

2021

An Investigation of the Moderating Effects of Household Composition and Developmental Age on Food Insecurity Impacting Mental Health

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An Investigation of the Moderating Effects of Household Composition and Developmental Age
on Food Insecurity Impacting Mental Health

by

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A master's thesis submitted to the Department of Psychology
in partial fulfillment of the requirements for the degree of
Master of Science in Psychological Sciences

UNIVERSITY OF NORTH FLORIDA

COLLEGE OF ARTS AND SCIENCES

April 2021

Acknowledgements

I would like to express my gratitude to my advisor, Dr. Jody Nicholson. Thank you for your constant encouragement throughout my graduate studies and providing me with an abundance of opportunities to grow as a researcher. I am truly inspired by your dedication and passion for research, which will remain with me throughout my career path. Secondly, thank you to Dr. Lauri Wright, whose expertise and knowledge greatly guided me throughout this process and enhanced my work.

I would also like to thank all the graduate students in my cohort, especially Sarah, Abby, and Hope. I am so grateful for our time together, both in-person and virtually. I could not have imagined a better social support group during this time. Your friendship and support have meant the world to me. I will always be thankful that UNF brought us all together as classmates but turned us into family.

Lastly and most importantly, I want to express my greatest appreciation to my parents, Max and Hazel, who have given me endless love, support, and encouragement. Thank you for instilling in me a sense of curiosity and love for education. Without you, none of this would have been possible.

Table of Contents

Acknowledgements.....	ii
List of Tables	iv
Abstract.....	v
Introduction.....	1
Current Study.....	12
Methodology.....	13
Results.....	21
Discussion.....	24
Conclusion	28
References.....	30
Tables and Figures	37

List of Tables

Table 1. Sociodemographic Characteristics of Participants	37
Table 2. Food Security Levels, Food-Related Protective Strategies, and Food Assistance Programs	38
Table 3. Individual Items of Food Security Survey	40
Table 4. Anxiety and Depression Exceeding Clinical Threshold	41
Table 5 Moderated Moderation Models	41
Figure 1	42
Figure 2	42
Figure 3	42

Abstract

The current study examined how developmental stages of adulthood (emerging, middle, and late) and household composition (living with or without children) influence the experiences of food insecurity in regard to food-related protective strategies and mental health consequences. Using a moderated moderation analysis, the impact of age conditional on the effects of household composition aimed to quantify how food-related protective strategies predicted levels of food insecurity thus leading to anxiety and depression. Results indicated developmental stages and household composition are non-significant moderators across three models. However, middle-adult participants demonstrated increased susceptibility to severe food insecurity, further contributing to literature on midlife vulnerability. Additionally, significant patterns in developmental stage and household composition were observed when examining the domains of food insecurity and food-related protective strategies but not mental health outcomes. Applying a developmental lens on research surrounding food insecurity provides important implications as to how coping and mental health manifest non-uniformly among varying demographic groups within food-insecure households.

Keywords: food insecurity, adulthood, children, mental health

An Investigation of the Moderating Effects of Household Composition and Developmental Age on Food Insecurity Impacting Mental Health

Understanding the experiences of household food insecurity can provide insight into human development and identify those who are at risk of health complications that extend across the lifespan. An extensive amount of literature within the disciplines of nutrition and public health addresses how food insecurity gives rise to various health conditions (Gunderson & Ziliak, 2015). However, there is a lack of research from a psychological perspective comparing how the food-related protective strategies and mental health implications of food insecurity differ relative to the lifespan. The current study addresses the gap in the literature by investigating how poor mental health stemming from food insecurity manifest differently in accordance with the critical demographic influences of household composition and developmental stages of adulthood.

Development throughout the lifespan involves patterns of non-linearity attributed to an inherent series of gains (growth) and losses (decline), which are influenced by age-graded, history-graded, and nonnormative contextual factors (Baltes, 1987). When transitioning into new life stages, these components of development impact individuals' developmental tasks that consist of demands and opportunities that may be distinct to the present period of the lifespan (Havighurst, 1973). Additionally, the aforementioned contextual factors produce multidirectional interactions with individuals' surrounding environment and biological functioning resulting in certain traits increasing and decreasing over time, representative of the series of gains and losses (Baltes, 1987), which can further shift the trajectory of future development. Therefore, it is important to investigate how the non-normative life event of food insecurity leads to differences

in protective strategies and mental health outcomes among distinct developmental groups.

Background of Food Insecurity

According to the United States Department of Agriculture, rates of food insecurity have followed a consistent 8-year decline as rates in 2018 dropped from 11.1% to 10.5% the following year (Coleman-Jensen, Rabbit, Gregory, 2020). However, due to the economic implications of the COVID-19 global pandemic, there has been a rapidly growing number of individuals and families experiencing food insecurity with an estimated 21% increase in food insecurity in relation to pre-pandemic estimates (Baquedano et al., (2021). As the global pandemic continues to disrupt the country's economy, millions of Americans are faced with the challenges of food insecurity and its accompanying consequences (Feeding America, 2020), further highlighting the importance of researching the implications of food insecurity at the micro-level. According to Nord & Prell (2007), the national poverty rate and prevalence of food insecurity shift nearly in parallel with one another as food insecurity is significantly associated with income at both the household and national level. In addition, food insecurity is a direct measure of well-being as it links levels of poverty to material hardship and physical and mental health (Nord & Prell, 2007).

As outlined by the USDA (2019), the complex experiences of food insecurity lie along a continuum divided into four categories: high food security, marginal food security, low food security, and very low food security. High food security refers to households with no problems or anxieties accessing adequate food (National Research Council, 2006). Marginal food security is described as occasionally having problems or anxieties accessing adequate food, while still maintaining the quality, variety, and quantity of food intake (National Research Council, 2006). Low food security is characterized as households experiencing a reduction in quality, variety, and desirability of their diets with little to no indication of reduced food intake (National

Research Council, 2006). Very low food security involves one or more members of the household experiencing disrupted eating patterns and reduced food intake due to lack of money or other resources (National Research Council, 2006). For most reporting purposes, high food security and marginal food security are grouped together as food security, and low and very low food security are referred to as food insecurity (United States Department of Agriculture, 2019).

Mental Health Consequences of Food Insecurity

Research consistently reports of the association between increasing severity of food insecurity and higher frequencies of adverse mental health problems such as perceived stress, anxiety, depression, poor mental health status, and suicidal ideation across the lifespan (Davison, Marshall-Fabien, & Tecson, 2015; Jessiman-Perreault & McIntyre, 2017). In a systematic review and meta-analysis of mental health conditions among a total sample of 169,433 food-insecure adults, results across 57 studies indicate food insecurity is positively correlated with depression and anxiety/psychological distress (Arenas, Arthur Thomas, & DeLisser, 2019). Results of the review also indicate a significant comparison between the increased risks of depression and anxiety suggesting that both conditions developing from food insecurity share predisposing factors and interconnected mechanisms (Arenas, Arthur Thomas, & DeLisser, 2019).

Therefore, it is imperative to address the potential bidirectional interaction between food insecurity and mental health, which can be explained through the theories of social selection and social causation (Maxfield, 2020). Social selection postulates mental health increases the risk of poverty through reduced productivity, increased health expenses, and loss of employment/earnings (Lund, et al., 2011). Conversely, social causation hypothesizes poverty increases the risk of mental illness through increased stress, malnutrition, trauma, and decreased social capital (Lund, et al., 2011). Results from a study conducted by Tarasuk et al. (2013)

support current literature stating that issues in mental health increases vulnerability to household food insecurity. Furthermore, food insecurity compromises individuals' mental health and chronic health conditions leading to increased difficulties in managing self-care and accessing material support (such as financial means or resources for food) further perpetuating the experiences of food insecurity (Tarasuk, Mitchell, McLaren, & McIntyre, 2013).

