12-15-2017

An Examination of Household Food Security’s Measurement, Report and Experience by Gender

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An Examination of Household Food Security’s Measurement, Report and Experience by Gender
Jaime S. Foster, PhD
University of Connecticut
2017

Abstract
Food security (FS), access sufficient food for an active, healthy life has been measured annually using the Household Food Security Module (HFSM) since the 1990s; however, responses to this self-report measure may vary by household member. Thus, this study aims to 1) determine how gender is related to differences in interpretation and report of FS; 2) determine if gender is related to interpretation of terms relevant to FS measurement, and; 3) pilot test a qualitative technique novel to the field. Twenty-five pairs of low-income parents of young children were recruited to participate in one-on-one interviews to assess FS, interpretation of the HFSM, and complete related questionnaires. Intraclass correlations and regressions were conducted to compare the responses of each dyad. Mothers’ and fathers’ report of FS was significantly related (B=.40, p=.02), some items had poor interrater reliability between parents. Further, mothers’ report of coping strategies was significantly associated with report of household food inventory (B=0.865, p=0.03). Qualitative analysis revealed that gender was related to interpretation of key terms relevant to FS measurement including “household,” “balanced meal,” and “worry.” Discourse Analysis allowed researchers to garner new understanding about gender’s influence on communication patterns. Overall, this research identifies potential shortcomings of the HFSM such as underestimating the efficacy of the national safety net, fathers struggling to feed their families and, related insufficient resources allocated to underserved families.
An Examination of Household Food Security’s Measurement, Report and Experience by Gender

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M.S. University of Connecticut, 2014
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A Dissertation
Submitted in Partial Fulfillment of the
Requirements for the Degree of
Doctor of Philosophy
at the
University of Connecticut

2017
APPROVAL PAGE

Doctor of Philosophy Dissertation

An Examination of Household Food Security’s Measurement, Report and Experience by Gender

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Acknowledgements

First and foremost, I would like to thank Dr. Amy Mobley whose advice, mentorship and teaching has brought me so far along this journey. I remember what my skills were like when I started as a Masters Degree student and I can’t believe how far I have come. Being my mentor meant more than professional training. You taught me research techniques, provided me opportunities to work on many projects holding variable roles and gaining diverse experiences. Perhaps most importantly, or notably, she you helped me improve my writing immeasurably. Overall, I’ve grown as a researcher and I look forward to continued collaboration as colleagues. Thank you, Dr. M!

Dr. Kari Adamsons was with me throughout my whole graduate degree program. I learned everything I know about studying dyads from you and your suggested materials. I never left a meeting in your office without a phenomenal suggested reading or a new idea or outlook on my research. Further, your stats class was one of the most beneficial course I have ever taken. Thank you, Dr. A!

Dr. Amy Gorin, thank you for the opportunity to work on Project Teams. I enjoyed that work more than I could have possibly imagined. Working with you and the rest of your team has expanded my understanding of psychology and about the absolute benefit of interdisciplinary collaboration in research, health care and weight loss work.
Dr. Nancy Rodriguez, I have known you as an undergraduate instructor, a graduate instructor, a professor I TA’d for and as an advisor. I appreciate all the mentorship you have given me over the many years I have been at UCONN. Thank you for everything!

Dr. Marlene Schwartz, thank you for serving on my doctoral committee and bringing your advice and mentorship to the final product. I appreciate the writing support, research ideas and mentorship you have provided me over the past few years and I look forward to our continued work together moving forward! Thank you!

To my former lab mate and best colleague, I’ve ever had, Dr. Rachel Vollmer, I would not have graduated if it were not for your advice and talking me off a few ledges. Thank you for setting a path for me to follow, for including me on your doctoral work and for always being my friend.

To the rest of my lab mates, past and present; Laura Joseph, Dr. Molika Chea, Becca Heller, Jesse Chiero and Julian Chan, thank you for sharing this journey with me. Your feedback and advice along the way on presentations, posters and projects has helped me grow as a researcher and presenter. I have learned so much from the opportunities to work with each of you on your projects, from All4Kids, to Healthy Fathers Healthy Kids, The Evaluation of the Dietary Guidelines, The Whole Grain Detectives Challenge and The Child Messaging Project; working with all of you has helped me grow as a researcher and person.

To undergraduate extraordinaire, Emily Taylor, you made this research possible. I would have never completed 50 qualitative interviews by myself, no parents would agree to block of 3-
4 hours of their busy lives to talk to me alone and scheduling and recruiting by myself would have been an impossible task. You are brilliant, hardworking and deserve my thanks!

Completing a PhD is no easy task and I would not have been able to do any of this without the love and support of my family. To my Mom and Dad, thank you for the support you’ve given me over my lifetime to allow me to get here. You both have done so much that is inspirational to me, but you set my sisters and I up for success in every way. I could not thank you enough. To my sisters, Ashley, Emily and Julie, your friendship and support make life so much more enjoyable and your encouragement is immeasurable. To my Grandma Marth, whose daily check-ins, love and support I couldn’t imagine life without, thank you! To Rita, Jon, Mark and Debbie, you are the very best family I could have ever married into and I consider myself very lucky to have your love in support in my life. Thank you to my family!

Lastly, and perhaps most important I want to thank my partner in life Aaron. I think to have great success you need to take risks. I know that no matter what you will always be there encouraging me to reach for the stars, but you will never love me less, if and when I fail. Being loved by someone who loves me unconditionally is the greatest privilege in my life. You allow me to continue to reach higher and work harder because in life you are my partner. Thank you!
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Introduction

Approximately, 14.3 percent of United States (U.S.) households experience food insecurity at least some time during the year [1]. Food security is defined as all people at all times have access to enough food for an active, healthy life [2]. Food insecurity has been associated in adults with depression, anxiety, obesity (only consistently in women), nutrient deficiencies, high blood pressure, diabetes, heart disease, and early death [3-14]. Food insecurity in children is associated with lower test scores, increased absenteeism, higher rates of discipline and lower likelihood of completing school. Thus, better understanding of food insecurity is a public health priority [15-22].

Since the early 1990’s, food insecurity has been measured and monitored nationally using the U.S. Department of Agriculture’s (USDA) Household Food Security Module (HFSM) in which an adult member of a household reports on his/her perception of the adequacy of food in his/her own home [2, 24]. This monitoring functions as a national benchmark giving policy makers and government officials the ability to monitor the efficacy of the national safety net, the purpose of which is to prevent food insecurity, and the physical and psychological consequences associated with it. It has, however, been noted that food insecurity might be perceived and reported differently by different members of a household. For example, it has been documented that adult and child members of a household experience food security differently, perhaps because parents and adults in the household protect the children from the consequences of food insecurity [30]. Additionally, in a Canadian study using the USDA 18-item household food security measure, researchers observed gender difference in the responses of heads of household to the questionnaire, even when controlling for socioeconomic factors that might contribute to differences in responses [31]. Further, previous research has indicated that food security scores
are only weakly correlated between mothers and fathers of young children within the same household. Variations in question responses during food security assessment with parents warrant further exploration.

Thus, this dissertation aims to:

1) Determine how gender is related to differences in interpretation and report of one’s household food security including investigation into the Household Food Security Module;

2) Determine if gender and other key demographic factors are related to interpretation of key terms relevant to the measurement of food insecurity, and;

3) Pilot test a novel qualitative technique that may enhance this research and similar investigations in the field of nutrition.
Chapter 2: Literature Review
2.1 Food Insecurity

2.1.1 Food Insecurity

The World Food Summit defines food security as, “all people at all times having access to sufficient, safe, nutritious food to maintain a healthy and active life.”

Conceptually, food security relies on three pillars: 1) availability of food on a consistent basis, 2) sufficient financial resources to obtain food and, 3) the ability to use that food appropriately. Food utilization requires knowledge of basic nutrition, adequate water and sanitary conditions. Hunger, a feeling of unease or physical discomfort, is related to food insecurity, and often its consequence. Over time, food insecurity, particularly when hunger is present, can contribute to nutrient deficiencies and other health and mental health consequences discussed in detail later.

In the U.S. and other developed countries it has been documented that adult and child members of a household experience food security differently, perhaps because parents or other adults in the household protect the children. Consequentially, an ideal measure of food insecurity in the U.S. addresses the three pillars of food insecurity but also address constructs that are unique to developed countries. First are the differential experiences of food insecurity at the adult and child level; second, the components of food insecurity directly related to income and food: diet quality and quantity; and finally, certainty and acceptability (similarly worry) which are psychological constructs that occur in less severe food insecurity.

The USDA defines food security as access to culturally appropriate and nutritious food sufficient to maintain a healthy lifestyle. This definition presumes access to food without having to resort to stealing or other coping strategies. In the U.S., food insecurity measurement addresses not only hunger but the physical and psychological consequences of impaired diet
quality, including the stress and worry about running out of food. Conceptually, food insecurity is a hierarchal construct, with hunger only occurring at the more severe stages. In the less severe stages, individuals experience anxiety related to poverty and the financial constraint limiting a household’s ability to obtain food, which has documented health consequences. An individual’s satisfaction with the sufficiency of their household’s diet, including its quality and variety, is related to perceived quality of life. In the U.S., measuring food insecurity assesses this hierarchy of experiences.

Since the early 1990’s food insecurity has been measured in the U.S. almost exclusively using the either the 18-item USDA Household Food Security Module (HFSM) or a validated short-form of this measure. This literature review will document food insecurity prevalence, its relation to health and disease, and the measure’s origins, analysis techniques relevant to the aims of this dissertation and research limitations to date.

