

St. John's University

**St. John's Scholar**

---

Theses and Dissertations

---

2022

# THE RELATIONSHIP OF SCHEMAS OF REJECTION AND ETHNIC IDENTITY WITH FOOD CONSUMPTION

Shelagh Mahbubani

Follow this and additional works at: [https://scholar.stjohns.edu/theses\\_dissertations](https://scholar.stjohns.edu/theses_dissertations)



Part of the [Psychology Commons](#)

---

THE RELATIONSHIP OF SCHEMAS OF REJECTION AND ETHNIC IDENTITY  
WITH FOOD CONSUMPTION

A thesis submitted in partial fulfillment  
of the requirements for the degree of

MASTER OF ARTS

to the faculty of the

DEPARTMENT OF PSYCHOLOGY

of

ST. JOHN'S COLLEGE OF LIBERAL ARTS AND SCIENCES

at

ST. JOHN'S UNIVERSITY

New York

by

Shelagh Mahbubani

Date Submitted \_\_\_\_\_

Date Approved \_\_\_\_\_

\_\_\_\_\_  
Shelagh Mahbubani

\_\_\_\_\_  
Elizabeth Brondolo, Ph.D.

**© Copyright by Shelagh Mahbubani 2022**

**All Rights Reserved**

## ABSTRACT

### THE RELATIONSHIP OF SCHEMAS OF REJECTION AND ETHNIC IDENTITY WITH FOOD CONSUMPTION

Shelagh Mahbubani

Unhealthy eating behaviors, such as increased consumption of unhealthy food and decreased consumption of healthy food, have been linked to poor health outcomes (Ambrosini, 2014). Stress, including social rejection, has been associated with an increase in unhealthy eating behaviors (Groesz et al., 2012; Laugero et al., 2018). Conversely, an increased sense of ethnic identity has been linked to healthy eating behaviors (Brown et al., 2016; Lewis et al., 2018). In this study, we examined the association of relational schemas concerning social rejection as well as ethnic identity to food consumption. While prior studies have examined the relationship of social stressors to unhealthy eating behaviors, the relationship of the relational schemas examined in this study to unhealthy eating behaviors has not been previously examined. An ethnically diverse sample of participants recruited from a community medical center (N = 137) completed self-report measures. These included a demographics questionnaire, measures of rejection schemas, measures of ethnic identity schemas, and measures of eating behavior. Results showed a significant main effect of social rejection schemas on overall food consumption and no effect of ethnic identity. In conclusion, the hypothesis that there would be different effects on unhealthy consumption versus healthy consumption was not supported.

## **ACKNOWLEDGEMENTS**

I would like to express my gratitude to Dr. Elizabeth Brondolo for her mentorship on this project.

I would also like to extend my thanks to Dr. Melissa Peckins for her feedback and advice.

Additionally, I would like to thank Jessica Korins for her collaboration in the initial literature review as well as everyone on the CHIRP team for their support.

## TABLE OF CONTENTS

<b>ACKNOWLEDGEMENTS</b> .....	<b>ii</b>
<b>LIST OF TABLES</b> .....	<b>iv</b>
<b>INTRODUCTION</b> .....	<b>1</b>
<b>Public Health Significance</b> .....	<b>1</b>
<b>Stress and Eating</b> .....	<b>2</b>
<b>Ostracism and Eating</b> .....	<b>3</b>
<b>Ethnic Belonging and Eating</b> .....	<b>6</b>
<b>Study Goals and Hypotheses</b> .....	<b>9</b>
<b>METHODS</b> .....	<b>10</b>
<b>Participants</b> .....	<b>10</b>
<b>Procedure</b> .....	<b>10</b>
<b>Measures</b> .....	<b>11</b>
<b>Demographic Questionnaire</b> .....	<b>11</b>
<b>Measures of Rejection Schemas</b> .....	<b>11</b>
<b>Measures of Ethnic Identity Schemas</b> .....	<b>12</b>
<b>Measures of Food Consumption</b> .....	<b>13</b>
<b>RESULTS</b> .....	<b>14</b>
<b>Analytic Plan</b> .....	<b>14</b>
<b>Results</b> .....	<b>15</b>
<b>DISCUSSION</b> .....	<b>18</b>
<b>CONCLUSION</b> .....	<b>22</b>
<b>APPENDICES</b> .....	<b>23</b>
<b>REFERENCES</b> .....	<b>33</b>

## LIST OF TABLES

<b>Table 1 Demographics.....</b>	<b>23</b>
<b>Table 2.1 Sociodemographic Differences.....</b>	<b>24</b>
<b>Table 2.2 Sociodemographic Differences.....</b>	<b>25</b>
<b>Table 2.3 Sociodemographic Differences.....</b>	<b>27</b>
<b>Table 2.4 Sociodemographic Differences.....</b>	<b>28</b>
<b>Table 2.5 Sociodemographic Differences.....</b>	<b>29</b>
<b>Table 3 Correlations.....</b>	<b>30</b>
<b>Table 4 Factor Loadings.....</b>	<b>31</b>
<b>Table 5 Fit Indices.....</b>	<b>32</b>

## INTRODUCTION

### Public Health Significance

Obesity, defined by the World Health Organization (WHO) as having a Body Mass Index (BMI) of 30 or higher in adults, is a highly prevalent condition worldwide (Arroyo-Johnson & Mincey, 2016). Over the last few decades, obesity prevalence has increased worldwide but rates remain highest in the United States (Arroyo-Johnson & Mincey, 2016). According to the most recent data collected by the Centers for Disease Control and Prevention, 42.4% of adults in the United States qualify as obese (Hales et al., 2020). Out of all ethnic groups, non-Hispanic black adults in the United States have the highest obesity rate at 49.6% (Hales et al., 2020)

These prevalence rates are a concern because obesity raises the morbidity risk from a plethora of illnesses (NHLBI, 2013). These include hypertension, Type 2 diabetes, stroke, coronary heart disease, gallbladder disease, osteoarthritis, respiratory conditions and some cancers (NHLBI, 2013). In the United States, the cost of treating obesity related health conditions is estimated to be \$147 billion dollars (Finkelstein et al., 2009). Compared with normal BMI patients, it is estimated that obese patients spend 46% more on inpatient care, 27% more on outpatient care, and 80% more on prescription medication (Finkelstein et al., 2009). Overall, the obesity epidemic is one of the most serious public health issues facing the United States (NHLBI, 2013).

Many factors have been identified as contributing to the obesity epidemic in the United States, including lack of exercise, genetics and nutrition (Brug, 2008). Food consumption, specifically high consumption of unhealthy foods and low consumption of healthy foods are related to obesity risk (Brug, 2008). Specifically, the Nutrition Evidence Library Dietary Patterns Systematic Review Project indicated that a diet higher in vegetables, fruits, and whole grains, moderate in dairy products, lower in meats and low in sugar-sweetened foods, beverages and

refined grains is associated with a lower risk of obesity in adults (Nutrition Evidence Library, 2014). A similar review found that children and adolescents who consumed a diet high in sugar-sweetened foods and beverages, refined grains, processed meats, and fast foods increased their risk of obesity later in life (Ambrosini, 2014).

Targeting food consumption is considered a key intervention in the public health literature to reduce obesity risk, as food consumption is modifiable (Brug, 2008). However, current healthy eating interventions have not proved effective, as the proportion of obese adults in the United States has been increasing (Hales et al., 2020). Obesity prevalence among adults increased from 30.5% in 1999-2000 to 42.4% in 2017-2018 (Hales et al., 2020). Multiple behavioral determinants have been linked to food choice including self-efficacy, nutritional knowledge, stress, parenting influences, cultural influences, as well as access and affordability of healthy food (Brug, 2008).

### **Stress and Eating**

Stress is defined as any event or episode that is perceived as threatening or harmful by the individual (Lazarus, 1999). Stress is often operationalized in the literature through time, as acute stress and chronic stress. Chronic stress is often operationalized as an individual's perceived stress over a period of time, such as a month (Arsiwalla et al., 2018; Finch & Tomiyama, 2015; Groesz et al., 2012; Laugero et al., 2018; Nastaskin et al., 2015). It has also been operationalized as daily hassles (Debeuf et al., 2018; Michels et al., 2012; O' Conner et al., 2008). Acute stress is commonly operationalized through stressful laboratory tasks, such as unrealistic time constraints to complete visuospatial puzzles, serial subtraction of a prime number from a high number or doing a videotaped speech or a stroop task (Epel et al., 2001; Habhab et al., 2009; Svaldi et al., 2012; Tryon et al., 2013; Wallis et al., 2014).

