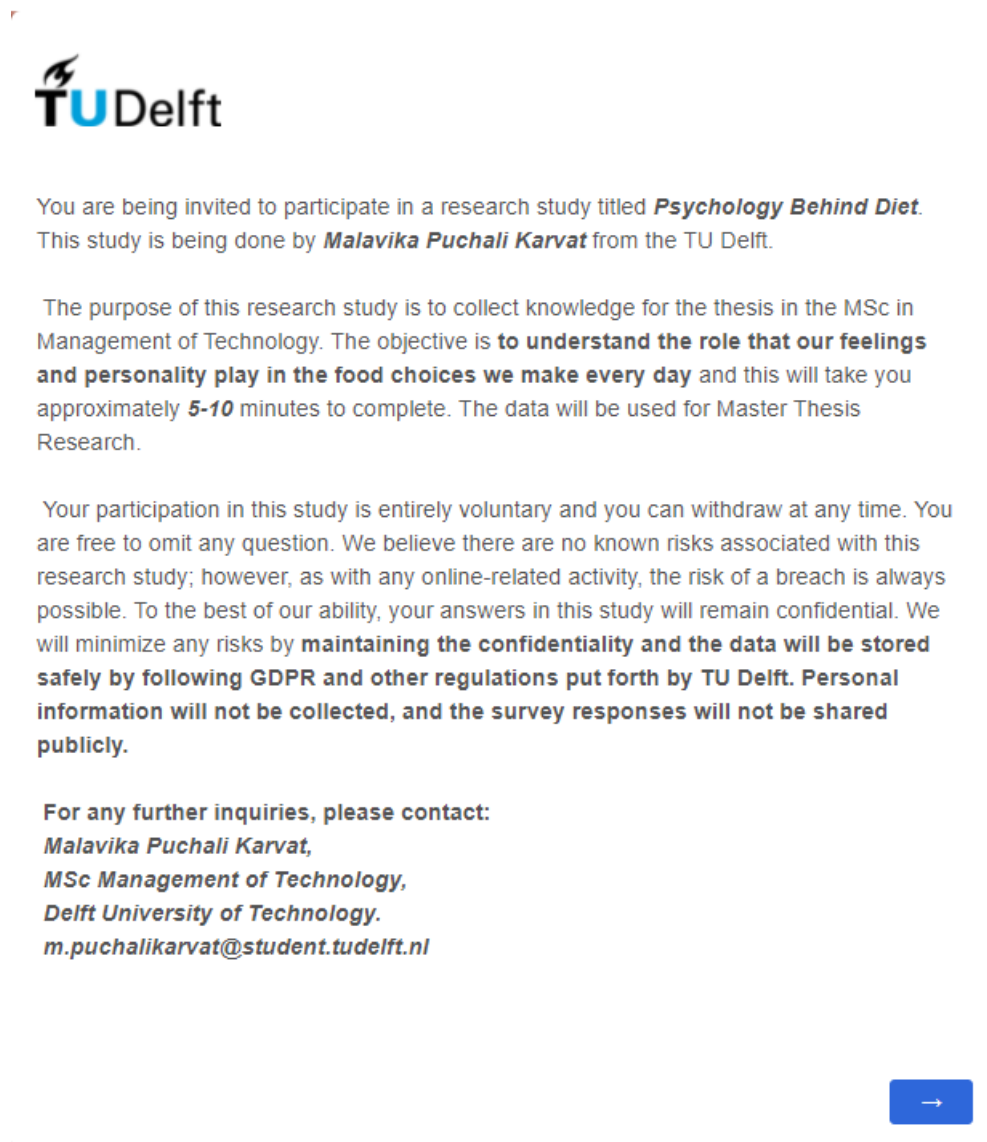


Figure 6: Survey Questionnaire-Introduction

C

Below are a number of statements that people often use to describe themselves. Please read each statement and then CHOOSE a statement to indicate your answer. There are no right or wrong answers: Your own impression is the only thing that matters.