2.1.2 Food Insecurity Prevalence

Food security rates in the U.S. were steady for most of the early 2000’s, with 11 percent of all U.S. households and 18 percent of households with children reporting food insecurity. After the onset of the Great Recession in 2007-2008, the prevalence of food insecurity increased to nearly 30 percent in households with and without children. Unfortunately, food insecurity rates have not recovered to prerecession levels. Food insecurity prevalence is highest in low income, minority populations. The highest risk of food insecurity for households with children lies with households headed by African Americans, Hispanics, or a single parent. Furthermore, households headed by a younger or less educated person are also more likely to be food insecure.

2.1.3 Food Insecurity and Health
Food insecurity is hypothesized to be correlated with disease or contribute to various health consequences. In recent years, food insecurity has been related to iron deficiency and corresponding anemia in pregnant women\textsuperscript{13} as well as oral health disparities, which are theorized to have a cyclical risk, such that, as oral health declines dietary diversity decreases.\textsuperscript{14} Among the elderly, food insecurity is related to lower nutrient intake and more frequent rates of self-reported poor or fair health. Food insecure elderly are also more likely to have limitations in the activities of daily living.\textsuperscript{15-18} In the NHANES, a cross-sectional nationally representative data set, food insecurity is related to diabetes mellitus and other chronic diseases or conditions such as hyperlipidemia and hypertension for both men and women.\textsuperscript{18-20} Because these diseases or conditions are related to overweight and obesity, there has been scientific discourse about the paradoxical relationship between food insecurity and overweight.\textsuperscript{19}

2.1.4 Food Insecurity and Obesity/Overweight

The food insecurity obesity paradox is commonly discussed in theory, and often assumed as fact.\textsuperscript{21} The paradox refers to the counterintuitive finding that with greater food insecurity and food insufficiency, obesity risk and prevalence rise.\textsuperscript{21} One theory is that food insecurity leads to weight gain due to poor diet quality and the psychological stress of food insecurity. Obesity and overweight do in fact disproportionately affect low income and minority populations. Food insecurity, which is the result of poverty, disproportionately effects women headed households, and the food insecurity obesity paradox is consistently observed in women.\textsuperscript{22} A 2011 review by Larson and colleagues examined the literature related to food insecurity and weight status in children and families.\textsuperscript{23} They identified several cross sectional studies that observed weight and food insecurity in men.\textsuperscript{24-31} Two studies found correlation between weight and food insecurity, and in one study food insecurity was positively associated with weight, such that with worsening
severity of food security men had higher body weight. However, in another study, those in the marginal food security category had higher body weight than those experiencing more severe food insecurity.

In women, longitudinal studies revealed mixed results including one study of thirteen identified found that women with persistent food insecurity had lower weight trajectories over time. However, of thirteen cross sectional studies, seven of the thirteen have demonstrated a positive relationship of food insecurity (and its increasing severity) and overweight or obesity, with others noticing no significant relationship or the inverse.

2.1.5 Food Insecurity and Mental Health Status

Food insecurity is associated with depression and anxiety in mothers of young children, and overall poor mental health in women. Notably, these mental health changes are influenced by changes in assistance programs, namely SNAP, such that symptoms are worsened when support systems are diminished. Among elderly Americans, food insecurity is related to impaired quality of life, diminished participation in activities of daily living, depression, and reported experiences of loneliness.

2.1.6 Food Insecurity and Children

The majority of research to date related to food insecurity and health outcomes investigates the consequences of food insecurity on children in a household. It is important to note that the experiences of children facing food insecurity is typically assessed based on the report of a single adult respondent who is assessed to categorize the entire household's food security status. Parents of food insecure children are more likely to report that their children have overall poor health than parents of non-food insecure children. In children, food insecurity predicts an increased risk of certain birth defects, iron deficiency anemia, low nutrient intake,
asthma, poor oral health or impaired diet quality. Beyond physiological impacts, children’s behavior and academic performance as reported by teachers is poorer in food insecure children. Typically, this research uses multivariate regressions with binary dependent variables, e.g. having a disease or not, although some research reports dose effects with children experiencing worse outcomes with greater severity or longer duration of food insecurity (such as a magnitude of 2.0-3.0 higher risk of anemia.

Further, in children, food insecurity is related to psychological problems such as increased behavioral issues, aggression, anxiety, depression, and suicidal ideations.

### 2.2 Food Security Measurement

#### 2.2.1 Food Security Measurement in the US

Prior to the large-scale use of the HFSM, the Radimer-Cornell index scale was used. This tool clearly influenced this HFSM’s development and includes very similar language. The Radimer-Cornell Index is designed for use in households with women and children to measure hunger. The Radimer-Cornell Index was developed to directly identify and quantify food insecurity and was based on findings from qualitative in-depth interviews. Prior to this tool, all previous measures were indirect or proxy measures. This tool offered a marked improvement in the ability to conduct research on food insecurity and to monitor its prevalence. Validity was measured in a sample of women by comparing subscales of the measure (household’s hunger, women’s hunger, and children’s hunger scales) to established risk factors for hunger, such as a decline in fruit and vegetable consumption. This tool had adequate internal reliability with Cronbach’s Alpha scores greater than or equal to 0.85. It is important to note that this measure was influential in contributing to what would later become the HFSM. The Radimer-Cornell Index used quotations from women experiencing food insecurity gathered in
qualitative interviews to create statements regarding experiences that respondents could affirm or deny. It was developed and validated to measure food insecurity exclusively for women with children and was validated in populations that had single-female heads of household, which is a population at highest risk for food insecurity. Overall, the HFSM has origins as a tool developed and validated exclusively for women and this is an important and often overlooked history of food insecurity measurement in the US. The implications of the HFSM being designed for women, given observed gendered differences in measurement is the key impetus and purpose of this dissertation.

In 1992, there was an effort to create a national benchmark to evaluate food insecurity. A comprehensive national benchmark allows for the measurement and documentation of prevalence and severity of food insecurity and hunger across the U.S. crucial for public health monitoring. Further, this monitoring serves to evaluate the adequacy and efficacy of the food security safety net. Creation of this measure was spearheaded by the USDA and involved review of past and current literature and consultation with area experts.

Development of the HFSM involved empirically derived, through data fitting, testing and validation of a Rasch Scale. The Rasch model, a latent trait model named for the work by Georg Rasch, was originally used in educational testing but is now commonly used in health research. The primary benefit of this model is that it allows for the quantitative viewing and scale development for topics that are not traditionally linear or normally distributed. Food insecurity fits this description because 85 percent of the population is food secure. Further, the Rasch model allows a scale with increasing severity to be measured without assumed equidistance between response options on the scale.
In April 1995, the first measurement was taken using the USDA’s 18-item HFSM with the Community Populations Survey of the Census. In 1995, for the first time, researchers, policy makers and public health professional had access to categorically assigned data with designated ranges of severity related to food insecurity in the U.S. This measurement’s results reflected the severity of food insufficiency in a household as experienced and reported by a single member of that household. This new measure was promptly incorporated into several longitudinal data collection efforts, including the National Health and Nutrition Examination Survey (NHANES). The use of a common measure across federal datasets allowed reliable comparisons of food insecurity over time and across population groups. The HFSM added consistency to national reporting and is presently and commonly used in North America and many other countries.

The full 18-item HFSM, was most recently updated in 2000 with minor changes in the ordering of questions and word choice to increase validity. The changes included altering the skip pattern to avoid asking potentially uncomfortable child-centric questions, and to align more readily to the 10-item short form used in households without children. This tool typically takes 5-10 minutes to complete and is very brief in those not experiencing food insecurity, with only 5 items due to the skip pattern. The HFSM was designed to offer the most reliability with the lowest respondent burden.

The HFSM progresses in severity as the questions continue and scoring allows researchers to assign households to one of four categories. The most food secure category is High Food Security (prior to 2000 called Food Security) in which the respondent has offered no affirmative responses indicating food insecurity. Marginal Food Security (previously called Food Security) is assigned to a respondent affirming one or two reported indicators. Before 2000 the
two aforementioned categories were one category. For the majority of respondents, these responses are related to anxiety about having enough food or shortcomings in perceived and self-reported quality of food in the house. At this level, there are little or few indications of changes to the diet or food intake. The first food insecure category is Low Food Security (previously Food Insecurity without Hunger). This label is assigned to respondents reporting reduced quality, variety or desirability of food in the diet. At this level, there is little or no report of reduced food intake. For the most food insecure category, Very Low Food Security (previously called Food Insecurity with Hunger) the respondent reports multiple indicators of disordered diet patterns and reduction in food intake which could include skipped meals or whole days without eating. This is typically the only level at which a respondent would report that children are affected.5

The best option in validation is to compare the HFSM to conditions known to contribute to or to be associated with food insecurity. Correlation coefficients between HFSM score and weekly expenditures (-0.12), annual income (-0.32), and income relative to poverty line (-0.33) are all, as expected negatively associated with HFSM scores.57 This is affirming of the HFSM’s validity because theoretically, one would expect as income increases, perception and self-report of food insecurity to decline. This association is weak however, which is not surprising as there are several in-kind programs that contribute to a food budget without counting as income, for example Supplemental Nutrition Assistance Program, or Food Stamp (SNAP) benefits, which might weaken the correlation.57

In a large, diverse sample of low income households (n=5,282) the mean Cronbach’s alpha score for the HFSM was 0.88.58 The technical report published in 1997 found that each individual item of the measure contributes meaningfully, such that, deleting any item lowers the Cronbach’s alpha.55 Further, they reported several internal reliability statistics including
Spearman (0.899), Rulan (0.932) and Cronbach’s Alpha (0.856) each calculated for a large national sample of households with children. Including only families with children ensures that a response can be provided for all 18 items. Finally, when comparing the responses on a categorical scale (four values of food insecurity) and the continuous scale, to the dichotomized food secure (all negative responses) versus food insecure (one or greater affirmative response) categories, Hamilton and colleagues found a high level of agreement using the Kappa Statistic.