Chronic stressors have been found to be associated with increased consumption of unhealthy foods and decreased consumption of healthy food in adults (Debeuf et al., 2018; Groesz et al., 2012; Hill et al., 2018; Hill et al., 2021; Laugero et al., 2018; Michels et al., 2012). Acute stressors have been associated with increased unhealthy food consumption in laboratory settings – participants who had experienced the acute stressor ate significantly more unhealthy snacks than participants who did not (Epel et al., 2001; Habhab et al., 2009; Svaldi et al., 2012; Tryon et al., 2013; Wallis et al., 2014). However, this relationship of increased unhealthy consumption and decreased healthy consumption with stress does not hold true for all adults. It is estimated that approximately 40% of adults increase unhealthy consumption with stress eating, whereas approximately 40% reduce food consumption overall when stressed (Merali et al., 2013; Oliver & Wardle, 1999; Pool et al., 2015; Sproesser et al., 2015).

The relationship of stress to consumption has also been shown to be moderated by multiple factors, including gender and personality facets such as conscientiousness and perfectionism (O’Conner et al., 2008; O’Conner & O’Conner 2014; Scott & Johnstone 2012). Restrained eating style, defined as consciously limiting food intake, has also been shown to be a significant moderator in increasing unhealthy consumption when stressed (Hill et al., 2021).

### **Ostracism and Eating**

Ostracism, a form of social stress, is the rejection or exclusion of individuals by other individuals or groups (Williams, 2007). The literature shows that ostracism is a common occurrence, with many adults reporting at least one episode a day (Williams, 2007). Both self-report and physiological measures of stress have demonstrated that even a single episode of ostracism is exceedingly stressful (Eisenberger et al., 2003). Humans appear to have a fundamental need for belonging, which is undercut by ostracism (Williams, 2007). Challenges to this need for belonging can lead to unhealthy behaviors (Williams, 2007).

One unhealthy behavior that has been linked to ostracism is the increased consumption of unhealthy food (Baumeister et al., 2005). A handful of experimental studies have found that participants who experience rejection consume more palatable energy dense foods when offered, such as cookies, M&M candies or potato crisps (Baumeister et al., 2005; Hayman et al., 2015; Oaten et al., 2008; Salvy et al., 2011; Salvy et al., 2012). A majority of these used the Cyberball paradigm to simulate rejection (Hayman et al., 2015; Oaten et al., 2008; Salvy et al., 2011; Salvy et al., 2012). Participants were also given measures such as the standard Cyberball needs satisfaction measure (Hayman et al., 2015) or the Aversion Impact Index questionnaire (Salvy et al., 2012) to assess the impact of the Cyberball ostracism condition on perceptions of belongingness, self-esteem, control, meaningfulness and affect. Participants in the ostracism condition overall reported significantly less positive levels of these perceptions than did the control conditions (Hayman et al., 2015; Salvy et al., 2012).

The association of ostracism with eating behavior may vary by the social context in which the ostracism occurs. For example, one study examined the differential impact of rejection on African-American women's' eating behavior when they thought they were being rejected by Caucasian women as opposed to other African-American women (Hayman et al., 2015). The participants consumed significantly more potato crisps after having been excluded by Caucasian women, although they self-reported more emotional distress after being excluded by other African-American women (Hayman et al., 2015).

In the current literature, mental representations of rejection have been studied through negative relational schemas such as stereotype confirmation concern, own-group conformity pressure and social constraints on discrimination disclosure (Contrada et al., 2001; French & Chavez, 2010; French et al., 2013; Lepore & Ituarte, 1999; Mikrut et al., 2022; Ojeda et al., 2012). Relational schemas are cognitive maps that individuals develop to help navigate their interpersonal interactions (Baldwin, 1992). More generally, schemas are abstract or generalized knowledge that impact the interpretation of stimuli (Smith & Queller, 2004). Relational schemas

develop over time as individuals build “declarative and procedural memory” around their interpersonal experiences (Baldwin, 1992). As individuals are continually exposed to experiences, schemas become more solidified and more easily accessible (Smith & Queller, 2004). If individuals are exposed to stressors over time, they could develop negative relational schemas around certain situations or individuals (Baldwin, 1992). These schemas influence behavior as they provide internal mental representations that individuals use to navigate their interactions (Smith & Queller, 2004).

Stereotype confirmation concern, own group-conformity pressure and perceived social constraints around discrimination disclosure are schemas that capture ethnicity related stressors (Lepore & Ituarte, 1999, Mikrut et al., 2022; Ojeda et al., 2012). Stereotype confirmation concern is an ethnicity related stressor as it involves concern over whether an individual is perceived to be confirming an ethnic stereotype (Contrada et al., 2001). It is distinguished from stereotype threat as it is a chronic condition as opposed to an acute state or event (Contrada et al., 2001). Own-group conformity pressure is pressure from one’s own ethnic group to conform to the group’s norms (Contrada et al., 2001). It manifests as subtle reminders from one’s own group of norm violations in dress, behavior, etc (Contrada et al., 2001). Perceived social constraints around discrimination disclosure is an ethnicity related stressor as it considers whether the individual has constraints around disclosure with one’s own ethnic group versus others (Mikrut et al., 2022).

These schemas of stereotype confirmation concern, own group-conformity pressure and perceived social constraints around discrimination disclosure have been shown to be negatively related to psychological wellbeing (French & Chavez, 2010, French et al., 2013; Mikrut et al., 2022; Ojeda et al., 2012). Among Hispanic-American college students, both stereotype confirmation concern and own-group conformity pressure were negatively related to psychological wellbeing (French & Chavez, 2010; Ojeda et al., 2012). Among Asian-American college students, both were found to be positively related to anxiety (French et al., 2013). Taken

together, these schemas have been found to be positively associated with depressive symptoms (Mikrut et al., 2022). However, none of these schemas has been studied in relation to health behaviors such as food consumption.

### **Ethnic Belonging and Eating**

In contrast to ethnicity related stressors, a greater sense of individual ethnic identity may promote psychological and physical wellbeing. According to a meta-analysis of 184 studies, a greater sense of individual ethnic identity was linked to overall well-being and self-esteem in adults and adolescents in North America (Smith & Silva, 2011). Ethnic identity has also been found to moderate the impact of ethnicity related stressors on psychological wellbeing (French & Chavez, 2010).

According to the original conceptualization by Phinney (1992), ethnic identity is considered as a sense of belonging to an ethnic group. More specifically, ethnic identity is defined as an individual's sense of self as connected to culture, race, language or kinship (Burlew, 2000). Ethnic identity can also be considered as a relational schema, as it qualifies as abstract or generalized knowledge that impact the interpretation of stimuli (Smith & Queller, 2004).

Phinney (1992) defined ethnic identity with three dimensions: ethnic identity achievement, affirmation and belonging, and ethnic behavior. Ethnic identity achievement is defined as the extent to which a person has explored and committed to their own ethnic identity (Phinney, 1992). Affirmation and belonging refers to whether an individual feels pride and attachment to their own ethnic group (Phinney, 1992). Ethnic behavior refers to the extent which an individual participates in the social and cultural activities of their own ethnic group (Phinney, 1992). Ethnic identity can be conceptually considered to be separate from racial identity as it is applicable to multiple ethnic groups, while racial identity is specific to certain racial groups (Phinney & Ong, 2007). However, in the literature, the terms ethnic identity and racial identity are often used

interchangeably (French et al., 2013). There has been some research into the overlap between racial identity measures and ethnic identity measures in the African-American population, but not in any other populations (French et al., 2013).

There is some literature to suggest that a strong ethnic identity can help protect against disordered eating. Particularly among African-American women, those who endorse a stronger sense of ethnic identity exhibit both lower drive for thinness, restrained eating and body dissatisfaction than those who identify more with mainstream American culture (Abrams et al., 1992; Henrickson et al., 2010; Petersons et al., 2000; Rhea & Thatcher, 2013). Literature is not available on African-American men. This relationship has also not been examined as thoroughly among Hispanic-Americans. One study on Hispanic-American women did not find the same positive relationship between ethnic identity and drive for thinness/body dissatisfaction as among African-American women (Rhea & Thatcher, 2013). Literature is lacking on Hispanic-American men. The literature is similarly mixed on individuals of East Asian descent. One study found that ethnic identity had no association with drive for thinness in Asian-American men and women (Barry & Garner, 2001). However, another study on Chinese-Australian women found that ethnic identity moderated pressure from family and friends to lose weight (Humphrey & Ricciardelli, 2004). Overall, the relationship between ethnic identity and disordered eating has not been well established.

The question of whether ethnic identity is related to healthy/unhealthy food choice has also not been extensively studied. One study on pregnant women with gestational diabetes in the United States did find that greater ethnic identity was associated with greater fiber intake and greater fruit/vegetable intake (Brown et al., 2016). Another study on African-Americans found a positive relationship between ethnic identity and fruit consumption (Lewis et al., 2018). Ethnic identity has also been linked to other health behaviors, such as lower risk of alcohol use/substance abuse and less sexual risk taking (Ai et al., 2014; Beadnell et al., 2003; Rivas & Drake, 2014).

