

ASKING WHY, INSTEAD OF WHAT: INVESTIGATING A PICKY EATING SPECTRUM

A Thesis
Submitted to the Graduate Faculty
of the
North Dakota State University
of Agriculture and Applied Science

By

Savanna Elizabeth Jean Westrom Jellison

In Partial Fulfillment of the Requirements
for the Degree of
MASTER OF SCIENCE

Major Program:
Health, Nutrition and Exercise Sciences
Option: Exercise/Nutrition Science

May 2021

Fargo, North Dakota

North Dakota State University
Graduate School

Title

ASKING WHY, INSTEAD OF WHAT:
INVESTIGATING A PICKY EATING SPECTRUM

By

Savanna Elizabeth Jean Westrom Jellison

The Supervisory Committee certifies that this *disquisition* complies with North Dakota State University's regulations and meets the accepted standards for the degree of

MASTER OF SCIENCE

SUPERVISORY COMMITTEE:

Elizabeth Hilliard, Ph.D., RDN, IBCLC, LRD

Chair

Julie Garden-Robinson, Ph.D., LRD, FAND

Rebecca Woods, Ph.D.

Approved:

May 14, 2021

Date

Yeong Rhee, Ph.D., RD

Department Chair

ABSTRACT

There is currently no universal definition for picky eating. Picky eating is also currently viewed as a binary decision. The purpose of the current study was to develop a spectrum of picky eating. The researchers used a *why* instead of *what* approach to identifying 23 picky eating categories and themes among individuals. Exploratory Factor Analysis was utilized on pilot data ($N = 412$) and items loaded on three factors. The first factor consisted of 7 items ($\alpha = .76$) and accounted for 24.56% of the variance in the data. Factor two consisted of 10 items ($\alpha = .79$) accounting for 9.87% of variance and factor three consisted of 5 items ($\alpha = .66$) and accounted for 6.85% of the variance. Our results indicate that the picky eating spectrum identifies various behaviors of picky eating that could lead to targeted interventions and potentially reduce parental frustration and picky eating.

Keywords: picky eating, factor analysis, spectrum

ACKNOWLEDGEMENTS

I would like to acknowledge and thank everyone who supported me throughout my graduate career and my pursuit of additional degrees and areas of study including family, friends, teachers, and professors. I would like to express my extreme gratitude to Elizabeth Hilliard for her support, guidance, and insight throughout this project as well as projects outside her department and scope. I would like to thank Rebecca Woods and Julie Garden-Robinson for their excitement towards my project and their expertise. Thank you to all my close friends and family for the unyielding support and encouragement.

DEDICATION

I would like to dedicate this project to my family, friends, and those at NDSU who supported my desire to pursue an additional area of study that I am passionate about: thank you for believing in me and for all your continued positivity, support, love and encouragement along the way.

TABLE OF CONTENTS

ABSTRACT	iii
ACKNOWLEDGEMENTS	iv
DEDICATION	v
LIST OF TABLES	viii
LIST OF FIGURES	ix
CHAPTER ONE. INTRODUCTION.....	1
Statement of the Problem.....	2
Purpose of Study.....	3
Focus	3
Objective	4
Limitation of Study.....	4
Definition of Terms.....	5
Spectrum Definitions	5
CHAPTER TWO. REVIEW OF LITERATURE.....	8
Purpose of the Study.....	8
Introduction.....	8
CHAPTER THREE. METHODOLOGY	17
Purpose of the Study.....	17
Introduction.....	17
Spectrum	18
Population Sample And Sampling Procedure.....	25
Data Collection	25
Procedures.....	25
Research Design.....	26

Demographic Information.....	26
Picky Eating Categories.....	26
CHAPTER 4. MANUSCRIPT	27
Introduction.....	27
Methods.....	29
Sample.....	29
Measurements	29
Data Analysis	30
Results.....	33
Sample Characteristics.....	33
Discussion.....	50
REFERENCES	53
APPENDIX. SURVEY.....	67

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Compiled Picky Eating Definitions	10
2. Picky Eating Spectrum and Survey Questions Utilized to Measure.....	31
3. Demographics	33
4. Paired T-Test of Restrospective and Current Category Ratings.....	36
5. Exploratory Factor Analysis	50

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. Example Models of Picky Eating and Social Cognitive Theory	16
2. Visual Depiction of Picky Eating Categories	18
3. Visual Depiction of Picky Eating Spectrum	24
4. Visual Depiction of the Category: Dietary Preference	37
5. Visual Depiction of the Category: Memory Aversion	38
6. Visual Depiction of the Category: Knowledge	38
7. Visual Depiction of the Category: Routine	39
8. Visual Depiction of the Category: Food Color	39
9. Visual Depiction of the Category: Food Group	40
10. Visual Depiction of the Category: Luxury	40
11. Visual Depiction of the Category: Appetite Driven	41
12. Visual Depiction of the Category: Physical Sensitives	41
13. Visual Depiction of the Category: General Perfectionist	42
14. Visual Depiction of the Category: Medical	42
15. Visual Depiction of the Category: Visual Displeasure	43
16. Visual Depiction of the Category: Olfactory	43
17. Visual Depiction of the Category: Taste Sensitive	44
18. Visual Depiction of the Category: Self-Fulfilling Prophecy	44
19. Visual Depiction of the Category: Fussy Eating	45
20. Visual Depiction of the Category: Nonadventerous	45
21. Visual Depiction of the Category: Neophobia	46
22. Visual Depiction of the Category: Texture	46
23. Visual Depiction of the Category: Culture	47

24.	Visual Depiction of the Category: Current Trend.....	47
25.	Visual Depiction of the Category: Belief System.....	48
26.	Visual Depiction of the Category: Affordability	48

CHAPTER ONE. INTRODUCTION

The first three years of life are a critical time to develop healthy eating preferences (Cole, An, Lee & Donovan, 2017; Cashdan, 1994). The habits developed within the first three years of life can potentially persist across the lifespan into late adulthood (Coleman et al., 2005). The critical period for the development of taste preferences that are acquired through direct exposure to flavors is a monumental building block in the developmental trajectory (Skinner et al. 2002). Eating habits and preferences are developed early in life, for example, a mother's dietary choices have the power to influence which foods are accepted in later infancy and into early childhood (Cooke & Fides, 2011). The lifelong consequences of healthy eating habits can be shown in the predictive relationship between eating habits and weight status, cognitive function, physical performance, and psycho-social health (O'Dea, 2003).

Nutritional behaviors, a term that encompasses food preferences, choices, and all meal-time behaviors, is considered one of the major contributing factors in predicting risk of obesity (Lynch, 2012). In addition to a potential genetic predisposition passed on by an obese parent, the risk of a child becoming obese is related to shared family experiences related to nutritional behaviors (Mccaffery et al.,2007). Nutritional behaviors related to healthy eating have been found to improve overall cognitive, physical, and psychosocial health (Lynch, 2012). However, nutritional behaviors related to limited dietary variety and food refusal can lead to the need for vitamin and mineral supplementation. If supplementation does not occur, it can lead to nutritional deficiencies. This is especially true, and recommended by professionals, when there is avoidance of specific foods and/or whole food groups (Carruth & Skinner, 2001).

Statement of the Problem

The definition of picky eating is relatively ambiguous. Currently, there is not a universal definition, or even agreement, on what constitutes or "counts" as picky eating behavior and whether the characteristics before or during mealtime or both and/or general mealtime preferences should be included in the definition (Boquin et al., 2014; Brown & Perrin, 2020). The only semi-clear indicator is an overly generalized identifier of having low dietary variety while responding negatively to the sensory properties of food. A major limitation of picky eating research is the lack of definition and only a few recurrent characteristics across current literature. Additionally, picky eating is often grouped with other terms that are not interchangeable, such as fussy eating (i.e., rejects a food one day but will eat it the next) or food neophobia (i.e., fear of eating or trying new foods) (Hazel, et al., 2020). For example, the top two characteristics parents use to describe picky eating include the definition of neophobia (i.e., unwilling to try new things) and limited type and amount of food consumed. The term picky eating is used to cover a wide array of behaviors without a clear and concise definition (Boquin et al., 2014).

On the opposite side of the current binary choice (e.g., yes, they are a picky eater or no, they are not), there seems to be some agreement on what a nonpicky eater is. The most common characteristic of a nonpicky eater is the willingness to try new food. In addition, they are described as enjoying eating and the whole mealtime process without hesitation about eating (Boquin et al., 2014). However, this definition does not take into account several important questions. For instance, does the willingness to try new foods extend to all food, including those foods outside of one's culture? Does one have to enjoy all food or just tolerate it? Does hesitation about eating include new food or just familiar food? These are all important questions that need to be considered if someone is going to be categorized as a picky or nonpicky eater.

Purpose of Study

The purpose of the study is to define and identify subgroups of picky eating and subsequent present classification as a picky eater that is determined by cause rather than a binary choice. The first step in this process is understanding *why* people do not enjoy the foods they dislike instead of asking individuals *what* foods they dislike.

Picky eating is the most commonly used term to describe eating preferences. It is common to describe individuals as picky eaters when they have low dietary variety regardless of the reason. Furthermore, picky eating in adulthood is characterized by different behaviors than picky eating in childhood (Ellis et al., 2018). For example, in adulthood increased psycho-social impairment (i.e., a mental health condition that interacts with one's environment and restricts their ability to exist in a given environment) is identified as an additional symptom associated with picky eating. The potential psycho-social impairment was reported by adults who identified as picky eaters in situations where food and others were involved. These adults reported increased anxiety and social pressures during mealtimes with peers (Ellis et al, 2018). The small dietary variety can be displayed through eating only a limited number of foods and/or being unwilling to try new foods. Numerous people find themselves being described as picky eaters for a variety of reasons beyond the standard definition of picky eating (e.g., having low dietary variety). For many, some of the dietary choice resistance stems from childhood.

Focus

The focus of the current study is to identify common characteristics of picky eating, develop thematic categories of resistance and begin the foundation for specified understanding and intervention. This study expands the current literature by compiling themes from common

reasons people dislike various foods. From there, a survey was developed to further assess the themes and subcategories of picky eating.

Objective

1. To define and identify categories of picky eating and subsequent classification as a picky eater.
2. Develop a survey to assess the categories for subgroupings.

Limitation of Study

There are some potential limitations to this study. Firstly, the generalizability of the demographics leads to the need for replication of the study in other settings. Based on pilot data, the population is not diverse enough to be able to be generalized to the public. Therefore, a replication of the study in a more diverse sample would be an important future direction. Secondly, the overall sampling technique was convenient, which could also cause generalizability issues. Lastly, some of the identified categories may not translate to younger populations. Furthermore, the proposed categories may not be seen in all populations or other additional categories may be present.

Definition of Terms

Food Neophobia- fear of eating new food that makes an individual resistant to trying new flavors and foods

Fussy Eating- Inconsistent rejections and acceptance of the same food day to day

Umami- having a savory taste

Spectrum Definitions

Affordability- Low dietary variety due to an inability to afford or experience new or other foods (Pechey et al., 2021).

Appetite Driven- The resistance to eat familiar foods due to not wanting the taste at the present moment, the flavor right now is displeasing.

Belief System -Not eating something due to strong beliefs (accurate or not) (e.g., GMOs are bad) (Zafar et al., 2020).

Cultural - Resistance to try foods of other cultures for reasons other than religion or ethics (Huotilainen, 2005).

Current Trend- A trend in the media not to eat something.

Dietary Preference - Refusal to eat certain foods due to preferred diet (i.e. vegetarian, vegan, etc.) (Sneijder & te Molder, 2009).

Food Color - Refusal to eat foods that are not the color they are expected to be (Boquin et al., 2014).

Food Group- Refusal to eat foods of a certain food group (Boquin et al., 2014).

Fussy Eating- the tendency of individuals to be highly selective and particular about the foods one eats (Smith et al., 2020; Carruth et al., 2004).

General Perfectionist - The resistance to eat foods if they have touched other foods (Boquin et al., 2014).

Knowledge- Refusal to eat identifiable organs, or limbs (Boquin et al., 2014).

Luxury -The ability to be a picky eater due to socio-economic status (SES), geographical location or nation.

Medical- While limited dietary variety can be due to choice, some individuals have an inability to eat certain foods for medical reasons (Antonella & Hernandez, 2020).

Memory Aversion - Flavor exposure and condition aversions can trigger a distaste for food that was not initially present during previous acceptance. This aversion can cause the avoidance of certain foods due to an associated memory (i.e. choking, nausea, etc.) (Gaultier et al., 2011).

Neophobia- Food neophobia is a condition that includes refusal of new foods and the overwhelming fear of new food that causes significant distress or anxiety (Smith et al., 2017).

Non-adventurous- Lack of willingness or adventurous behaviors that lead to increased diet variety (Brown & Perrin, 2020).

Olfactory - Sensitivity to the smell of a particular food causing a distaste (Zickgraf & Elkins, 2018).

Physical Sensitivities - Therefore, one can have an inability to eat certain foods for self-diagnosis (non-medically confirmed) reasons and personal perceptions (Siegrist, Bearth & Harmann, 2020).

Routine -Only eating certain foods continuously due to routine in cooking or shopping.

Self-fulfilling prophecy- Having a distaste for certain foods due to a parent/guardian/adult proclaiming to and or advising a dislike of the food (Lynch, 2011).

Taste Sensitive - Having a distaste for a particular food due to the flavor (Zickgraf & Elkins, 2018).

Textural – Individual refusing food due to texture (Kohyama, 2018).

Visual Displeasure- Sensitivity to the visual display of food causing a resistance to eat food (Zickgraf & Elkins, 2018).

CHAPTER TWO. REVIEW OF LITERATURE

Purpose of the Study

Eating habits are established early in life. Infancy, the first three years of life, is a sensitive time period for developing healthy eating preferences (Cashdan, 1994; Cole, An, Lee & Donovan, 2017). For example, food choices during this period have the power to influence food preferences and eating behavior throughout the lifespan including dietary patterns, growth and health outcomes (Boak et al., 2016). The taste preferences developed during infancy are acquired through direct exposure to flavors (Skinner et al., 2002). Within the literature, the terms taste and flavor are used interchangeably to describe the subjective experiences each individual has with food through the balance of the five basic taste properties (i.e., sweetness, saltiness, bitterness, sourness, and umami) (Duffy & Bartoshuk, 1996). In addition to taste and flavor, the term picky eating is used as a blanket statement with the determination of being a picky eater being a binary choice.

Within the literature and across the world, picky eating is being used as an umbrella term to describe a variety of conditions without specialized subgroups that depend on a variety of factors. The purpose of the current study is to define and identify subgroups of picky eating and subsequently present a spectrum of picky eating that is determined by cause rather than a binary choice.

Introduction

Picky eating is a common phenomenon in early childhood. Regardless of age of parent, gender, ethnicity, or household income, by 24 months of age, the chance of a child being a picky eater is 1 in 2 (Carruth, Ziegler, Gordon, & Barr, 2004). The rate of picky eating is concerning because it can lead to deficiencies of vitamins and minerals during childhood (Carruth &

Skinner, 2001). In addition, there are long term risks. For example, picky eating increases the risk of later depression, eating disorders, and emotional and behavioral problems (Cole, An, Lee & Donovan, 2017). Given the potential long-term influence of picky eating, it is understandable that parents try to intervene. There are various parental interventions such as social modeling, offering a variety of healthy foods, hiding vegetables, and offering praise or rewards, are all popular ways to try and counteract picky eating. Interventions have different rates of success and some can actually increase picky eating. If there was another diagnosis that affected 1 in 2 individuals, society would expect specialized interventions dependent on the type and severity of the problem.

Whether the eating habits developed during this critical period are healthy or not are determined by a variety of factors. Currently, picky eating is described by numerous behaviors across the literature (Table 1). Picky eating is associated with having low dietary variety in addition to the displeasure to different tastes or flavors as well as numerous and varied traits of individuals. Picky eating is currently being used interchangeably with fussy eating, selective eating, and food neophobia; all of which are different but can occur concurrently. Fussy eating occurs when someone rejects a food one day but will eat it the next. Selective eating occurs when someone will avoid foods of particular taste, texture or color. Food neophobia is the fear of eating or trying new foods.

Additionally, taste and flavor are currently being used interchangeably to describe one's subjective experience with food based on taste properties (i.e., sweetness, saltiness, bitterness, sourness and umami; Duffy & Bartoshuk, 1996). Furthermore, taste and flavor are measured differently; indirect measurements typically measure flavor and are not validated for taste. The identified five basic tastes are used to measure taste intensity (Boltong & Campbell, 2013).

Given the differences between taste and flavor, either could be reasons for food rejection and, similar to picky eating, fussy eating, selective eating and food neophobia, should not be used interchangeably when identifying intensity and reasonings for food preferences.