The HFSM has been extensively validated, however, it is important to note that no true or accurate measure exists to compare the HFSM results to anything else in an effort to confirm validity.

2.2.2 The HFSM and Gender Differences

In 2013-2014, our laboratory endeavored to understand the interplay of household food security status and nutrition assistance program participation on parental feeding practices, styles and diet quality of parents and children in two parent households. This work was the first of its kind to investigate how similarly mothers and fathers report household food security variables. Surprisingly, we found that food insecurity scores were only weakly correlated within households, with fathers consistently reporting lower levels of food insecurity than the mother within the same household. Then, in 2013, Matheson and McIntyre published an article that investigated reporting patterns on household food insecurity using a nationally representative dataset in Canada, using the USDA 18-item HFSM. Matheson and McIntyre findings were similar in that female respondents in two parent households reported higher levels of food insecurity than their male counterparts in similar situations. They did note that when the respondent was the single head of household, these gender differences disappeared when
controlling for other sociodemographic characteristics. Thus, our lab sought to investigate why these variations by gender may exist.

2.3 Measurement and Self-Report Data

2.3.1. Gender and SES Differences in Self-Report Data

Gender is traditionally thought of as the state of being either male or female (though research to support a non-binary gender system exists\textsuperscript{60}) and is typically discussed in reference to social or cultural norms rather than biological differences.\textsuperscript{61} For the purpose of this investigation it is difficult to disentangle variations related to sociologically constructed gender versus biological sex because gender is not strictly interchangeable with biological sex. Therefore, in this discussion when gender is discussed, it is meant as a broader concept that encompasses sex and gender differences unless specifically discussed otherwise.

Although not well understood, there are observed differences in self-reported data between men and women across multiple domains.\textsuperscript{62-67} For example, women often report higher symptoms related to depression and loneliness than men and there are differences in self-reported quality of life or overall health by gender. Although several domains of study have observed differences in self-report data by gender, these difference could be related to differences in honesty, accuracy, social desirability or perhaps that the measure was developed for just one gender, etc. In the domain of self-reported depression, the difference is theorized to be related to differences in social desirability between men and women.\textsuperscript{68-73} A major source of potential error in any data collected by self-report is a participant altering a response as a result of social desirability.\textsuperscript{69} Social desirability as a phenomenon is experienced differently by men and women and can influence responses at the item level or skew responses to entire assessments or questionnaires.\textsuperscript{74}
There has been little research to investigate how alternative measurement might accommodate these differences to allow for improved measurement. Factors that might explain differences in honesty or accuracy of self-report data have been investigated outside the nutrition realm. Further, varying levels of literacy and health literacy are observed by gender and SES. Food insecurity having varied measurement by gender has not yet been investigated, however based on gender differences in other measurement, Figure 1.1 has been proposed as an operationalized depiction of the theorized gender and sex differences in the report and measurement of food insecurity, which is the focus of this dissertation.

2.3.2. Analyzing data with both Qualitative and Quantitative Techniques

Nutrition research is predominately driven by quantitative methodologies, and qualitative techniques used in the field are limited to basic interpretive and inductive methodologies. Inductive analysis condenses qualitative data, establish links to research questions, and draws themes. Qualitative research differs from quantitative methodologies in several significant ways. First, in qualitative research, subjectivity is valued and not avoided. This means that the researcher is not viewed as neutral or blinded, but rather, a valued contributor to the data collection. In quantitative research, the tools are survey instruments, impartial machines, and quantifiable/consistent measurements. In qualitative work, the researcher is the research tool. In quantitative research, a statistical package for analysis is a research tool that performs the analysis. In qualitative research, the analysis is conducted by the researcher, with input from the participant, and a software program might help with organization and depicting data, but cannot conduct the actual analysis. In quantitative research, validity refers to whether an instrument measures what it is intended to measure, and reliability refers to a measure’s ability to consistently deliver similar results under similar circumstances. In qualitative research, validity
is synonymous with trustworthiness and reliability. In quantitative research, generalizability is valued and refers to whether findings are likely applicable to a larger or broader sample. In qualitative research, generalizability is less important than obtaining a rich, deep understanding of a narrower population. Quantitative researchers strive for reproducibility and generalizability; in qualitative research, the holistic view that is time and contextual bounds are intrinsic to the research, and thus reproducibility is not sought after or prized.

To date, qualitative research methods have only been used to a limited extent in the field of nutrition research. The most common qualitative analyses have been basic interpretive and content analyses. While these techniques are uniquely suited to answer certain research questions, there are other qualitative methods to consider. Discourse Analysis is a novel qualitative technique that has the potential to deepen the understanding of how individuals respond to questions about food insecurity in the field of nutritional sciences.

2.3.3. Discourse Analysis

Discourse is a segment of text or a spoken conversation, but Discourse Analysis (DA) refers to the language as it is used. DA aims to find the true or intended meaning of the used language, this is particularly important because common definitions do not always match the message that the speaker or writer aims to convey. Further, in this technique the researcher considers that the way words are spoken, and delivery and context can alter the meaning. Similarly, who the speaker and listener are matters, because language is socially situated and co-created. A leader in the field of DA, James Paul Gee, describes language as encompassing saying, doing and being. DA as a technique includes many tools for exploring a socially situated identity. Identity, defined as the fact of being who or what a person or thing is, is associated with
specific, unique language patterns. This is important in conducting DA because the stereotypes, biases, presumptions and practices that predicate the bidirectional speech pattern between an interviewer and respondent are often subconscious, and therefore unlikely to be described in self-report. The aim of DA is to make meaning from this content. DA provides a rigorous method that can be used to analyze sociological constructs that might otherwise be viewed as too subjective or opinion-based to analyze quantitatively.

2.3.4. Quantitative Dyadic Data Analysis

Quantitative techniques are commonly used in nutrition research; however, researchers infrequently acknowledge the influence that the close members of a dyad might have on one another. This is a concern because dyadic relationships characterize the majority of our social relationships. Further, in research with families, the majority of parents (62 percent of households) parent in a two parent household, even though “non-traditional” parenting situations are increasingly common. In dyadic data analysis, two or more people who are in a relationship with one another are assessed using some of the same variables. The nature of being in a relationship contributes to interdependence, which means that the subjects in a relationship share more similarity than subjects that are not in a relationship. Parenting is an interdependent reality. Traditionally, statistics require independence in data, thus dyadic data need to be handled differently to account for interdependence. Gonzalez and Griffin refer to the ‘ritual mutilation’ of dyadic data, where data are truncated by removal of one partner’s data which is a waste; averages are created between partners to compensate for interdependence, which is a misrepresentation of their experiences; or interdependent variables are separated, which leaves a clean set of independent scores but limits possible analyses. These errors are common in parenting research and other dyadic investigations of relationships. In much of nutrition research
on families, researchers collect information from just one parent and ignore the other, presuming that he/she has no influence on the target parent or the phenomenon under study.

2.3.5. A Quantitative Dyadic Technique

A common and simple technique with dyadic applications is the intra class correlation (ICC). This analysis is commonly used in reliability testing for paired measurements and explains the degree of dependence between two variables.\textsuperscript{88} This is an important first step in understanding interdependent data. The ICC is more effective than a simple correlation because it explains the difference between linked pairs, accounting for the dyadic nature of the variables. This is important because techniques used in research without dyadic data can produce biased parameter estimates.\textsuperscript{87-89} Another way of viewing the ICC is as an explanation of the similarity between the variables. In this dissertation, one of the primary roles of the ICC is to determine the level of similarity in parents’ individual responses to the HFSM. As noted earlier, this variable is theoretically a household level variable; however, it relies on an individual’s self-report.

2.4 Inadequacies and Research Needs

Current measurement depicts diet quality as a subjective construct, which it is not. The HFSM uses the terms “balanced meal,” and “lower quality;” which may not be defined by all respondents in a way that is consistent with the researcher’s intention. Specifically, perceptions of diet quality might vary by nutrition knowledge, which tends to be lower in males. If this the case, males may be less likely to endorse the items about diet impairment. Therefore, knowing how men versus women view these words could shine light on discrepancies in reporting based on gender.

Diet quality and children’s experience of food insecurity both rely on the assumption of accuracy, reliability and validity in the parent’s self-reported data. Self-reported data is limited
because it can vary from reality due to a respondent’s perception which may be influenced by the
respondent’s history, knowledge, education, SES, and gender. Further, it might vary
related to social desirability, guilt or shame, which in turn plays a role in responses chosen. As
previously mentioned, these tools are validated by comparison with conditions or other validated
measures theorized or known to be associated with food insecurity. It is unknown however, if
men and women experience and perceive food insecurity similarly when in similar conditions.
Thus, it is difficult to validate if a measure similarly quantifies men and women’s experiences.
Not enough research has been done to determine if a term like “worry” is gendered like
“loneliness” and “depression” and as already mentioned, health literacy might relate to
differences in interpretation of the phrase, “a balanced diet.”

Recently, Canadian researchers found that in similar households, married female
respondents reported worse food security than similar male respondents living in comparable
conditions. A fundamental assumption of the HFSM is that it performs similarly on all
respondents, regardless of gender or culture. Hagquist states that when using a Rasch model in
health research, the instrument is required to work consistently, regardless of gender. Which is
problematic because the the Radimer-Cornell Index contributed to the creation of the HFSM and
was developed using exclusively women.