Research on acculturation to Anglosphere countries suggests that the adoption of mainstream Anglosphere cultural values, norms and customs is associated with worse food choices and higher obesity rates (Alidu & Grunfield, 2018). For instance, Hispanic immigrants who first arrive in the United States have healthier diets than their descendants, even with an increase in socioeconomic status over time (Ayala et al., 2008; Riosmena et al., 2015). Later generation immigrants consume worse diets overall, including greater intake of saturated fat, sugar-sweetened foods and beverages, processed foods and sodium (Allen et al., 2007; Popkin & Udry, 1998). They also have a decreased intake of fruits, vegetables and whole grains (Allen et al., 2007; Popkin & Udry 1998).

One of the potential mechanisms for this relationship between acculturation/assimilation and increasing unhealthy food choices is the loss of a sense of ethnic belonging. One study found that Hispanic-American youth with a bicultural orientation (identifying equally with Hispanic and US culture) ate healthier diets than youth with an assimilated orientation (identifying more with US culture than Hispanic culture) (Arandia et al., 2018). However, there are no standardized definitions of either “acculturation” or “assimilation” in the literature (Zhang & Tsai, 2014). Many studies operationalize acculturation through measures of time such as generational status or years spent in the country of immigration (Zhang & Tsai, 2014). Others operationalize acculturation using measures with items that appear at face validity to measure the ethnic identity dimensions of ethnic behavior as well as attachment and belonging (Zhang & Tsai, 2014). Some studies use the terms ethnic identity and acculturation interchangeably (Humphrey & Ricciardelli, 2004). There has been no research looking at the association between measures that examine acculturation and those that examine ethnic identity.

## **Study Goals and Hypotheses**

There are several gaps in the current literature regarding the relationship between measures of ethnic belonging, social stress induced by rejection and eating behavior. Firstly, the schemas of stereotype confirmation concern, own group conformity pressure and social constraints around discrimination disclosure have never been examined in relation to eating. Furthermore, while ethnic identity has been studied in relation to healthy food consumption (Brown et al., 2016; Lewis et al., 2018), it has not been studied in relation to unhealthy food consumption. These relationships could provide guidance for interventions which target eating behavior among minority group members. Specifically, we hypothesize:

- 1) Schemas of rejection will be negatively associated with healthy consumption and positively associated with unhealthy consumption.
- 2) Schemas of ethnic identity will be positively associated with healthy consumption and negatively associated with unhealthy consumption.

## METHODS

### Participants

Participants were adults recruited from a local hospital medical center. They met eligibility criteria if they were 18 years or older and could read and write in English. The recruited sample included 157 adults, with an age range of 18 to 85 years ( $M = 39.27$ ;  $SD = 12.89$ ). Due to missing data, the final sample included 137 adults with an age range of 18 to 67 years ( $M = 39.08$ ;  $SD = 12.66$ ). The gender breakdown of the sample comprised of 92 (67.15%) participants identifying as female, and 45 (32.85%) as male. In terms of ethnic breakdown, participants identifying as African-American made up the largest group ( $n = 60$ , 43.80%). 30 (21.90%) participants identified as Latino, 5 (3.65%) identified as American Indian/Alaskan Native, 7 (5.11%) identified as Asian/Pacific Islander, 23 (16.79%) identified as White and 12 (8.76%) identified as Other. Full demographics information can be found in Table 1.

### Procedure

Participants were asked to sign a statement of informed consent, and then they were asked to complete a series of self-report measures. These included a demographics questionnaire, measures of rejection schemas, measures of ethnic identity schemas, and measures of eating behavior. The participants received monetary compensation for their time. This study was approved by the St John's University Institutional Review Board.

## **Measures**

### **Demographic Questionnaire**

Participants filled out a demographics questionnaire that asked about their age in years, gender (Male/Female), race/ethnicity (Asian/ African-American/Latino/American Indian/ White/Other), education level (Less than High School/High School or Some College/ College Graduate or Higher) and marital status (Married/Not Married).

### **Measures of Rejection Schemas**

Rejection was measured by the Stereotype Confirmation Concerns Scale (Contrada et al., 2001), the Own-Group Conformity Pressure Scale (Contrada et al., 2001) and a Social Constraints Scale adapted from Lepore and Ituarte (1999).

The Stereotype Confirmation Concerns Scale (Contrada et al., 2001) consists of eleven items that examine concern over confirming stereotypes of one's own ethnic group. It asks participants to respond to the question "How often have you been concerned that you will appear to confirm a stereotype about your racial or ethnic group by...". Answers include items such as "eating certain foods" and "dressing a certain way". Answers are recorded on a 7-point Likert scale ranging from 1 (Never) to 7 (Always). The mean of the items was taken, and higher scores indicated higher stereotype confirmation concern ( $\alpha = .96$ ).

The Own-Group Conformity Pressure Scale (Contrada et al., 2001) consists of eight items that examine participants' experience of being pressured to conform to their own ethnic group. It asks participants to respond to the question "How much have you felt pressured by members of your own ethnic group to...". Answers include "date only members of your own ethnic group" and "pursue/not pursue particular interests or hobbies". Answers are recorded on a

7-point Likert scale ranging from 1 (Never) to 7 (Always). The mean of the items was taken, and higher scores indicated higher own-group conformity pressure ( $\alpha = .89$ ).

The Social Constraints Scale was adapted from Lepore and Ituarte (1999). The adapted version used in this study assesses social constraints around disclosing experience of discrimination. This adapted version consists of two five item measures. It assesses for constraint around disclosure to members of one's own ethnic group versus members of another ethnic group. In the first five item measure (social constraint – same race), participants are asked “How much did you feel that other people of your race/ethnicity would...”. In the second five item measure (social constraint – other race), they are asked “How much did you feel that people of another race/ethnicity would...”. Answers to both questions include items such as “minimize your problems” and “not understand your situation”. Answers are recorded on a 5-point Likert scale ranging from 1 (Not at all) to 5 (Very much). For each five-item measure, the mean was taken. Higher scores indicated greater perceived social constraints during communication with members of one's own or other racial/ethnic groups ( $\alpha = .78$  and  $.83$ , respectively).

### **Measures of Ethnic Identity Schemas**

Ethnic identity was measured using the Multigroup Ethnic Identity Measure (Roberts et al., 1999) and adapted items from the Multi-Dimensional Inventory of Black Identity (Sellers et al., 1997).

The Multigroup Ethnic Identity Measure (MEIM) (Roberts et al., 1999) consists of 12-items that assess ethnic identity. Items include “I understand pretty well what my ethnic group membership means to me, in terms of how to relate to my group and other groups” and “I have spent time trying to find out more about my ethnic group, such as its history, traditions, and customs”. Answers are recorded on a 4-point Likert Scale ranging from 1 (Strongly Disagree) to 4 (Strongly Agree). The mean of the items was taken, and higher scores indicated greater identification with ethnic identity ( $\alpha = .82$ ).

Three items were taken and adapted from the Multi-Dimensional Inventory of Black Identity (MIBI-A) (Sellers et al., 1997). They were adapted to be relevant to all ethnic groups. These items include “In general, my race/ethnicity is an important part of my self-image” and “My race/ethnicity is an important reflection of who I am”. Answers are recorded on a 4-point Likert Scale ranging from 1 (Strongly Disagree) to 4 (Strongly Agree). The mean of the items was taken, and higher scores indicated greater identification with ethnic identity ( $\alpha = .70$ ).

### **Measures of Food Consumption**

Food consumption was measured using a food frequency questionnaire, based on the scale used in the Special Diabetes Program for American Indians Diabetes Prevention Demonstration Project (Teufel-Shone et al., 2015). The questionnaire asks participants about the frequency of their consumption of a variety of both healthy and unhealthy foods over the last 7 days. They are asked to “Please think about what you ate or drank during the last 7 days starting yesterday and counting back. How often did you have...”. Answers are recorded on a 5-point Likert Scale with response options from 1 to 5: *None in 7 days; 1-2 times in 7 days; 3-4 times in 7 days; 5-6 times in 7 days; 1+ times every day*. The unhealthy consumption score was the mean across items assessing consumption of processed or red meat, fried foods, sugary foods, sugary drinks, salty foods, high-fat dairy, and starchy or white grains ( $\alpha = .84$ ). The healthy consumption score was the mean across items assessing consumption of fruits or vegetables, low-fat fish or poultry, whole grains, nuts and legumes, and low-fat dairy ( $\alpha = .81$ ).