Table 1

Compiled Picky Eating Definitions

Author	Definitions of Picky Eater
Brown & Perrin, 2020	“Decreased variety of food or fussy eater”
Cardona Cano et al., 2015	“Refusal to eat” and “not eating well”
Cardona Cano et al., 2016	“Food refusal, limited variety, food neophobia”
Steinsbekk et al., 2017	“Unwillingness to eat certain familiar and unfamiliar food”
Galloway et al., 2003	“Low dietary variety”
Carruth et al., 2004	“Consuming less or avoid particular food categories”
Galloway et al., 2005	“Food neophobia”
Nicklaus et al., 2005	“Rejecting previously accepted food”
Dovey et al., 2008	“Having longer feeding times”
Jacobi et al., 2008	“Having strong preference for certain foods, presentations and preparations”
Walton et al., 2017	“Unwillingness to eat familiar foods or try new foods, severe enough to interfere with daily routines to an extent that is problematic to the parent, child or parent-child relationship”
Boquin et al., 2014	“People know it when they see it, or when it is described”
Luchini et al., 2016	“Eating a narrow range of food or rejecting several new and familiar food items”
Ellis et al., 2018	“narrow range of food, rigidity about how preferred foods are prepared or served, and difficulty trying novel foods”
Leung, Marchand, Sauve et al., 2012	“Food neophobic – dislike of new food”
Sandvik et al., 2018	“Picky eating refers to a child’s unwillingness to eat familiar foods or try new foods, with negative impacts on children and parents in their daily activities “
Wolsethholme et al., 2020	Fussy eating or Food neophobia
Dubois et al., 2007	eating small meals, eating slowly and accepting a limited number of foods

Table 1*Compiled Picky Eating Definitions (continued)*

Author	Definitions of Picky Eater
Sandcik et al., 2019	“fussy or choosy eating....unwillingness to eat familiar foods or try new foods, with negative impacts on children and parents in their daily activities”
Wildes, Zucker, Marcus, 2012	“characterized by food neophobia (i.e., the avoidance of novel foods), as well as rejection of food that is familiar to the child, usually based on taste, texture, or sensory quality of the food”
Dubois et al., 2007	“‘neophobic', 'fussy eater', 'choosy', and 'problem eaters'....tend to: eat small meals, eat slowly, be less interested in food, acceptance of a limited number of foods, have an unwillingness to try new foods, have a limited intake of vegetables and other foods, and exhibit strong food preferences”
Chong Cole et al., 2017	“characterized by low dietary variety, unwillingness to eat either familiar or novel foods, and problematic interference with the parent–child relationship”
Ellis et al., 2017	“lack of food variety; rejection of new foods; rejection of foods based on taste, texture, or visual appearance; avoidance of foods that have been mixed or touch each other; rituals around eating; and worries about social eating”
Mak, 2017	“selective behavior found among children regarding the domain of food”
Knopf, 2015	“selective eating”
Tharner et al., 2014	“rejection of specific familiar foods and new foods (food neophobia) ...inadequate amounts of food consumed, or rejecting certain food textures”
Horodyski et al., 2010	“Disrupted food acceptance patterns”

From birth, we have initial preference for sweet and salty foods and an innate distaste for sour or bitter foods (Maccaffery et al., 2007). However, these innate preferences can be

influenced through the prenatal decisions due to transference of flavor through amniotic fluid and postnatal decisions due to transference of flavors through breastmilk and other food offerings. This means the development of an infant's taste and flavor preferences are being influenced early, which will impact the flavors they accept once they begin solid foods; a mother's dietary choices have the power to influence which foods are accepted in later infancy and into early childhood (Cooke & Fides, 2011). Additionally, mothers, a majority of the time, are responsible for food decisions made in infancy. The power of parental influence on food choices is greater in younger children before the age of four than when compared to the influence in older children under the age of eight (Maccaffery et al., 2007). Development of healthy eating food preferences in younger children is essential.

A majority of children exhibit picky eating behaviors at some point before the age of 4 (Wolstenholme et al., 2020). During this time, picky eating can be the source of parental frustration due to how challenging the behavior can be (Boquin et al., 2014). Currently, there are numerous strategies parents utilize to try and increase food acceptance and subsequently decrease picky eating (Lumeng et al., 2018). Some strategies are more effective than others and the degree of success can be dependent on the child as well as the parent-child relationship. Pressuring a child to eat a certain food does not decrease the risk of picky eating or increase a picky eaters' desire to try a food (Lumeng et al., 2018). In some instances, the strategy (e.g., pressuring children to finish their plate or hiding the desired food, often a vegetable, in another food) can increase rejection of the desired food.

The reason for a child's picky eating behavior could be a potential indicator of the success of the strategy parents utilize. For example, a child may refuse to eat broccoli because the parents force him to sit at the table until he does. However, how picky eating is currently

assessed, there is limited information available to parents on what strategy would work best for their circumstance. This leaves parents with an overwhelming number of options, that may or may not work for their child, and continued frustration while utilizing a trial-and-error method of intervention. Failed interventions increase the time a child has a limited dietary variety and worsen the behavior, which will continue to influence a child's food preferences.

A child's food preferences, and potential lack of dietary variety at age 4 have been found to be the most significant predictor of later food preferences (Lynch, 2011). These potentially restrictive early food preferences are setting the stage for lifelong dietary limitations and have the power to negatively impact growth (Chong Cole et al., 2017). Picky eating is most likely to emerge during infancy between 12 and 36 months but has been identified as early as 4-months (Carruth et al., 2004; Lumeng et al., 2018). Cathey and Gaylord (2004) identified three main influences of picky eating: development, personal preferences and family. All three of these influences are encompassed by social cognitive theory.

Social cognitive theory is based on the belief that individuals learn through observing others' social interactions, experiences and other outside influences. Albert Bandura's social learning theory is the foundation for social cognitive theory and is commonly used to help identify major components of complex health problems and for the development of interventions (Gaines & Turner, 2009). In applying social cognitive theory to picky eating behaviors, children learn through observation during mealtime and develop food preferences from there. The power of parental influence on food preference extends into early childhood. Infants learn what, when and how much to eat based on the influences of food choices and eating behaviors of their parents and those around them (Savage, Fisher, Birch, 2007). Not only do mother's dietary choices, as mentioned previously, influence preferences, mealtime behaviors of parents (and

other siblings) do as well. For example, when someone else at a table dislikes a food and verbally or physically rejects it, this can cause a learned behavior to occur. Additionally, if a parent is quick to reject a food and ultimately not offer it, learning about the food, taste and flavor, cannot occur.

A study by Hinton (1998) used social cognitive theory as related to child food habits to predict later fruit and vegetable intake. Social cognitive theory was used due to the inclusion of potential cultural, psychosocial, economic and situational variables that influence fruit and vegetable consumption. Hinton (1998) found that role-modeling, nutrition knowledge, exposure and availability to fruit and vegetables, self-efficacy, preferences, asking skills and outcome expectations had the highest impact on consumption. The direct and indirect effects of these various factors on children's fruit and vegetable consumption further indicate the complicated relationship between numerous variables and eating behaviors in children. The outcome of these variables on childhood eating behaviors will ultimately continue to impact lifelong dietary patterns.

In addition to Hinton (1998), a study by Ahlstrom (2009) utilized factors of social cognitive theory including food availability, nutrition education factors such as knowledge, ability and self-efficacy to predict fruit and vegetable intake among college students. All of these factors were found to be significant predictors of level of consumption with availability being the strongest influencer of consumption. These results indicate the continued influence of variables within social-cognitive theory on lifelong dietary patterns, suggesting the need to look at aspects of dietary patterns, such as picky eating, as multidimensional rather than unidimensional and binary.

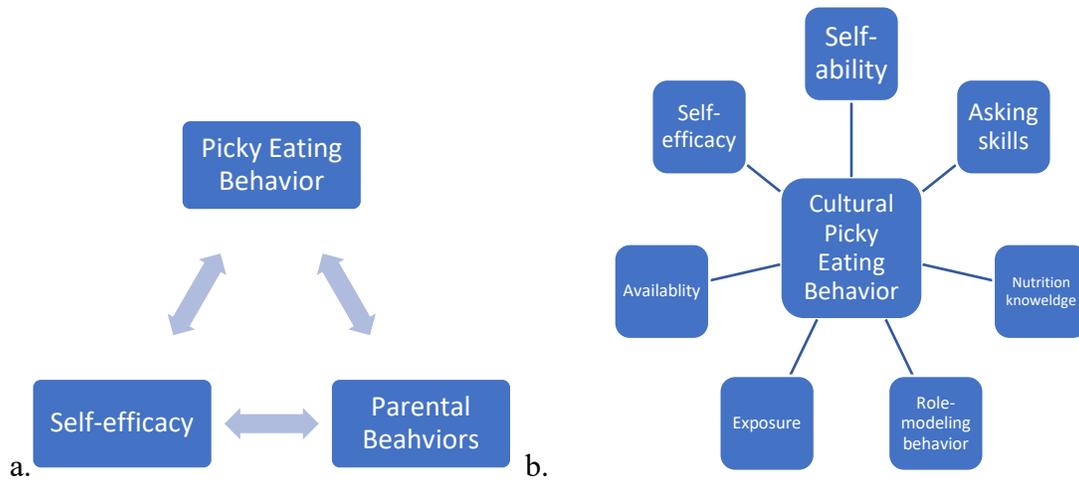
An additional aspect of social cognitive theory is self-efficacy. Bandura supported the notion that self-efficacy influences almost every aspect of an individual's life (Bandura, 1997). This notion can be applied to nutrition, from intake to preferences. Within picky eating behavior, the display of one's ability to exert control could be argued as the foundation for food rejection (e.g., "I am not going to eat that because I am in control of what I eat). Numerous aspects of a breakdown of picky eating behavior definitions can be inserted into a social-cognitive theory model. Models of social cognitive theory often present a behavior, an environmental influence and a personal influence (Figure 1a). Taking one of the picky eating categories developed within the current study (e.g. cultural) and utilizing the variables identified by Hinton (1998) and Ahlstrom (2009), Figure 1b displays the potential influences of picky eating behaviors classified under cultural picky eating. When comparing a binary view of picky eating to one that takes a multidimensional approach using social cognitive theory, the models in Figure 1 show the complexity of factors influencing one behavior of picky eating.

Through the application of Social Cognitive Theory dimensions (e.g., cultural, psychosocial, economic and situational) to nutrition, various factors (food availability, nutrition education factors such as knowledge, ability, self-efficacy, etc.) have been identified as contributors to the development of healthy eating behaviors and preferences. These factors can ultimately also contribute to the development of picky eating. Given the variety of factors from multiple dimensions that have been identified as contributors to picky eating, it is reasonable to assume there is an increased scope to picky eating behaviors. More specifically, if there are various factors and dimensions that contribute to picky eating behaviors, it is logical that there are also various degrees and causes of picky eating. Therefore, applying findings from previous

applications of Social cognitive theory to picky eating further indicates the need for a categorical picky eating variable, rather than the former binary measurement.

Figure 1

Example Models of Picky Eating and Social Cognitive Theory



CHAPTER THREE. METHODOLOGY

Purpose of the Study

The purpose of the current study was to develop a spectrum of picky eating that is determined by degree rather than binary choice through the use of subgroups that reflect reasons for food preferences. In other words, utilizing a *why* instead of *what* approach to identifying picky eating categories and themes among individuals.

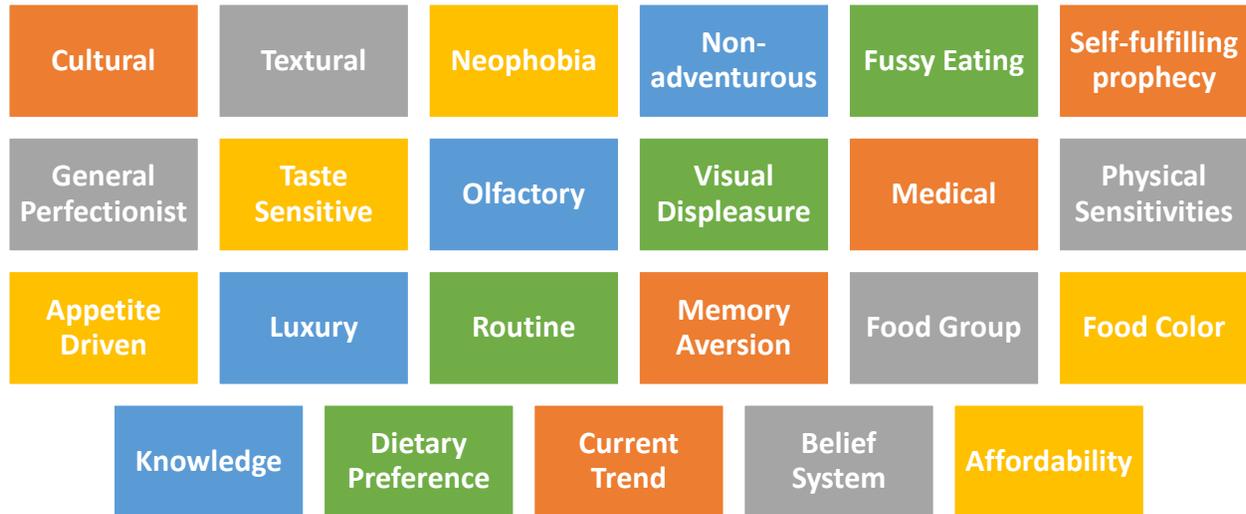
Introduction

Within picky eating literature there are identified “common” traits of picky eaters from a parent perspective. In addition to the compilation of these traits there are other picky eating definitions that include various characteristics. From these characteristics, thematic groups were developed (Figure 2). In addition to the literature, a limited number of peer interviews were conducted. To conduct the interviews, the authors close peers and family who are consistently described by others as being picky eaters or are very vocal about their food preferences were contacted via social media applications or personal phone numbers. These individuals were asked, “Without listing the foods you do not like, why do you not like them?” This sample of individuals was between the ages of 18 and 30, but no other demographic information was collected. Based on their responses and previous literature, the categories below were named and defined to develop a 23-category spectrum (Figure 3).

Spectrum

Figure 2

Visual Depiction of Picky Eating Categories



Cultural

Food choice is influenced by one's traditions, culture and ethnicity (Huotilainen, 2005). These traits are individual and can influence food choice for someone of any culture or ethnicity leading to the resistance to try foods of other cultures for reasons other than religion or ethics.

Textural

Food selectivity can be influenced by a resistance to eat certain foods due to the texture. Texture is perceived by the sense of touch through the hand and/or in the mouth (Kohyama, 2018). The way the food feels can sometimes lead to an adverse initial reaction leading an individual not to consume it.

Neophobia

Food neophobia is a condition that includes refusal of new foods and the overwhelming fear of new food that causes significant distress or anxiety (Smith et al., 2017).

Non-Adventurous

The most common reason for lack of dietary variety is an unwillingness to try any new foods regardless of culture or ethnicity. Within current picky eating research this is the definition given to encompass all behaviors of low dietary variety (Brown & Perrin, 2020). However, at the core, there are various reasons for low variety, including lack of willingness or adventurous behaviors that lead to increased diet variety.

Fussy Eating

Fussy eating is the tendency of individuals to be highly selective and particular about the foods one eats. This can include a limitation in variety but also in the particular way foods are presented (Smith et al., 2017). The limitation in variety occurs at any time, including after initial acceptance while picky eating is the rejection of food initially (Smith et al., 2020; Carruth et al., 2004).

Self-Fulfilling Prophecy

Parents have a tendency to project their own taste preferences, consciously and unconsciously, onto their children (Lynch, 2011). Having a distaste for certain foods due to a parent/guardian/adult proclaiming to and or advising a dislike of the food.

General Perfectionist

One picky eating characteristic identified by parents included not eating foods that had touched another food (Boquin et al., 2014). In some instances, the resistance to eat foods if they have touched other foods also involves a sensory sensitivity and not necessarily a personal choice in low dietary variety (Zickgraf et al., 2020). Therefore, a category was created for general resistance and separate categories for sensory sensitivities related to nutritional behaviors.

Taste Sensitive

Sensory sensitivities are common and have been identified as a contributor to picky eating. Zickgraf and Elkins (2018) investigated the link between sensitivities, anxiety and picky eating in adolescents and emerging adults. Sometimes, having a distaste for particular food is due to flavor. Other times, it is because of a sensitivity due to another sense such as olfactory or sight.

Olfactory

Most of the time before a food is tasted it gives off an aroma. The smell of a food item can be the basis for a dislike before the food is even tasted. Therefore, the dislike of a smell of a particular food is causing a distaste (Zickgraf & Elkins, 2018).

Visual Displeasure

In addition to taste and smell, our desire to eat a food is also influenced by sight. If a food is visually unappetizing, it can cause some individuals to refuse to try it. This sensitivity to the visual display of food can cause a resistance to eat food (Zickgraf & Elkins, 2018). This category also includes a refusal to eat food if it “doesn’t look right,” a characteristic described by parents of their picky eater (Boquin et al., 2014).

Medical

Prevalence for food allergies has been increasing drastically (Abrams et al., 2020). While limited dietary variety can be due to choice, some individuals have an inability to eat certain foods for medical reasons (e.g. can cause anaphylaxis) (Antonella & Hernandez, 2020). Often, a decision to not eat foods is criticized as being picky while not fully knowing the reasons.

Physical Sensitivities

The perception of food being hazardous to oneself can lead to an individual to have a limited dietary variety (Siegrist, Bearth & Harmann, 2020). Therefore, one can have an inability to eat certain foods for self-diagnosis (non-medically confirmed) reasons and personal perceptions of perceived sensitivities.

Appetite Driven

Appetite is a large determinant of food intake. When ill, sometimes appetite is decreased or nonexistent, causing a lack of food consumption. The resistance to a food item can also be appetite driven. If, for example, foods you have tried and liked before do not sound appealing right now, it may cause you to have a distaste. This category is having the resistance to eat familiar foods due to not wanting the taste right now or the flavor right now is displeasing.

Luxury

Some individuals may identify themselves as not being a picky eater because when growing up they weren't *able* or allowed to be due to socioeconomic status, geographical location or the nation they were raised in. Some families have an inability to be picky about what they eat and must eat what is available or what they can afford. Therefore, the *ability* to be a picky eater can be due to SES, geographical location, or nation.

Routine

Most individuals have favorite foods to eat and or cook. Others only know how to cook certain items. While others, still, only cook or eat certain foods because it is what they always purchase. Therefore, only eating certain foods continuously due to routine in cooking or shopping could be a cause of being a non-adventurous eater.

Memory Aversion

Memories can be powerful. Flavor exposure and condition aversions can trigger a distaste for food that was not initially present during previous acceptance (Gaultier et al., 2011). This aversion can cause the avoidance of certain foods due to an associated memory (i.e. choking, nausea, conditioned taste aversion etc.)

Food Group

A common parental report of picky eater characteristics includes preferring foods from one food group and refusing others (e.g., only wanting bread, only wanting fruit, refusing vegetables) (Boquin et al., 2014). Therefore, a category was created for the refusal to eat foods of a certain food group

Food Color

In addition to food groupings, a second common parental report of picky eater characteristics included food color preferences (e.g., refusing foods that are not the color they are “supposed to be”; Boquin et al., 2014). Refusal to eat foods that are not the color they are expected to be.

Knowledge

When foods are not eaten or offered routinely, this can cause refusal due to being rarely or never eaten, causing an additional identified characteristic of food refusal of a picky eater (Boquin et al., 2014). The items in this category are identifiable organs, limbs or whole animals (i.e. snails, frog legs, liver) and or knowledge of the item. The power of knowledge can make it difficult to overcome the mind when it comes to trying new food.