Food Insecurity throughout the Lifespan

Emerging and Middle Adulthood

In addition to the multidirectional contextual factors contributing to mental health, age-graded influences also play a role in the onset of anxiety and depression. Based on epidemiological research, the presence of anxiety disorders begins in childhood, adolescence, or emerging adulthood but reaches its peak in middle adulthood (Bandelow & Michaelis, 2015). During middle adulthood, individuals experience an increase in demands and responsibilities (Robinson, Lachman, & Rickenbach, 2016), which can further contribute to worsened stress and anxiety. As individuals in middle adulthood have an increased risk of loss in the form of declining mental health, those who may see a decline in anxiety and depression demonstrate a gain of self-regulatory skills within the model of selection, optimization, and compensation (SOC) (Freund & Baltes, 2002; Robinson, Lachman, & Rickenbach, 2016). Selection involves setting and committing to a set of goals, optimization involves acquiring and adapting resources necessary to achieve goals, and compensation involves using alternative strategies to maintain functioning when goal-relevant resources are unavailable (Freund & Baltes, 2002). Within the context of food insecurity, protective strategies against food insecurity and participation in food assistance programs serve as forms of compensation. Similar to anxiety, the use of SOC strategies peak in middle adulthood, which may be a result of the cultivation of experiences in

young adulthood that have led to the attainment and refinement of these self-regulatory skills by the time of middle adulthood (Robinson, Lachman, & Rickenbach, 2016). As individuals transition from middle to late adulthood, they engage in less SOC strategies potentially due to limitations of aging (Robinson, Lachman, & Rickenbach, 2016) as a product of developmental loss. As the use of SOC strategies decline, so do frequencies of stress and anxiety in later age, which can be considered as a developmental gain. The peaks of anxiety and SOC strategies during middle adulthood illustrate the nonlinearity patterns of development through Baltes' (1987) proposition of the series of gains and losses. In addition, past research has also reported that overall food insecurity rates were highest among middle-aged adults compared to younger and older adults consistent with patterns of midlife vulnerability (Miller et al., 2020) as demonstrated by the aforementioned peaks of stress, anxiety, and responsibility.

Late Adulthood

Among senior adults in America, certain groups face an increased risk of food insecurity based on the following demographics: those that are 60-64 years old, African American or Hispanic, living at or below the poverty line, divorced/separated/or living with a grandchild, or renters (Ziliak, Gundersen, & Haist, The Causes, Consequences, and Future of Senior Hunger in America, 2008). Similar to those in middle adulthood, senior adults experiencing food insecurity reported lower nutrient intakes and poorer overall health (Ziliak, Gundersen, & Haist, The Causes, Consequences, and Future of Senior Hunger in America, 2008), which can worsen existing medical conditions that are common in older adults. Food-insecure older adults are also more likely to have limitations in activities of daily living (ADL) (Ziliak, Gundersen, & Haist, The Causes, Consequences, and Future of Senior Hunger in America, 2008). The ADL effects of being marginally food secure for seniors is roughly equivalent to being 14 years old since these

limitations can result in restrictions in obtaining necessary household resources such as food (Ziliak, Gundersen, & Haist, *The Causes, Consequences, and Future of Senior Hunger in America*, 2008). The multidirectional interactions occurring between older adults' surrounding environments and physical health negatively impacts mental health conditions and can further heighten their vulnerability to the consequences of food insecurity.

Past research has highlighted the buffering effect of social support in alleviating food insecurity among late adult populations (Burriss, et al., 2019; Woltil, 2012). Social support in the form of emotional and instrumental assistance refers to the frequency of contact with others and perceived adequacy of support by the receiver (Heaney & Israel, 2008). Emotional social support involves emotional relief, comfort, empathy, love, and care; whereas, instrumental social support refers to tangible aid and services (Heaney & Israel, 2008). In a study investigating the role of social support in food insecure environments, older adults who reported receiving emotional social support were significantly more likely to be food secure (Woltil, 2012). Additionally, results stated that the quantity of social support sources did not significantly affect food security status emphasizing the importance of recipients' perceived adequacy of support (Woltil, 2012). Results from the study correspond with the socioemotional selectivity theory that implies losses in old age (in regards to one's social network) is balanced by the gain of quality of time and energy invested in the individuals that create their social network (Carstensen, 1992).

In a systematic review of 18 epidemiological studies, results indicated older adults presented higher prevalence rates of subthreshold generalized anxiety disorder (GAD) (Haller, Cramer, Lauche, Gass, & Dobos, 2014), potentially explaining why anxiety declines with older age after its peak in middle adulthood (Bandelow & Michaelis, 2015). However, the risk of depression is higher among older adults with low socioeconomic status (Koster, et al., 2006). In

a study examining major depression among senior adults following the Great Recession of 2007-2009, participants who were initially food insecure had 1.2 times greater odds of major depression than their food-secure counterparts (Bergmans & Wegryn-Jones, 2020). However, participants who became and remained food insecure as a result of the Great Recession had 1.7 times greater odds of major depression (Bergmans & Wegryn-Jones, 2020). Results emphasize how history-graded influences and macro-level factors impact individuals at the micro-level. This past research on how the Great Recession impacted rates of food insecurity and its influence on mental health provides specific insight into the potential economic and mental health consequences senior adults may face as a result of the COVID-19 global pandemic.

Household Composition

In addition to age, household composition is also an important demographic to examine when investigating the context of food insecurity. According to the USDA, households with children are at an increased risk of food insecurity (Coleman-Jensen, Rabbit, Gregory, & Singh, 2019). In 2019, households with children under the age of 18 experienced food insecurity at rates of 13.6%, which exceeded the national average (Coleman-Jensen, Rabbitt, Gregory, & Singh, 2019). Additionally, rates of food insecurity are recorded to be twice as much higher for multigenerational households compared to single-generational households (Ziliak & Gundersen, *Multigenerational Families and Food Insecurity*, 2016). Multigenerational households consist of at least two generations living in one household, oftentimes being grandparents, parents, and children. Data also reveals that the progression into very low food security increased significantly faster for multigenerational households over the course of a decade (Ziliak & Gundersen, *Multigenerational Families and Food Insecurity*, 2016). These prevalence rates illustrate the differential impact of food insecurity on different households and family structures.

Parents and caregivers living in food-insecure households face the responsibilities of dividing limited resources among multiple family members and caring for the needs of their children while potentially having unmet basic nutritional needs of their own.

A study conducted by Wilde (2004) compared the differential response patterns for food insecurity survey items between households with and without children. Results indicate households with children answered affirmatively more frequently to adult-referenced food-related items than households without children (Wilde, 2004). Specifically, 22.2% of households with children answered affirmatively to worrying food would run out, whereas only 11.3% of households without children answered affirmatively (Wilde, 2004). Results suggest households with children are more prone to stress and anxiety stemming from food-related worries than households without children. As explained by Wilde (2004), both types of households are faced with challenges within a food-insecure environment; however, the study illustrates how these food-related struggles manifest differently in varying types of households (Wilde, 2004).

Research consistently reports of food insecurity's detrimental effects on caregiver mental health resulting in poorer parenting practices that negatively influence children's physical and cognitive development (Fiese, Gundersen, Koester, & Washington, 2011). In a study investigating food security status in association with psychosocial and socioeconomic factors among pregnant women, results indicated that participants categorized as food insecure had higher perceived stress than those categorized as food secure or marginally food secure (Laraia, Siega-Riz, Gundersen, & Dole, 2006). Compared to the other psychosocial variables utilized in the study, perceived stress had larger point estimates suggesting that mothers who had higher perceived stress were more likely to experience food insecurity (Laraia, Siega-Riz, Gundersen, & Dole, 2006). In another study investigating depression and anxiety within a food-insecure

context, increasing severity of food insecurity was positively correlated with the presence of major depressive episodes and generalized anxiety disorders among a sample of mothers (Whitaker, Phillips, and Orzol, 2006). Results from both studies suggest food-insecure mothers are more likely to experience poorer mental health conditions compared to food-secure mothers.