## RESULTS

### **Analytic Plan**

Preliminary analyses assessed the normality of all study variables. All variables met criteria for normal distribution, with skewness less than 2 and kurtosis less than 4. Zero-order correlations were also examined among the eight key variables and are presented in Table 3. Differences in demographics variables were examined to identify potential covariates, which were included in adjusted models. Correlational analysis was used for the continuous variable (age), and the remaining categorical variables were examined using analysis of variance. Results are presented in Tables 2.1-2.5. Differences between those with and without missing data were also examined using analysis of variance. Based on this analysis, two covariates of age and education level were included in the subsequent analyses. Statistical significance was determined with a cutoff of  $p > .05$ .

Since there was both theoretical and empirically demonstrated shared variance among the six predictor measures in this study, an exploratory factor analysis employing iterated principal factor analysis and varimax rotation was employed to determine whether these measures defined separate factors. Confirmatory factor analysis was then employed to further validate the factor structure.

Primary inferential analyses using repeated measures regression excluding missing data were conducted to examine effects of the Rejection and Ethnic Identity predictors across types of food consumption (healthy consumption, unhealthy consumption), as well as to examine interactions between these predictors and type of consumption. The analyses were conducted separately for each of the two predictor groups with no covariates and then with adjustment for the relevant covariates of age and education level. Analyses were conducted with Proc GLM in SAS 9.4.

To account for potential differences between those with and without missing data, inferential analyses were performed again in Proc Calis (SAS 9.4) separately for the two outcomes of healthy/unhealthy consumption using full information maximum likelihood.

## Results

20 (12.74%) of the 157 participants had missing data. One significant difference was found between the participants with missing data and those without, on unhealthy food consumption ( $F(1,153) = 5.69, p = 0.02$ ). Post hoc analyses using the Scheffe criterion for significance revealed that participants with missing data ate less unhealthy food ( $M = 1.86$ ) than those without ( $M = 2.33, p = .02$ ). No other variables significantly differed in participants with and without missing data ( $p > .05$ ).

Analysis of variance with post-hoc analyses using the Scheffe criterion for significance were conducted to examine differences in key variables by demographic variables (age, gender, ethnicity, marital status and education level) to determine covariates. Healthy consumption, unhealthy consumption, own-group conformity pressure, stereotype confirmation concerns, social constraint- same race, social constraint – other race and ethnic identity as measured by the MEIM and MIBI-A did not differ according to gender or marital status ( $p > .05$ , Tables 2.1 -2.5). Unhealthy food consumption and own-group conformity pressure did differ according to ethnicity, however post-hoc analyses do not reach significance ( $p > .05$ ). Unhealthy consumption did differ according to education level ( $F(2, 148) = 3.54, p = .03$ ). Post hoc analyses revealed that participants with a 4-year college degree or higher ate less unhealthy food ( $M = 2.02$ ) than those with a high school education ( $M = 2.41, p = .03$ ). Unhealthy consumption and stereotype confirmation concerns differed by age as well, with unhealthy consumption negatively correlated with age ( $p = .001$ ), and stereotype confirmation concerns negatively correlated as well ( $p = .02$ ). Hence, education level and age were included as covariates in all subsequent adjusted models.

Zero-order correlations revealed positive correlations among the measures of rejection as well as among measures of ethnic identity. Results are available in Table 3. Exploratory factor analysis indicated two factors with eigenvalues greater than one (Rejection and Ethnic Identity), which were extracted and subjected to varimax rotation. The two-factor structure solution accounted for 42% of the total variance. Factor 1 was defined by the four measures concerning rejection. Factor 2 was defined by the two measures concerning ethnic identity. Table 4 presents the factor loading matrix.

Confirmatory factor analysis with full information maximum likelihood was then performed to evaluate the factor structure. Two latent factors with eigenvalues greater than one were obtained. The highest loading indicators within each latent factor were fixed to 1. Multiple fit indices were used to determine model fit, as shown in Table 5. The two-factor model fit the data adequately. The confirmatory factor analysis confirmed the two-factor structure that was initially found in the exploratory factor analysis. Aggregate variables for Rejection and Ethnic Identity were created using scale mean scores, which were used in subsequent repeated measures regression analyses.

Repeated measures regression analyses indicated the effect of Rejection on overall consumption was significant in both unadjusted ( $F(1, 135) = 12.54, p = .0005$ ) and adjusted ( $F(1, 132) = 11.19, p = .001$ ) models. There was no interaction between Rejection and type of consumption in either unadjusted ( $F(1, 135) = 0.39, p = .53$ ) or adjusted ( $F(1, 132) = 0.00, p = .97$ ) models. Additional sensitivity analyses at the level of individual scales revealed a significant effect of stereotype confirmation concern on both healthy ( $\beta = -0.27, t = -2.75, p = .01$ ) and unhealthy consumption ( $\beta = .25, t = 2.62, p = .01$ ). It also revealed a significant effect of social constraints – same race on both healthy ( $\beta = 0.22, t = 2.08, p = .04$ ) and unhealthy consumption ( $\beta = .34, t = 3.24, p = .002$ ).

Repeated measures regression analyses indicated the effect of Ethnic Identity on overall consumption was not significant in either unadjusted ( $F(1, 135) = 1.22, p = .27$ ) or adjusted ( $F(1,$

132) = 1.55,  $p = .22$ ) models. Furthermore, there was no interaction between Ethnic Identity and type of consumption in either unadjusted ( $F(1, 135) = 1.48, p = 0.23$ ) or adjusted ( $F(1, 132) = 6.17, p = 0.14$ ) models. Follow-up analyses were conducted to examine whether effects differed by education level (College Graduate vs Not College Graduate). No significant interaction was found between ethnic identity and whether individuals graduated from college ( $F(1, 133) = 0.05, p = 0.82$ ).

Inferential analyses were repeated using Proc Calis (SAS 9.4) using full information maximum likelihood. The effect of Rejection on unhealthy consumption was significant in both unadjusted ( $\beta = .35, t = 4.23, p < .0001$ ) and adjusted ( $\beta = .30, t = 3.48, p = .0005$ ) models. Rejection was positively associated with unhealthy consumption in both models. Rejection was also significantly positively associated with healthy consumption in both unadjusted ( $\beta = .23, t = 2.73, p = .01$ ) and adjusted ( $\beta = .27, t = 3.01, p = .003$ ) models.

The effect of Ethnic Identity on unhealthy consumption was not significant in either unadjusted ( $\beta = .09, t = 0.93, p = 0.35$ ) or adjusted ( $\beta = .14, t = 1.37, p = 0.17$ ) models. The effect of Ethnic Identity on healthy consumption was not significant in either unadjusted ( $\beta = -0.06, t = -0.70, p = 0.50$ ) or adjusted ( $\beta = -0.03, t = -0.21, p = 0.84$ ) models.

## DISCUSSION

Research has shown that approximately 40% of adults increase unhealthy consumption and decrease healthy consumption when experiencing chronic stressors (Debeuf et al., 2018; Groesz et al., 2012; Hill et al., 2018; Hill et al., 2021; Laugero et al., 2018; Merali et al., 2013; Michels et al., 2012; Oliver & Wardle, 1999; Pool et al., 2015). Social stressors, specifically the experience of being rejected by others, has been shown to be linked to increased consumption of unhealthy food (Baumeister et al., 2005; Hayman et al., 2015; Oaten et al., 2008; Salvy et al., 2011; Salvy et al., 2012). However, the relational schemas examined by this paper have never been studied in relation to consumption. Furthermore, while a strong sense of ethnic identity has been shown to be related to increased healthy consumption (Brown et al., 2016, Lewis et al., 2018), the impact of ethnic identity on unhealthy consumption has not been examined. This paper provides evidence to address both gaps in the literature.

This study sought to answer whether either schemas of rejection and ethnic identity were differentially associated with healthy and unhealthy consumption. This study found a main effect of rejection on overall food consumption, which did not differ by healthy or unhealthy consumption. There was no effect of ethnic identity found on consumption. This was consistent across different types of analyses. At the level of individual measures, stereotype confirmation concern and social constraints – same race appear to be the strongest contributors to the effects. Social constraints – same race was positively associated with both healthy and unhealthy consumption, while stereotype confirmation concern was positively related to unhealthy consumption and negatively related to healthy consumption. This suggests that different types of social stress possibly impact consumption through different mechanisms. Future research could further explore these differential effects.

The findings on rejection are consistent with prior research showing that social stressors lead to increased food consumption for some adults (Groesz et al., 2012; Oliver & Wardle).

These findings are also consistent with the Environmental Affordances Model which proposes that consumption of food and other substances contributes to stress reduction (Mezuk et al., 2013). The lack of differentiation in our findings between healthy and unhealthy consumption suggests that the act of eating, rather than the type of food consumed, might function as a stress reducer. Individuals may employ food consumption as a coping strategy to control their mood in the face of stressors.