Dietary Preference

There are numerous reasons to refuse food and some are due to personal choices regarding diets. These diets include a variety of options including vegetarian and vegan among others. Options regarding diets such as those mentioned involving choice food preference are becoming more common (Sneijder & te Molder, 2009).

Current Trend

The media has been a strong influencer of various aspects related to development. For example, within nutrition choices, this includes fad diets, cheat meals, or avoiding foods based on limited research backing (Pila et al., 2017).

Affordability

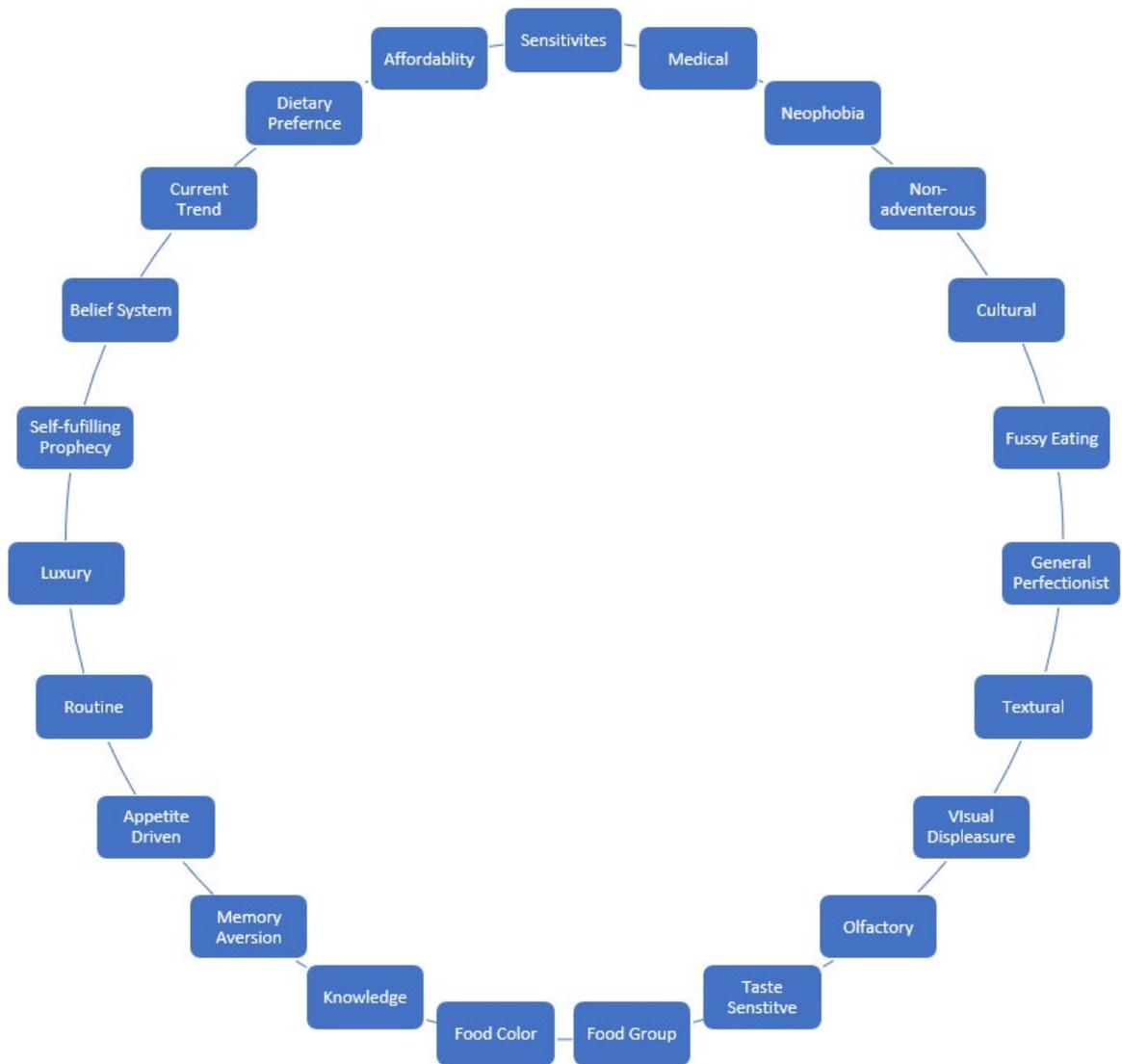
A strong influence of food choice, which ultimately predicts food preferences, is affordability. For various reasons, people choose foods based on whether they are able to pay for them (Pechey et al., 2021).

Belief System

Food selection and food choice can be impacted before food is purchased. Packaging on items, reports and misunderstanding of information (e.g. organic, GMO's) can influence individuals food preferences (Zafar et al., 2020).

Figure 3

Visual Depiction of Picky Eating Spectrum



Population Sample And Sampling Procedure

We recruited 426 college students over the age of 18 in two waves from two institutions, North Dakota State University and Minot State University. Participants in the first wave of data collection were from Minot State University and the data was collected Fall of 2019. The second wave was collected from North Dakota State University students in Spring of 2021. Participants were screened out for having been diagnosed with any form of disordered eating.

Data Collection

Participants were recruited using university email lists at North Dakota State University and Minot State University.

Procedures

Participants were given a link to access a single questionnaire constructed through Qualtrics survey software. The survey consisted of 66 questions that included Likert-type scales, yes/no and short response. Basic demographic questions were included. The survey took approximately 10 minutes to complete.

Informed Consent

The survey was approved by the Institutional Review Board at North Dakota State University. Prior to beginning the survey, each participant was presented with a consent form that included information on their rights as a participant and were asked if they would like to continue or not. If “no” is selected the survey automatically ended. Additionally, participants were be asked if they have ever been diagnosed with any form of disordered eating. If “yes” is selected the survey automatically ended.

Research Design

Demographic Information

Participant's gender, age, current education level, personal income, race/ethnicity, annual average family income, family income level growing up and current employment hours were determined in the demographic information section of the questionnaire.

Picky Eating Categories

The questionnaire was developed based on responses from a peer interview, previous research on factors that contribute to picky eating, and definitions of picky eating within previous literature. The question asked in the interview that was conducted via social media apps: "Without listing what foods you do not like, why do you not like them?" From there, 23 categories were developed and a subsequent measure was developed. The measure was reviewed by experts prior to piloting. Participants were asked to rank how well the category fit them when they were younger and then later asked how well it fits them currently. Exploratory factor analysis was used to analyze the validity and reliability of the survey. The analysis will be discussed in greater detail in Chapter 4.

CHAPTER 4. MANUSCRIPT

Introduction

By the age of 4, at least 50% of children will be identified by their parents as being a picky eater (Carruth et al, 2004; Wolstenholme et al., 2020). This is an alarming statistic when taking into consideration the lack of a universal definition of what constitutes picky eating behavior (Boquin et al., 2014; Brown and Perrin, 2020). If a parent perceives a child is a picky eater when, in fact, the child is not, it may lead to interventions that increase the risk of picky eating (Lumeng et al., 2018). There are numerous picky eating interventions that others, including grandparents and online sources, may promote to parents that have the opposite effect and increase picky eating (Lumeng et al., 2018). Parents try various methods in order to increase the child's intake and reduce mealtime frustration (Boquin et al., 2014).

In addition to parental frustrations picky eating can lead to increased health risks. Having poor dietary variety, as is common with picky eating, can lead to increased nutritional risk. Picky eaters are at an increased risk for low intake of meat, fruits and vegetables which can lead to low iron, zinc and fiber intake. If these deficient intakes extend for a prolonged time, they could impede optimal development and lead to other illnesses and complications later in life (Taylor & Emmett, 2019). It is not just a picky eater problem however, limited and poor dietary variety that can lead to nutrient deficiencies can be seen across the lifespan. Most Americans are not meeting current dietary recommendations for fruit and vegetable intake (United States Department of Health and Human Services [USDHHS] & United States Department of Agriculture [USDA], 2020). In addition to nutrient deficiencies, picky eating has been identified as a risk factor for the development of anorexia nervosa (Marchi & Cohen, 1990), decreased cognitive function (Hegazi

et al., 2015), weakened immune system (Dovey et al., 2008), increased risk for weight problems (Cardona et al., 2015) and increased dental problems (Taylor & Emmett, 2019).

Due to the numerous health risks and parental frustrations, parents may attempt numerous interventions for picky eating. Some of the most common interventions parents utilize include forcing a child to eat, hiding the target food in another item, negotiating and rewarding the child with sweets. All of these have been shown to have the opposite of the desired effect and most of the time, can lead to an increase in picky eating behavior (Lumeng et al., 2018; Martins, 2002; Sanders et al., 1993).

Most of the time, if presented with an epidemic health issue, parents would be provided with a targeted treatment plan to treat symptoms and behaviors. However, when it comes to combating picky eating, parents are left to determine the best strategy, typically through trial and error, of increasing food consumption with their children. The binary view of picky eating does not take into account individualistic differences and underlying reasons why a child may refuse certain foods. Therefore, it does not help parents determine the best intervention based on the reasons behind their child's food preferences and choices, which in turn can make the problem worse. There are a variety of factors and conditions that contribute to an individual being a picky eater, which can make utilizing the best intervention for any given child difficult without understanding the dimensions behind the behavior. The current study seeks to view picky eating as a spectrum created by defining behaviors and identifying specialized subgroups of picky eating with the goal of one day being able to provide parents targeted interventions. This paper reports on the validation of an instrument constructed to measure 23 defined categories of potential picky eating behavior and the degree that they change over time in order to begin laying the foundation for targeted interventions.

Methods

Sample

Undergraduate and graduate students, who were at least 18-years-old were recruited to participate in the pilot study. Two waves of data were collected. The first wave was collected Fall of 2019 from Minot State University and the second wave was collected Spring 2021 from North Dakota State University. Both waves of data were collected over the span of a week. The first wave focused on piloting the survey while the second wave focused on targeting groups that were underrepresented in the first wave (males, etc.). We utilized email list announcements at Minot State University and North Dakota State University in North Dakota, USA, to recruit participants. Individuals who were interested in participating clicked on a single-access link that redirected them to a consent form. Upon giving consent, participants were presented with 2 screening questions to determine if they were a student and if they had ever been diagnosed with any form of disordered eating. Individuals who were not currently a student or had been diagnosed with disordered eating were not eligible to participate and their survey ended. If they were a student and had not been diagnosed with any form of disordered eating, they were able to continue to the questionnaire.

Measurements

In order to investigate the degree of picky eating and to pilot test the survey, students were given a link to access a single questionnaire constructed through Qualtrics survey software. The survey was reviewed by experts prior to dissemination. Questions include Likert-type scales, yes/no and short response. The survey took approximately 10 minutes to complete and consisted of 75 questions. The survey was approved by the Institutional Review Board at North Dakota State University. Prior to beginning the survey, each participant was presented with a consent

form that includes information on their rights as a participant and asked if they would like to continue or not. If “no” was selected the survey automatically ended. Additionally, participants were asked if they have ever been diagnosed with any form of disordered eating. If “yes” was selected the survey automatically ended.

Demographic Information

Participants reported their gender, age, their annual income, their race/ethnicity, their employment status, if they were breastfed and breastfeeding duration, and their family income level growing up including annual family income.

Picky Eating

Participants were asked to report if they had been described as a picky eater by others and if they would describe themselves as picky eaters on a yes/no scale. Additionally, participants reported what food items they disliked and *why* they disliked the foods they do not like. Participants were then provided with 2 sets of the same 23 questions, one set for their experience prior to high school and one for their current experience, created by the researchers based on previous research and the 23 categories of picky eating. The 23 questions were ranked on a 5-point Likert scale ranging from 1 *strongly agree* to 5 *strongly disagree*.

Data Analysis

Data was analyzed using IBM SPSS Statistics Version 26. Sample characteristics were analyzed using demographic data. Paired t-tests were used to investigate the frequency of each picky eating category and the degree of change in picky eating over time. An Exploratory Factor Analysis was conducted to determine the validity of the construct utilizing the current data responses.

Table 2*Picky Eating Spectrum and Survey Questions Utilized to Measure*

Category – Definition	Current Measure	Retrospective Measure
Cultural - Resistance to try foods of other cultures for reasons other than religion or ethics	Now, I am resistant to try new foods from a different culture or ethnicity.	When I was younger, I was resistant to try new foods from a different culture or ethnicity.
Textural – Individual refusing food due to texture	Now, I will not eat certain foods due to the texture.	When I was younger, I would not eat certain foods due to the texture.
Neophobia - Food neophobia is a condition that includes refusal of new foods and the overwhelming fear of new food that causes significant distress or anxiety	Now, I am terrified to try new foods.	When I was younger, I was terrified to try new foods
Non-adventurous - Lack of willingness or adventurous behaviors that lead to increased diet variety	Now, I am unwilling to try new foods.	When I was younger, I did not like trying new foods in general.
Fussy Eating - the tendency of individuals to be highly selective and particular about the foods one eats	Now, I will only eat certain foods if they are cooked or presented in certain ways.	When I was younger, I would only eat certain foods if they were cooked or presented in a certain way.
Self-fulfilling prophecy - Having a distaste for certain foods due to a parent/guardian/adult proclaiming to and or advising a dislike of the food	Now, I will not eat certain foods because an adult in my life didn't like them or told me I wouldn't like them.	When I was younger, I did not eat certain foods because an adult in my life didn't like them or told me I wouldn't like them.
General Perfectionist - The resistance to eat foods if they have touched other foods	Now, I will not eat my food if it has touched other foods on my plate.	When I was younger, I would not eat my food if it had touched other food on my plate.
Taste Sensitive - Having a distaste for a particular food due to the flavor	Now, I dislike a particular food due to the flavor.	When I was younger, I disliked a particular food due to only to the flavor.
Olfactory - Sensitivity to the smell of a particular food causing a distaste	Now, I refuse to eat certain foods due to how they smell.	When I was younger, I refused to eat certain foods due to how they smelled.
Medical - While limited dietary variety can be due to choice, some individuals have an inability to eat certain foods for medical reasons	Now, I will not eat certain foods due to medical reasons diagnosed by a medical professional.	When I was younger, I did not eat certain foods due to medical reasons diagnosed by a medical professional.
Physical Sensitivities - Therefore, one can have an inability to eat certain foods for self-diagnosis (non-medically confirmed) reasons and personal perceptions	Now, I will not eat certain foods due to a self-diagnosed sensitivity not confirmed by a medical professional.	When I was younger, I did not eat certain foods due to a self-diagnosed sensitivity not confirmed by a medical professional.
Visual Displeasure - Sensitivity to the visual display of food causing a resistance to eat food	Now, I am unwilling to eat foods due to the way they look.	When I was younger, I was unwilling to eat certain foods due to the way they looked.

Table 2*Picky Eating Spectrum and Survey Questions Utilized to Measure (continued)*

Category – Definition	Current Measure	Retrospective Measure
Appetite Driven- The resistance to eat familiar foods due to not wanting the taste at the present moment, the flavor right now is displeasing.	Now, at times, I am resistant to eat familiar foods due to not having a desire, or "being in the mood" for the taste in the moment.	When I was younger, at times, I was resistant to eating familiar foods due to not having a desire for the taste in the moment.
Luxury -The ability to be a picky eater due to socio-economic status (SES), geographical location or nation	Now, I refuse to eat certain foods because I can.	When I was younger, I refused to eat certain foods due to the fact that I had the luxury of being able to refuse them.
Routine -Only eating certain foods continuously due to routine in cooking or shopping.	Now, I only eat certain foods that are part of my regular food routine (same food for breakfast).	When I was younger, I only ate certain foods that were part of my regular eating routine (E.g., ate same food for breakfast, certain nights of the week only eat certain foods).
Memory Aversion - Flavor exposure and condition aversions can trigger a distaste for food that was not initially present during previous acceptance. This aversion can cause the avoidance of certain foods due to an associated memory (i.e. choking, nausea, etc.)	Now, I avoid certain foods due to an associated memory (e.g., I choked or became nauseous after eating it once).	When I was younger, I avoided certain foods due to an associated memory (e.g., I choked or became nauseous after eating it once).
Food Group- Refusal to eat foods of a certain food group	Now, I refuse to eat foods in a certain food group (e.g., fruits, vegetables, etc.). Please do not include if groups are refused for medical reasons.	When I was younger, I refused to eat foods in a certain food group (e.g., fruits, vegetables, etc). Please do not include if the refusal was for medical reasons.
Food Color - Refusal to eat foods that are not the color they are expected to be	Now, I refuse to eat foods that are not the color they are "supposed" to be (e.g., green eggs, purple potatoes).	When I was younger, I refused to eat foods that were not the color they are "supposed" to be (e.g., green eggs, purple potatoes).
Knowledge- Refusal to eat identifiable organs, or limbs	Now, I refuse to eat foods if they are identifiable organs or limbs (liver, chicken legs, etc.).	When I was younger, I refused to eat foods if they were identifiable organs or limbs (liver, chicken legs, etc.)
Dietary Preference - Refusal to eat certain foods due to preferred diet (i.e. vegetarian, vegan, etc.)	Now, I refuse to eat certain foods due to a preferred diet (vegetarian, vegan, etc.).	When I was younger, I refused to eat certain foods due to a preferred diet (vegetarian, vegan, etc.)
Affordability- Low dietary variety due to an inability to afford or experience new or other foods	Now, I do not eat certain foods due to not being able to afford them.	When I was younger, I did not eat certain foods due to not being able to afford them.
Belief System -Not eating something due to strong beliefs, religious or otherwise	Now, I will not eat certain foods due to personal beliefs (i.e., religion).	When I was younger, I refused to eat certain foods due to personal beliefs (i.e., religion).

Table 2*Picky Eating Spectrum and Survey Questions Utilized to Measure (continued)*

Category – Definition	Current Measure	Retrospective Measure
Current Trend- A trend in the media not to eat something.	Now, I will not eat certain foods due to widespread current trends such as not eating gluten, sugar, GMO's.	When I was younger, I refused to eat certain foods due to widespread current trends such as not eating gluten, sugar, GMO's.

Results*Sample Characteristics*

After the two waves of recruiting a total of 710 surveys were collected. After screening, 75 participants were removed from the data set (51 due to having been diagnosed with a form of disordered eating and 24 for not being an undergraduate or graduate student) and another 199 were excluded for incomplete data. The final sample, reported in Table 1, consisted of 426 individuals including 112 males and 310 females (4 participants did not report their gender) between the ages of 18 and 60. Of the participants, 89.2% identified as Caucasian.