In his 2010 perspective piece, Dr. Christopher Barret stated that “[c]ontinued reliance on
a contested national food availability measure reflects the limited availability and timeliness of
household and individual data collected in nationally representative surveys.” And further,
this measure, which is based solely on only individuals’ report of their household and self-report
individual data routinely generates estimates of food insecurity that are higher than estimates
based on more aggregated data. Thus, expanding the tool, or practicing inclusion of tools that
measure financial information, asset information, measures of spending, assessment of knowledge related to budgeting and general nutrition, objective dietary data, health indicators and the self-report information related to worry and anxiety would paint a clearer picture of a household’s food security and allow researchers to better understand complexities related to food insecurity such as obesity risk and how well programs function at addressing food insecurity. Understandably though, from a national monitoring standpoint and a participant burden lens, this would be far less feasible to administer. Thus, in many ways, the HFSM is the best measure that presently exists. Therefore, it is crucial to understand the limitations of the HFSM to allow policy makers and programs to better inform their decisions and actions based on findings from this national benchmark.

2.5 Conclusion

In the U.S., a good measure of food security not only addresses the three pillars of food security observed internationally: food availability, sufficiency of financial resources and appropriate skills and conditions, but also the three concepts unique to food insecurity in the developed world: differentiation between experiences of adult and child, assessment of diet sufficiency in both quality and quantity and, assessment of the psychological ramifications of food insecurity like worry. The best tool presently available to do this is the USDA 18-item HFSM, however, it does have limitations. Knowledge of these limitations and understanding how to compensate for them, perhaps by the addition of questions to be used with women or men specifically, is critical. Better measurement will allow the publicly and privately-run programs that operate at the community, state, and national levels to make better informed decisions, improve programs’ functional capacity, and enhance advocacy to better meet the needs of the hungry and food insecure.
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Chapter 3: A pilot examination of the inter-rater reliability and validity of the 18-item Household Food Security Module between cohabiting mothers and fathers
Introduction

Food security is defined as all people at all times having access to enough food for an active, healthy life.\textsuperscript{5} In the U.S., food security is most commonly measured using the U.S. Department of Agriculture’s (USDA) 18-item Household Food Security Module (HFSM).\textsuperscript{95} This measure assesses the experience of food security at the adult and child level. The components addressed include income and food, diet quality and quantity,\textsuperscript{4} and the certainty and acceptability which are psychological constructs that occur even in less severe instances of food insecurity (several items specifically reference worry)(Figure 3.1). While there has been debate about whether or not this measure accurately measures this combination of these attributes,\textsuperscript{96} the HFSM remains the gold standard measure, and is important to longitudinal assessment of food security in the U.S. In 2016, 9.9% of U.S. two-parent households were food insecure. These rates of food insecurity are twice as high for households headed by a single male (21.7%) and three times as high for those headed by a single woman (31.6%).

In a 2005 report on food security measurement, experts posed that the USDA 18-item HFSM aims to measure three distinct experiences related to food insecurity: 1) uncertainty and worry, which cause mental, emotional and physical stress; 2) insufficiency or lack of access to an appropriate quantity and desirable quantity of food; and 3) hunger, which incorporates both the physiological experience of physical discomfort due to insufficient food and the recurrent and involuntary lack of access to food.\textsuperscript{97} Related to the experience of uncertainly and worry, food security status has been related to mental health, most notably there is an association between food insecurity and depression in female populations of varying ages, race and ethnicities.\textsuperscript{6,43,98-101} Related to the second distinct experience (insufficiency or lack of access), food insecurity with diet quality and self-reported household food availability that includes impairment in diet
quality. Finally, in various countries, food insecurity is associated with and often measured by the report of coping strategies. These behaviors are incorporated as a response to the third distinct experience related to food insecurity, the repeated involuntary exposure to insufficient food. The majority of the aforementioned research investigating food security and depression, food availability and coping, detect relationships between food insecurity and the related situations only in female populations or, the studies only included women. Thus, one approach to assessing construct validity of the food insecurity measure is the investigation of the strengths of the associations between food insecurity and the aforementioned variables.

The HFSM has been extensively validated and developed using a Rasch Model. This model is used for psychometric data that are not normally distributed or linear and instead of fitting the test to a population and data. The items are related to one another and increases in severity with responses theoretically only related to the experience being measured and previous responses predicted likelihood to offer and affirmative response moving forward in the scale. Food security is non-linear and non-normally distributed, with less than 15 percent of the population classified as food insecure. A Rasch model assumes adequate performance regardless of a participant’s gender. However, recent literature and research by Smith and colleagues suggests that there may be gender differences in the interpretation and response to HFSM questions. There is an expectation that in any measure there will be both inter-individual variation between people and intra-individual variation within a person. However, systematic variation based on a single attribute, such as gender, is cause for concern. In other domains, studies have found that gender is related to differences in responses on self-report data. For example, women often report higher symptoms related to depression and loneliness than men. In nutrition, men over-report caloric intake and meat intake, while women underreport
total calories, fat intake and their own weight. The HFSM is a self-report measure completed by a single respondent, but the responses are presumed to accurately represent all members of that individual's household. This measure is relied upon by federal and state policymakers as an index of how food security is changing over time as a result of policy or programmatic changes. If the HFSM is less valid for men or women, it is important to understand the root of these discrepancies because it could be necessary to adjust the results in a sample based on the gender of the respondents, or add a complementary measure that could compensate for shortcomings in the HFSM. Further, understanding gender differences might allow for improved services to men, who are typically underserved by the food insecurity safety net and related nutrition education efforts.

The main objectives of this pilot study are to investigate: 1) inter-rater reliability of the HFSM among cohabiting mothers and fathers within a household with a young child; 2) the item level response similarities and differences of mothers and fathers reporting food security within a household; and 3) the construct validity of the HFSM by determining the relationships among food security, depression, anxiety, household food availability, and the employment of coping strategies by mothers and fathers.

**Methods**

This exploratory study is part of a larger mixed methods investigation into the validity of the 18-item HFSM. This protocol was approved by the IRB at the University of Connecticut.

**Subjects.** Twenty-five pairs of low-income, food-insecure, cohabiting heterosexual parents (n=50) of children ages 2.5-10 years old within a household were recruited to participate in separate, one-on-one interviews. Parents of this age range of children were selected because they are more likely to be receiving nutrition assistance than parents of older children. Low
income was defined as eligibility for certain federal food assistance programs. Food security status was ascertained prior to participation in interviews by at least one parent per household responding affirmatively to one of the first three items on the HFSM. Pending eligibility, interviews were scheduled and informed consent was obtained prior to conducting interviews.

Measures. A demographics questionnaire developed for this study was used to ascertain descriptive variables (race, ethnicity, employment status, marital status, nutrition assistance program participation).

Depression was assessed using the Center for Epidemiological Studies Depression measure (CES-D).\textsuperscript{92,128,129} This validated tool has approximately equal efficacy in detecting generalized anxiety as it does in assessing current depression.\textsuperscript{92} For this measure, scores range from 0-60 with greater scores indicating higher severity and higher frequency of depression or anxiety related symptoms.\textsuperscript{128}

The Household Food Inventory (HFI), a self-report measure previously validated, was used to assess a household’s dietary diversity.\textsuperscript{130} This measure is a list of 34 food categories and 12 additional low fat versions of food categories already listed, for each affirmative response to having food in a given category the respondent receives one point, thus scores can range from 0-46.

Because household food insecurity often necessitates the use of coping strategies to endure insufficient household resources, the Coping Strategies Index (CSI), modified for use with a U.S. population, was used.\textsuperscript{96,111} This measure contains 13 coping strategies and corresponding severity weights, higher scores reflect a family employs less coping strategies, thus, appearing more food secure and financially better off, while lower scores reflect greater use
of coping strategies. Severity weights could range between 1 and 4 and scores could range between 0 and 135.

**Procedure.** After obtaining written, informed consent, the interviews were conducted by trained researchers and all questionnaires were read aloud to the participants. Mothers and fathers were interviewed separately in private rooms to ensure parents did not influence each other’s responses. Each parent was provided with a $20 gift card incentive for participation in the interview.

**Analysis.** All statistics were conducted using SPSS Version 20. Descriptive statistics were aggregated to describe the sample population. For the present analysis, continuous food security scores were used.

For aim one, intra class correlations (ICC) were calculated to compare the reports of household food security between mothers and fathers, as well as employment of coping strategies, depression/anxiety and household dietary diversity. An ICC coefficient is a score of how closely pairs resemble each other. An ICC is a more appropriate test than a simple correlation in this case because the coefficient refers to the correlation between linked pairs, not just two groups over all. The Cicchetti (1994) cut points were used to interpret the ICCs: score of < 0.4 is poor, between 0.40 and 0.59 is fair, between 0.60 and 0.74 is good and between 0.75 and 1.00 is excellent. The p value for significance was set at 0.05, however attention was given to items with p values up to 0.10, in light of the small sample size and exploratory nature of this investigation. In exploratory studies such as this, results with p-value of 0.10 will likely become significant at p < 0.05 in a larger sample. For aim two, ICCs were also used to investigate item level response variations between cohabiting parents on the HFSM. For this analysis, ICCs were conducted comparing mothers
and fathers within a household on each item of the 18-item HFSM. Due to the exploratory nature of this pilot, significance was set at p<0.10. Items in which parents did not consistently reply to due to skip pattern were excluded from this analysis.

For the third aim, multiple regression analyses were conducted to assess the relationships between various factors related to food insecurity and scores on the HFSM. The HFSM was used as the dependent variable (DV) in three separate regression with the following independent variables (IV): anxiety and depression score (CES-D), household food availability and diversity score (HFI), and use of coping strategies. Finally, where statistically significant correlations were detected in a correlation matrix, additional exploratory regressions were conducted.

Results

The demographic characteristics of the sample are presented in Table 1. The majority of the sample was white, with one-third identifying as Hispanic and less than one-fifth as black. All parents reported at least some impairment in their food security. Mothers were mostly marginally food secure, while fathers were mostly food secure and marginally food secure.