Based on the family stress theory, the non-normative life event of poverty impacts family's resources to food both in quality and quantity; thus causing parents/caregivers to perceive their financial situation as a barrier in meeting their children's nutritional and dietary needs, which triggers an emotional crisis in parents'/caregivers' mental health (Price, Price, & McKenry, 2016; McCurdy, Gorman, & Metallinos-Katsaras, 2010). Furthermore, family crisis evokes new coping strategies in order to achieve balance between existing resources and the needs of all family members (Daneshpour, 2016). Oftentimes, families engage in coping strategies that support the child sacrifice theory in which parents/caregivers sacrifice their own food supply in order to ensure food security for their children (Franklin, et al., 2012), which could indirectly impact their physical and mental health. Based on data from 2019, 7.1% of food-insecure households with children consisted of only adults experiencing food insecurity (Coleman-Jensen, Rabbit, & Gregory, 2020), providing further evidence of the child sacrifice theory. Although parents/caregivers shield their children from the direct consequences of food insecurity by maintaining the children's normal meal and eating patterns, children are still indirectly impacted by food insecurity's negative effects on their parents.

Research conducted by Whitaker et al. (2006) reported that children of food-insecure mothers engaged in higher frequencies of behavioral problems such as aggression, anxiety/depression, and inattention/hyperactivity (Whitaker, Phillips, & Orzol, 2006). Children's behavioral issues also increased in association with mothers' increasing severity of food

insecurity (Whitaker, Phillips, & Orzol, 2006). Similarly, household food insecurity was significantly associated with mothers' increased frequency and intensity of harsh disciplinary strategies with their child in addition to the presence of negative maternal physical health and depressive symptoms (Johnson & Markowitz, 2018). Results suggest that parental emotional distress stemming from food insecurity spill over into parent-child daily interactions. The transactional model of stress postulates a bidirectional interaction between parenting stress and child behavioral problems stating children's behavioral problems elevates parenting stress, which in turn causes increased behavioral problems in children (Orsmond, Seltzer, Krauss, & Hong, 2003; Baker, McIntyre, Blacher, & Crnic, 2003).

As the unmet economic needs associated with poverty and food insecurity erode the mental health of parents/caregivers, disruptions occur in qualities of patience, energy, confidence, and creativity, which are necessary elements for responsive parenting and positive parent-child interactions (Teti, Cole, Cabrera, Goodman, & McLoyd, 2017). With these characteristics negatively compromised, parents/caregivers lack the proper emotional assets to effectively address their children's psychological and physical needs, highlighting the need for investigating the specific impact of food insecurity on households with children as they may be particularly vulnerable to poorer mental health outcomes.

Age and Household Composition in Tandem

Current research highlights the role of age and presence of children in the household as contributing factors that place individuals at risk of food insecurity and its consequences. Yet, there is a lack of literature investigating how these factors mutually influence individuals' behaviors of food-related protective strategies and mental health outcomes. From a developmental perspective, both inter- and intra-individual changes and differences across the

lifespan pertain to the concept of continuity and discontinuity (Lerner, Leonard, Fay, & Isaac, 2011). Descriptive continuity refers to behaviors that consistently occur the same way at different points in the lifespan (Lerner, Lewin-Bizan, & Warren, Concepts and Theories of Human Development, 2010). However, if a behavior does not exist or occur in the same way as another point in the lifespan then it is considered descriptive discontinuity (Lerner, Lewin-Bizan, & Warren, Concepts and Theories of Human Development, 2010). For example, changes in food-related protective strategies and mental health outcomes over time illustrate descriptive discontinuity. Changes in individuals' behaviors occur for many reasons, which can be known as explanatory continuity and explanatory discontinuity (Lerner, Lewin-Bizan, & Warren, Concepts and Theories of Human Development, 2010). Explanatory continuity refers to the consistent reasons that account for an individual's behavior across time (Lerner, Lewin-Bizan, & Warren, Concepts and Theories of Human Development, 2010). Explanatory discontinuity refers to different reasons accounting for one's behavior throughout time (Lerner, Lewin-Bizan, & Warren, Concepts and Theories of Human Development, 2010). Therefore, in relation to the current study, patterns in individuals' food-related protective strategies and mental health outcomes within the context of food insecurity may be attributed to the influential demographics of age and household composition.

Role of Food Assistance Programs

In the current study, participants received food assistance benefits constituting as a form of resource accessibility. Therefore, it is important to consider the influence of food assistance programs in relation to recipients' levels of food insecurity impacting mental health. In accordance with existing research, Leung et al. (2014) reported that for every depressive symptom reported by participants, there was a dose-response relation with increasing severity of

food insecurity. In addition, results indicated that participants classified as low or very low food secure when receiving SNAP benefits were associated with higher probability of depression than those not receiving SNAP (Leung et al., 2014). Specifically, among elderly populations, participation in food assistance programs modified the association between food insecurity and depression. Results demonstrate that food-insecure elderly participants receiving home-delivered meals reported a slight decrease in depression (Kim & Frongillo, 2007). While such social safety nets may alleviate the consequences of food insecurity in later adulthood, fewer social welfare options are accessible to those in middle adulthood; thus, placing additional pressure to remain in the workforce (Miller et al., 2020), which may exacerbate the consequences of food insecurity as explained by the theories of social selection and social causation further contributing to midlife vulnerability. Past research highlights how food assistance programs contrast in its impact among differing generations, further signifying the importance of examining the experiences of food insecurity across the lifespan.

Current Study

Current literature on food insecurity has only researched its impact on the different types of households and age groups independently from each other. The present study investigates how both household composition (presence/absence of children in the household) and age jointly moderate the pathway linking food-related protective strategies to severity of food insecurity as well as the pathway from food insecurity to mental health. Specifically, in the manner that increasing older adulthood will be associated with less protective strategies, lower food insecurity, and lower symptoms of anxiety and depression. However, the moderating effects of age will be conditional on household composition as presence of children in the household will

be associated with higher levels of protective strategies, food insecurity, and mental health symptoms in comparison to households without children.

Therefore, Model 1 hypothesizes that participants with children during emerging and middle adulthood will engage in more protective strategies against food insecurity yet report worsened levels of food insecurity compared to households without children and those in late adulthood. Furthermore, Model 2 demonstrates the pathway linking food insecurity to symptoms of anxiety. It is predicted that emerging and middle adults with children will have worsened food insecurity leading to higher anxiety in comparison to participants without children and in late adulthood. Similarly, the pathway linking food insecurity to depression is represented in Model 3, which also predicts that emerging and middle adults with children will have worsened food insecurity resulting in worsened depression compared to participants without children and those in late adulthood. A conceptual representation of all three models can be found in Figures 1-3.

The present study builds towards a more accurate understanding of how individuals' protective strategies against food insecurity and corresponding mental health outcomes manifest differently in relation to developmental periods of the lifespan and differing household compositions.

Research Methodology

To ensure a limited chance of Type I and Type II errors and closer estimations of significance and effect sizes, the following four assumptions were tested: normality, linearity, multicollinearity, and homogeneity of variance. To examine the assumptions of normality and linearity, residuals were screened through expected and detrended normal probability plots between DV scores and errors of prediction (Tabachnick & Fidell, 2012). Multicollinearity was

examined using the regression collinearity diagnostics. The assumption of homogeneity of variance was evaluated through Levene's test (Tabachnick & Fidell, 2012).