The findings on ethnic identity are not consistent with prior research which found a significant positive impact of ethnic identity on healthy consumption (Brown et al., 2016; Lewis et al., 2017). This study employed similar consumption measures and the same ethnic identity measures as previous research. The mixed findings could be due to regional differences, as this study was conducted in the Northeastern US, and previous research was conducted in the Southwestern US (Brown et al., 2016; Lewis et al., 2017). This study did not examine food insecurity and access to affordable healthy food, both of which could possibly differ by region and could have influenced the findings. Food insecurity, defined as lack of consistent access to sufficient food, has been linked to decreased consumption of healthy food (Leung et al., 2014). Limited access to affordable healthy food has also been documented as having an impact on consumption (Cheadle et al., 2014). This study recruited from a socio-demographically diverse sample which could be experiencing both issues with food insecurity and healthy food access, which could have influenced the findings on the relationship between ethnic identity and consumption.

Future research could examine the mechanisms that underly the relationship between rejection and increased eating. The exact physiological mechanism of how eating might contribute to stress reduction is not fully understood, however there is some evidence that eating inhibits the response of the hypothalamic-pituitary-adrenal axis (Epel et al., 2000). There has also been previous research that suggests that self-regulation decreases in the face of social rejection, specifically in terms of regulating unhealthy food consumption (Baumeister et al.,

2005). Baumeister et al. (2005) hypothesize this occurs because social belongingness is a major incentive to self-regulate unhealthy consumption. When that incentive is withheld due to social rejection, the incentive to self-regulate unhealthy consumption also disappears (Baumeister et al., 2005).

There were a variety of limitations present in this study. Firstly, the study relied on self-report measures. The questionnaire used in this study also did not examine portion size, which limits the possibility of asking about the quantity of food consumed. Whether unhealthy food has a negative impact on an individual's health depends on the quantity consumed. Moreover, the usage of food frequency questionnaires, such as the one used in this study, has been controversial (Dhurandhar et al., 2015; Archer et al., 2015). Previous research has found that participants consistently underreport unhealthy consumption when using food frequency questionnaires (Dhurandhar et al., 2015). Archer et al. (2015) argue that memory-based dietary assessment methods, which include questionnaires, surveys and interviews, have no empirical support. They state that “the assumption that human memory can provide accurate or precise reproductions of past ingestive behavior is indisputably false” (Archer et al., 2015). Given this limitation, future research could include more empirically robust measures of food intake, such as ecological momentary assessment measures (Maugeri & Barchitta, 2019). As ecological momentary assessment measures record consumption in real time, they are less likely to be subject to errors of human memory (Maugeri & Barchitta, 2019). Some measures in development that could be used include food photography, chewing and swallowing monitors and wrist motion detectors (Dhurandhar et al., 2015). Given this limitation, it is possible that there were differential effects of type of consumption that were undetected.

Future research would benefit from examining these questions with a greater variety of populations, both within and outside the United States. Currently, the research looking at the relationship between these schemas and eating behavior has only been conducted in the United

States (Brown et al., 2016, Lewis et al., 2018). Given the history of ethnic minorities in the United States, it is likely a different relationship could be found in other countries.

This study raises some potential implications for future interventions targeting eating behavior. As the stress of rejection can lead to increased overall consumption, this could have implications for the treatment of loss of control eating and binge eating disorder. Previous research has found that ethnic minorities in the United States often consider issues regarding race and ethnicity as important components of their mental health treatment (Meyer & Zane, 2013). However, they also frequently report dissatisfaction with their providers' abilities to address such topics (Meyer & Zane, 2013). This study suggests that eating intervention providers need to address the issues of race and ethnicity during treatment.

## **CONCLUSION**

In conclusion, rejection was found to be related to greater overall consumption, while ethnic identity was not found to be related to consumption in any form. This is one of few studies that have examined the relationship between relational schemas and eating behavior. Research on how these schemas might contribute to healthy behaviors, and hence health disparities, is sparse. This study adds to the body of literature on a segment of the population at risk for chronic health conditions that can be addressed through eating interventions. It also highlights the need for further research on how experiences of rejection can influence health behaviors.

## APPENDICES

**Table 1**

*Demographics*

<b><i>N</i> = 137</b>	
<b>Age (Years)</b>	
[M (SD) Range]	39.08 (12.66) Range: 18-67
<b>Gender</b>	
Female	<i>n</i> = 92; 67.15%
Male	<i>n</i> = 45; 32.85%
<b>Race/Ethnicity</b>	
Asian/Pacific Islander	<i>n</i> = 7; 5.11%
Black/African-American	<i>n</i> = 60; 43.80%
Latino	<i>n</i> = 30; 21.90%
American Indian/Alaskan Native	<i>n</i> = 5; 3.65 %
Other	<i>n</i> = 12; 8.76%
White	<i>n</i> = 23; 16.79%
<b>Education Level</b>	
Less than High School	<i>n</i> = 16; 11.68 %
High School or Some College	<i>n</i> = 88; 64.23 %
College Graduate or Higher	<i>n</i> = 33; 24.09 %
<b>Marital Status</b>	
Married	<i>n</i> = 37; 27.01 %
Not Married	<i>n</i> = 100; 72.99 %

**Table 2.1***Sociodemographic Differences*

		<b>N</b>	<b>Unhealthy Consumption</b> [Mean (SD)]	<b>Healthy Consumption</b> [Mean (SD)]
<b>Gender</b>	Women	104	2.30 (0.78)	2.68 (0.95)
	Men	50	2.25 (0.77)	2.39 (0.90)
<b>Race/Ethnicity</b>	Asian/Pacific Islander	7	2.12 (0.52)	2.84 (0.93)
	Black/African- American	70	2.27 (0.82)	2.622 (1.02)
	Latino	33	2.18 (0.76)	2.26 (0.74)
	American Indian/Alaskan Native	5	3.23 (1.06)	2.39 (2.00)
	Other	15	2.12 (0.67)	3.10 (1.01)
	White	24	2.4 (0.66)	2.56 (0.78)
<b>Education Level</b>	Less than High School	20	2.26 (0.97)	2.34 (0.94)
	High School or Some College	92	<b>2.41 (0.78)<sup>a</sup></b>	2.58 (0.90)
	College Graduate or Higher	37	<b>2.02 (0.62)<sup>b</sup></b>	2.66 (1.04)
<b>Marital Status</b>	Married	44	2.19 (0.76)	2.78 (0.96)

	Not Married	110	2.32 (0.78)	2.50 (0.93)
--	-------------	-----	-------------	-------------

**Notes:** Differences between two levels within a column are significant ( $p < .05$ ) if superscripts are different. Total Ns may differ due to missing data.

**Table 2.2**

*Sociodemographic Differences*

		N	Stereotype Confirmation Concern [Mean (SD)]	Own-Group Conformity Pressure [Mean (SD)]
<b>Gender</b>	Women	106	2.21 (1.25)	2.21 (1.35)
	Men	50	2.28 (1.51)	2.08 (1.13)
<b>Race/Ethnicity</b>	Asian/Pacific Islander	7	1.37 (0.65)	1.91 (1.17)
	Black/African- American	72	2.35 (1.37)	2.53 (1.30)
	Latino	33	2.19 (1.165)	1.87 (1.90)
	American Indian/Alaskan Native	5	2.85 (1.84)	1.68 (1.05)
	Other	15	2.21 (1.18)	1.79 (1.10)
	White	24	2.08 (1.54)	1.92 (1.34)
<b>Education Level</b>	Less than High School	20	2.33 (1.45)	2.36 (1.38)

	High School or Some College	93	1.23 (1.34)	2.10 (1.32)
	College Graduate or Higher	38	2.26 (1.32)	2.28 (1.18)
<b>Marital Status</b>	Married	45	2.23 (1.28)	2.19 (1.42)
	Not Married	111	1.23 (1.36)	2.16 (1.22)

*Note: Total Ns may differ due to missing data.*

**Table 2.3***Sociodemographic Differences*

		N	Social- Constraints (Same-Race) [Mean (SD)]	Social- Constraints (Other-Race) [Mean (SD)]
<b>Gender</b>	Women	105	2.40 (0.98)	2.51 (1.06)
	Men	50	2.22 (0.83)	2.42 (0.91)
<b>Race/Ethnicity</b>	Asian/Pacific Islander	7	2.04 (0.83)	2.40 (0.73)
	Black/African- American	72	2.51 (0.99)	2.54 (1.06)
	Latino	32	2.27 (0.74)	2.35 (0.79)
	American Indian/Alaskan Native	5	2.75 (1.00)	2.75 (0.61)
	Other	15	2.15 (1.02)	2.71 (1.22)
	White	24	1.98 (0.90)	2.35 (1.16)
<b>Education Level</b>	Less than High School	20	2.20 (0.96)	2.31 (1.09)
	High School or Some College	92	2.45 (0.95)	2.53 (0.93)
	College Graduate or Higher	38	2.20 (0.87)	2.58 (1.17)
<b>Marital Status</b>	Married	45	2.32 (1.03)	2.49 (1.07)