As shown in Table 2, the ICC values between mothers’ and fathers’ report of household food security on a continuous scale was statistically significant (B=.40, p=.02)). There was a statistically significant correlation between mothers and fathers report of depression (B=.49, p=.01) but not with coping strategies or household food inventory (Table 2).

To examine the inter-rater reliability of the HFSM, ICC’s were conducted on each of the 18 items (see Table 3). This investigation resulted in flagging HH2, HH3, AD2, AD4, CH3 and CH5 as questions that performed inconsistently between cohabiting parents (for full questions see the appendices). Due to the skip patterns in the instrument, the child referenced questions
CH6 and CH7, as well as the follow up questions to assess severity did not have sufficient responses to determine inter-rater reliability.

To further examine how mothers’ and fathers’ responses on different measures related, ad hoc analyses compared the responses across measures within each group. These analyses revealed that mothers’ report of coping strategies was significantly associated with their report of household food inventory (B=0.865, p=0.03), such that when parents reported more food available in their home, there was less severe, and less frequent use of coping strategies. Further, there was a trend for a relationship between coping strategies and depression (B=-0.245, p=0.08), suggesting that with greater employment of coping strategies parents experienced more often and severe symptoms of depression. For fathers, the use of coping strategies was not significantly associated with household food inventory (B= 0.026, p=0.892) but similarly to mothers, approached significance with predicting depression (B=-0.461, p=0.08).

**Discussion**

This pilot study aimed to better understand how cohabiting couples describe their household food insecurity and related factors. Although HFSM overall scores were significantly related between cohabiting parents within a household, the weight of the relationship was fair. Further, the categorical food security scores of mothers and fathers were different, with fathers’ mean scores reflecting high food security and mothers’ mean score indicating marginal food security.

It is important to further understand why parents living in the same household are reporting different levels of food insecurity, as this may result in differential misclassification of a condition or state. The current findings suggest that fathers are consistently less forthcoming in discussing a condition that may be perceived as emasculating. Further quantitative
investigations should assess both gender and household roles and how they relate to alternate responses on the HFSM (depicted in Figure 1.1 in the Cultural Domain). Rigorous qualitative methodologies, such as elicitation techniques could prove fruitful to better understand sources of these discrepancies and even identify phrasing or terminology that might better ascertain desired data.

Next, this investigation assessed the item level response similarities and differences of mothers and fathers reporting food security within a household. Certain questions were flagged for having low reliability. Item HH2 contains the word worry, which may, similar to reports of depression or loneliness vary in report by gender.\(^{62,65}\) Item HH3 is paradigmatic example of food insecurity but might vary between men and women. Perhaps, what is considered money (SNAP benefits versus cash) might vary by gender, this can be an example of a collocational pattern, or example of words that “hang together,” for a given population or cultural group. Item AD2 discusses an adult household member eating less than they felt they should have. Perhaps, differences in report here are related to societal differences in food sufficiency, with it being socially acceptable, or valued for men to eat more.\(^{135}\) Further, it is possible that there are differences in ideals of sufficiency depending on weight status or perceived weight bias,\(^{136,137}\) with overweight or obese individuals being less likely to report food insufficiency. Further, there are certain terms utilized in the HFSM that were flagged in the recent Institute of Medicine Report, specifically “balanced meal” and “worry.”\(^ {138}\) In other fields, content validity has been improved for alternate populations through use of elicitation techniques to create a mental model to better understand where variability in responses exist and how measures might be improved. Items related to a more severe and consequential experience of food insecurity, with affirmation of weight loss and children skipping meals, demonstrated low interrater reliability. It is possible
that males experience a greater sense of shame from the social stigma of not being able to provide for their families than their female partners and are therefore less likely to admit that their families are struggling in this way. This type of varied social desirability influence has been observed in reports of poverty and its related consequences.\textsuperscript{139,140} Overall, it is unknown what is contributing to different report on these items however, differences in self-report data by gender has been theorized to be related to social desirability.\textsuperscript{71,72,74,78,141,142}

Interestingly, there was variability in mothers’ versus fathers’ report of other household level variables, including household food inventory and reported use of coping strategies. While fathers reported that fewer foods were available in the household compared to mothers, they also reported better food security. One possible explanation for these apparently inconsistent answers is that fathers may be less aware or knowledgeable about the food available in the household or foods not purchased because of financial insufficiency if they are not the parent coping with the insufficiency at the point of food preparation or purchase. Thus, fathers might not report impairment in measures such as the HFSM. Perhaps, because men have lower rates of health literacy this could be related to ability to interpret the questionnaire’s medical terminology such as “balanced meals”.\textsuperscript{78} Additionally, perhaps fathers are less aware of the foods presently in their home of less able to report on them. Some research has revealed that fathers are less effective or accurate at communicating about their home environment compared to mothers.\textsuperscript{143} In this work, even fathers who felt involved found it difficult to report on the household and deferred to the mothers.\textsuperscript{143} Although fathers have a growing role in domestic responsibilities, there are research measures that were purportedly designed for parents, but were actually developed only with mothers. It is important to assess whether these measures function equally well for fathers. This relationship is depicted in the interpersonal ring of Figure 1.1. This
research is prudent and timely as the role of the father at home and at meal times has shifted and researchers need to identify and create tools that can assess parents indiscriminate of gender.\textsuperscript{144-146} While random variability in self-report data is expected, systematic variability based on gender is cause for concern.\textsuperscript{121}

Curiously, depression, which is assessed as an individual experience was significantly correlated within pairs. This finding is consistent, however, with other studies that have found that rates of depression are correlated within households when couples are faced with adverse situations, such as a cancer diagnosis, post-traumatic stress disorder or infertility.\textsuperscript{147-150} In the case of cancer diagnosis, treatment and couple’s stress, typically, the individual with the cancer diagnosis has the higher stress.\textsuperscript{150} It is unclear though, when the stress is a household level stress how depression might be related between partners. With a larger sample, this could be investigated through an Actor Partner Interaction Model (APIM).

The use of coping strategies was significantly related to food security for both mothers and fathers in that more coping strategies were used when the household was experiencing greater severity in food insecurity. In a 2010 perspective piece in Science, Christopher Barrett suggests that measurement of food insecurity is an elusive construct, but that measurement of coping strategies might offer better depth in all three of the pillars related to food insecurity because they are behaviors that are easier to measures. Previous research has found associations between depression and household food insecurity; however, this relationship was not found for either mothers or fathers in the current study. This is surprising because the HFSM is intended to measure worry or anxiety related to insufficient food.\textsuperscript{151,152} This relationship was not observed here, however in addition to the small sample size, respondents were all low income and
experiencing some level of food insecurity or food related hardship. Further, worry, which is an experience assessed in the HFSM, is itself a symptom or attribute of depression.153,154

Coping strategies were significantly related to HFSM for both mothers and fathers in that with greater severity in food insecurity, more coping strategies, including those that were deemed more severe, were used with increased frequency. Mothers’ but not fathers’ coping strategies significantly predicted household food inventory. Coping strategies are the behaviors a household engages in to make due with household food insecurity, such as relying on less preferred foods, borrowing, purchasing on credit, sending household members to beg, limiting mealtime portions, and eating less meals.111,112 Conceivably, mothers report use of more coping strategies because they are the ones preparing and purchasing the foods, or perhaps, mothers are more apt to admit engaging in these behaviors which do not align with a father’s self-ascribed role of provider.146,155-157 Further, sources of misinterpretation exist because presently, eating healthfully and the right amount is increasing difficult to describe.158-160 Interestingly, dietary impairment is a self-report construct based on an individual’s perception of high diet quality and sufficient quantity. In the HFSM, this information is sought using terms like “eat enough,” and “low cost foods.” The CSI uses terms like “rely on less expensive or less preferred foods.” It is possible that depending on what is important for an individual’s definition of sufficiency and healthfulness, responses might vary in a meaningful way.

While there is considerable evidence that diet quality and food availability decline as food insecurity increases, this relationship was not observed in the present study. One reason why this relationship may not have been evident in the current sample is because the dyads were recruited from mobile food pantry sites that featured fresh vegetables and fruits and interviews were scheduled quickly after recruitment and concurrent receipt of produce. Therefore, the
family had just obtained an assortment of healthy foods which may have been reflected in the HFI, which assesses one’s current food inventory, but not captured in the HFSM which is retrospective over the past 12 months. 161-163

The present study has limitations. The HFSM was administered as a cognitive interview, so the findings may not generalize to studies where the HFSM is assessed using paper and pencil. The sample was drawn from one city in Connecticut; therefore, these findings may not generalize to other geographical regions. Further, the small sample size in this pilot investigation limits the type of statistical tests that can be performed.

This study also has notable strengths. This is the first study of its kind to investigate self-report of food security, depression and anxiety, coping and household food availability between partners. This sample also included cohabiting partners experiencing food security to allow for comparison of mothers and fathers who share a household to report on their shared environment.

Conclusions

National data indicate that food insecurity is a problem that plagues nearly one fifth of the US population with children. 164 Food insecurity is associated with a profusion of adverse health effects including malnutrition, diabetes, heart disease and in some studies, mental health consequences like depression and anxiety. However, it seems that the HFSM is less content valid for men compared to women. Thus, further work is required to better understand the root of these discrepancies. Ultimately, it could be necessary to adjust the results in a sample based on the gender of the respondents, or add a complementary measure that could compensate for shortcomings in the HFSM.