The assumption of normality means residuals (differences between predicted and obtained scores) are symmetrically distributed around a mean value of zero indicated by the horizontal line in the scatterplot (Tabachnick & Fidell, 2012). Normality also means there is a value of zero in skewness and kurtosis (Tabachnick & Fidell, 2012). An examination of the WHO-5 Well-Being Index and Generalized Anxiety Disorder 7-Item Scale indicated normal distribution. The total sum score of participants' food insecurity items as a dependent variable demonstrated a minimal negative skew; however, transformation was not needed in order to ensure clear interpretation of results.

The assumption of linearity means a presence of straight-line interactions with predicted dependent variable scores (Tabachnick & Fidell, 2012). When assessing linearity through the use of residual plots, the assumption is met if the scatterplot possesses a rectangular shape; if nonlinearity is present then the overall shape of the scatter plot will be curved (Tabachnick & Fidell, 2012). An examination of residuals in the current study indicated linearity for participants' total sum scores on measures of food insecurity, anxiety, and depression.

Multicollinearity indicates if variables are highly correlated, redundant, and if one variable is a combination of two or more other variables. (Tabachnick & Fidell, 2012). Using the collinearity diagnostics through regression, multicollinearity was detected via the variance inflation factor (VIF). VIF values below 10 indicate multicollinearity (Tabachnick & Fidell, 2012). Therefore, the variables for participants' total scores on food insecurity, anxiety, and depression meets the assumption of multicollinearity.

The assumption of homoscedasticity means that the standard deviation of errors of prediction are approximately equal for all predicted DV scores for ungrouped data (Tabachnick & Fidell, 2012). When data is grouped, homoscedasticity is then referred to as homogeneity of variance (Tabachnick & Fidell, 2012). The assumption of homogeneity of variance involves both t-tests and F tests in which the distribution of scores around the mean are equal among two or more population samples (Salkind, 2010). Homogeneity of variance was tested using Levene's test with results indicating a violation, referred to as heterogeneity of variance. The study utilizes the untransformed variables as to avoid limitations in interpretations of transformed scores. The violation is addressed by utilizing a more stringent α level (for nominal α use .025 with moderate violation and .01 with severe violation) with the untransformed variables (Tabachnick & Fidell, 2012).

Participants

The Sunshine State Hunger Study consisted of individuals receiving services from food pantries and food assistance programs throughout Jacksonville and Tampa, Florida. Since participants were collected from the general community, the sample provides clear representation of an adult population receiving food assistance benefits. The present study examines participants ($n = 251$; $M = 51.70$ years old; $SD = 19.235$) at different stages of adulthood, which were categorized into the following groups: emerging adulthood without children ($n = 15$; $M = 23.40$ years old.; $SD = 2.947$), emerging adulthood with children ($n = 24$; $M = 24.42$ years old; $SD = 3.682$), middle adults without children ($n = 58$; $M = 48.14$ years old.; $SD = 8.347$), middle adults with children ($n=62$; $M = 41.95$ years old; $SD=8.886$), late adults without children ($n=78$; $M = 72.55$ years old; $SD=9.419$), and late adults with children ($n=14$; $M = 70.50$; $SD=9.121$). Emerging adulthood was classified as between the ages of 18-29, middle adulthood was

classified as between the ages of 30-59, and late adulthood was classified as 60 years and older. As previous research has consistently established, families and those of certain age groups face a greater risk of food insecurity and its accompanying consequences. By examining the demographics of age and household composition in tandem, the current study quantifies how the combination of common risk factors can exacerbate the experiences of food insecurity. Table 1 presents demographic characteristics of the sample and specific developmental groups of interest.

Procedures

Participants were asked to complete a survey with questions about health and well-being as well as their behaviors and experiences with food. The survey was administered face-to-face with clients at food pantries and food assistance programs, which consisted of the following sections: Demographics, Food Security, Health and Well-Being, WHO-5 Well-Being Index (World Health Organization, 1998), GAD-7 Item Survey (Spitzer, Kroenke, & Williams, 2006), Spending Tradeoffs, and Food Assistance. Surveyors were trained by the principal investigator. Responses were recorded on paper surveys and entered by a research assistant. The study was approved by the UNF IRB.

Measures

USDA Self-Administered Food Security Survey Module for Children Ages 12 Years and Older (Connell, Nord, Lofton, & Yadrick, 2004). The survey consists of 9-items regarding frequency (A Lot, Sometimes, Never) of having certain food-related experiences at home related to worrying about food insecurity and the quality and quantity of food available (see table 2). Responses of “A lot” and “Sometimes” are coded as affirmative with a numerical value of 1. The sum of affirmative responses was calculated to determine the respondents’ raw scores. Raw

scores of 0 indicate high food security, 1 indicate marginal food security, 2-5 indicate low food security, and 6-9 indicate very low food security. The current study also divides the survey items into the following domains: worry about food access, utilization, availability, and access. In addition, participants were asked about ways in which they coped with food insecurity and types of food assistance programs received (see table 3). Among the sample, 187 participants utilized food assistance programs with variations in duration of program use and how long food lasted.

WHO-5 Well-Being Index (World Health Organization, 1998). The WHO-5 Well-Being Index is a questionnaire that assesses current mental well-being using a 6-point scale. With application across different areas of studies among a wide array of participant demographics, the WHO-5 has demonstrated to have high clinical validity, responsiveness/sensitivity, and potential use as a screening tool for depression (Topp, Ostergaard, & Sondergaard, 2015). Respondents indicate how often they relate to the five positive statements in the questionnaire. Answers range from “All of the time”, “Most of the time”, “More than half of the time”, “Less than half of the time”, “Some of the time”, and “At no time” and are, respectively, assigned numerical scores of 5, 4, 3, 2, 1, and 0. Scores are calculated by totaling the figures of the five answers with 0 representing the worst possible and 25 representing the best possible quality of life. For the current study, scores were reversed so higher scores were indicative of greater prevalence of depressive symptomatology. With reversed scores, a total sum greater than 12 indicated poor well-being. Participants who also answered individual survey items with numerical scores greater than 3 were also considered to have poor well-being. For such cases in which participants are classified as having poor well-being, it is recommended to further administer the Major Depression Inventory (MDI) under ICD-10. Among the whole sample, 111 participants indicated total scores on the WHO-5 Well-Being Index that suggested further testing.

Generalized Anxiety Disorder 7 Item Scale (Spitzer, Kroenke, & Williams, 2006).

The GAD-7 is a tool used to screen and assess the severity of anxiety-related symptoms.

Respondents rate the frequency of experiencing seven anxiety symptoms within the last two weeks. Numerical values of 0, 1, 2, and 3 were respectively assigned to “Not at all”, “Several days”, “More than half the days”, and “Nearly every day”. Scores of 0-4 represent minimal anxiety, 5-9 represent mild anxiety, 10-14 represent moderate anxiety, and 15-21 represent severe anxiety. The GAD-7 has a sensitivity of 89% and a specificity of 82% as a screening tool for Generalized Anxiety Disorder using a threshold of 10. It is recommended that scores greater than 10 require further evaluation. The GAD-7 can also be utilized as a screening tool for panic disorder (sensitivity of 74%, specificity of 81%), social anxiety disorder (sensitivity 72%, specificity of 80%), and post-traumatic stress disorder (sensitivity of 66%, specificity of 81%) (Spitzer, Kroenke, Williams, & Lowe, 2006). In the current study, 80 participants possessed scores exceeding the GAD-7 threshold indicating moderate to severe anxiety warranting further evaluation.