0 = FALSE 1 = RATHER FALSE 2 = NEUTRAL 3 = RATHER TRUE 4 = TRUE

	0	1	2
I make contact easily when I meet people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often make a fuss about unimportant things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often talk to strangers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often feel unhappy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am often irritated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often feel inhibited in social interactions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I take a gloomy view of things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find it hard to start a conversation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am often in a bad mood	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am a closed kind of person	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would rather keep other people at a distance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often find myself worrying about something	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am often down in the dumps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When socializing, I don't find the right things to talk about	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 8: Survey Questionnaire -Block C

Q1

Do you identify as any of the following?

- Vegan
 - Vegetarian
 - Pescetarian (no meat, but eat fish and/or shellfish)
 - None of the above
-
-

Q2

Are you allergic to any of the following food items? (please select all that apply)

- Peanuts
- Tree nuts
- Sesame
- Dairy
- Shellfish
- Fish
- Egg
- Wheat / Gluten
- Soya
- Celery
- Mustard
- Other (please specify):

Figure 9: Survey Questionnaire-Block Q1 Q2

Please read the following list of food items and tick the box which most accurately reflects how much (on average) you like the specific item (not necessarily how much you actually consume). For any foods you don't know, or don't remember ever having tried, please select "Not applicable".

	Dislike a lot	Dislike a little	Neither like nor dislike	Like a little	Like a lot	Ⓢ Not applicable
Beef	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Beef Burgers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lamb	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chicken	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bacon	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ham	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sausages	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
White fish (e.g. cod, haddock)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oily fish (e.g. mackerel, kippers)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smoked salmon	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tinned Tuna	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eggs (boiled, scrambled, or fried)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Baked beans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bread or Bread rolls	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bran cereal (e.g. All-Bran, Bran Flakes)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Porridge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Plain boiled rice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sugared cereal (e.g. Frosties, Sugar Puffs)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hummus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wheat cereal (e.g. Weetabix, Shredded Wheat)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Potatoes (boiled or mashed)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rice or corn cereal (e.g. Corn Flakes, Rice Krispies)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soft cheese (e.g. Camembert, Brie)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hard cheese (e.g. cheddar)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cottage Cheese	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Plain, low-fat yoghurt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oranges	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grapes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apples	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Melon	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Peaches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apricots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Strawberries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Avocados	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spinach	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carrots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Green beans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cucumber	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Celery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mushrooms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parsnips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Peas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sweetcorn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Broccoli	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Salad leaves (e.g. lettuce)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Red peppers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Raw tomatoes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Beetroot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Brussels sprouts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Butter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Butter-like spreads (e.g. sunflower spread, Flora)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cream	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mayonnaise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Plain biscuits (e.g., Digestives)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chocolate biscuits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cake	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ice cream	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Custard	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chocolate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Crisps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chewy gummy sweets (e.g., Haribo-style sweets, wine gums)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 10: Survey Questionnaire-Block D

E

You have reached the end of the questionnaire. Please, fill in the following details to complete the survey.