Table 3*Demographics*

Demographic	N (%)	Measure of Central Tendency
Gender		
Male	112 (26.3)	NA
Female	310 (72.8)	
Prefer Not to Say	4 (0.9)	
Total	426	
Age		
18 to 24 years	320 (75.1)	Mean: 25.74 years SD: 7.8
25 to 29 years	50 (11.7)	
30 to 34 years	28 (6.6)	
35 to 39 years	10 (2.3)	
40 to 44 years	10 (2.3)	
45 to 49 years	5 (1.3)	
50+ years	3 (0.7)	
Total	426	
Education		
Undergraduate	327 (76.8)	NA
Graduate	99 (23.2)	
Total	426	

Table 3*Demographics (continued)*

Demographic	N (%)	Measure of Central Tendency
Personal Income		
\$0 – 5,000	120 (28.6)	
\$5,001 – 10,000	105(24.7)	
\$10,001 – 15,000	60 (14.1)	
\$15,001 – 20,000	33 (7.8)	
\$20,001 – 25,000	16 (3.8)	Median: \$5,001 – 10,000
\$25,001 to 40,000	22 (5.2)	
\$40,001 to 60,000	32 (7.5)	
\$60,001 to 80,000	21 (4.9)	
\$80,001 to 100,000	5 (1.2)	
More than \$100,000	11 (2.6)	
Total	425	
Race/Ethnicity		
Caucasian	378 (89.2)	
AI/AN	3 (0.7)	
Hispanic/Latino- White	6 (1.4)	
Hispanic/Latino-Nonwhite	3 (0.7)	NA
Black/African	8 (1.9)	
Indian	3 (0.7)	
Middle-Eastern/North African	2 (0.5)	
Asian	9 (2.1)	
Multiracial	8 (1.9)	
Other	4 (0.9)	
Total	426	
BMI		
Underweight	10 (4.7)	
Normal or Healthy Weight	102 (47.7)	
Overweight	61 (28.5)	
Obese	41 (19.2)	NA
Total	214	
Current Employment Status		
40+ Hours per week	64 (15.1)	
26-39 Hours per week	55 (12.9)	NA
< 25 Hours per week	306 (48.5)	
Seeking employment	29 (6.8)	
Not seeking outside employment	71 (16.7)	
Total	425	
Breastfed as a Child		
Yes	249 (58.5)	
No	105 (24.6)	NA
I do not know	72 (16.9)	
Total	426	

Table 3*Demographics (continued)*

Demographic	N (%)	Measure of Central Tendency
Breastfeeding Duration		
I do not know	160 (64.3)	
1 Month	4 (1.6)	
2 Months	5 (2.0)	
3 Months	3 (1.2)	NA
4 Months	6 (2.4)	
5 Months	2 (0.8)	
6 Months	13 (5.2)	
More than 6 months	56 (22.5)	
Total	249	
Described as picky eater by others		
Yes	181 (42.5)	NA
No	245 (57.5)	
Total	426	
Describe self as picky eater		
Yes	143 (33.6)	NA
No	283 (66.4)	
Total	426	
Family Income Level		
Lower income (less than \$20,000)	14 (3.4)	
Low income (\$20,001- 44,999)	60 (14.6)	
Middle Class (\$45,000-139,000)	257 (62.7)	Median: Middle Class
Upper Middle Class (140,000 – 149,999)	56 (13.7)	
High Income (150,00-199,999)	12 (2.9)	
Highest (200,000+)	11 (2.7)	
Total	410	
Family Average Annual Income		
\$0 – 5,000		
\$5,001 – 10,000	4 (1.0)	
\$10,001 – 15,000	3 (0.7)	
\$15,001 – 20,000	3 (0.7)	
\$20,001 – 25,000	8 (1.9)	Median: \$60,001 - \$80,000
\$25,001 to 40,000	8 (1.9)	
\$40,001 to 60,000	36 (8.7)	
\$60,001 to 80,000	79 (19.2)	
\$80,001 to 100,000	85 (20.6)	
More than \$100,000	77 (18.7)	
Total	109 (26.5)	
	412	

In order to examine picky eating behaviors over time, participant responses were compared in the categories using their retrospective responses and current ratings of each picky

eating category. Paired t-test analyses using childhood rating (retrospective) and adult ratings (current), showed significant differences in a majority of categories with only a few exceptions (Table 3). On average, individual ratings for each category increased from retrospective childhood rating to now in all categories except, medical, physical sensitives, appetite driven, luxury, dietary, current trends and belief systems. Comparison of participant perceptions of their agreement of how well each category described them currently as well as when they were younger showed significant increases over time in a few categories including: knowledge, affordability, medical, belief system, physical sensitivities, appetite driven and luxury.

Table 4

Paired T-Test of Restrospective and Current Category Ratings

Category	N	Retrospective		Current		t	Df	p
		Mean	SD	Mean	SD			
Cultural	426	3.03	1.46	4.28	1.14	-17.46	425	0.00***
Textural	426	2.22	1.37	2.74	1.48	-8.33	425	0.00***
Neophobia	425	3.44	1.39	4.47	0.92	-15.89	424	0.00***
Non-adventurous	427	3.21	1.44	4.45	0.95	-17.68	426	0.00***
Fussy Eating	425	3.20	1.40	3.92	1.29	-11.63	424	0.00***
Self-fulfilling Prophecy	426	3.61	1.35	4.53	0.92	-14.21	425	0.00***
General Perfectionist	426	3.64	1.50	4.19	1.25	-7.45	425	0.00***
Taste Sensitive	425	2.15	1.21	2.14	1.29	0.15	424	0.88
Olfactory	426	2.45	1.31	2.73	1.38	-4.70	425	0.00***
Medical	425	4.50	1.04	4.26	1.27	4.06	424	0.00***
Physical Sensitivities	426	4.23	1.27	3.89	1.47	5.55	425	0.00***
Visual Displeasure	427	2.78	1.37	3.46	1.33	-10.86	426	0.00***
Appetite Driven	426	2.88	1.29	2.42	1.25	7.44	425	0.00***
Luxury	427	3.44	1.39	2.59	1.33	10.87	426	0.00***
Routine	426	3.44	1.37	3.58	1.32	-1.92	425	0.06
Memory Aversion	427	2.79	1.56	3.21	1.52	-6.90	426	0.00***
Food Group	425	3.21	1.52	4.26	1.22	-7.05	424	0.00***
Food Color	425	3.86	1.35	4.19	1.16	-6.64	424	0.00***
Knowledge	426	3.80	1.33	3.53	1.53	-5.18	425	0.00***
Dietary Preference	425	3.26	1.58	4.33	1.24	3.91	424	0.00***
Affordability	425	4.51	1.03	3.35	1.41	3.35	424	0.00***
Current Trend	425	3.60	1.41	4.44	1.11	1.90	424	0.06
Belief System	425	4.52	1.02	4.39	1.08	5.40	424	0.00***

*Note: p-value <.05 denoted *, <.01**, <.001****

The frequency of responses from participants for each category are displayed in graphs (figures 4 through 26). From these graphs, we can visually see how common a category of picky eating was for the current populations. While a majority of the categories had a mix in responses or overall agreement, in some of the categories, most people disagree or do not identify. These included: dietary preference, food color, food group, physical sensitivity, medical, Non-adventurous (current), current trend, and belief (current).