Health Rating Status. The current study asks participants to self-rate their overall health status ranging from poor to excellent. Utilizing a self-reported health status provides a simple and direct measure of respondents’ perceptions of their health that allows for a broad and comprehensive rating as interpreted by the individual (Idler & Benyamini, 1997; Krause & Jay, 1994). The subjectivity of self-reported health rating provides external observers with insight into how individuals perceive their overall health that is representative of the biological, psychological, and social dimensions of health. Self-reported health status possesses high validity and has demonstrated to be a strong predictor between perceived health and future mortality in middle-aged and late adulthood populations (Miilunpalo et al., 1997). Poor ratings of

one's health status can be reflective of the absence of resources that influence health and can be indicative of decreased engagement in preventative practices or self-care that contribute to good health (Idler & Benyamini, 1997). In relation to the current study, self-reported health ratings can be associated with participants' mental health as well as levels of food insecurity and coping strategies and is an appropriate covariate to control for when examining mental health outcomes based on food insecurity.

Analytic Strategy

The current study employs a causal-comparative research design to investigate how age groups and household compositions contribute to differing experiences of food insecurity and mental health outcomes. Participants were excluded from the study if they indicated being under the age of 18 years old, reported receiving food assistance benefits for programs that they did not meet eligibility requirements as determined by demographics, and providing invalid responses to survey items, such as employment status.

Data Analysis

Analyses were conducted using SPSS software (version 25) (IBM, 2017). First, chi-square analyses were conducted to examine group differences in demographics. Then, a one-way ANOVA was conducted to examine differential response patterns between the three developmental age groups when examining the average of affirmative scores within the four domains of food insecurity (i.e., worry, utilization, availability, and access) (Jones et al., 2013). Differential responses patterns within the four domains were also examined in relation to household composition using a one-way ANOVA.

Participants' total sum scores on the food insecurity survey were then calculated to determine level of food security. Chi-square analyses were conducted to examine how groups

compared in levels of food security. Next, the groups were compared in the manner in which they tried to cope with food insecurity by examining differences in the frequencies of protective strategies and participation in food assistance programs using a chi-square analysis. Differences among groups in mental health represented by anxiety and depression were also examined using chi-squares.

Pearson's correlations were conducted to examine the association between the number of protective strategies utilized and participants' food insecurity total sum scores. The correlation between the total number of participants' involvement in food assistance programs and food insecurity total sum scores were also examined via Pearson's correlation. When examining mental health, the association between the total sum scores of food insecurity and participants' scores on the GAD-7 and WHO-5 Well-Being Index were analyzed using separate correlations.

Lastly, Hayes' Process Macro for moderated moderation (three-way interaction) was utilized to analyze three models in the current study. Participants' self-reported health rating was utilized as the covariate in all three moderated moderation models. Additionally, age as a continuous and household composition served as the primary and second moderators, respectively, in all three models. For model 1, the outcome variable was participants' total sum scores on the food insecurity survey with total number of protective strategies serving as the predictor variable. Model 2 utilizes participants' total food insecurity sum scores to predict anxiety via participants' total scores on the GAD-7 as the outcome variable. Similarly, model 3 investigates participants' total scores on the WHO-5 Well-Being Index as the outcome variable predicted by sum scores from the food insecurity survey.

A post-hoc power analysis was conducted using G*Power statistical software (Faul et al. (2009) to determine the retrospective power of the observed effect based on the sample size and

parameter estimates of the existing dataset. Results from the G*Power analysis indicated the current study had low power to conduct a three-way interaction for model 1 (alpha= .05, power= 0.33), model 2 (alpha=.05, power=0.15), and model 3 (alpha=.05, power= 0.16).

Results

Demographics

In Table 1, results indicate a significant difference across gender, race/ethnicity, marital status, education, and employment between individuals receiving food assistance with and without children and across different age groups. The sample included more females with children than without, whereas male participants were less likely to report living in a household with children ($X^2 (1, N = 247) = 18.175, p = .000$). Results also show African American participants were more likely to have children, whereas White participants were less likely to have children ($X^2 (3, N = 249) = 13.400, p < .005$). As for marital status, those in emerging adulthood were more likely to report having never been married while late adults were more likely to report being widowed ($X^2 (6, N = 249) = 58.378, p = .000$). Households with children were also more likely to report currently being married ($X^2 (3, N = 249) = 9.545, p < .05$). As for education, late adults were more likely to report having less than a high school education ($X^2 (8, N = 247) = 27.401, p < .001$). There was also a significant difference between emerging and late adults in education as emerging adults were more likely to have a High School Diploma/GED than late adults ($X^2 (8, N = 247) = 27.401, p < .001$). As for employment status, late adults were more likely to report being unemployed and least likely to report working full-time ($X^2 (4, N = 251) = 36.791, p = .000$). Additionally, households with children were more likely to report working full time and least likely to be unemployed ($X^2 (2, N = 251) = 9.503, p < .05$).

Levels of Food Security

When examining levels of food insecurity among the total sample (see table 2), 80.1% of participants ($n=201$) reported low or very low food security. Results from the chi-square analysis indicated non-significant differences within the mid ranges of the food security spectrum (marginal and low food security) across developmental groups; however, there were significant differences on the polarizing ends of the spectrum in which late adults were more likely to report food security, while middle adults were more likely to report very low food security ($X^2(6, N = 250) = 25.419, p < .001$). Very low food security was statistically highest among middle adults (58.5%) followed by late adults (30.6%) then emerging adults (10.9%). Accordingly, results from the one-way ANOVA reveal that middle adults answered affirmatively at higher frequencies than emerging and late adults to the individual items within the domains of worry, availability, utilization, and accessibility ($F_{worry}(2, 355) = 43.08; p < .001; F_{availability}(2, 246) = 14.62; p < .001; F_{utilization}(2, 246) = 14.61; p < .001; F_{access}(2, 246) = 12.99; p < .001$). When examining household composition, households with children were significantly more likely to answer affirmatively within the domains of worry and utilization ($F_{worry}(1, 246) = 13.773; p = .000; F_{utilization}(1, 248) = 4.944; p < .001$). Additionally, the domain of availability approached significance in the manner that households with children were more likely to answer affirmatively ($F_{availability}(1, 248) = 2.891; p = .09$). Table 3 presents the differential responses to the individual survey items by age group and household composition.

Food-Related Protective Strategies and Food Assistance Programs

Table 2 displays the frequencies in which each group engaged in food-related protective strategies and participation in food assistance programs. There was a significant difference between those in emerging and late adulthood in which late adults reported eating expired food

at a greater frequency than emerging adults ($X^2(2, N = 212) = 7.78, p < .05$). However, late adults reported eating less at a significantly lower frequency than both emerging and middle adults ($X^2(2, N = 211) = 17.461, p < .001$). When examining household composition, results indicate that households with children were more likely to report eating less than those without children ($X^2(1, N = 211) = 54.004, p < .001$). In addition, participants' number of food-related protective strategies were moderately correlated with the total sum score of the food security survey ($r(208) = .327, p < .001$).

In regard to participation in food assistance programs, emerging adults were more likely to utilize WIC benefits than middle and late adults ($X^2(2, N = 181) = 24.088, p < .001$). There were also significant differences among child-focused and senior-focused programs, however that can be attributed to excluding participants who were not technically eligible for these programs. In addition, the number of food assistance programs was not correlated with participants' total sum score on the food security survey.

Mental Health

Reports of anxiety and depression exceeding the clinical threshold demonstrated to be consistent across groups as displayed in Table 4. Furthermore, total sum scores on the food security survey was moderately correlated with participants' sum scores on the GAD-7 ($r(227) = .497, p < .001$) and WHO-5 Well-Being Index ($r(237) = .374, p < .001$).