Q11

Gender

- Male
- Female
- Non-binary / third gender
- Prefer not to say

Q12

Age

- 18-24
- 25-34
- 35-44
- 45-54
- 55 or above

Q13

Please indicate your Nationality

Figure 11: Survey Questionnaire -Block E

B Supplementary Analysis

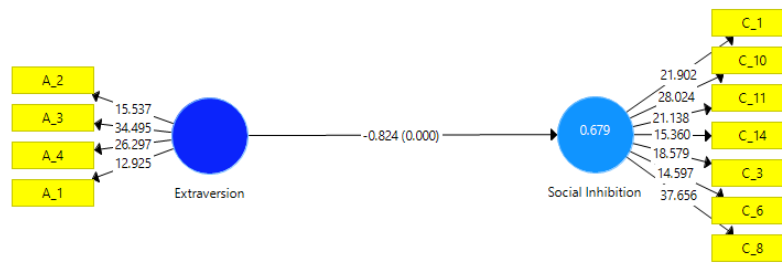


Figure 12: Extraversion and Social Inhibition

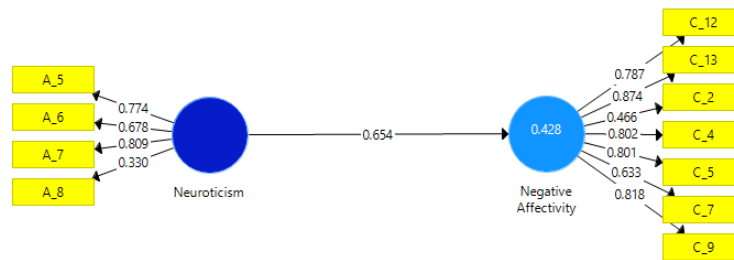


Figure 13: Neuroticism and Negative Affectivity

C Interaction effect of other constructs