It has been observed in this study as well as in previous research that responses to measures assessing a household can vary depending on respondent. Gaining further
understanding of why and how responses to the HFSM varies between members of the same household is important as this measure is used in development and assessment of changes in public policy and outreach. Often, in nationally representative studies, such as NHANES, “heads of households” are interviewed, but that definition is not clearly defined or consistently interpreted and may include both mothers and fathers. Future research should consider investigating the differentiating roles of individuals in a household (i.e. food preparation and grocery shopping) in a similar analysis using a larger, nationally representative dataset. Until a complementary or alternative measure of food insecurity is developed to adjust for these inadequacies, caution should be used when interpreting USDA HFSM data.
References


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Table 3.1. Demographic Variables and Characteristics of Low Income Parents of 2.5-10 year-olds

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<td>72</td>
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<tr>
<td>Participating in WIC(^b)</td>
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<td>48</td>
</tr>
<tr>
<td>Participating in Head Start</td>
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<td>48</td>
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<th>Father n (%)</th>
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<td>Father n (%)</td>
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<td>4(16)</td>
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<tr>
<td>Full Time</td>
<td>1(4)</td>
<td>11(44)</td>
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<tr>
<td>Not employed</td>
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<td>White</td>
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<td>5(20)</td>
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<td>Ethnicity (Hispanic)</td>
<td>n (%)</td>
<td>n (%)</td>
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<td>America Indian/Alaska Native</td>
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<td>4 (16)</td>
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<td>5 (20)</td>
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<th>Categorical Report of Food Security</th>
<th>n (%)</th>
<th>n (%)</th>
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<tbody>
<tr>
<td>0 – High food security</td>
<td>7 (28)</td>
<td>12 (48)</td>
</tr>
<tr>
<td>1 – Marginal food security</td>
<td>14 (56)</td>
<td>10 (40)</td>
</tr>
<tr>
<td>2 – Low food security</td>
<td>4 (16)</td>
<td>3 (12)</td>
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<tr>
<td>3 – Very low food security</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household food security score (0-18)</td>
<td>4.3 (2.6)</td>
</tr>
<tr>
<td>Coping Strategies Index</td>
<td>111 (7.8)</td>
</tr>
<tr>
<td>Household Food Inventory</td>
<td>22.1 (4.8)</td>
</tr>
<tr>
<td>CES-D&lt;sup&gt;c&lt;/sup&gt;</td>
<td>18.2 (11.5)</td>
</tr>
</tbody>
</table>

<sup>a</sup>SNAp: The Supplemental Nutrition Assistance Program
<sup>b</sup>WIC: The Supplemental Nutrition Assistance Program for Women Infants and Children
<sup>c</sup>CES-D: The Center for Epidemiological Studies’ Depressive Symptoms Inventory
Table 3.2. Intra Class Correlations of Self-Reported Household Food Security, Food Inventory, Individual Coping Strategies and Depression of Cohabiting Mothers and Fathers of Young Children

<table>
<thead>
<tr>
<th>Scale</th>
<th>Intra Class Correlations</th>
<th>95% Confidence Interval</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household Food Security Scale</td>
<td>0.40</td>
<td>0.01-0.68</td>
<td>.02</td>
</tr>
<tr>
<td>Coping Strategies Index</td>
<td>0.10</td>
<td>-0.33-0.49</td>
<td>.33</td>
</tr>
<tr>
<td>Household Food Inventory</td>
<td>0.07</td>
<td>-0.38-0.50</td>
<td>.38</td>
</tr>
<tr>
<td>Center for Epidemiological Studies</td>
<td>0.49</td>
<td>0.13-0.74</td>
<td>.01</td>
</tr>
</tbody>
</table>
Table 3.3. Item level analysis comparing mothers’ (n=25) and fathers’ (n=25) responses to the USDA 18-item household food security measure

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Question</th>
<th>ICC</th>
<th>CI</th>
<th>P- value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HH1</td>
<td>Which of these statements best describes the food eaten in your household in the last 12 months: — enough of the kinds of food (I/we) want to eat; — enough, but not always the kinds of food (I/we) want; — sometimes not enough to eat; or, — often not enough to eat?</td>
<td>0.66</td>
<td>0.21- 0.85</td>
<td>.007</td>
</tr>
<tr>
<td>HH2</td>
<td>The first statement is “(I/We) worried whether (my/our) food would run out before (I/we) got money to buy more.” Was that often true, sometimes true, or never true for (you/your household) in the last 12 months?</td>
<td>0.33</td>
<td>-0.51- 0.71</td>
<td>.164a</td>
</tr>
<tr>
<td>HH3</td>
<td>“The food that (I/we) bought just didn’t last, and (I/we) didn’t have money to get more.” Was that often, sometimes, or never true for (you/your household) in the last 12 months?</td>
<td>0.24</td>
<td>-0.73- 0.67</td>
<td>.253a</td>
</tr>
<tr>
<td>HH4</td>
<td>“(I/we) couldn’t afford to eat balanced meals.” Was that often, sometimes, or never true for</td>
<td>0.54</td>
<td>-0.07- 0.80</td>
<td>.036</td>
</tr>
</tbody>
</table>
In the last 12 months, did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food?

| AD2 | In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food? | -0.08 | -1.4-0.53 | .567a |
| AD3 | In the last 12 months, were you ever hungry but didn't eat because there wasn't enough money for food? | 0.46 | -0.23-0.76 | .071 |
| AD4 | In the last 12 months, did you lose weight because there wasn't enough money for food? | 0.42 | -0.34-0.75 | .100a |
| AD5 | In the last 12 months, did (you/you or other adults in your household) ever not eat for a whole day because there wasn't enough money for food? | 0.88 | 0.67-0.95 | .000 |
| CH1 | “(I/we) relied on only a few kinds of low-cost food to feed (my/our) child/the children) because (I was/we were) running out of money to buy food.” | 0.73 | 0.38-0.89 | .001 |
| CH2 | “(I/We) couldn’t feed (my/our) child/the children) a balanced meal, because (I/we) couldn’t afford | 0.51 | -0.12-0.78 | .045 |
that.”

| CH3 | "(My/Our child was/The children were) not eating | -0.03 | -1.34-0.55 | .530a |
|     | enough because (I/we) just couldn't afford enough |     |          |       |
|     | food."                                             |     |          |       |

| CH4 | In the last 12 months, since (current month) of last | 0.67 | 0.23-0.86 | .006 |
|     | year, did you ever cut the size of (your child's/any |     |          |      |
|     | of the children's) meals because there wasn't      |     |          |      |
|     | enough money for food?                             |     |          |      |

| CH5 | In the last 12 months, did (CHILD’S NAME/any       | -0.15 | -1.83-.53 | .620a |
|     | of the children) ever skip meals because there     |     |          |      |
|     | wasn't enough money for food?                      |     |          |      |

*aitems are flagged for future qualitative investigation into sources of discrepancy in parent response
Table 3.4. Regression Analysis of Coping Strategies Index (CSI), Household Food Inventory (HFI), and the Center for Epidemiological Studied Depression Index (CES-D) (IVs\textsuperscript{a}) on Household Food Security (DV\textsuperscript{b}) of Cohabiting Mothers (n=25) and Fathers (n=25) of Young Children

<table>
<thead>
<tr>
<th>IV\textsuperscript{a}</th>
<th>B</th>
<th>Std Error</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mothers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSI</td>
<td>-0.162</td>
<td>.063</td>
<td>.018</td>
</tr>
<tr>
<td>HFI</td>
<td>-0.201</td>
<td>.117</td>
<td>.101</td>
</tr>
<tr>
<td>CES-D</td>
<td>0.069</td>
<td>.045</td>
<td>.133</td>
</tr>
<tr>
<td><strong>Fathers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSI</td>
<td>-0.235</td>
<td>.077</td>
<td>.006</td>
</tr>
<tr>
<td>HFI</td>
<td>-0.019</td>
<td>.136</td>
<td>.890</td>
</tr>
<tr>
<td>CES-D</td>
<td>0.075</td>
<td>.065</td>
<td>.260</td>
</tr>
</tbody>
</table>

\textsuperscript{a}IV=independent variable

\textsuperscript{b}DV=dependent variable
Figure 3.1: A depiction of the three pillars of food insecurity and theoretical correlates

1uncertainty and worry which cause mental, emotional and physical stress

2insufficiency or lack of access to an appropriate quantity and desirable quantity of food

3hunger which incorporates both the physiological experience of physical discomfort due to insufficient food, but also the recurrent and involuntary lack of access to food
Chapter 4: Discourse Analysis, a New Analytical Technique for Qualitative Nutrition Research
Introduction

Traditionally, when a nutrition professional designs research, quantitative methodologies come to mind, but in recent years, increased attention has been paid to qualitative research for professionals in the field of nutrition and dietetics. Qualitative research is often relegated to thesis generating or is used to guide future iterations of research using quantitative methods; however, qualitative research is also appropriate for discerning the meanings that individuals ascribe to their lived experiences. Purely qualitative studies are less frequently published in the leading, peer-reviewed journals of the nutrition field, but those published tend to utilize content analysis or a basic inductive method of data analysis. These studies use inductive analysis in order to condense qualitative data, establish links to research questions, and draw themes. A limitation to using a basic inductive analysis method is that researchers are constrained in their ability to capture nuance in displays of emotions, changes in cadence or tone, word choice, or body language. It limits the researchers’ potential to understand the participant’s experience to only stated and transcribed words. In community nutrition research, this is particularly problematic because spoken word often does not convey the full meaning of an individual’s experience especially if and when a researcher and participant might use language differently. Common techniques used in the field of nutrition research only allow some voices to be heard and understood and limits the opportunity to explore deeper understanding of communicating ideas.

Discourse Analysis (DA) provides an alternative to inductive analyses because it allows the researcher to investigate the meaning and intention behind participants’ use of words and phrases in response to interview questions. DA is particularly useful for investigating gendered experiences because culture and gender norms can influence word choice or speech
patterns. When the use of a wider range of methods of data collection and analysis are encouraged, certain phenomena such as food insecurity might be better understood. If nutrition researchers are interested in understanding individuals’ lived experiences and how that relates to health and nutritional status, then methodologies such as DA are needed to better capture these experiences. This purpose of this article is to serve as a primer on DA for the field of nutrition. Through an introduction to DA and the presentation of a case example of its application in a research study, the applications of DA will be demonstrated and discussed for community nutrition research on the topic of food security.