	Not Married	110	2.33 (0.90)	2.48 (1.00)
--	-------------	-----	-------------	-------------

*Note: Total Ns may differ due to missing data.*

**Table 2.4**

*Sociodemographic Differences*

		<b>N</b>	<b>MEIM</b> [Mean (SD)]	<b>MIBI-A</b> [Mean (SD)]
<b>Gender</b>	Women	107	2.91 (0.60)	4.14 (1.45)
	Men	49	3.06 (0.47)	4.30 (1.35)
<b>Race/Ethnicity</b>	Asian/Pacific Islander	7	3.01 (0.69)	3.86 (1.65)
	Black/African- American	71	3.04 (0.53)	4.51 (1.33)
	Latino	33	2.90 (0.52)	3.98 (1.41)
	American Indian/Alaskan Native	5	2.74 (0.33)	4.40 (0.55)
	Other	15	2.87 (0.67)	3.87 (1.51)
	White	24	2.87 (0.67)	3.81 (1.59)
<b>Education Level</b>	Less than High School	20	2.96 (0.59)	4.65 (1.27)
	High School or Some College	93	2.92 (0.56)	4.05 (1.34)
	College Graduate or Higher	37	3.03 (0.56)	4.32 (1.58)

<b>Marital Status</b>	Married	44	3.02 (0.60)	4.34 (1.46)
	Not Married	111	2.93 (0.55)	4.13 (1.40)

*Note: Total Ns may differ due to missing data.*

**Table 2.5**

*Sociodemographic Differences*

	<b>Age</b>
<b>Unhealthy Consumption</b>	-0.26**
<b>Healthy Consumption</b>	0.12
<b>Stereotype Confirmation Concern</b>	-0.19*
<b>Own-Group Conformity Pressure</b>	-0.13
<b>Social-Constraints (Same-Race)</b>	-0.09
<b>Social-Constraints (Other-Race)</b>	-0.16
<b>MEIM</b>	0.04
<b>MIBI-A</b>	0.04

Note: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

**Table 3***Correlations*

<b>Variable</b>	<b>1.</b>	<b>2.</b>	<b>3.</b>	<b>4.</b>	<b>5.</b>	<b>6.</b>	<b>7.</b>	<b>8.</b>
<b>1.</b> Unhealthy Consumption	-							
<b>2.</b> Healthy Consumption	0.09	-						
<b>3.</b> Stereotype Confirmation Concern	0.31**	-0.05	-					
<b>4.</b> Own-Group Conformity Pressure	0.11	0.09	0.50**	-				
<b>5.</b> Social Constraints – Same Race	0.34**	0.23**	0.42**	0.36**	-			
<b>6.</b> Social Constraints – Other Race	0.13	0.23**	0.30**	0.31**	0.60**	-		
<b>7.</b> Multigroup Ethnic Identity Measure	0.09	-0.03	0.09	0.03	0.12	0.03	-	
<b>8.</b> Multidimensional Inventory of Black Identity - Adapted	0.10	0.02	0.13	0.12	0.04	0.04	0.36**	-
** $p < .01$								

**Table 4***Factor Loadings*

<b>Variable</b>	<b>Factor 1 – Rejection/</b>	<b>Factor 2 – Ethnic Identity</b>
Stereotype Confirmation Concern	.57	
Own-Group Conformity Pressure	.53	
Social Constraints – Same Race	.77	
Social Constraints – Other Race	.67	
Multigroup Ethnic Identity Measure		.45
Multidimensional Inventory of Black Identity - Adapted		.75

**Table 5**

*Fit indices*

<b>Model Description</b>	<b>Parameter Estimates</b>	<b>AIC</b>	<b>Chi<sup>2</sup></b>	<b>CHI<sup>2</sup>DF</b>	<b>Bentler's CFI</b>	<b>RMSEA (90% CI)</b>	<b>SRMR</b>
Factor 1: Rejection/ Factor 2: Ethnic Identity	13	2500	23.05	8	0.91	0.11	0.06

## REFERENCES

- Abrams, K. K., Allen, L. R., & Gray, J. J. (1993). Disordered eating attitudes and behaviors, psychological adjustment, and ethnic identity: a comparison of black and white female college students. *The International journal of eating disorders*, *14*(1), 49–57.  
<https://doi.org/10.1002/1098-108x>
- Agras, W. S., & Telch, C. F. (1998). The effects of caloric deprivation and negative affect on binge eating in obese binge-eating disordered women. *Behavior Therapy*, *29*(3), 491–503. [https://doi.org/10.1016/S0005-7894\(98\)80045-2](https://doi.org/10.1016/S0005-7894(98)80045-2)
- Ai, A. L., Aisenberg, E., Weiss, S. I., & Salazar, D. (2014). Racial/Ethnic Identity and Subjective Physical and Mental Health of Latino Americans: An Asset Within? *American Journal of Community Psychology*, *53*(1–2), 173–184. <https://doi.org/10.1007/s10464-014-9635-5>
- Alidu, L., & Grunfeld, E. A. (2018). A systematic review of acculturation, obesity and health behaviours among migrants to high-income countries. *Psychology & Health*, *33*(6), 724–745. <https://doi.org/10.1080/08870446.2017.1398327>
- Allen, M. L., Elliott, M. N., Morales, L. S., Diamant, A. L., Hambarsoomian, K., & Schuster, M. A. (2007). Adolescent Participation in Preventive Health Behaviors, Physical Activity, and Nutrition: Differences Across Immigrant Generations for Asians and Latinos Compared With Whites. *American Journal of Public Health*, *97*(2), 337–343.  
<https://doi.org/10.2105/AJPH.2005.076810>
- Ambrosini, G. L. (2014). Childhood dietary patterns and later obesity: A review of the evidence. *Proceedings of the Nutrition Society*, *73*(1), 137–146.  
<https://doi.org/10.1017/S0029665113003765>
- Arandia, G., Sotres-Alvarez, D., Siega-Riz, A. M., Arredondo, E. M., Carnethon, M. R., Delamater, A. M., Gallo, L. C., Isasi, C. R., Marchante, A. N., Pritchard, D., Van Horn, L., & Perreira, K. M. (2018). Associations between acculturation, ethnic identity, and diet

- quality among U.S. Hispanic/Latino Youth: Findings from the HCHS/SOL Youth Study. *Appetite*, 129, 25–36. <https://doi.org/10.1016/j.appet.2018.06.017>
- Archer, E., Pavela, G., & Lavie, C. J. (2015, July). The inadmissibility of what we eat in America and NHANES dietary data in nutrition and obesity research and the scientific formulation of national dietary guidelines. In *Mayo Clinic Proceedings* (Vol. 90, No. 7, pp. 911-926).
- Arroyo-Johnson, C., & Mincey, K. D. (2016). Obesity Epidemiology Worldwide. *Gastroenterology Clinics of North America*, 45(4), 571–579. <https://doi.org/10.1016/j.gtc.2016.07.012>
- Arsiwalla, D. D., Arnold, A. W., Teel, K. P., Ulrich, P. V., & Gropper, S. S. (2018). The interactive role of eating regulation and stress in the prediction of weight-related outcomes among college students. *Stress and Health*, 34(1), 59–71. <https://doi.org/10.1002/smi.2760>
- Ayala, G. X., Baquero, B., & Klinger, S. (2008). A Systematic Review of the Relationship between Acculturation and Diet among Latinos in the United States: Implications for Future Research. *Journal of the American Dietetic Association*, 108(8), 1330–1344. <https://doi.org/10.1016/j.jada.2008.05.009>
- Baldwin, M. W. (1992). Relational schemas and the processing of social information. *Psychological Bulletin*, 112(3), 461–484. <https://doi.org/10.1037/0033-2909.112.3.461>
- Barry, D. T., & Garner, D. M. (2001). Eating concerns in East Asian immigrants: Relationships between acculturation, self-construal, ethnic identity, gender, psychological functioning and eating concerns. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, 6(2), 90–98. <https://doi.org/10.1007/BF03339757>
- Baumeister, R. F., DeWall, C. N., Ciarocco, N. J., & Twenge, J. M. (2005). Social exclusion impairs self-regulation. *Journal of Personality and Social Psychology*, 88(4), 589–604. <https://doi.org/10.1037/0022-3514.88.4.589>