Figure 4

Visual Depiction of the Category: Dietary Preference

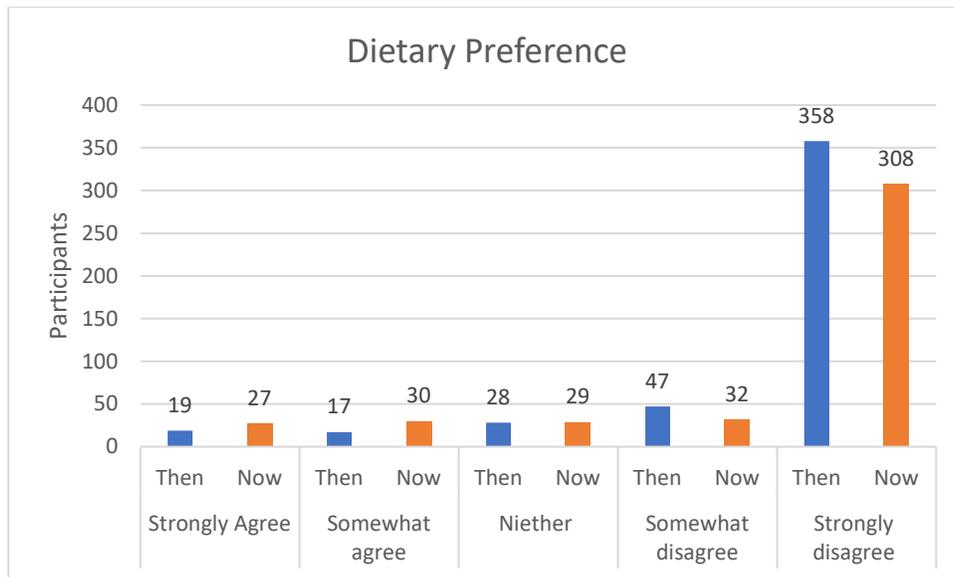


Figure 5

Visual Depiction of the Category: Memory Aversion

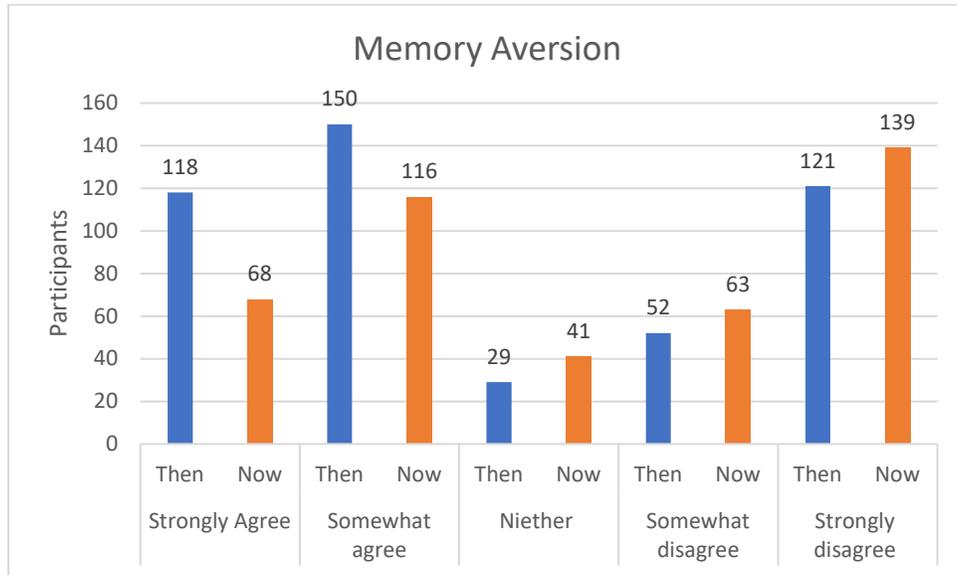


Figure 6

Visual Depiction of the Category: Knowledge

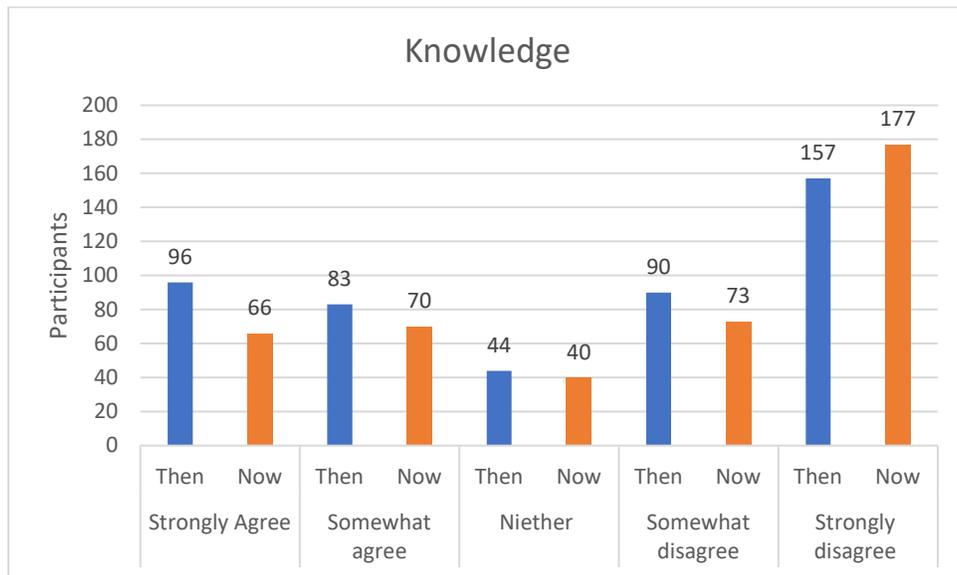


Figure 7

Visual Depiction of the Category: Routine

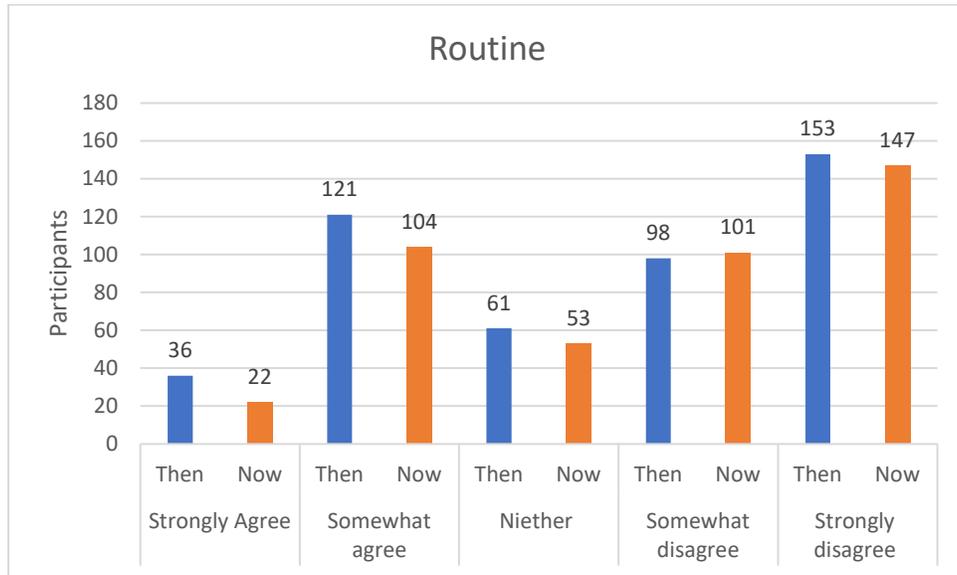


Figure 8

Visual Depiction of the Category: Food Color

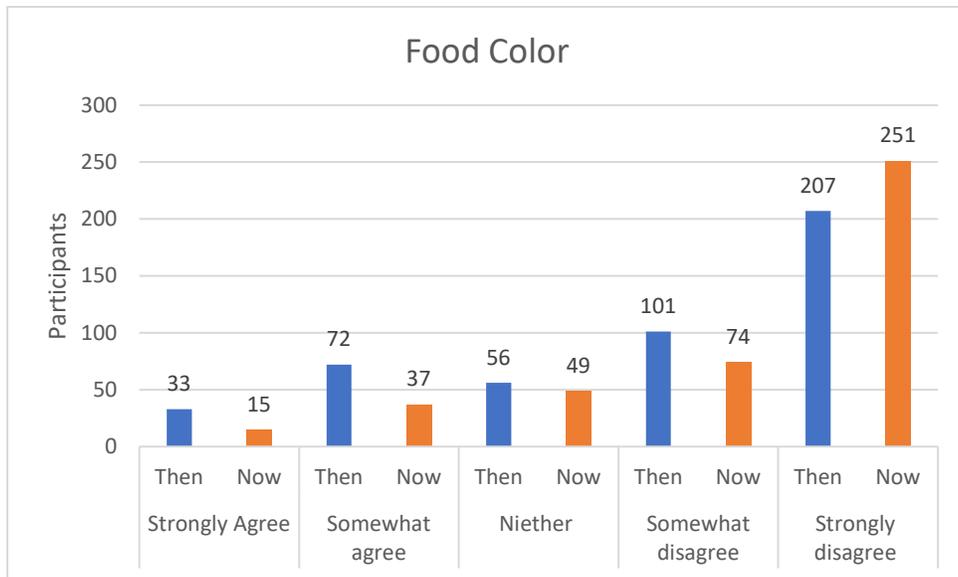


Figure 9

Visual Depiction of the Category: Food Group

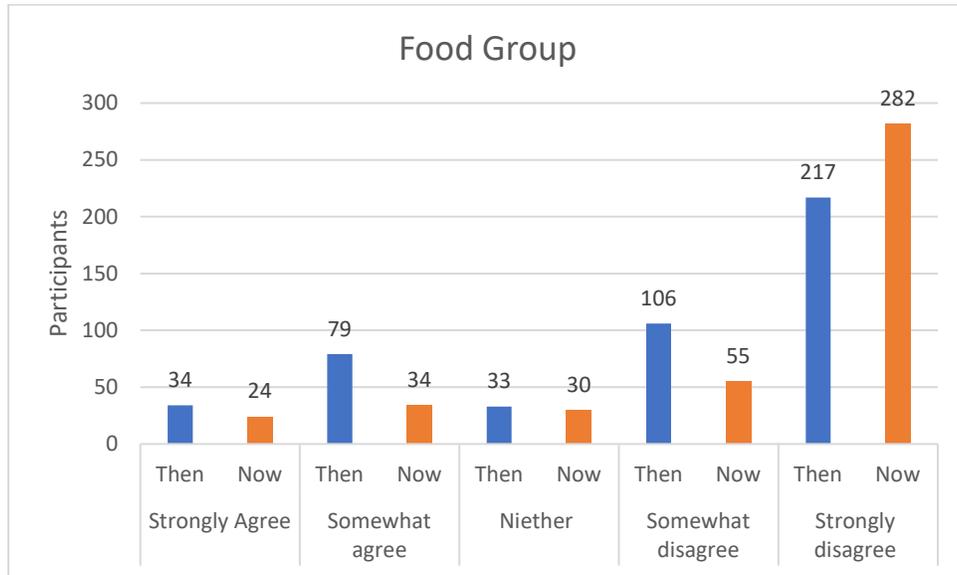


Figure 10

Visual Depiction of the Category: Luxury

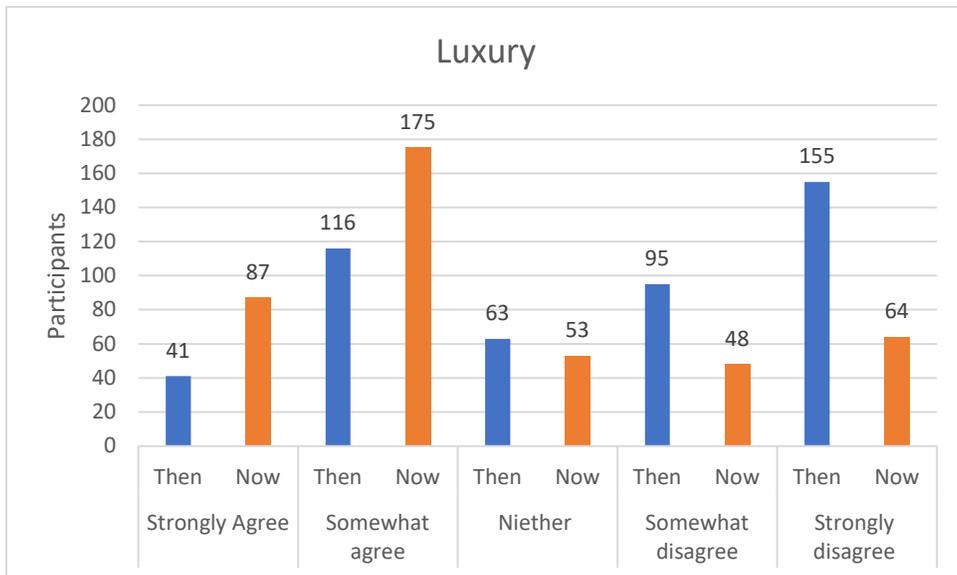


Figure 11

Visual Depiction of the Category: Appetite Driven

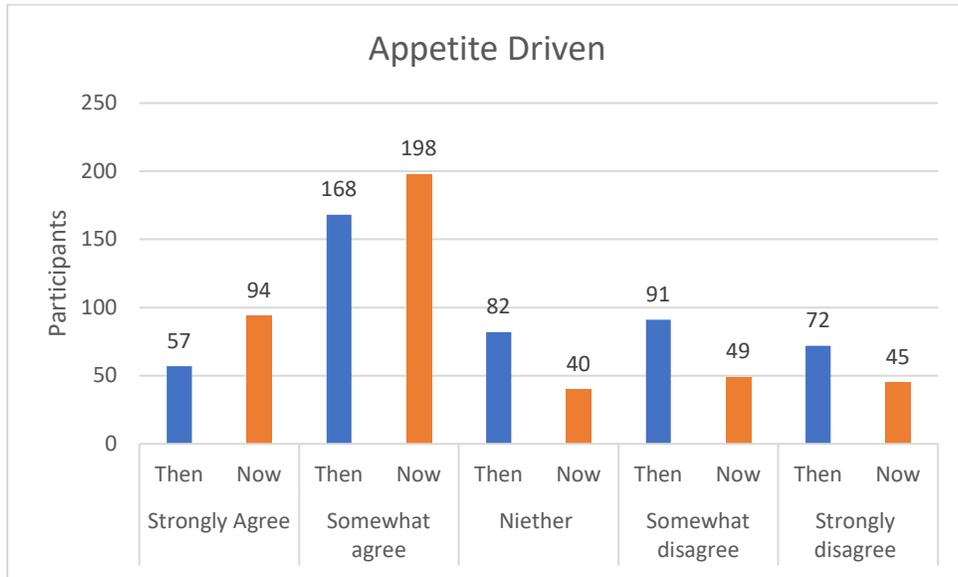


Figure 12

Visual Depiction of the Category: Physical Sensitives

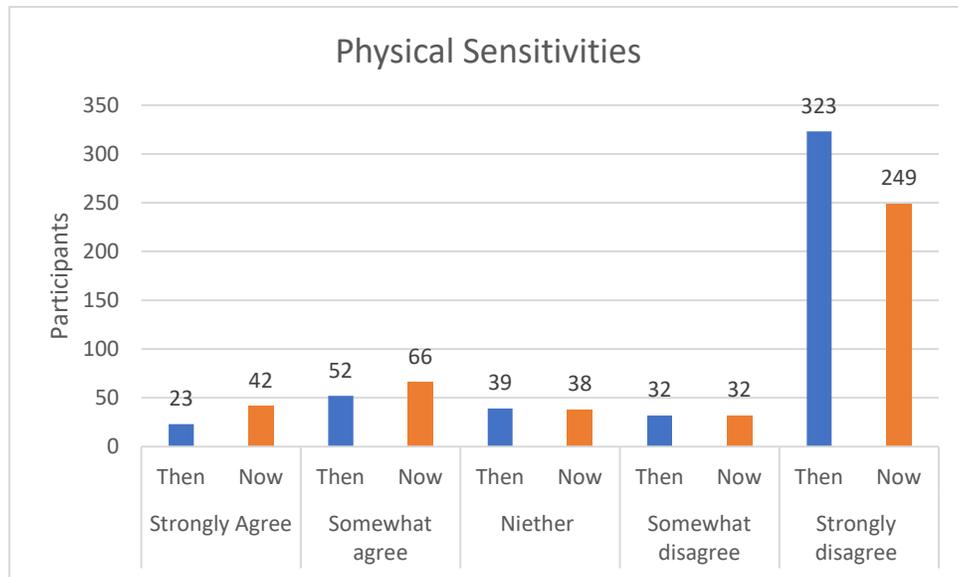


Figure 13

Visual Depiction of the Category: General Perfectionist

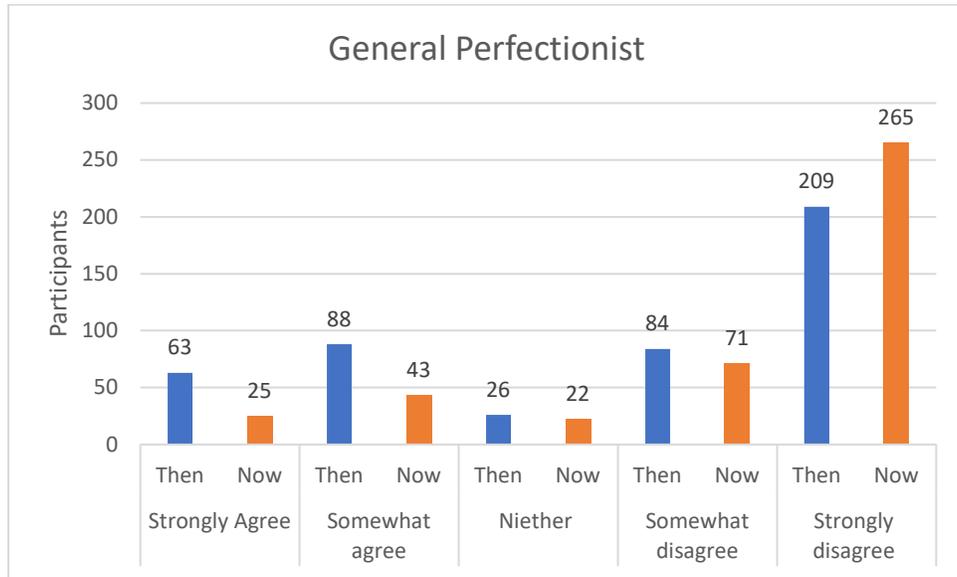


Figure 14

Visual Depiction of the Category: Medical

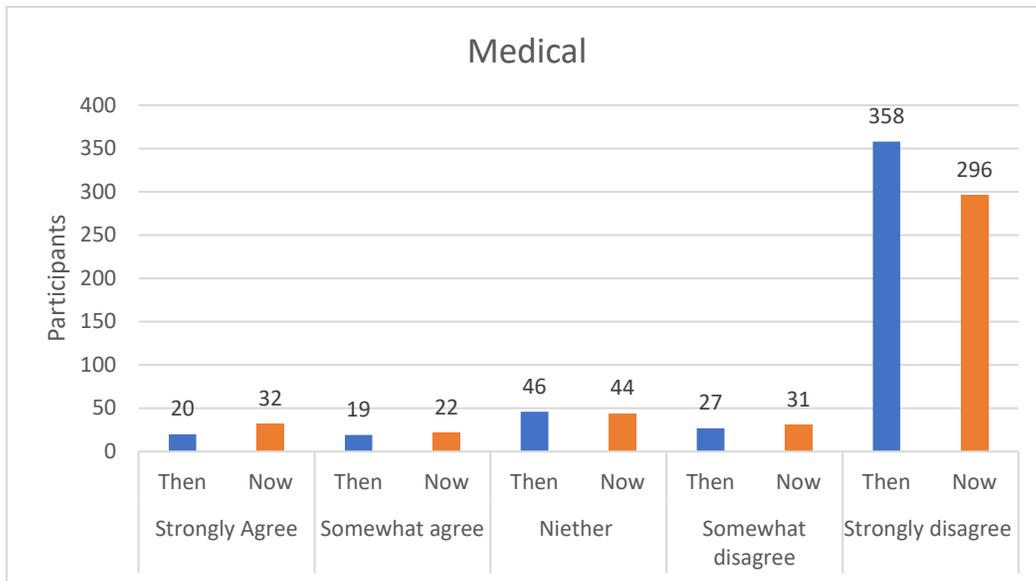


Figure 15

Visual Depiction of the Category: Visual Displeasure

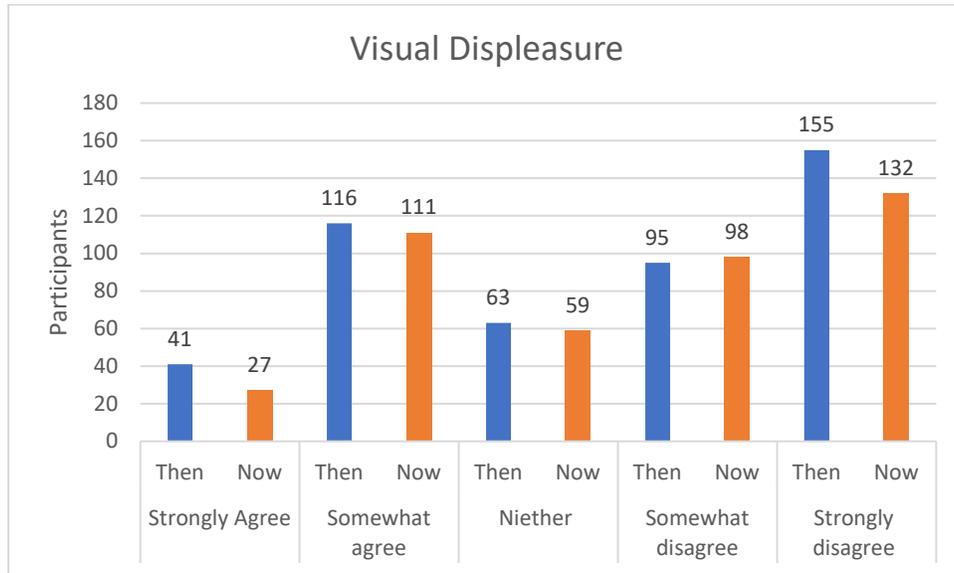


Figure 16

Visual Depiction of the Category: Olfactory

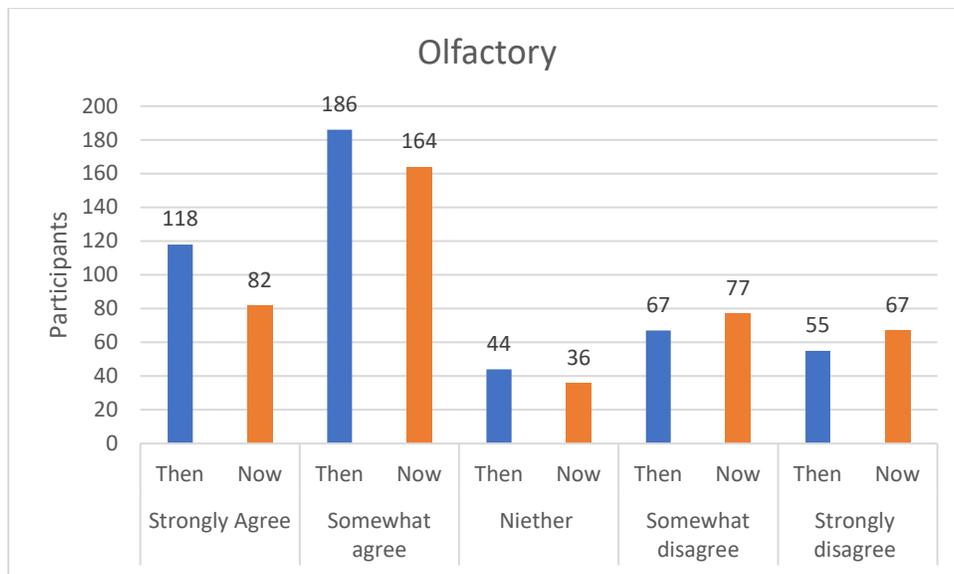


Figure 17

Visual Depiction of the Category: Taste Sensitive

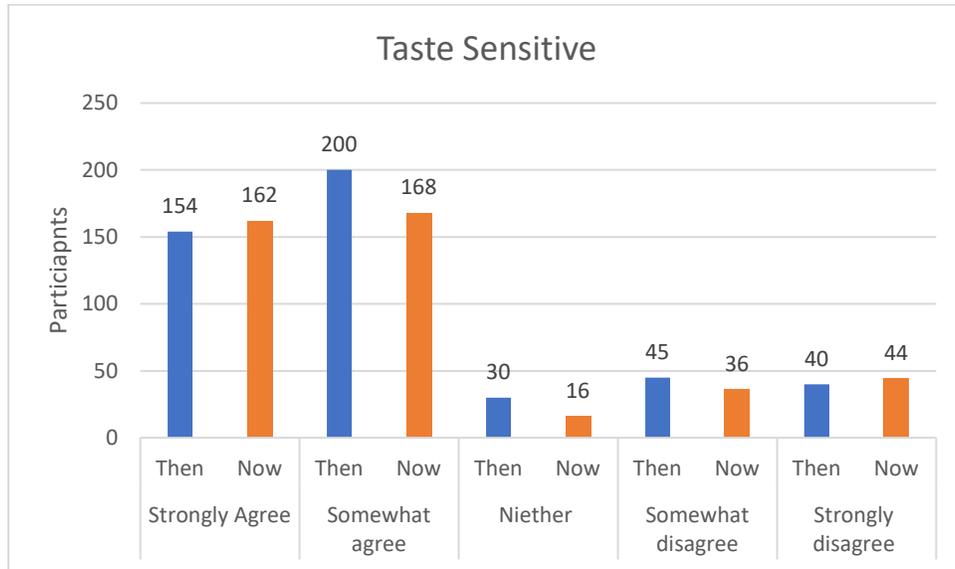


Figure 18

Visual Depiction of the Category: Self-Fulfilling Prophecy

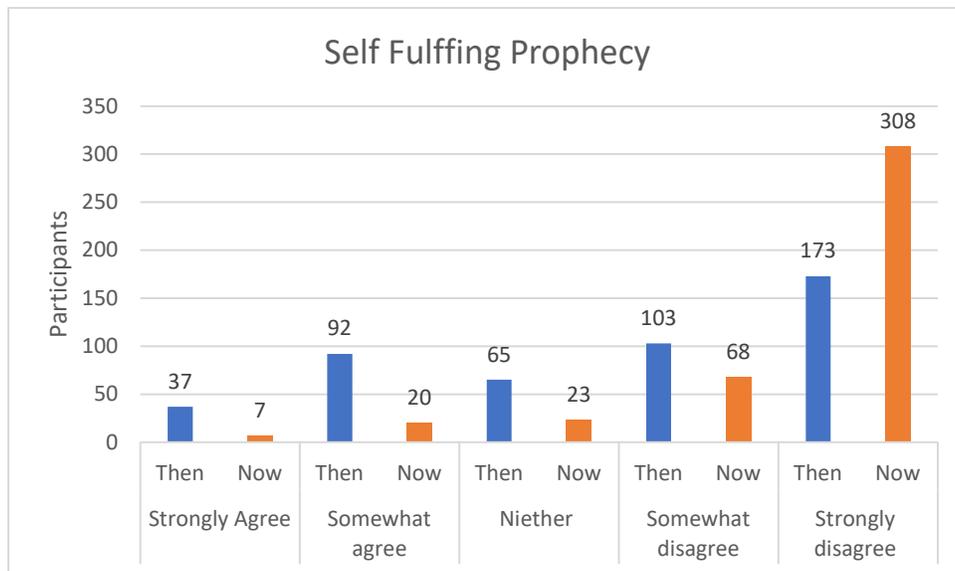


Figure 19

Visual Depiction of the Category: Fussy Eating

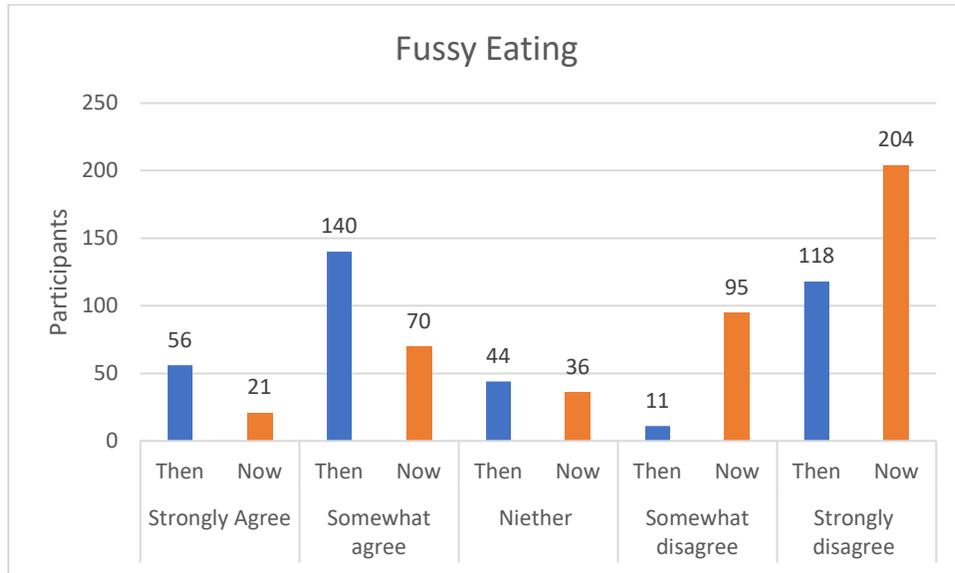


Figure 20

Visual Depiction of the Category: Nonadventerous

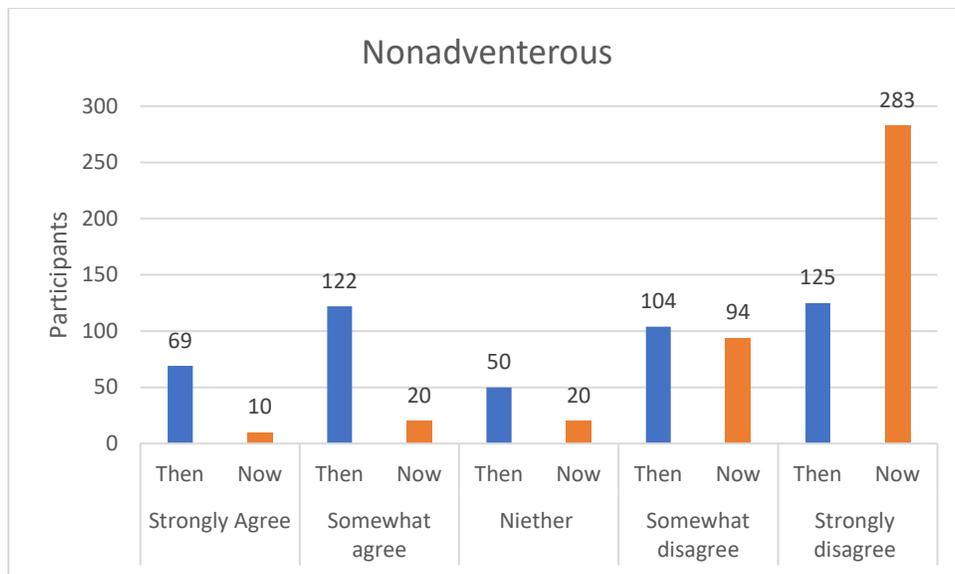


Figure 21

Visual Depiction of the Category: Neophobia

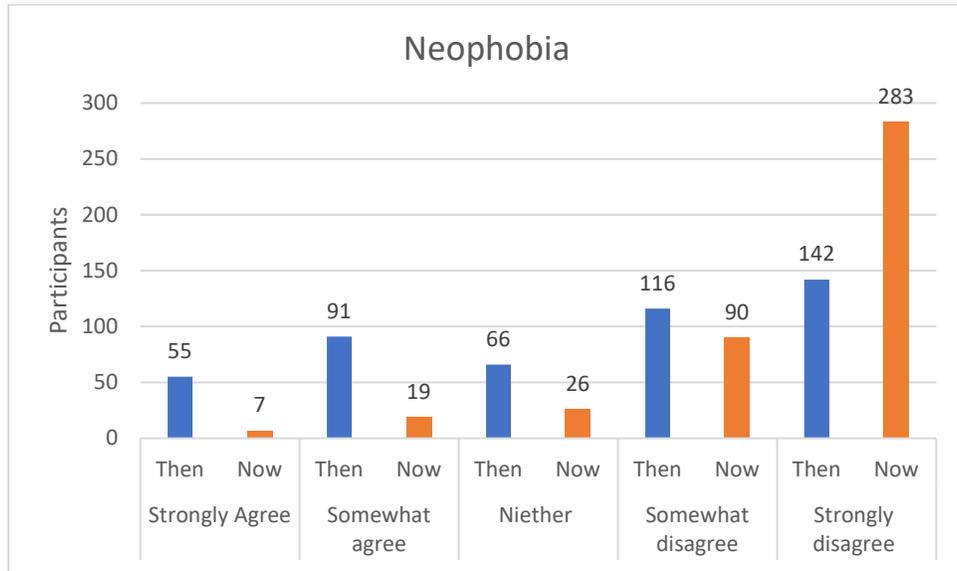


Figure 22

Visual Depiction of the Category: Texture

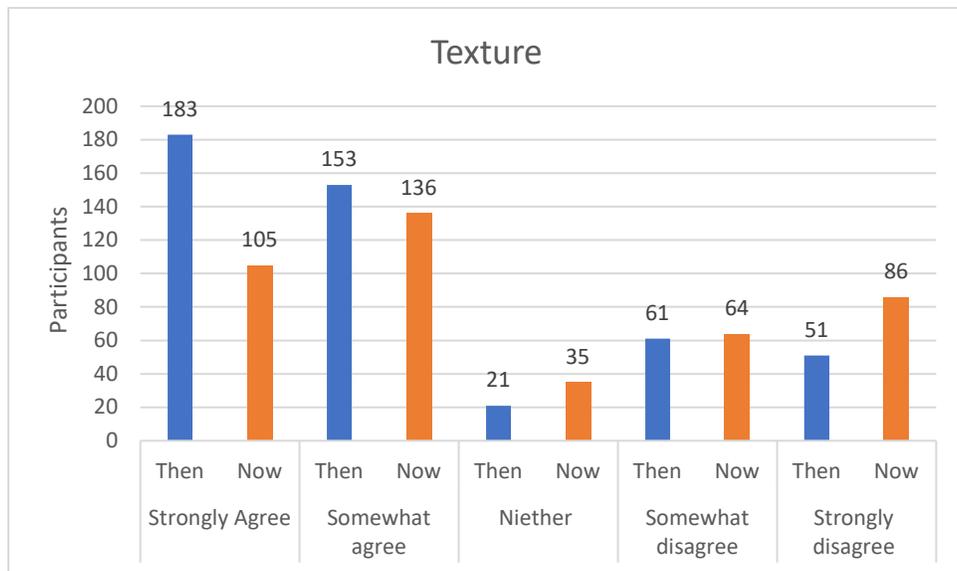


Figure 23

Visual Depiction of the Category: Culture

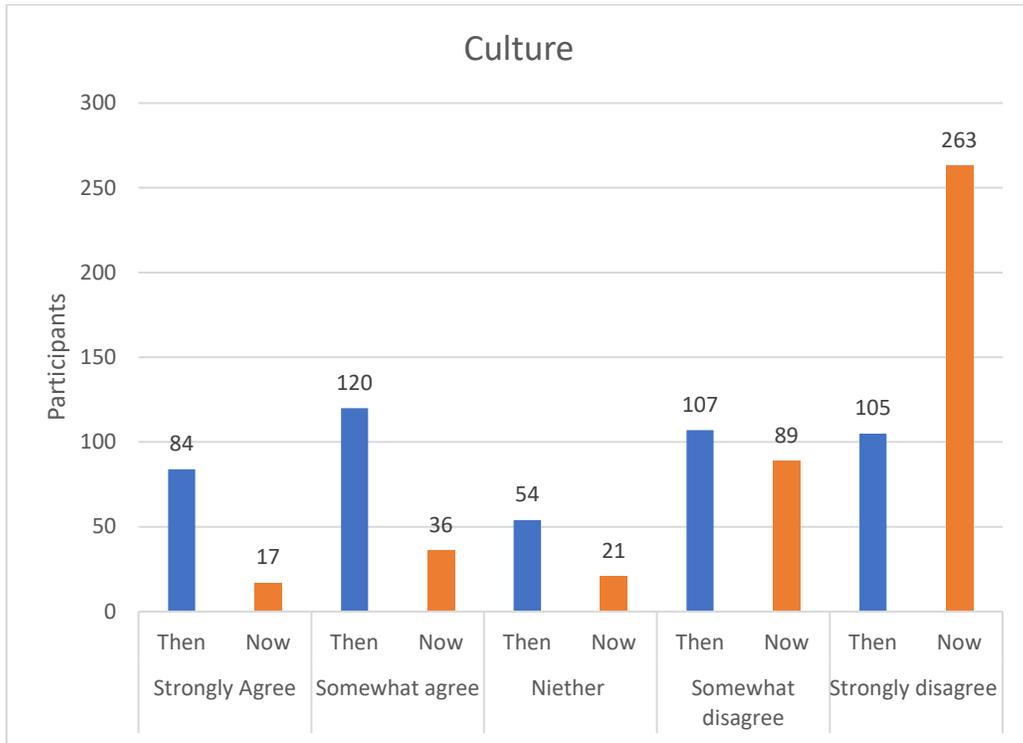


Figure 24

Visual Depiction of the Category: Current Trend

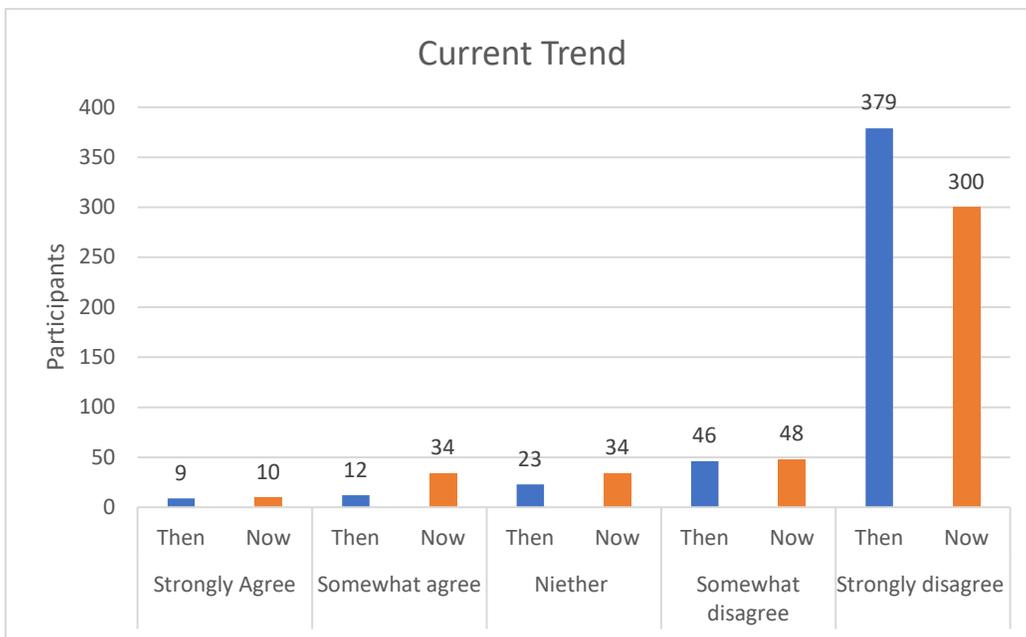


Figure 25

Visual Depiction of the Category: Belief System

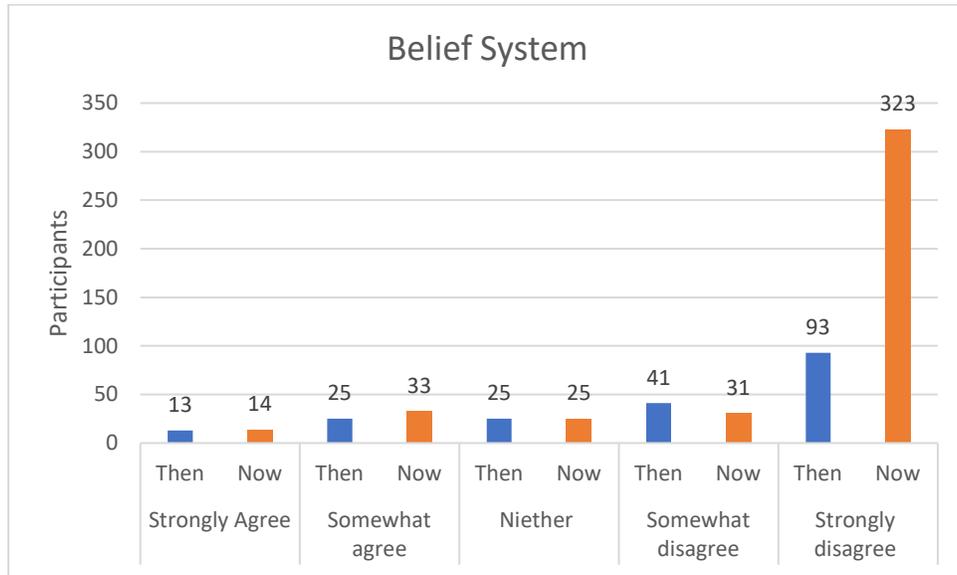
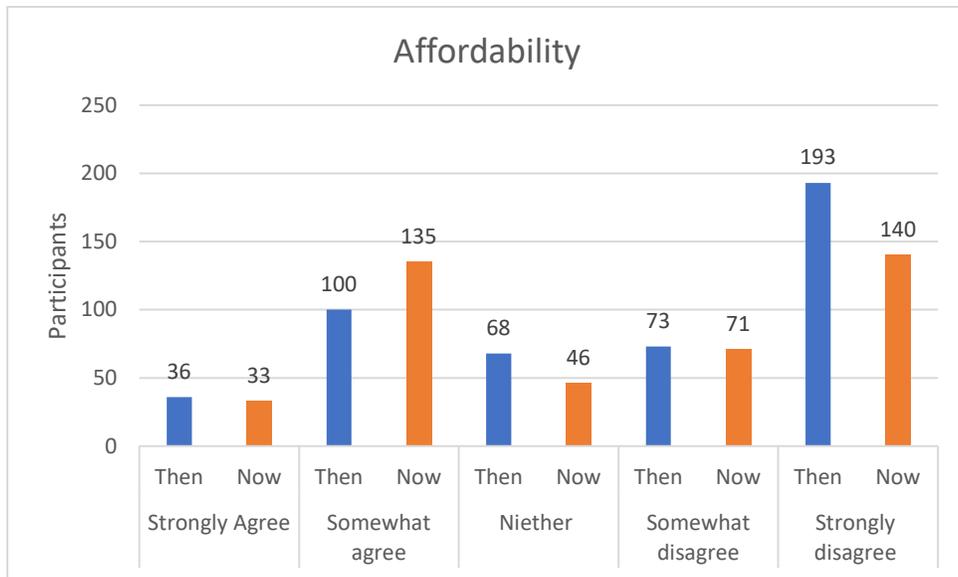


Figure 26

Visual Depiction of the Category: Affordability



An exploratory factor analysis of the pilot data was performed using the Maximum Likelihood method of extraction. Bartlett's test of sphericity, which tests the overall significance of all correlations within the correlation matrix, was significant ($\chi^2(253) = 852.15, p < 0.001$),

indicating that it was appropriate to use the factor analysis for the pilot data. The Kaiser-Meyer-Olkin measure of sample adequacy indicated that the strength of the relationships among variables was high ($KMO = .758$), also indicating the analysis was acceptable. Initially, 6 factors with eigenvalues greater than one were extracted to be included in analysis. After a series of analyses, only 3 factors led to interpretable results. An oblimin rotation was performed since factors were expected to be correlated. The pattern matrix is displayed in Table 4 all items with loadings less than .3 are suppressed. The 23 items loaded across the 3 factors.