Food insecurity refers to limited access to culturally competent, nutritionally sound food sufficient to maintain health and wellbeing. Food insecurity is typically associated with poverty, but not all low-income households experience food insecurity and there are families living above the poverty line who are food insecure, often due to competing financial demands, such as medical expenses. Food insecurity, particularly in developed countries, includes the psychological consequences related to worrying about where one’s food is coming from in addition to the experience of hunger. The commonly used measure for household food security, the 18-item household food security measure of the USDA, was developed using qualitative techniques to derive statements that respondents chose for expressing how completely they agreed or disagreed using a Likert scale and Rasch model. While this instrument is useful, there are limitations in our understanding that persist around the experience of food insecurity and in fact, recent literature begs the question if food insecurity might be differentially experienced by gender.

Discourse is defined in a variety of ways based on specialty, but essentially, is a segment of text or a spoken conversation when a language is in use. The “in use,” part is important
because as a technique, DA allows a researcher to draw conclusions from text and spoken word when common definitions do not suffice to understand the message the speaker or writer is attempting to convey.\textsuperscript{80,81} In conducting this form of qualitative analysis, the researcher considers language and communication to be more than spoken words alone because the way words are spoken can significantly alter their meaning.\textsuperscript{80,81} Moreover, who is speaking and who is listening changes the meaning of the words as well.\textsuperscript{80,81} James Paul Gee, a leader in the field of DA, describes language as encompassing “saying, doing and being;” this is the basis of Discourse Analysis.

The philosophy underlying DA is that in any given moment or conversation, people co-create a socially situated identity with the people they are communicating with. This socially situated identity is associated with specific language patterns unique to that identity. This is a crucial acknowledgement because the stereotypes, biases, presumptions, and practices that predicate speech patterns in a bidirectional way between interviewer and respondent are often subconscious, and therefore unlikely to be described in self-report. Thus, using DA as a technique with transcripts and videotaped interviews, in addition to traditional field notes, allows for analysis of this social interaction not likely to be captured otherwise.\textsuperscript{84} This ability is unique to DA and allows the researcher to draw hypothesis generating conclusions supported by rigorous research methodology on phenomena like societal inequity, that might otherwise be viewed as too subjective or opinion-based to be considered rigorously collected evidence.

DA generally involves two steps. The first step involves identifying forms of discourse and coding for these specific approaches to speech and communication. Identifying forms of discourse in the data assists the researchers to better understand segments of discourse. Table 4.1 includes a list of the forms that focus on how language is employed to convey a conscious or
unconscious message, and examples of each. When coding the forms of discourse depicted in Table 1, it is helpful for the researcher to also write analytical memos of the interview context. These might include things like major news topics with rhetoric that might have influenced an interview, or mention of a family tragedy that occurred before the camera was rolling and might influence the emotional state of the participant. This example demonstrates when an analytical memo might prove useful to DA.

Second, once forms of discourse are identified, the researcher then applies coding techniques that focus on the way words are delivered by respondents. These tools require more than a transcript to be practical and are best applied to a transcribed interview that has been videotaped or audio recorded. As demonstrated in Table 4.2, these DA tools allow a researcher to code for, among other things, complexity of language, cadence, tone, body language, and raised voice.

Methods

Data used in this article are from an investigation of how socially constructed language might alter the report of household food security status. DA was applied to a case study of the experience of food insecurity between cohabiting parents, in order to acknowledge and incorporate body language, word choice, and speech patterns. This methodological decision was grounded in previous work on psychological constructs like depression and loneliness, which have documented differences in measurement by gender.\textsuperscript{123,172} Additionally, there are documented differences by gender in health literacy which might impact interpretation of the measures related to medical terminology.\textsuperscript{78}

The data selected for use in the present study on DA were collected as a part of a larger investigation into the gendered experience of food insecurity within low-income food insecure
households. The project was approved by the University of Connecticut Institutional Review Board for Human Subjects Research. Written informed consent was obtained from participants prior to each interview. This data set includes 25 pairs of cohabiting parents (only male-female pairs included) of 2.5-10-year-old children who live below 185% of the US federal poverty level and suffer from inadequate or inconsistent supply of food or worry about their food running out. Men and women were interviewed separately by a trained researcher. Interviews were recorded using audio and videotapes.

The USDA 18-item HFSM served as the framework for the semi-structured cognitive interviews with scripted and unscripted probes (Appendix A) administered using the “think-aloud” method. The HFSM is the US national benchmark of food security assessment and is commonly presumed the most effective measurement tool. The scripted part of the case study interviews was identical for mothers and fathers, however, the 18-item HFSM dictates a skip pattern that might have excluded some questions and their related probes if a parent did not endorse certain items.

Data were initially coded and analyzed using a basic inductive technique. The case example examines a pair of interviews with a low-income couple with young children living in a Northeast US state and currently experiencing food insecurity. The interviews were chosen from a mother/father pair who both identify as the same race, ethnicity, and report the same number of cohabiting children. Similar to other pairs in the study, the parents were cohabiting and experiencing food insecurity according to affirmative responses to the screening questions.

The two respondents, Rain and Jes, are the mother and father of a 4-year-old boy and an 18-month old girl in Hartford, CT. Although able to work, Rain stays at home and cares for her daughter who has a disability. Jes is supporting two daughters from a previous relationship, as
well as his children with Rain, and he works fulltime. Although an important distinguishing characteristic between mother and father is that Jes works and has children from a previous marriage, having a single working parent was common in the couples included in the larger data set and this couple’s employment ascribed to traditional gender roles and was selected for this reason. Although Jes has children from a previous relationship, in his description of a ‘household’, which is a key term in the USDA 18-item HFSM, he initially refers to the same individuals as Rains does. Following more directed probing, Jes did adjust his description of his household to include his two older daughters.

For this pair, a second analysis was conducted using DA. The selection of this pair is due in large part to the Jes’ responses indicating that he perceives their home as more food secure that Rain perceives that same home environment. This difference in responses is an example of the observation that contributed to this series of investigations and is indicative of a weakness identified in previous research. The HFSM is commonly discussed as a household level variable, but it is in fact an individual self-report measure of one’s own perception of his or her household environment.

The interviews were transcribed verbatim, and then transcripts were read while viewing the video to allow for the additional coding consistent with a discourse analytical approach. These coding techniques are depicted in Tables 4.1 and 4.2 and demonstrated in tables 4.3 and 4.4. In analyzing this pair of interviews using DA, we were attentive to two major things: 1) how parents use language to describe and fashion their lives and experiences of food insecurity and the related worry, and 2) how discourse might vary based on a participant’s gender. Acknowledging that there is a bi-directional relationship in which information is exchanged in interviews, we sought to investigate how language is used to fashion different identities and
might therefore depict different categorical “levels” of food insecurity depending on the gender of the respondent.

Case Example

Descriptions of the coding techniques, explanations of findings based on the application of DA, and tables to demonstrate the application of codes to data are presented. In reviewing the transcript excerpt tables, a reader might find it helpful to use Tables 4.1 and 4.2 as a legend side by side with the text. This can assist the reader’s understanding of the punctuation, text format changes, or the use of symbols and characters that can help denote the tone of the interview as it was delivered. The resulting interpretation of the data offers a cross-sectional, but at times retrospective view, of how these partners paint a meaningfully different picture of a shared household.

Included are four DA tools used to analyze the Jes and Rain interviews – Position Design and Identity building, I-statements vs We-statements, Collocational Patterns and Types of Discourse, and Figured World. Specifically, position design and the identity building tools are applied to juxtapose ‘mothers’ and ‘fathers’ identities and how those roles differ from the gender-neutral role of ‘parent.’ “I,” versus “We,” statements demonstrate the parents’ perspective of paternal versus maternal versus parental roles, in describing their roles as parents and their home food environment. Furthermore, collocational patterns, which are examples of words that ‘hang together’ for a particular group are identified. Finally, the use of the, “figured world tool” is demonstrated. This tool embodies a theory, story, model or image of a simplified world that captures what is taken to be “normal” about people, practices or interactions.

*Position Design and Identity Building Tools*
The Position Design and Identity Building forms work in connection to help researchers understand how individuals build their identity through conversation (Identity Building) and how this identity is related to how they fit in with the world around them (Position Design). For example, when a man uses words such as husband, father, dad, daddy, partner, parent, hard worker, protector and provider to describe himself, those words portray different facets of his identity. Using the Identity Building form, one can deduce whether his identity as a father, romantic partner or provider are most important to the present discussion. Further, that man’s identity is not just built based on his own attributes, but those around him. If he is married, part of his identity that he can display in conversations with others is that of a husband or partner. If a man is a father, his identity can be built around fatherhood and paternal responsibilities.

Important to Position Design is an individual’s definitions of their ascribed roles. Is fatherhood defined as a male parent, the breadwinner, the protector, a playmate? How a father defines this role will be depicted in his socially constructed identity and how he sees that identity playing a role.

DA revealed that Rain and Jes portray distinctly different identities between mother and father. As a parent and as a father, Jes views himself as in control of the budget through being an effective budgeter, identifying as a protector and a provider. See Table 4.3 for a demonstration of DA coding for these findings. Rain views herself as a worrier and she views Jes as stoic and macho. These differed identities would only allow them to provide certain responses when those identities were being conveyed. For example, a stoic macho persona would not cry, admit defeat or short-comings, or even admit worrying about the future, whereas Rain’s identity as a mother, who is “supposed to” perpetually worry about her child, allows her to discuss worrying. Thus, in answering the same question, about the same household, in the same situation answers would
logically differ. One way of viewing these different discourse patterns is that the identity built, chosen or assigned to an individual, forces that person into a type of “restricted code.” That is, their language is restricted to discourse appropriate for that identity, i.e. men don’t show emotions like worry and must demonstrate being “macho,” and an adequate provider and protector and it is a mother’s role to worry for the family.