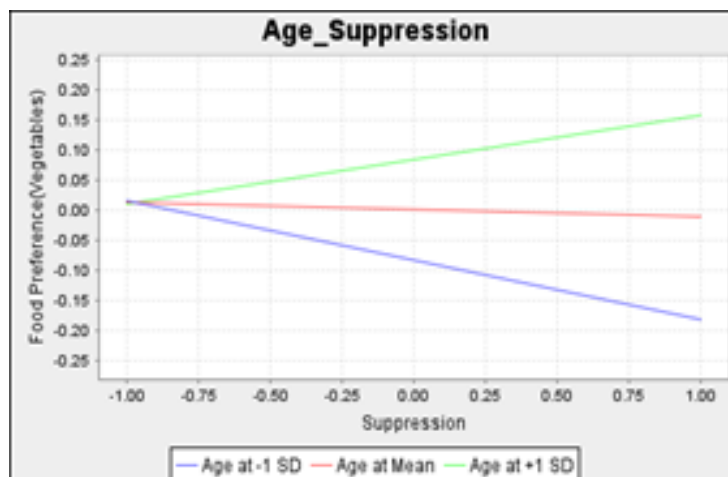


Figure 14: Age x Suppression on vegetables

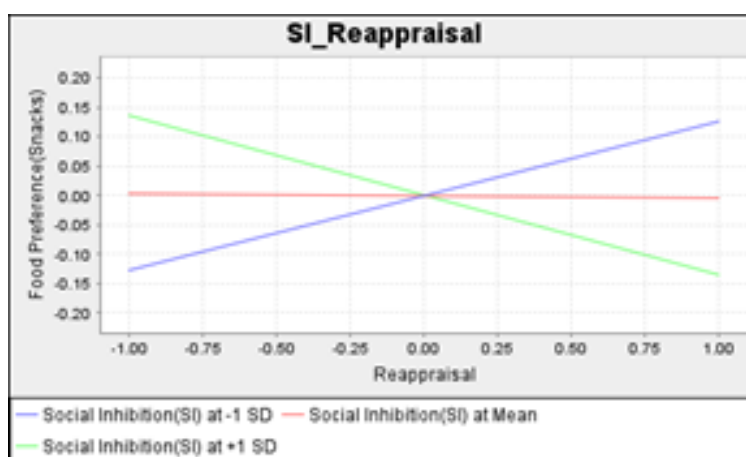


Figure 15: Social Inhibition x Reappraisal on snacks

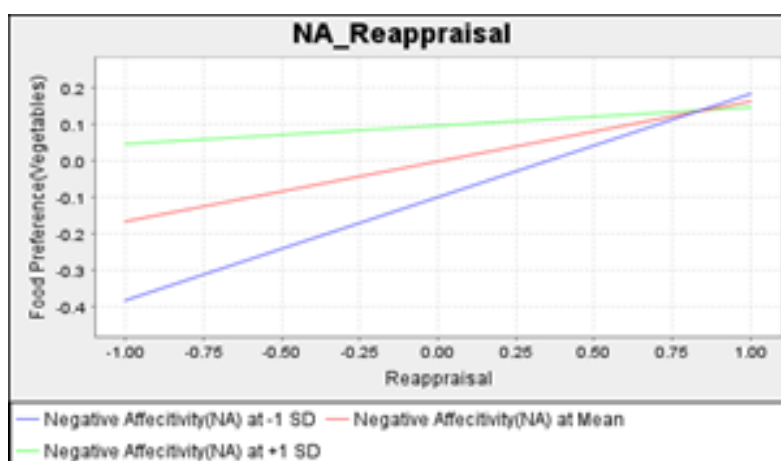


Figure 16: Negative Affectivity x Reappraisal on vegetables

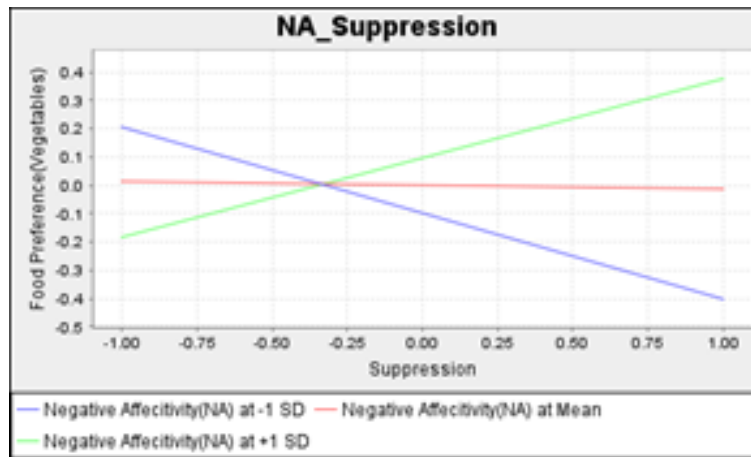


Figure 17: Negative AffectivityxSuppression on vegetables

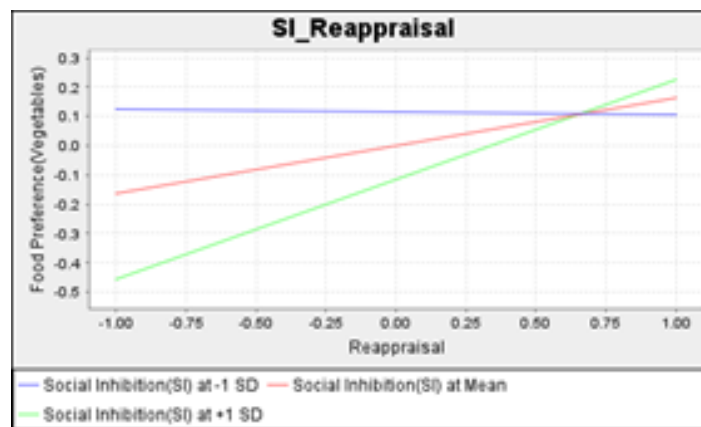


Figure 18: Social Inhibition x Reappraisal on vegetables