The first factor accounts for 24.56 percent of the variance in the data and had an eigenvalue of 5.64. Factor two accounted for 9.87 percent of variance and factor three for 6.85 percent of the variance with eigenvalues of 2.27 and 1.58, respectively. Factor 1 consisted of 7 items ($\alpha = .76$), Factor 2 consisted of 10 items ($\alpha = .79$), and Factor 3 consisted of 5 items ($\alpha = .66$). Only one item did not load on any factor, affordability. Based on the items that load onto each factor, Factor 1 has been named Primary, Factor 2 has been named Aversion and Factor 3 has been named Decisional.

Table 5*Exploratory Factor Analysis*

Category	Factor Loadings		
	Factor 1 Primary	Factor 2 Aversion	Factor 3 Decisional
Cultural	0.746		
Textural		0.512	
Neophobia	0.834		
Non-adventurous	0.825		
Fussy Eating		0.39	
Self-fulfilling prophecy	0.518		
General Perfectionist	0.413		
Taste Sensitive		0.731	
Olfactory		0.703	
Medical			0.568
Physical Sensitivities			0.588
Visual Displeasure		0.501	
Appetite Driven		0.580	
Luxury		0.520	
Routine		0.382	
Memory Aversion		0.396	
Food Group	0.536		
Food Color	0.521		
Knowledge		0.354	
Dietary Preference			0.693
Affordability			
Current Trend			0.604
Belief System			0.608
Eigenvalues	5.65	2.27	1.58
% of variance	24.56	9.87	6.85

Discussion

The purpose of the current study was to develop and validate a measure focused on 23 identified categories of picky eating behaviors. Items were drawn from anecdotal evidence, previous research and various definitions of picky eating that exist within the literature. Our results showed that certain picky eating categories persisted into adulthood, and some of the categories persisted at increased rates (in knowledge, affordability, medical, belief system, physical sensitivities, appetite driven and luxury) while the others slightly decreased but were

still present. This finding suggests that picky eating is not just a childhood problem and can persist into adulthood. Picky eating in adulthood has been associated with psycho-social impairment –leading to increased anxiety in social environments involving food or mealtime, as well as increased depression related eating, emotional and behavioral disorders (Chong Cole et al., 2017; Ellis et al., 2018). Therefore, identifying and effectively intervening early is a necessary first step in optimal growth and development across the lifespan.

The results of this pilot test provide evidence of the validity of the picky eating spectrum to assess picky eating behaviors. Items loaded across three factors which have been identified as Primary, Aversion and Decisional. These factor names were chosen based on the categories/items that loaded on each. Primary was chosen due to these categories being the most common picky eating behaviors utilized in the various definitions of picky eating within the literature. Aversion was selected for factor two due to the categories that loaded on the factor being closely linked due to physical or cognitive sensitivities that would cause aversions to foods. Lastly, decisional was identified as the name for factor three due to these categories being linked to decisions made due to individual beliefs or by others (e.g., medical professionals) in a way that is different from the other two categories.