- Beadnell, B., Stielstra, S., Baker, S., Morrison, D. M., Knox, K., Gutierrez, L., & Doyle, A. (2003). Ethnic identity and sexual risk-taking among African-American women enrolled in an HIV/STD prevention intervention. *Psychology, Health & Medicine*, 8(2), 187–198. <https://doi.org/10.1080/1354850031000087564>
- Brown, S. D., Ehrlich, S. F., Kubo, A., Tsai, A.-L., Hedderson, M. M., Quesenberry Jr., C. P., & Ferrera, A. (2016). Lifestyle behaviors and ethnic identity among diverse women at high risk for type 2 diabetes. *Social Science & Medicine*.
- Brug, J. (2008). Determinants of healthy eating: Motivation, abilities and environmental opportunities. *Family Practice*, 25(Supplement 1), i50–i55. <https://doi.org/10.1093/fampra/cmn063>
- Burlew, A. (2000). Ethnic and racial identity: Racial identity. In A. E. Kazdin (Ed.): *Encyclopedia of Psychology, Vol. 3* (pp. 259-263). Washington, DC: American Psychological Association. doi:10.1037/10518-123
- Cheadle A, Psaty BM, Curry S, Wagner E, Diehr P, Koepsell T, et al.. Community-level comparisons between the grocery store environment and individual dietary practice. *Preventive Medicine*. 1991;20:250–261.
- Contrada, R. J., Ashmore, R. D., Gary, M. L., Coups, E., Egeth, J. D., Sewell, A., Ewell, K., Goyal, T. M., & Chasse, V. (2001). Measures of Ethnicity-Related Stress: Psychometric Properties, Ethnic Group Differences, and Associations With Well-Being<sup>1</sup>. *Journal of Applied Social Psychology*, 31(9), 1775–1820. <https://doi.org/10.1111/j.1559-1816.2001.tb00205.x>
- Dallman, M. F., Pecoraro, N. C., & la Fleur, S. E. (2005). Chronic stress and comfort foods: self-medication and abdominal obesity. *Brain, behavior, and immunity*, 19(4), 275-280.
- Debeuf, T., Verbeken, S., Van Beveren, M.-L., Michels, N., & Braet, C. (2018). Stress and Eating Behavior: A Daily Diary Study in Youngsters. *Frontiers in Psychology*, 9, 2657. <https://doi.org/10.3389/fpsyg.2018.02657>

- Dhurandhar, N. V., Schoeller, D., Brown, A. W., Heymsfield, S. B., Thomas, D., Sørensen, T. I., ... & Allison, D. B. (2015). Energy balance measurement: when something is not better than nothing. *International journal of obesity*, 39(7), 1109-1113.
- Eisenberger, N. I. (2003). Does Rejection Hurt? An fMRI Study of Social Exclusion. *Science*, 302(5643), 290–292. <https://doi.org/10.1126/science.1089134>
- Epel, E., Lapidus, R., McEwen, B., & Brownell, K. (2001). Stress may add bite to appetite in women: A laboratory study of stress-induced cortisol and eating behavior. *Psychoneuroendocrinology*, 26(1), 37–49. [https://doi.org/10.1016/S0306-4530\(00\)00035-4](https://doi.org/10.1016/S0306-4530(00)00035-4)
- Finch, L. E., & Tomiyama, A. J. (2015). Comfort eating, psychological stress, and depressive symptoms in young adult women. *Appetite*, 95, 239–244. <https://doi.org/10.1016/j.appet.2015.07.017>
- Finkelstein, E. A., Trogon, J. G., Cohen, J. W., & Dietz, W. (2009). Annual Medical Spending Attributable To Obesity: Payer-And Service-Specific Estimates: Amid calls for health reform, real cost savings are more likely to be achieved through reducing obesity and related risk factors. *Health Affairs*, 28(Supplement 1), w822–w831. <https://doi.org/10.1377/hlthaff.28.5.w822>
- French, S. E., & Chavez, N. R. (2010). The Relationship of Ethnicity-Related Stressors and Latino Ethnic Identity to Well-Being. *Hispanic Journal of Behavioral Sciences*, 32(3), 410–428. <https://doi.org/10.1177/0739986310374716>
- French, S. E., Tran, N., & Chávez, N. R. (2013). Exploring the effect of in-group and out-group race-related stressors on anxiety among Asian Pacific Islander American students: Asian Pacific Islander American racial identity. *Journal of Applied Social Psychology*, 43, E339–E350. <https://doi.org/10.1111/jasp.12028>

- Groesz, L. M., McCoy, S., Carl, J., Saslow, L., Stewart, J., Adler, N., Laraia, B., & Epel, E. (2012). What is eating you? Stress and the drive to eat. *Appetite*, *58*(2), 717–721. <https://doi.org/10.1016/j.appet.2011.11.028>
- Habhab, S., Sheldon, J. P., & Loeb, R. C. (2009). The relationship between stress, dietary restraint, and food preferences in women. *Appetite*, *52*(2), 437–444. <https://doi.org/10.1016/j.appet.2008.12.006>
- Hales, C. M. (2020). *Prevalence of Obesity and Severe Obesity Among Adults: United States, 2017–2018*. *360*, 8.
- Hayman, L. W., McIntyre, R. B., & Abbey, A. (2015). The bad taste of social ostracism: The effects of exclusion on the eating behaviors of African-American women. *Psychology & Health*, *30*(5), 518–533. <https://doi.org/10.1080/08870446.2014.983923>
- Henrickson, H. C., Crowther, J. H., & Harrington, E. F. (2010). Ethnic identity and maladaptive eating: Expectancies about eating and thinness in African American women. *Cultural Diversity and Ethnic Minority Psychology*, *16*(1), 87–93. <https://doi.org/10.1037/a0013455>
- Hill, D. C., Moss, R. H., Sykes-Muskett, B., Conner, M., & O'Connor, D. B. (2018). Stress and eating behaviors in children and adolescents: Systematic review and meta-analysis. *Appetite*, *123*, 14–22. <https://doi.org/10.1016/j.appet.2017.11.109>
- Hill, D., Conner, M., Clancy, F., Moss, R., Wilding, S., Bristow, M., & O'Connor, D. B. (2021). Stress and eating behaviours in healthy adults: A systematic review and meta-analysis. *Health Psychology Review*, 1–25. <https://doi.org/10.1080/17437199.2021.1923406>
- Humphry, T. A., & Ricciardelli, L. A. (2004). The development of eating pathology in Chinese-Australian women: Acculturation versus culture clash. *International Journal of Eating Disorders*, *35*(4), 579–588. <https://doi.org/10.1002/eat.10269>

- Laugero, K. D., Falcon, L. M., & Tucker, K. L. (2011). Relationship between perceived stress and dietary and activity patterns in older adults participating in the Boston Puerto Rican Health Study. *Appetite*, *56*(1), 194–204. <https://doi.org/10.1016/j.appet.2010.11.001>
- Lazarus, R. S. (1999). *Stress and emotion: A new synthesis*. Springer Publishing Co.
- Lepore, S. J., & Ituarte, P. H. (1999). Optimism about cancer enhances mood by reducing negative social interactions. *Cancer Research, Therapy and Control*, *8*(3), 165-174.
- Lewis, F. B., Boutrin, M. C., Dalrymple, L., & McNeill, L. H. (2018). The influence of Black identity on wellbeing and health behaviors. *Journal of Racial and Ethnic Health Disparities*, *5*(3), 671-681.
- Leung, C. W., Epel, E. S., Ritchie, L. D., Crawford, P. B., & Laraia, B. A. (2014). Food insecurity is inversely associated with diet quality of lower-income adults. *Journal of the Academy of Nutrition and Dietetics*, *114*(12), 1943-1953.
- Macht, M. (2008). How emotions affect eating: A five-way model. *Appetite*, *50*, 1–11. doi:10.1016/j.appet.2007.07.002.
- Merali, Z., Graitson, S., MacKay, J. C., & Kent, P. (2013). Stress and eating: A dual role for bombesin-like peptides. *Frontiers in Neuroscience*, *7*. <https://doi.org/10.3389/fnins.2013.00193>
- Mezuk, B., Abdou, C. M., Hudson, D., Kershaw, K. N., Rafferty, J. A., Lee, H., & Jackson, J. S. (2013). “White Box” epidemiology and the social neuroscience of health behaviors: the environmental affordances model. *Society and mental health*, *3*(2), 79-95.
- Michels, N., Sioen, I., Braet, C., Eiben, G., Hebestreit, A., Huybrechts, I., Vanaelst, B., Vyncke, K., & De Henauw, S. (2012). Stress, emotional eating behaviour and dietary patterns in children. *Appetite*, *59*(3), 762–769. <https://doi.org/10.1016/j.appet.2012.08.010>
- Mikrut, E. E., Keating, L. H., Barnwell, P. V., Cioffi, L., Vega, D., Contrada, R. J., & Brondolo, E. (2022). Pathways from exposure to racial/ethnic discrimination to depression: Testing a social-cognitive model. *Social Science & Medicine*, *292*, 114558.