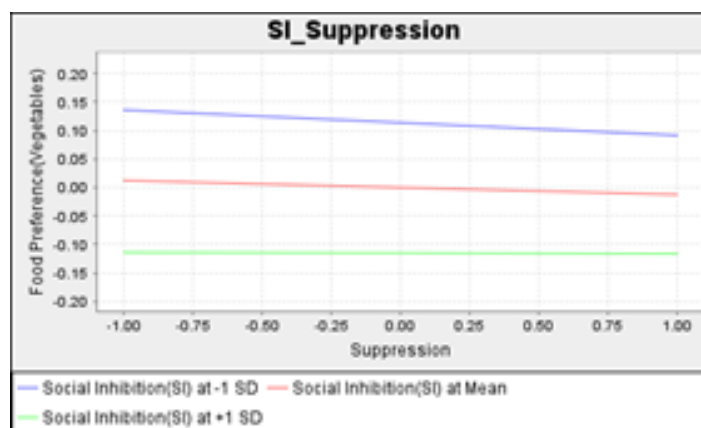


Figure 19: Social InhibitionxSuppression on vegetables

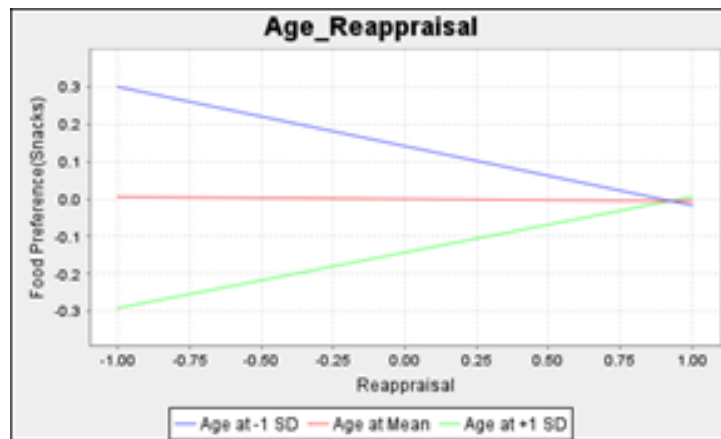


Figure 20: AgexReappraisal on snacks

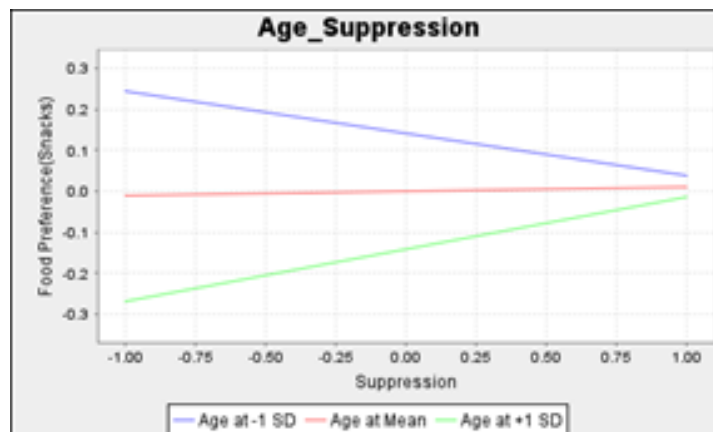


Figure 21: AgexSuppression on snacks

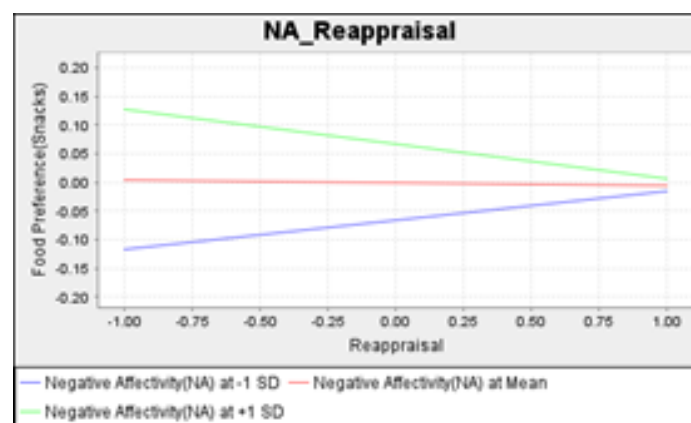


Figure 22: Negative Affectivity x Reappraisal on snacks

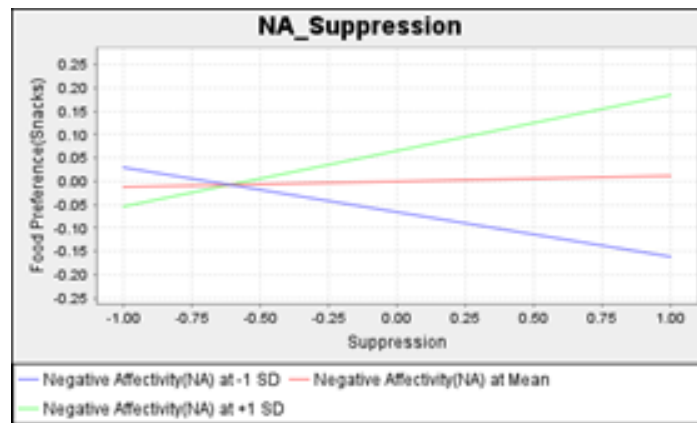


Figure 23: Negative AffectivityxSuppression on snacks