Moderated Moderation

To test the hypothesis that participants' level of food insecurity is a function of number of food-related protective strategies moderated by age and household composition, a moderated moderation analysis was conducted. The three-way interaction between protective strategies and both moderators was found to be nonsignificant [$b^7 = .031, p = .101$]. However, the overall model

was significant, $R^2 = .177$, $F(8, 197) = 5.305$, $p = .000$. Similarly, model 2 examining anxiety as an outcome of participants' sum scores on the food security survey indicated significance in the overall model, $R^2 = .301$, $F(8, 216) = 11.646$, $p = .000$. However, the three-way interaction between food security sum scores, age, and household composition was nonsignificant [$b^7 = .015$, $p = .291$]. Lastly, the third model examined depression predicted by sum scores on the food security survey. The overall model was significant, $R^2 = .266$, $F(8, 225) = 10.207$, $p = .000$. However, results indicate a nonsignificant three-way interaction between the predictor and moderators [$b^7 = .015$, $p = .262$].

Discussion

Perception of food insecurity remained high among the current sample as more than half of participants still reported experiencing low or very low food security, despite receiving benefits from food assistance programs. Participants from the current study are representative of food assistance recipients, which emphasizes the issue that although social safety net programs aim to provide relief, programs do not modify recipients' perceptions of their food insecurity status, ultimately influencing mental health outcomes. The current study highlights the importance of applying a developmental lens on research examining food insecurity to identify those at-risk as well as to prevent and intervene when considering the maladaptive protective strategies and mental health consequences of food insecurity.

When examining the levels of food insecurity in relation to developmental age, results demonstrate that middle adults were more likely to be categorized as very low food secure, which contributes to midlife vulnerability. Identifying middle adulthood as a period in the lifespan facing increased risk of severe food insecurity provides important implications within development. Not only are middle adults at increased risk of the immediate effects of food

insecurity, but such experiences can serve as determining factors that can negatively shift the trajectory of aging later in the lifespan (Miller et al., 2020). However, contrary to previous research, levels of food insecurity were not statistically different when comparing households with and without children as it was expected food insecurity would be more prevalent among households with children. Findings may be attributed to the sample consisting of food assistance recipients prior to data collection, which may have equalized participants' levels of food insecurity across household compositions.

Although significant differences were not observed in levels of food insecurity among households with children, results do indicate significance when examining the domains that comprise the food security survey. Previous research has suggested differential response patterns among households with and without children, specifically in the manner that households with children were more likely to report worrying about food insecurity (Wilde, 2004). The current study expands upon previous research as analysis demonstrated households with children were more likely to answer affirmatively to the domains of worry, utilization, and availability. Moreover, the current study also reveals differential response patterns when considering the developmental stages of adulthood. Participants within middle adulthood had higher average scores in the domains of worry, availability, utilization, and accessibility than both emerging and late adulthood. Majority of research in the area of food insecurity is limited and simplified to only examining participants' levels of food insecurity determined by total sum scores on the survey. However, assessing the individual domains provides greater detail and insight into the experiences of those who are food insecure. Based on results from the current study, it is revealed that food insecurity extends beyond general accessibility to food but is also an issue of both quality and quantity of food supply.

When examining protective strategies in relation to household composition, results from the current study provide further evidence supporting the child sacrifice theory which is characterized by parents/caregivers sacrificing their own food supply in order to provide food for the children of the home (Franklin, et al., 2012). Results showed that households with children were more likely to report eating less in order to make food last longer. Although eating less may serve as a means to ration limited food supplies and provide for the child as a form of temporarily relief, engaging in such behaviors possesses maladaptive implications. As established in past research, reduced food intake leads to decreased nutritional intake, which negatively impacts parents' behavioral and socioemotional outcomes that constitute parenting practices and responsiveness thus jeopardizing parent-child relationships. Therefore, parents' maladaptive food-related protective strategies in conjunction with increased food-related worries indirectly compromises children's healthy development and functioning (Fiese et al., 2011; Johnson & Markowitz, 2006; Whitaker et al., 2006).

When considering the ways in which individuals cope with food insecurity via protective strategies and participating in food assistance programs, it was expected that middle adults would report the highest engagement in such behaviors as a means of compensation within the framework of Selective Optimization and Compensation (SOC) strategies similar to the results of Robinson et al. (2016). Conversely, results indicated that middle adults were averaging frequencies of protective strategies and receiving food assistance benefits similar to those of other developmental age groups, despite reporting significantly worsened levels of food insecurity. However, late adults were more likely to report eating expired foods yet were more likely to be categorized as food secure than emerging adults. Therefore, results demonstrate that

across the stages of adulthood, eating patterns and dietary behaviors may differ but are nonetheless negatively compromised.

Similarly to coping, it was expected that symptoms of anxiety and depression would peak in middle adulthood in addition to households with children compared to those without. However, results reveal that participants within the current study demonstrate similar mean levels of anxiety and depression across all developmental groups in both age and household composition. Although significant differences were not indicated in the average level of anxiety and depression across age groups, it can be seen in Table 4 that the proportion of the sample reporting clinically significant levels of anxiety and depression were highest in middle adulthood, which is in accordance with previous research (see Bandelow & Michaelis, 2015). Middle adults within the current sample demonstrate increased risk of food insecurity and its accompanying mental health consequences which contribute to midlife vulnerability in the manner that anxiety reaches its peak during middle adulthood along with increased responsibility in daily life to cope with the experiences of food insecurity (Miller et al., 2020). Results demonstrating the increase of food insecurity and mental health symptomology in middle adulthood and decline in late adulthood provides a clear illustration of the nonlinear patterns of lifespan development attributed to the series of gains and losses as explained by Baltes (1987).

In regard to the mental health implications of food insecurity, the current study provides further evidence of the association between food insecurity and mental health as both anxiety and depression were moderately correlated with participants' total scores on the food security survey. Results from the moderated moderation analyses were surprising given food-related protective strategies were significantly correlated with participants' total food insecurity scores; additionally, age and household composition were expected to serve as significant moderators

together based on chi-square and ANOVA results of the current study as well as past research. However, the nonsignificant findings of the three models may be attributed to the lack of sufficient power needed to indicate a significant three-way interaction as determined by the post-hoc G*Power analysis. Although age and household composition were not shown to be significant moderators, the positive direction of the coefficients in the three-way interaction of all three moderated moderation models suggests meaningful interpretation. Therefore, it is important to consider exploring these variables within multiple models as they do nevertheless demonstrate to be influential demographic characteristics in how individuals function within food-insecure environments.

Limitations and Future Directions

While the findings provide important implications in the area of lifespan development and food insecurity, it is important to understand the limitations of the current study. Since the study collected data from a general community population among those who participated in food pantries and food assistance programs, the sample size of participants was relatively small specifically among the participant groups with children in emerging and late adulthood. The small sample size resulted in a reduced power indicated by the post-hoc power analysis. The non-significant three-way interactions within the three moderated moderation models may also be a result of the insufficient power. Conducting a similar study with a larger sample size with equal proportions across developmental groups and household compositions would be beneficial to detect moderating effects of age and household composition in tandem.

Conclusion

Based on results from the current study and existing literature, the common demographic variables of age and household composition serve as important factors to consider in the context

of coping strategies and mental health, especially in situations of food insecurity. The present study extends this field of research as it reveals that age and household composition play a role in the perception of food insecurity in the manner that perceptions differed in parallel with developmental stage of adulthood and household composition. Individuals' perceptions of food insecurity influence the ways in which they attempt to resolve such issues, thus leading to behaviors of food-related protective strategies. As many individuals succumb to behaviors that provide temporary relief, these maladaptive protective strategies then lead to greater problems in the future extending beyond the present circumstances of food insecurity.