All items loaded onto a factor except one, affordability. The affordability category could be an influencing factor for every category of picky eating identified in the study. Additionally, affordability may be a factor influencing food choice in picky and non-picky eaters alike. Further replication and understanding of the potential influence of economic status on picky eating is needed to establish if any possible connection exists. Future use of the picky eating spectrum should exclude affordability as a category.

The picky eating spectrum is a potential tool for practitioners and researchers to use when interested in measuring picky eating beyond a binary construct. Furthermore, the spectrum can be applied within practice and further research focused on dietary variety, mealtime behaviors and interventions for picky eating. This instrument can be used potentially as a predictive tool to define and identify picky eaters. Future research with the picky eating spectrum should provide insights into its use with younger populations and parental assessments of their child's behavior when a child is not able to fill it out for themselves. Additionally, the spectrum should be conducted in more diverse populations to see if there are racial, ethnic or cultural differences not found here. The goal of future studies should focus on examining the spectrum within larger populations in order to determine its effectiveness related to assessing picky eating changes over time as well as identifying potential interventions based off degree and categories of picky eating within an individual. Limitations of the current study involve the generalizability of the results. The study was conducted in North Dakota and future studies should focus on more densely populated and diverse areas. This could allow for validation within diverse and cross-cultural settings.

In conclusion, this measure could assist practitioners, parents and researchers in assessing, measuring, and intervening with regard to picky eating behavior. The goal is to one day apply this measure to younger populations to intervene early and prevent numerous potential health problems. The value of the picky eating spectrum is in the potential application within childhood to potentially increase the likelihood of optimal development across the lifespan. Since this measure does not ask about specific foods, it is likely that the measure could be validated for many groups of people.

REFERENCES

- Dovey, T. M., Staples, P. A., Gibson, E. L., & Halford, J. C. G. (2008). Food neophobia and “picky/fussy” eating in children: A review. *Appetite*, *50*(2–3), 181–193. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1016/j.appet.2007.09.009>
- Taylor, C. M., & Emmett, P. M. (2019). Picky eating in children: causes and consequences. *The Proceedings of the Nutrition Society*, *78*(2), 161–169. <https://doi.org/10.1017/S0029665118002586>
- Marchi, M., & Cohen, P. (1990). Early childhood eating behaviors and adolescent eating disorders. *Journal of the American Academy of Child and Adolescent Psychiatry*, *29*(1), 112–117. <https://doi.org/10.1097/00004583-199001000-00017>
- Martins, Y. (2002). Try it, you’ll like it! Early dietary experiences and food acceptance patterns. *The Journal of Pediatric Nutrition and Development*, *98*, 12–20.
- Sanders, M. R., Patel, R. K., Le Grice, B., & Shepherd, R. W. (1993). Children with persistent feeding difficulties: An observational analysis of the feeding interactions of problem and non-problem eaters. *Health Psychology*, *12*, 64–73.
- Hegazi, M. A., Sehlo, M. G., Al, J. A., & El, D. B. S. (2015). Development and cognitive functions in Saudi pre-school children with feeding problems without underlying medical disorders. *Journal of Paediatrics and Child Health*, *51*(9), 906–912. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1111/jpc.12880>
- Adamo, K. B., & Brett, K. E. (2014). Parent perceptions and childhood dietary quality. *Maternal and Child Health Journal*, *18*, 978 - 999. Doi:10.1007/s10995-013-1326-6.
- Ahmed, S. E., Guillem, K., Vandaele, Y. (2013). Sugar addiction: pushing the drug – sugar analogy to the limit. *Current Opinion in Clinical Nutrition and Metabolic Care*, *16*(4), 434– 439. Doi: 10.1097/MCO.0b013e328361c8b8.

- Alpers, B., Blackwell, V., & Clegg, M. E. (2019). Standard . baby-led complementary feeding: a comparison of food and nutrient intakes in 6-12-month-old infants in the UK. *Public Health Nutrition*, 22(15), 2813–2822. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1017/S136898001900082X>
- Anderson, L. N., van den Heuvel, M., Omand, J. A., & Wong, P. D. (2020). Practical tips for paediatricians: Baby-led weaning. *Paediatrics & Child Health (1205-7088)*, 25(2), 77–78. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1093/pch/pxz069>
- Anderson, S. E., Must, A., Curtin, C., & Bandini, L. G. (2012). Meals in Our Household: Reliability and Initial Validation of a Questionnaire to Assess Child Mealtime Behaviors and Family Mealtime Environments. *Journal of the Academy of Nutrition & Dietetics*, 112(2), 276–284. <https://doi.org/10.1016/j.jada.2011.08.035>
- Arden, M. A., & Abbott, R. L. (2015). Experiences of baby-led weaning: trust, control and renegotiation. *Maternal & Child Nutrition*, 11(4), 829–844. <https://doi.org/10.1111/mcn.12106>
- Bakke, A. J., Stubbs, C. A., McDowell, E. H., Moding, K. J., Johnson, S. L., & Hayes, J. E. (2018). Mary Poppins was right: Adding small amounts of sugar or salt reduces the bitterness of vegetables. *Appetite*, 126, 90–101. <https://doi.org/10.1016/j.appet.2018.03.015>
- Black, M. M., & Aboud, F. E. (2011). Responsive Feeding Is Embedded in a Theoretical Framework of Responsive Parenting. *Journal of Nutrition*, 141(3), 490–494. <https://doi.org/10.3945/jn.110.129973>

- Boltong, A., & Campbell, K. (2013). “Taste” changes: A problem for patients and their dietitians. *Nutrition & Dietetics*, 70(4), 262–269. <https://doi.org/10.1111/1747-0080.12101>
- Boquin, M. M., Moskowitz, H. R., Donovan, S. M., & Lee, S. (2014). Defining perceptions of picky eating obtained through focus groups and conjoint analysis. *Journal of Sensory Studies*, 29(2), 126–138. <https://doi.org/10.1111/joss.12088>
- Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist*, 32(7), 513–531. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1037/0003-066X.32.7.513>
- Brown, A. (2016). Differences in eating behaviour, well-being and personality between mothers following baby-led vs. traditional weaning styles. *Maternal & Child Nutrition*, 12(4), 826–837. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1111/mcn.12172>
- Brown, A. (2018). No difference in self-reported frequency of choking between infants introduced to solid foods using a baby-led weaning or traditional spoon-feeding approach. *Journal of Human Nutrition & Dietetics*, 31(4), 496–504. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1111/jhn.12528>
- Brown, A., & Lee, M. (2013). An exploration of experiences of mothers following a baby-led weaning style: Developmental readiness for complementary foods. *Maternal & Child Nutrition*, 9(2), 233–243. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1111/j.1740-8709.2011.00360.x>
- Brown, C. L., & Perrin, E. M. (2020). Defining picky eating and its relationship to feeding behaviors and weight status. *Journal of Behavioral Medicine*, 43(4), 587–595. <https://doi.org/10.1007/s10865-019-00081-w>

- Cameron S. L, Taylor R. W, Heath A.M. Parent-led or baby-led? Associations between complementary feeding practices and health-related behaviours in a survey of New Zealand families. *BMJ Open*. 2013;3:e003946. PMID: 24327363. doi: 10.1136/bmjopen-2013-003946.
- Cardona Cano, S., Tiemeier, H., Van Hoeken, D., Tharner, A., Jaddoe, V. W. V., Hofman, A., Verhulst, F. C., & Hoek, H. W. (2015). Trajectories of picky eating during childhood: A general population study. *International Journal of Eating Disorders*, 48(6), 570–579. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1002/eat.22384>
- Cardona Cano, S., Tiemeier, H., Van Hoeken, D., Tharner, A., Jaddoe, V. W. V., Hofman, A., Verhulst, F. C., & Hoek, H. W. (2015). Trajectories of picky eating during childhood: A general population study. *International Journal of Eating Disorders*, 48(6), 570–579. <https://doi.org/10.1002/eat.22384>
- Carruth B, Ziegler P, Gordon A, Barr S. 2004. Prevalence of Picky Eaters among infants and toddlers and their caregivers' decisions about offering a new food. *J Am Diet Assoc* 104(1): S57– 64.
- Carruth, B. R., Ziegler, P. J., Gordon, A., & Barr, S. I. (2004). Prevalence of picky eaters among infants and toddlers and their caregivers' decisions about offering a new food. *Journal of the American Dietetic Association*, 104, 57–64. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1016/j.jada.2003.10.024>
- Cathey, M., & Gaylord, N. (2004). Picky Eating: A Toddler's Approach to Mealtime. *Pediatric Nursing*, 30(2), 101–109.
- Chatoor, I. 2009. Sensory food aversions in infants and toddlers. *Zero Three* 29(3): 44– 49.

- Chong Cole, N., Ruopeng An, Soo-Yeun Lee, & Donovan, S. M. (2017). Correlates of picky eating and food neophobia in young children: a systematic review and meta-analysis. *Nutrition Reviews*, 75(7), 516–532. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1093/nutrit/nux024>
- Chong Cole, N., Ruopeng An, Soo-Yeun Lee, & Donovan, S. M. (2017). Correlates of picky eating and food neophobia in young children: a systematic review and meta-analysis. *Nutrition Reviews*, 75(7), 516–532. <https://doi.org/10.1093/nutrit/nux024>
- Cichero, J. A. Y. (2016). Introducing solid foods using baby-led weaning vs. spoon-feeding: A focus on oral development, nutrient intake and quality of research to bring balance to the debate. *Nutrition Bulletin*, 41(1), 72–77. <https://doi.org/10.1111/nbu.12191>
- Cogswell, M. E., Gunn, J. P., Yuan, K., Park, S., & Merritt, R. (2015). Sodium and sugar in complementary infant and toddler foods sold in the United States. *Pediatrics*, 135(3), 416–423. <https://doi.org/10.1542/peds.2014-3251>
- D’Auria, E., Bergamini, M., Staiano, A., Banderali, G., Penderzza, E., Penagini, F., Zuccotti, G. V., Peroni, D. G., & on behalf of the Italian Society of Pediatrics. (2018). Baby-led weaning: what a systematic review of the literature adds on. *Italian Journal of Pediatrics*, 44(1), N.PAG. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1186/s13052-018-0487-8>
- DeJesus, J. M., Du, K. M., Shutts, K., & Kinzler, K. D. (2019). How information about what is “healthy” versus “unhealthy” impacts children’s consumption of otherwise identical foods. *Journal of Experimental Psychology: General*. <https://doi.org/10.1037/xge0000588.supp> (Supplemental)

- Dovey TM, Staples PA, Gibson EL, Halford JCG. 2008. Food neophobia and ‘picky/fussy’ eating in children: a review. *Appetite* 50(2–3) 181–93.
- Dubois, L., Farmer, A. P., Girard, M., & Peterson, K. (2007). Preschool children’s eating behaviours are related to dietary adequacy and body weight. *European Journal of Clinical Nutrition*, 61(7), 846–855. <https://doi.org/10.1038/sj.ejcn.1602586>
- Dubois, L., Farmer, A., Girard, M., Peterson, K., & Tatone-Tokuda, F. (2007). Problem eating behaviors related to social factors and body weight in preschool children: A longitudinal study. *International Journal of Behavioral Nutrition & Physical Activity*, 4, 9–10. <https://doi.org/10.1186/1479-5868-4-9>
- Duffy, V. B., & Bartoshuk, L. M. (1996). Sensory factors in feeding. In E. D. Capaldi (Ed.), *Why we eat what we eat: The psychology of eating* (p. 145–171).
- Elliott, C. D., & Conlon, M. J. (2015). Packaged baby and toddler foods: Questions of sugar and sodium. *Pediatric Obesity*, 10(2), 149–155. <https://doi.org/10.1111/j.2047-6310.2014.223.x>
- Ellis, J. M., Galloway, A. T., Webb, R. M., & Martz, D. M. (2017). Measuring adult picky eating: The development of a multidimensional self-report instrument. *Psychological Assessment*, 29(8), 955–966. <https://doi.org/10.1037/pas0000387>
- Ellis, J. M., Zickgraf, H. F., Galloway, A. T., Essayli, J. H., & Whited, M. C. (2018). A functional description of adult picky eating using latent profile analysis. *International Journal of Behavioral Nutrition & Physical Activity*, 15(1), N.PAG. <https://doi.org/10.1186/s12966-018-0743-8>
- Erickson, J., & Slavin, J. (2015). Are restrictive guidelines for added sugars science based? *Nutrition Journal*, 14, 1–6. <https://doi.org/10.1186/s12937-015-0114-0>

- Evans, A., Seth, J., Smith, S., Harris, K., Loyo, J., Spaulding, C., Eck, M., & Gottlieb, N. (2011). Parental Feeding Practices and Concerns Related to Child Underweight, Picky Eating, and Using Food to Calm Differ According to Ethnicity/Race, Acculturation, and Income. *Maternal & Child Health Journal*, *15*(7), 899–909. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1007/s10995-009-0526-6>
- Foterek, K., Hilbig, A., & Alexy, U. (2015). Associations between commercial complementary food consumption and fruit and vegetable intake in children Results of the DONALD study. *Appetite*, *85*, 84–90. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1016/j.appet.2014.11.015>
- Galloway AT, Fiorito L, Francisc L, Birch LL. 2006. ‘Finish your soup’: counterproductive effects of pressuring children to eat on intake and affect. *Appetite* **46**(3): 318– 23.
- Galloway AT, Lee Y, Birch L. 2003. Predictors and consequences of food neophobia and pickiness in young girls. *J Am Diet Assoc* **103**(6): 692– 8.
- Gaultier, A., Meunier, S. M. C., Malbert, C. H., & Val, L. D. (2011). Flavour exposures after conditioned aversion or preference trigger different brain processes in anaesthetised pigs. *European Journal of Neuroscience*, *34*(9), 1500–1511. <https://doi.org/10.1111/j.1460-9568.2011.07848.x>
- Hinton, A. W. (1998). A social cognitive theory model to predict frequency of fruit and vegetable consumption among third-grade children [ProQuest Information & Learning]. In *Dissertation Abstracts International: Section B: The Sciences and Engineering* (Vol. 58, Issue 8–B, p. 4172).
- Horodyski, M. A., Stommel, M., Brophy-Herb, H., Xie, Y., & Weatherspoon, L. (2010). Low-income African American and non-Hispanic White mothers’ self-efficacy, picky eater

- perception, and toddler fruit and vegetable consumption. *Public Health Nursing*, 27(5), 408–417. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1111/j.1525-1446.2010.00873.x>
- Horodyski, M. A., Stommel, M., Brophy-Herb, H., Yan Xie, & Weatherspoon, L. (2010). Low-Income African American and Non-Hispanic White Mothers' Self-Efficacy, "Picky Eater" Perception, and Toddler Fruit and Vegetable Consumption. *Public Health Nursing*, 27(5), 408–417. <https://doi.org/10.1111/j.1525-1446.2010.00873.x>
- Jacobi C, Schmitz G, Agras W. 2008. Is Picky eating an eating disorder? *Int J Eat Dis* 41(7): 626– 34.
- Jones, S. W., Lee, M., & Brown, A. (2020). Spoonfeeding is associated with increased infant weight but only amongst formula-fed infants. *Maternal & Child Nutrition*, 16(3), 1–8. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1111/mcn.12941>
- Knopf, A. (2015). When picky eating is a sign of psychological distress. *Brown University Child & Adolescent Behavior Letter*, 31, 1–2. <https://doi.org/10.1002/cbl.30084>
- Komninou, S., Halford, J. C. G., & Harrold, J. A. (2019). Differences in parental feeding styles and practices and toddler eating behaviour across complementary feeding methods: Managing expectations through consideration of effect size. *Appetite*, 137, 198–206. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1016/j.appet.2019.03.001>
- Leung, A. K., Marchand, V., & Sauve, R. S. (2012). The "picky eater": The toddler or preschooler who does not eat. *Paediatrics & Child Health (1205-7088)*, 17(8), 455–457. <https://doi.org/10.1093/pch/17.8.455>
- Locke, A. (2015). Agency, 'good motherhood' and 'a load of mush': Constructions of baby-led weaning in the press. *Women's Studies International Forum*, 53, 139–146. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1016/j.wsif.2014.10.018>

- Lockyer, S. (2016). Commercial vs. home-made baby foods - how do they match up nutritionally? *Nutrition Bulletin*, *41*(4), 339–343. <https://doi.org/10.1111/nbu.12236>
- Luchini, V., MUSAAD, S. M., DONOVAN, S. M., & SOO-YEUN LEE. (2017). Differences and Agreement in Perception of Child Picky Eating Among Center- and Home-Based Childcare Providers and Parents and Its Impact on Utilized Mealtime Strategies. *Nutrition & Metabolic Insights*, *10*, 1–7. <https://doi.org/10.1177/1178638816684830>
- Mak, V. S.-W. (2017). How Picky Eating Becomes an Illness—Marketing Nutrient-Enriched Formula Milk in a Chinese Society. *Ecology of Food & Nutrition*, *56*(1), 81–100. <https://doi.org/10.1080/03670244.2016.1261025>
- Mennella, J., JAGNOW, C., & BEAUCHAMP, G., (2001). Prenatal and Postnatal Flavor Learning by Human Infants, *Pediatrics*, *107*. <https://doi.org/10.1542/peds.107.6.e88>
- Muraro, A., & MENDOZA HERNANDEZ, D. A. (2020). Managing food allergy and anaphylaxis: A new model for an integrated approach. *Allergology International*, *69*(1), 19–27. <https://doi.org/10.1016/j.alit.2019.10.004>
- Murray, R. D. (2017). Savoring Sweet: Sugars in Infant and Toddler Feeding. *Annals Of Nutrition & Metabolism*, *70 Suppl 3*, 38–46. <https://doi.org/10.1159/000479246>
- Nicklaus S. 2009. Development of food variety in children. *Appetite* **52**: 253– 5.
- Pechey, R., Sexton, O., Codling, S., & Marteau, T. M. (2021). Impact of increasing the availability of healthier vs. less-healthy food on food selection: a randomised laboratory experiment. *BMC Public Health*, *21*(1), 1–12. [https://doi.org/10.1186/s12889-020-10046-](https://doi.org/10.1186/s12889-020-10046-3)