- Nastaskin, R. S., & Fiocco, A. J. (2015). A survey of diet self-efficacy and food intake in students with high and low perceived stress. *Nutrition Journal*, *14*(1), 42.  
<https://doi.org/10.1186/s12937-015-0026-z>
- NHLBI. (2013). *Managing Overweight and Obesity in Adults: Systematic Evidence Review From the Obesity Expert Panel*.
- Nutrition Evidence Library. A series of systematic reviews on the relationship between dietary patterns and health outcomes. Alexandria, VA: U.S. Department of Agriculture, Center for Nutrition Policy and Promotion, March 2014. Available from:  
<http://www.nel.gov/vault/2440/web/files/DietaryPatterns/DPRptFullFinal.pdf>
- Oaten, M., Williams, K. D., Jones, A., & Zadro, L. (2008). The Effects of Ostracism on Self-Regulation in the Socially Anxious. *Journal of Social and Clinical Psychology*, *27*(5), 471–504. <https://doi.org/10.1521/jscp.2008.27.5.471>
- O'Connor, D. B., Jones, F., Conner, M., McMillan, B., & Ferguson, E. (2008). Effects of daily hassles and eating style on eating behavior. *Health Psychology*, *27*(1, Suppl), S20–S31.  
<https://doi.org/10.1037/0278-6133.27.1.S20>
- O'Connor, D. B., & O'Connor, R. C. (2004). Perceived changes in food intake in response to stress: The role of conscientiousness. *Stress and Health*, *20*(5), 279–291.  
<https://doi.org/10.1002/smi.1028>
- Ojeda, L., Navarro, R. L., Meza, R. R., & Arbona, C. (2012). Too Latino and Not Latino Enough: The Role of Ethnicity-Related Stressors on Latino College Students' Life Satisfaction. *Journal of Hispanic Higher Education*, *11*(1), 14–28.  
<https://doi.org/10.1177/1538192711435553>
- Oliver, G., & Wardle, J. (1999). Perceived effects of stress on food choice. *Physiology & behavior*, *66*(3), 511-515.
- Petersons, M., Rojhani, A., Steinhaus, N., & Larkin, B. (n.d.). *Effect of Ethnic Identity on Attitudes, Feelings and Behaviors Toward Food.pdf*.

- Phinney, J. S. (1992). The multigroup ethnic identity measure: A new scale for use with diverse groups. *Journal of adolescent research*, 7(2), 156-176.
- Phinney, J. S., & Ong, A. D. (2007). Conceptualization and measurement of ethnic identity: Current status and future directions. *Journal of Counseling Psychology*, 54(3), 271–281. <https://doi.org/10.1037/0022-0167.54.3.271>
- Pool, E., Delplanque, S., Coppin, G., & Sander, D. (2015). Is comfort food really comforting? Mechanisms underlying stress-induced eating. *Food Research International*, 76, 207–215. <https://doi.org/10.1016/j.foodres.2014.12.034>
- Popkin, B. M., & Udry, J. R. (1998). Adolescent Obesity Increases Significantly in Second and Third Generation U.S. Immigrants: The National Longitudinal Study of Adolescent Health. *The Journal of Nutrition*, 128(4), 701–706. <https://doi.org/10.1093/jn/128.4.701>
- Prentice, P. R. (2013). *Stress and Obesity: Facilitation of Neuroendocrine and Autonomic Nervous System Recovery from Stress while Eating Comfort Foods?* [PhD, West Virginia University Libraries]. <https://doi.org/10.33915/etd.4990>
- Rhea, D. J., & Thatcher, W. G. (2013). Ethnicity, Ethnic Identity, Self-Esteem, and At-Risk Eating Disordered Behavior Differences of Urban Adolescent Females. *Eating Disorders*, 21(3), 223–237. <https://doi.org/10.1080/10640266.2013.779177>
- Riosmena, F., Everett, B. G., Rogers, R. G., & Dennis, J. A. (2015). Negative Acculturation and Nothing More? Cumulative Disadvantage and Mortality during the Immigrant Adaptation Process among Latinos in the United States. *International Migration Review*, 49(2), 443–478. <https://doi.org/10.1111/imre.12102>
- Rivas-Drake, D., Seaton, E. K., Markstrom, C., Quintana, S., Syed, M., Lee, R. M., Schwartz, S. J., Umaña-Taylor, A. J., French, S., Yip, T., & Ethnic and Racial Identity in the 21st Century Study Group. (2014). Ethnic and Racial Identity in Adolescence: Implications for Psychosocial, Academic, and Health Outcomes. *Child Development*, 85(1), 40–57. <https://doi.org/10.1111/cdev.12200>

- Salvy, S.-J., Bowker, J. C., Nitecki, L. A., Kluczynski, M. A., Germeroth, L. J., & Roemmich, J. N. (2011). Impact of simulated ostracism on overweight and normal-weight youths' motivation to eat and food intake. *Appetite*, *56*(1), 39–45.  
<https://doi.org/10.1016/j.appet.2010.11.140>
- Salvy, S.-J., Bowker, J. C., Nitecki, L. A., Kluczynski, M. A., Germeroth, L. J., & Roemmich, J. N. (2012). Effects of Ostracism and Social Connection-Related Activities on Adolescents' Motivation to Eat and Energy Intake. *Journal of Pediatric Psychology*, *37*(1), 23–32. <https://doi.org/10.1093/jpepsy/jsr066>
- Scott, C., & Johnstone, A. M. (2012). Stress and Eating Behaviour: Implications for Obesity. *Obesity Facts*, *5*(2), 277–287. <https://doi.org/10.1159/000338340>
- Smith, T. B., & Silva, L. (2011). Ethnic identity and personal well-being of people of color: A meta-analysis. *Journal of Counseling Psychology*, *58*(1), 42–60.  
<https://doi.org/10.1037/a0021528>
- Smith, E. R., & Queller, S. (2004). Mental representations. In M. B. Brewer & M. Hewstone (Eds.), *Social cognition* (pp. 5–27). Blackwell Publishing.
- Stoody, E. E., Spahn, J. M., McGrane, M. M., MacNeil, P. C., Fungwe, T. V., Altman, J. M., Lyon, J., Obbagy, J.E. & Wong, Y. P. (2014). A series of systematic reviews on the relationship between dietary patterns and health outcomes. *United States Department of Agriculture: Alexandria, VA, USA*, 501.
- Svaldi, J., Tuschen-Caffier, B., Lackner, H. K., Zimmermann, S., & Naumann, E. (2012). The effects of emotion regulation on the desire to overeat in restrained eaters. *Appetite*, *59*(2), 256–263. <https://doi.org/10.1016/j.appet.2012.04.016>
- Tan, C. C., & Chow, C. M. (2014). Stress and emotional eating: The mediating role of eating dysregulation. *Personality and individual differences*, *66*, 1-4.

- Telch, C. F., Agras, W. S., & Linehan, M. M. (2001). Dialectical behavior therapy for binge eating disorder. *Journal of Consulting and Clinical Psychology, 69*(6), 1061–1065. <https://doi.org/10.1037/0022-006X.69.6.1061>
- Teufel-Shone NI, Jiang L, Beals J, et al.. Demographic characteristics and food choices of participants in the special diabetes program for American Indians diabetes prevention demonstration project. *Ethn Heal. 2015;20*(4):327-340.  
doi:10.1080/13557858.2014.921890
- Tryon, M. S., DeCant, R., & Laugero, K. D. (2013). Having your cake and eating it too: A habit of comfort food may link chronic social stress exposure and acute stress-induced cortisol hyporesponsiveness. *Physiology & Behavior, 114–115*, 32–37.  
<https://doi.org/10.1016/j.physbeh.2013.02.018>
- Wallis, D. J., & Hetherington, M. M. (2004). Stress and eating: The effects of ego-threat and cognitive demand on food intake in restrained and emotional eaters. *Appetite, 43*(1), 39–46. <https://doi.org/10.1016/j.appet.2004.02.001>
- Williams, K. D. (2007). Ostracism. *Annu. Rev. Psychol., 58*, 425-452.
- Zhang, Y. L., & Tsai, J. L. (2014). The assessment of acculturation, enculturation, and culture in Asian-American samples. In *Guide to psychological assessment with Asians* (pp. 75-101). Springer, New York, NY.

Vita

Name

*Shelagh Mahbubani*

Baccalaureate Degree

*Bachelor of Arts, Yale University,*

*New Haven*

*Major: History*

Date Graduated

*May, 2011*