Not only were households with children more likely to be food insecure in accordance with past data, but middle adulthood was identified as a developmental stage facing increased susceptibility to food insecurity and its consequences. Recognizing that middle adults and those with children face increased risk of food insecurity provides important implications on lifespan development. It is imperative to understand that the stage of middle adulthood sets the precedence for future aging; therefore, food-related worries and health struggles in middle adulthood can threaten one's well-being as they transition into late adulthood. Furthermore, the experiences of food insecurity are also influential in determining the health trajectory of both children and adults in the household as past research has consistently established (Fiese et al., 2011; Johnson & Markowitz, 2006; Whitaker et al., 2006).

The current study highlights the importance of applying a developmental lens when examining food insecurity as results demonstrate how severity, protective strategies, and mental health manifest differently in accordance with demographic characteristics that are considered to be common risk factors.

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Tables and Figures

Table 1
Sociodemographic Characteristics of Participants

	Full Sample N =251 (%)	Emerging adulthood without children (n= 15)	Emerging adulthood with children (n=24)	Middle adulthood without children (n=58)	Middle adulthood with children (n=62)	Late adulthood without children (n=78)	Late adulthood with children (n=14)
Location							
Jacksonville	43 (17.1%)	0	9 (20.9%)	12 (27.9%)	12 (27.9%)	6 (14.0%)	4 (9.3%)
Tampa	208 (82.9%)	15 (7.2%)	15 (7.2%)	46 (22.1%)	50 (24.0%)	72 (34.6%)	10 (4.8%)
Gender							
Male	92 (36.7%)	7 (7.6%)	6 (6.5%)	26 (28.3%)	12 (13.0%)	38 (41.3%)	3 (3.2%)
Female	155 (62.2%)	8 (5.2%)	18 (11.6%)	31 (20%)	40 (25.8%)	38 (24.5%)	10 (6.5%)
Race/Ethnicity							
White	99 (39.4%)	11 (11.1%)	3 (3.0%)	32 (32.3%)	20 (20.2%)	29 (29.3%)	4 (4.0%)
African American	90 (35.9%)	1 (1.1%)	14 (15.6%)	17 (18.9%)	25 (27.8%)	25 (27.8%)	8 (8.9%)
Hispanic	47 (18.7%)	2 (4.3%)	4 (8.5%)	6 (12.8%)	12 (25.6%)	21 (44.7%)	2 (4.3%)
Other	13 (5.2%)	1 (7.6%)	3 (23.1%)	3 (23.1%)	4 (30.8%)	2 (15.4%)	0
Marital Status							
Married	59 (23.5%)	1 (1.7%)	8 (13.6%)	13 (22.0%)	22 (37.3%)	13 (22.0%)	2 (3.4%)
Never Married	96 (38.2%)	14 (14.6%)	16 (16.7%)	24 (25.0%)	22 (22.9%)	18 (18.8%)	2 (2.1%)
Divorced	66 (26.3%)	0	0	18 (27.3%)	14 (21.2%)	27 (40.9%)	7 (10.6%)
Widowed	28 (11.2%)	0	0	3 (10.7%)	4 (14.3%)	18 (64.3%)	3 (10.7%)
Education							
Less than high school	42 (16.7%)	1 (2.4%)	0	7(16.7%)	9 (21.4%)	21 (50.0%)	4 (9.5%)
High School/GED	103 (41.0%)	8 (7.8%)	15 (14.6%)	25 (24.3%)	25 (24.3%)	24 (23.3%)	6 (5.8%)
Business or Trade School	17 (6.8%)	1 (5.9%)	0	5 (29.4%)	8 (47.1%)	2 (11.8%)	1 (5.9%)
Some College	55 (21.9%)	2 (3.6%)	7 (12.7%)	14 (25.5%)	16 (29.1%)	15 (27.3%)	1 (1.8%)

Bachelor's Degree or Higher	30 (12.0%)	3 (10.0%)	2 (6.7%)	7 (23.3%)	2 (6.7%)	14 (46.7%)	2 (6.7%)
Employment Status							
Full Time	57 (22.7%)	3 (5.3%)	13 (22.8%)	19 (33.3%)	18 (31.6%)	4 (7.0)	0
Part Time	40 (15.9%)	4 (10.0%)	5 (12.5%)	7 (17.5%)	12 (30.0%)	10 (25.0%)	2 (5.0%)
Unemployed	154 (61.4%)	8 (5.2%)	6 (3.9%)	32 (20.8%)	32 (20.8%)	64 (41.6%)	12 (7.8%)

Table 2

Food Security Levels, Food-Related Protective Strategies, and Food Assistance Programs

	Full Sample n= 251	Emerging adulthood without children n=15	Emerging adulthood with children n=24	Middle adulthood without children n=58	Middle adulthood with children n=62	Late adulthood without children n=78	Late adulthood with children n=14
Level of Food Security							
Food Secure	34 (13.5%)	2 (5.9%)	4 (11.8%)	4 (11.8%)	3 (8.8%)	19 (55.9%)	2 (5.9%)
Marginally Food Secure	15 (6.0%)	2 (13.3%)	1 (6.7%)	2 (13.3%)	2 (13.3%)	6 (40.0%)	2 (13.3%)
Low Food Secure	54 (21.5%)	6 (11.1%)	8 (14.8%)	11 (20.4%)	12 (22.2%)	16 (29.6%)	1 (1.9%)
Very Low Food Secure	147 (58.6%)	5 (3.4%)	11 (7.5%)	41 (27.9%)	45 (30.6%)	36 (24.5%)	9 (6.1%)
Making Food Last Longer							
Eating expired food	35 (13.9%)	1 (2.9%)	0	9 (25.7%)	10 (28.6%)	11 (31.4%)	4 (11.4%)
Growing food	8 (3.2%)	1 (12.5%)	2 (25.0%)	1 (12.5%)	3 (37.5%)	2 (25.0%)	1 (12.5%)
Selling or pawning items to buy food	24 (9.6%)	2 (8.3%)	3 (12.5%)	6 (25.0%)	6 (25.0%)	5 (20.8%)	1 (4.2%)
Purchasing damaged food	49 (19.5%)	2 (4.1%)	5 (10.2%)	15 (30.6%)	16 (32.7%)	10 (20.4%)	1 (2.0%)
Purchasing cheap food	76 (30.3%)	5 (6.6%)	8 (10.5%)	23 (30.3%)	21 (27.6%)	14 (18.4%)	5 (6.6%)
Receiving help from family to buy food	75 (29.9%)	5 (6.6%)	10 (13.3%)	20 (26.6%)	22 (29.3%)	16 (21.3%)	2 (2.6%)
Watering down food	24 (9.6%)	4 (16.7%)	1 (4.2%)	3 (12.5%)	7 (29.2%)	8 (33.3%)	1 (4.2%)
Eating less	58 (23.1%)	0	11 (19.0%)	8 (13.8%)	34 (58.6%)	2 (3.4%)	3 (5.2%)

Food Assistance Programs							
SNAP	96 (38.2%)	5 (5.2%)	9 (9.4%)	24 (25.0%)	26 (27.1%)	28 (29.2%)	4 (4.2%)
WIC	13 (5.2%)	0	7 (53.8%)	0	6 (46.2%)	0	0
School Meal Programs	26 (10.4%)	0	5 (19.2%)	0	20 (76.9%)	0	1 (3.8%)
Meals on Wheels	22 (8.8%)	0	0	0	0	20 (90.9%)	2 (9.1%)
Senior Congregate	30 (12.0%)	0	0	0	0	28 (93.3%)	2 (7.6%)