- Pila, E., Mond, J. M., Griffiths, S., Mitchison, D., & Murray, S. B. (2017). A thematic content analysis of #cheatmeal images on social media: Characterizing an emerging dietary trend. *International Journal of Eating Disorders, 50*(6), 698–706.
<https://doi.org/10.1002/eat.22671>
- Quinn, M. E. (2004). The Oxford Encyclopedia of Food and Drink in America (Book). *Booklist, 101*(7), 687.
- Riley, L. K., Rupert, J., & Boucher, O. (2018). Nutrition in Toddlers. *American Family Physician, 98*(4), 227–233. Retrieved from <https://ezproxy.lib.ndsu.nodak.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=cmedm&AN=30215978&site=ehost-live&scope=site>
- Rowan, H., Lee, M., & Brown, A. (2019). Differences in dietary composition between infants introduced to complementary foods using Baby-led weaning and traditional spoon feeding. *Journal of Human Nutrition & Dietetics, 32*(1), 11–20. <https://doi.org.ezproxy.lib.ndsu.nodak.edu/10.1111/jhn.12616>
- Sandvik, P., Ek, A., Eli, K., Somaraki, M., Bottai, M., & Nowicka, P. (2019). Picky eating in an obesity intervention for preschool-aged children—What role does it play, and does the measurement instrument matter? *The International Journal of Behavioral Nutrition and Physical Activity, 16*. <https://doi.org/10.1186/s12966-019-0845-y>
- Sandvik, P., Ek, A., Somaraki, M., Hammar, U., Eli, K., & Nowicka, P. (2018). Picky eating in Swedish preschoolers of different weight status: application of two new screening cut-offs. *International Journal of Behavioral Nutrition & Physical Activity, 15*(1), N.PAG. <https://doi.org/10.1186/s12966-018-0706-0>

- Savage, J. S., Fisher, J. O., & Birch, L. L. (2007). Parental influence on eating behavior: Conception to adolescence. *Journal of Law, Medicine & Ethics*, 35(1), 22–34. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1111/j.1748-720X.2007.00111.x>
- Scott, K. (2016). Housing children: South Auckland, the housing pathways longitudinal study. *Research in Anthropology and Linguistics*, 6.
- Siegrist, M., Bearth, A., & Hartmann, C. (2020). Food disgust sensitivity influences the perception of food hazards: Results from longitudinal and cross-cultural studies. *Appetite*, 153. <https://doi.org/10.1016/j.appet.2020.104742>
- Skinner JD, Carruth BR, Bounds W & Ziegler PJ (2002): Children’s food preferences: a longitudinal analysis. *J. Am. Diet. Assoc.* 102, 1638–1647.
- Smith, A. D., Herle, M., Fildes, A., Cooke, L., Steinsbekk, S., & Llewellyn, C. H. (2017). Food fussiness and food neophobia share a common etiology in early childhood. *Journal of Child Psychology & Psychiatry*, 58(2), 189–196. <https://doi.org/10.1111/jcpp.12647>
- Smith, B., Rogers, S. L., Blissett, J., & Ludlow, A. K. (2020). The relationship between sensory sensitivity, food fussiness and food preferences in children with neurodevelopmental disorders. *Appetite*, 150. <https://doi.org/10.1016/j.appet.2020.104643>
- Sneijder, P., & te Molder, H. (2009). Normalizing ideological food choice and eating practices. Identity work in online discussions on veganism. *Appetite*, 52(3), 621–630. <https://doi.org/10.1016/j.appet.2009.02.012>
- Specht, I. O., Rohde, J. F., Olsen, N. J., & Heitmann, B. L. (2018). Duration of exclusive breastfeeding may be related to eating behaviour and dietary intake in obesity prone normal weight young children. *PLoS ONE*, 13(7), 1–11. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1371/journal.pone.0200388>

- Springen, K. (2018). Baby-Led Weaning: The (Not-So) Revolutionary Way to Start Solids and Make a Happy Eater. *Booklist*, 115(6), 6.
- Steinsbekk, S., Bonneville-Roussy, A., Fildes, A., Llewellyn, C. H., & Wichstrøm, L. (2017). Child and parent predictors of picky eating from preschool to school age. *The International Journal of Behavioral Nutrition and Physical Activity*, 14.
<https://doi.org/10.1186/s12966-017-0542-7>
- Swanepoel, L., Henderson, J., & Maher, J. (2020). Mothers' experiences with complementary feeding: Conventional and baby-led approaches. *Nutrition & Dietetics*, 77(3), 373–381.
<https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1111/1747-0080.12566>
- Taylor C.M., Wernimont S.M., Northstone K., Emmett P.M. (2015). Picky/fussy eating in children: Review of definitions, assessment, prevalence and dietary intakes. *Appetite*. 95, 349-359. doi:10.1016/j.appet.2015.07.026
- Tharner, A., Jansen, P. W., Kiefte-de Jong, J. C., Moll, H. A., van der Ende, J., Jaddoe, V. W. V., Hofman, A., Tiemeier, H., & Franco, O. H. (2014). Toward an operative diagnosis of fussy/picky eating: a latent profile approach in a population-based cohort. *International Journal of Behavioral Nutrition & Physical Activity*, 11, 1–22.
<https://doi.org/10.1186/1479-5868-11-14>
- Townsend, E., & Pitchford, N. J. (2012). Baby knows best? The impact of weaning style on food preferences and body mass index in early childhood in a case-controlled sample. *BMJ Open*, 2(1), e000298. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1136/bmjopen-2011-000298>

- van der Horst, K., Deming, D. M., Lesniasukas, R., Carr, B. T., & Reidy, K. C. (2016). Picky eating: Associations with child eating characteristics and food intake. *Appetite, 103*, 286–293. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1016/j.appet.2016.04.027>
- Walton, K., Kuczynski, L., Haycraft, E., Breen, A., & Haines, J. (2017). Time to re-think picky eating?: A relational approach to understanding picky eating. *The International Journal of Behavioral Nutrition and Physical Activity, 14*. <https://doi.org/10.1186/s12966-017-0520-0>
- Westwater, M. L., Fletcher, P. C., Ziauddeen, H. (2016). Sugar addiction: the state of the science. *European Journal of Clinical Nutrition, 55* (S2), S55 – S69. Doi: 10.1007/s00394016-1229-6.
- Wildes, J. E., Zucker, N. L., & Marcus, M. D. (2012). Picky eating in adults: Results of a web-based survey. *International Journal of Eating Disorders, 45*(4), 575–582. <https://doi.org/10.1002/eat.20975>
- Wise, P. M., Nattress, L., Flammer, L. J., & Beauchamp, G. K. (2016). Reduced dietary intake of simple sugars alters perceived sweet taste intensity but not perceived pleasantness. *The American Journal of Clinical Nutrition, 103*(1), 50–60. <https://doi.org/10.3945/ajcn.115.112300>
- Wolstenholme, H., Kelly, C., Hennessy, M., & Heary, C. (2020). Childhood fussy/picky eating behaviours: A systematic review and synthesis of qualitative studies. *The International Journal of Behavioral Nutrition and Physical Activity, 17*. <https://doi-org.ezproxy.lib.ndsu.nodak.edu/10.1186/s12966-019-0899-x>
- Wolstenholme, H., Kelly, C., Hennessy, M., & Heary, C. (2020). Childhood fussy/picky eating behaviours: a systematic review and synthesis of qualitative studies. *International*

Journal of Behavioral Nutrition & Physical Activity, 17(1), 1–22.

<https://doi.org/10.1186/s12966-019-0899-x>

Zafar, M. Z., Hashim, N. A., Halim, F. B., & Attique, S. (2020). Factors Affecting on Healthy Package Food Selection; The Impact of Personality Traits. *Abasyn University Journal of Social Sciences*, 13(1), 169–193. <https://doi.org/10.34091/AJSS.13.1.13>

Zickgraf, H. F., Richard, E., Zucker, N. L., & Wallace, G. L. (2020). Rigidity and sensory sensitivity: Independent contributions to selective eating in children, adolescents, and young adults. *Journal of Clinical Child and Adolescent Psychology*.

<https://doi.org/10.1080/15374416.2020.1738236>

APPENDIX. SURVEY

Picky Eating

Start of Block: Default Question Block

Q55 NDSU North Dakota State University Department
of ---Health, Nutrition and Exercise Sciences 1310 Centennial Blvd.,
EML Hall 316 NDSU Dept. 2620 PO Box
6050 Fargo, ND 58108-6050 701.231.7474 **The**

Degrees of Picky Eating Dear -----participant: I would like to invite you to take part in a study investigating picky eating. My name is Savanna Jellison. I am a graduate student in Nutrition and Exercise Science at North Dakota State University, and I am conducting a research project investigating the various degrees of picky eating across the lifespan. It is our hope that the outcome of this study will contribute useful information regarding the complexities behind picky eating and eventually contribute to improved intervention methods. Because you are at least 18 and are enrolled in undergraduate or graduate courses, you are invited to take part in this research survey. Your participation is entirely your choice, and you may change your mind or stop participating at any time with no penalty to you. If you need assistance when filling out the survey, please contact me at savanna.jellison@ndsu.edu. It is not possible to identify all potential risks in research procedures, but we have taken reasonable safeguards to minimize any known risks. It should take about 10 minutes to complete the online survey. Questions ask about characteristics of you and your family, your preferences regarding food when you were a child and now. This study is anonymous. That means that no one, not even members of the research team, will know that the information you give comes from you. If you have any questions about this project or wish to receive a copy of the results, please contact me at savanna.jellison@ndsu.edu, or contact my advisor, Dr. Elizabeth Hilliard by phone at 701-231-7480 or by email Elizabeth.hilliard@ndsu.edu. You have rights as a research participant. If you have questions about your rights or complaints about this research, you may talk to the researcher or contact the NDSU Human Research Protection Program at 701.231.8995, toll-free at 1-855-800-6717, by email at ndsu.irb@ndsu.edu, or by mail at: NDSU HRPP Office, NDSU Dept. 4000, P.O. Box 6050, Fargo, ND 58108-6050. Thank you for your time and participation.

Q56 Do you agree to participate?

Yes (8)

No (9)

Q57 Have you ever been diagnosed with any form of disordered eating?

Yes (8)

No (9)

Skip To: End of Survey If Have you ever been diagnosed with any form of disordered eating? = Yes

3 Are you an undergraduate or graduate student?

Undergraduate Student (1)

Graduate Student (2)

I am NOT an Undergraduate or Graduate Student (3)

Skip To: End of Survey If Are you an undergraduate or graduate student? = I am NOT an Undergraduate or Graduate Student

Page _____
Break

Q66 What university, college, or school do you attend

1 What is your gender?

Male (1)

Female (2)

Prefer not to say (3)

Other (4) _____

2 What is your age?

Q49 What is YOUR (you will be asked about your family's in a later question) average annual income?

- \$0-\$5000 (1)
 - \$5,001-\$10,000 (9)
 - \$10,001-\$15,000 (10)
 - \$15,001-\$20,000 (11)
 - \$20,001-\$25,000 (12)
 - \$25,001-\$40,000 (13)
 - \$40,001-\$60,000 (14)
 - \$60,001-\$80,000 (15)
 - \$80,001-\$100,000 (16)
 - More than \$100,000 (17)
-

Q51 What is your Race/Ethnicity?

- White/Caucasian (1)
 - American Indian/Native Alaskan (2)
 - Hispanic/Latino-White (3)
 - Hispanic/Latino-Nonwhite (4)
 - Native Hawaiian/Pacific Islander (5)
 - Black/African (6)
 - Indian (7)
 - Middle-Eastern/North African (8)
 - Asian (10) _____
 - Multiracial (11) _____
 - Other (12) _____
-

Q68 What is your current employment status?

- Employed Full-time (40+ hours per week) (13)
 - Employed 26-39 hours per week (14)
 - Employed less than 25 hours per week (15)
 - Seeking Employment (16)
 - Not seeing outside employment (17)
-

Q53 Were you breastfed as a child?

- Yes (1)
- No (2)
- I do not know (3)

Skip To: Q54 If Were you breastfed as a child? = Yes

Skip To: Q49 If Were you breastfed as a child? = No

Skip To: Q49 If Were you breastfed as a child? = I do not know

Q54 How long were you breastfed?

I do not know (1)

2 weeks (3)

3 weeks (4)

1 month (5)

2 months (6)

3 months (7)

4 months (8)

5 months (9)

6 months (10)

More than 6 months (11)

Page _____
Break

Q49 Have others described you as a picky eater?

Yes (1)

No (2)

Q48 Would you describe yourself as a picky eater?

Yes (1)

No (2)

Q51 Please describe **why** you will not eat certain foods **without** listing the foods you won't eat.

Page _____
Break

Q50 Please list the foods you refuse to eat.

Q58 What best describes your family's income level growing up?

- Lower income (Less than \$20,000) (1)
 - Low income (\$20,001 -\$44,999) (2)
 - Middle Class (\$45,000-\$139,999) (3)
 - Upper Middle Class (\$140,000-\$149,999) (4)
 - High income (\$150,000-\$199,999) (5)
 - Highest (\$200,000+) (6)
 - I don't know (7)
-

Q67 What is your family's average annual income?

- \$0-\$5000 (1)
- \$5,001-\$10,000 (9)
- \$10,001-\$15,000 (10)
- \$15,001-\$20,000 (11)
- \$20,001-\$25,000 (12)
- \$25,001-\$40,000 (13)
- \$40,001-\$60,000 (14)
- \$60,001-\$80,000 (15)
- \$80,001-\$100,000 (16)
- More than \$100,000 (17)

Page _____
Break

Q59 For the following questions, please answer based on your experience prior to high school.

Q2 When I was younger, I was resistant to try new foods from a different culture or ethnicity.

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

Q3 When I was younger, I would not eat certain foods due to the texture.

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

Q4 When I was younger, I was terrified to try new foods

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

Q5 When I was younger, I did not like trying new foods in general.

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

Q6 When I was younger, I would only eat certain foods if they were cooked or presented in a certain ways.

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

Q7 When I was younger, I did not eat certain foods because an adult in my life didn't like them or told me I wouldn't like them.

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

Q8 When I was younger, I would not eat my food if it had touched other food on my plate.

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

Q9 When I was younger, I disliked a particular food due to only to the flavor.

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

Q10 When I was younger, I refused to eat certain foods due to how they smelled.

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

Q11 When I was younger, I did not eat certain foods due to medical reasons diagnosed by a medical professional.

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

Q12 When I was younger, I did not eat certain foods due to a self-diagnosed sensitivity not confirmed by a medical professional.

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

Q13 When I was younger, I was unwilling to eat certain foods due to the way they looked.

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

Q14 When I was younger, at times, I was resistant to eating familiar foods due to not having a desire for the taste in the moment.

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

Q15 When I was younger, I refused to eat certain foods due to the fact that I had the luxury of being able to refuse them.

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

Q16 When I was younger, I only ate certain foods that were part of my regular eating routine (e.g., ate same food for breakfast, certain nights of the week would only eat certain foods).

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

Q17 When I was younger, I avoided certain foods due to an associated memory (e.g., I choked or became nauseous after eating it once).

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

Q18 When I was younger, I refused to eat foods in a certain food group (e.g., fruits, vegetables, etc). *Please do not include if the refusal was for medical reasons.*

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

Q19 When I was younger, I refused to eat foods that were not the color they are "supposed" to be (e.g., green eggs, purple potatoes).

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

Q20 When I was younger, I refused to eat foods if they were identifiable organs or limbs (liver, chicken legs, etc.)

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

Q21 When I was younger, I refused to eat certain foods due to a preferred diet (vegetarian, vegan, etc.)

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

Q65 When I was younger, I did not eat certain foods due to not being able to afford them.

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

Q64 When I was younger,I refused to eat certain foods due to personal beliefs (i.e., religion).

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

Q63 When I was younger, I refused to eat certain foods due to widespread current trends such as not eating gluten, sugar, GMO's.

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

Page _____
Break

Q60 For the following questions, please answer based on your **current** preferences.

Q22 Now, I am resistant to try new foods from a different culture or ethnicity.

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

Q23 Now, I will not eat certain foods due to the texture.

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

Q24 Now, I am terrified to try new foods.

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

Q25 Now, I am unwilling to try new foods.

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

Q26 Now, I will only eat certain foods if they are cooked or presented in certain ways.

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

Q27 Now, I will not eat certain foods because an adult in my life didn't like them or told me I wouldn't like them.

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

Q28 Now, I will not eat my food if it has touched other foods on my plate.

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

Q29 Now, I dislike a particular food due to the flavor.

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

Q30 Now, I refuse to eat certain foods due to how they smell.

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

Q31 Now, I will not eat certain foods due to medical reasons diagnosed by a medical professional.

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

Q32 Now, I will not eat certain foods due to a self-diagnosed sensitivity not confirmed by a medical professional.

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

Q33 Now, I am unwilling to eat foods due to the way they look.

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

Q34 Now, at times, I am resistant to eat familiar foods due to not having a desire, or "being in the mood" for the taste in the moment.

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

Q35 Now, I refuse to eat certain foods because I can.

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

Q36 Now, I only eat certain foods that are part of my regular food routine (same food for breakfast).

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

Q37 Now, I avoid certain foods due to an associated memory (e.g., I choked or became nauseous after eating it once).

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

Q38 Now, I refuse to eat foods in a certain food group (e.g., fruits, vegetables, etc.).
Please do not include if groups are refused for medical reasons.

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

Q39 Now, I refuse to eat foods that are not the color they are "supposed" to be (e.g., green eggs, purple potatoes).

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

Q40 Now, I refuse to eat foods if they are identifiable organs or limbs (liver, chicken legs, etc.).

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

Q41 Now, I refuse to eat certain foods due to a preferred diet (vegetarian, vegan, etc.).

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

Q47 Now, I do not eat certain foods due to not being able to afford them.

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

Q61 Now, I will not eat certain foods due to personal beliefs (i.e., religion).

- Strongly agree (11)
 - Somewhat agree (12)
 - Neither agree nor disagree (13)
 - Somewhat disagree (14)
 - Strongly disagree (15)
-

Q62 Now, I will not eat certain foods due to widespread current trends such as not eating gluten, sugar, GMO's.

- Strongly agree (11)
- Somewhat agree (12)
- Neither agree nor disagree (13)
- Somewhat disagree (14)
- Strongly disagree (15)

End of Block: Default Question Block