Table 3
Individual Items of Food Security Survey

	Full Sample n=251	Emerging adulthood without children n=15	Emerging adulthood with children n=24	Middle adulthood without children n=58	Middle adulthood with children n=62	Late adulthood without children n=78	Late adulthood with children n=14
Worry about food access							
Do you worry that the food at home will run out before you have money to buy more?	180 (71.7%)	6 (3.3%)	18 (10.0%)	47 (26.1%)	56 (31.1%)	44 (17.5%)	9 (3.6%)
Utilization							
Do your meals only include a few kinds of cheap foods because you are running out of money to buy food?	193 (72.9%)	11 (5.7%)	19 (9.8%)	51 (26.4%)	55 (28.5%)	47 (24.4%)	10 (5.2%)
How often are you not able to eat a balanced meal because you don't have enough money?	169 (67.3%)	7 (4.1%)	15 (8.9%)	48 (28.4%)	49 (29.0%)	40 (23.7%)	10 (5.9%)
Availability							
Does the food that you buy run out and you don't have money to get more?	173 (68.9%)	9 (5.2%)	16 (9.2%)	44 (25.4%)	51 (29.5%)	44 (25.4%)	9 (5.2%)
Are you ever hungry but don't eat because you don't have enough food?	123 (49.0%)	7 (5.7%)	9 (7.3%)	34 (27.6%)	39 (31.7%)	29 (23.6%)	5 (4.1%)
Do you not eat for a whole day because you don't have enough money for food?	91 (36.3%)	4 (4.4%)	4 (4.4%)	25 (27.5%)	30 (33.0%)	22 (24.2%)	6 (6.6%)
Access							
Do you have to eat less because you don't have enough money to buy food?	171 (68.1%)	8 (4.7%)	15 (8.8%)	47 (27.5%)	49 (28.7%)	43 (25.1%)	9 (5.3%)
Do you cut the size of your meals because you don't have enough money for food?	169 (67.3%)	8 (4.7%)	12 (7.1%)	44 (26.0%)	50 (29.6%)	46 (27.2%)	9 (5.3%)

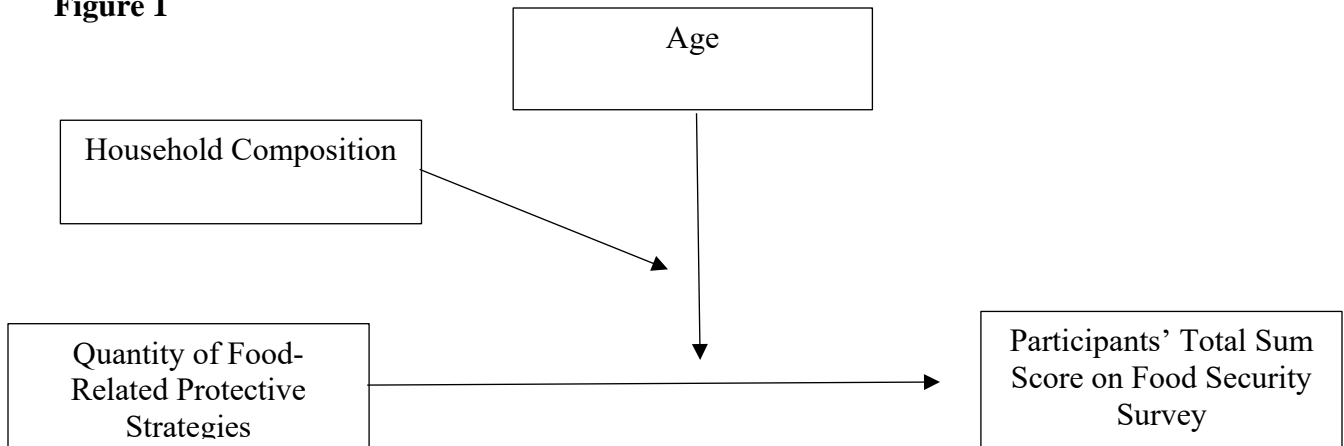
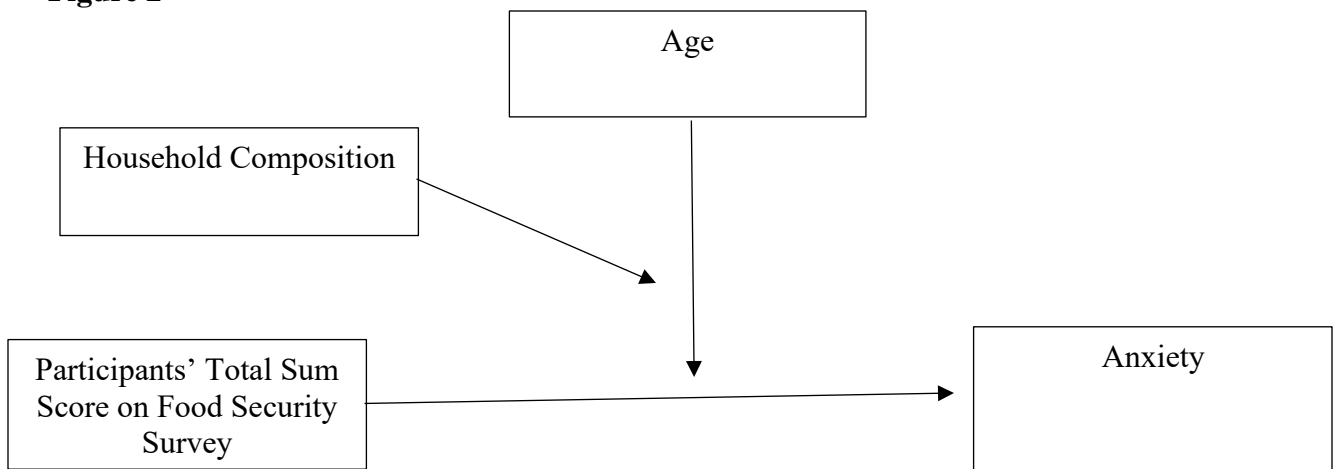
Do you have to skip a meal because you don't have enough money for food?	130 (51.8%)	6 (4.6%)	10 (7.7%)	37 (28.5%)	40 (30.8%)	29 (22.3%)	8 (6.2%)
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Table 4
Anxiety and Depression Exceeding Clinical Threshold

	Full Sample n=251	Emerging adulthood without children n=15	Emerging adulthood with children n=21	Middle adulthood without children n=53	Middle adulthood with children n=62	Late adulthood without children n=78	Late adulthood with children n=14
GAD-7							
Severe Anxiety	80 (31.9%)	6 (7.5%)	6 (7.5%)	24 (30.0%)	21 (26.3%)	18 (22.5%)	5 (6.3%)
WHO-5 Well-Being Index							
Clinical Depression	111 (44.2%)	8 (7.2%)	7 (6.3%)	30 (27.0%)	27 (24.3%)	32 (28.8%)	7 (6.3%)

Table 5
Moderated Moderation Models

Moderated Moderation Models				
Model 1: FI Total Sum Score	B	SE	t	p
Total Protective Strategies	.867	.680	1.274	.204
Age	-.013	.019	-.7173	.474
Household Composition	.986	1.78	.555	.580
Interaction	.031	.019	1.650	.101
Model 2: Anxiety				
FI Total Sum Score	.914	.484	1.889	.060
Age	-.044	.045	-.983	.327
Household Composition	1.99	4.14	.481	.631
Interaction	.015	.014	1.056	.291
Model 3: Depression				
FI Total Sum Score	.280	.471	.594	.553
Age	-.069	.044	-1.54	.124
Household Composition	-2.266	4.14	-.545	.587
Interaction	.015	.014	1.12	.262

Figure 1**Figure 2****Figure 3**