By using the Position Design and Identity Building forms one can juxtapose mother’s and father’s identities to demonstrate that integral to Jes’s identity was the sense of being a protector or provider. This sense made it so that disclosing worry or any shortcomings in his ability to provide would be difficult. Integral to Rain’s identity was that of being a doting and worrying mother. She viewed it as her responsibility to worry about her family, because if she did not worry about the details, who would? Her identity would allow her to disclose that she worried about whether the family’s food would run out before they had money to get more and that there were instances where they did run out or have to restrict their intake. If Jes confirmed these occurrences, he would be admitting failure in complying with his socially constructed identity.

I-statements vs We-statements

The second form DA case example investigates the parents’ use of I-statements when referring to themselves (as mothers or fathers), or we-statements when referring to themselves and their partner as a unit or team (as parents). Gee uses I-statements to investigate different types of I-statements: those that are cognitive, referring to an individual’s knowledge or thought process, those I-statements that are affective and speak to likes and desires, and those that are action or state statements that refer to taking action or state of being and others. In this case, since the focus is to identify differences in gender identity that might influence a parent’s responses to a standard questionnaire, this form was applied to compare when parents referred to
themselves as a mother or father with distinct roles using I-statements to describe their identity, their household responsibilities, or their opinions related to their household or parenting. Similarly, We-statements were examined to demonstrate which parental responsibilities are viewed as a unified task specific to parents as a whole, not to mothers or fathers differentially.

As Table 4.4 demonstrates, Jes most often ascribed I-statements to his individual responsibilities and the things that pertained to his identity as an adequate provider and as an individual ascribing to a “macho” persona. He used We-statements to describe his household, their actions and habits. His use of I-statements were often about the future and what he would need to do to prevent the problems that Rain would say are already occurring. In contrast, Rain’s I-statements were wrought with emotion, long pauses, quivering voice and admittance of shortcomings. Her We-statements referred to parental responsibilities she shared with Jes.

Both parents employed We-statements to refer to their parental responsibilities, but their use of I-statements to describe their roles and responsibilities in parenting coincided with their identities. Rain’s I-statements were wrought with emotion that was not only demonstrated in discussion of her emotions but the physical displays of emotions and changes in body language. Jes’s I-statements told a different story, he remained stoic, and conveyed how hard he worked to be an adequate provider, never disclosing any shortcomings. This finding is important in understand how parents respond differently to the HFSM because the HFSM is constructed entirely of quotations developed from interviews that the respondents can either confirm or deny similarity with. The quotes are constructed beginning with “I/we,” leaving it up to the survey administrator to choose pronoun at point to administration, with the respondent sometimes reading along. As this analysis shows, individuals hold different positions and identities as individuals and as a team, and use pronouns that reflect this. Thus, it could be difficult for a
respondent to confirm/deny similarity with a statement if it is being executed in a way different from how he or she speaks, particularly when a participant is not given the opportunity to delve into discussion or seek clarification.

Furthermore, this DA form can be useful in comparing the types of I- and We-statements by those that refer to knowledge (I know, we know), those that convey feeling (we feel, I felt, I cried, we were happy, I worry), those that state action (I bought, I cooked, we budgeted), and those that convey ability (I can do that, we don’t control) and to tabulate percentage use by each type of I- or We-statement. DA in this application is about comparisons, not about making quantifiable or statistical conclusions.

**Collocational Patterns and Types of Discourse**

The DA form, Collocational Patterns, seek to identify words that “hang together” for a specific group of people given a shared identity. Those identities can be, but are not limited to racial, ethnic, religious, regional, occupational or locational identities. To illustrate this concept, when children are learning the alphabet they often know that A and B and C are separate letters but L, M, N, O, P is often thought of as one letter named “el-em-en-o-pee.” Another example of collocational patterns specific to the field of nutrition research is how the plant-based food groups “hang together,” such as saying “fruits and vegetables” which tends to roll off the tongue in unison and represent food groups that are often thought of as a unit or interchangeable.

For this segment of discourse, an important collocational finding is one that is similar between mother and father. The shared identity in this situation is their income eligibility for nutrition assistance programs. When asked about their household’s money, they view and discuss their SNAP allocation as not only part of their household budget, but they discuss it interchangeably with money/cash. This finding might be related to the instrument’s validity,
because the questionnaire specifically references a household’s money. In these data, both Jes and Rain include SNAP allocations with the Collocational Pattern of “money.” It is unknown if this Collocational Pattern is racially, ethnically, income or program participation status specific, but it varies from the interviewers’ and researchers’ perception of that term, and thus could contribute to altered interpretation of the findings. See table 4.5 for examples.

Collocational patterns demonstrated that words that “hang together,” for specific groups might alter the way that they interpret language, even language that is not technical language on a questionnaire. Words that are concerning in this questionnaire include ones commonly thought of as technical, like “balanced meal.” Novel to this investigation, is the finding that “money running out,” might be measuring a household’s budget including governmental assistance, whereas when the question was written, the intention may have been to discuss a household’s liquid cash assets exclusive of additional funds from government programs.

**Figured World**

A figured world is a socially produced and socially constructed realm, or in some cases a way of viewing the real world that provides a sense of normalcy, predictability, or simplicity. In DA, the Figured World is used to identify segments of text that depict a simplified view of the world in which things are black and white, right or wrong.

The Figured World form was applied to the segment of discourse in Table 4.6. Jes views the world as a tough place where no help was offered to anyone if you didn’t work for it. He tried to teach his daughter this valuable lesson. This father’s discourse suggests that he might not believe he should get anything for free, but he does in fact partake in a welfare program, SNAP. He also benefits from WIC, a Block Granted program also misconstrued as a welfare program.
This example also incorporates another potential DA inquiry form that is often used in conjunction with the Figured World, Big “C” Conversations. This is used to identify where discourse reflects an individual’s view of a politically charged issue where there is a right and a wrong side. The side will depend on one’s view set and an individual’s discourse will shed light on which side on the conversation/debate they view as right. In the national debate on welfare and cash assistance there are often two sides. On one side, people think that providing for one’s self or one’s family is an individual’s responsibility; on the other side, people believe that when someone is unable to provide for themselves or their family, the government can and should step in to help. The Figured World is an interesting lens through which to view this debate, although it proved less helpful in interpreting gendered differences in the parent’s responses to the questions. The employment of this tool, however, did identify a need for future investigation into how parents’ discourse related to nutrition assistance program participation changes based on the rhetoric employed by media and political leaders.

**Implications and Conclusions**

This investigation demonstrates that DA and its forms can significantly contribute to the field, particularly as inductive, thesis generating work. In the field of nutrition research, DA allows for researchers to view transcribed interviews through a lens that, unlike traditional qualitative techniques, allows for the interpretation of not only the words, but the meaning behind the words used in communication.

Given the findings of this case example, DA has implications for further application in nutritional research. First, researchers need to consider including audio and visual recording of interviews to improve ability to use ad hoc analysis using DA as a technique. In this example,
body language and changes in volume and cadence improved the richness of the transcript and allowed for more thorough investigation into the spoken words.

Next, analytical memoing could prove important not just for immediate location contextualization, but also contextualizing interviews to media and world news. For example, as time passes one might forget that at the start of the interview a participant disclosed the loss of a family member and so the tears observed might not be related to the interview content but be related to something else. Additionally, conversations that start before the audio recorder turns on might set the stage for conversations that happened in the recorded interview, thus without the memoing, interpretation could be incomplete.

Third, this study in particular begs the question if we need to reconsider the design instruments of survey instruments for wide audiences. It is commonly acknowledged that validity and reliability of instruments varies based on gender, income, educational status of a participant. For example, in dietary self-report data and in depression and loneliness gender differences in the validity have been observed. Further, for certain measures, different survey tools are administered based on the participant’s gender. Perhaps through DA new instruments could be designed that offer better measurement.

Nutrition researchers need to try new research techniques, take risks, innovate, and question current instruments. One way to do this is by conducting a secondary analysis of existing data that were originally analyzed using thematic or basic inductive approaches. A unique benefit of Discourse Analysis as a technique is that it can help us garner ideas of what questions to ask and how those questions are best executed to a given audience. DA analysis leaders who investigated gender, race, class and intersectionality like West and Fenstermaker’s Doing Difference, 1995 and Kitzinger’s Doing Gender, 1987, lay the foundation
investigating intersectionality using DA as an ethnographic approach. These works amongst others discuss how an individual develops an identity and portrays that self through speech.

Finally, in preparation of future researchers, graduate students should be encouraged to pursue rigorous methodologies from outside their own field of inquiry. Only in this way can we as a field progress to better understand the world around us. Further understanding DA as a technique can be obtained through manuals by James Paul Gee titled “How To Do Discourse Analysis” and “An Introduction to Discourse Analysis.” Researchers should be encouraged to look for examples of methodologies from journals outside of their own field, to develop stronger qualitative techniques and applications.
### Table 4.1. Forms of Discourse Analysis

<table>
<thead>
<tr>
<th>Form</th>
<th>Explanation</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Discourse</td>
<td>Type of talk originating from how one was raised or brought up. It is likely unconscious and might include an accent or regional word choice. People who identify similarly have similar primary discourse.</td>
<td>“Being straight,” can refer to sexual orientation or could imply honesty or directness</td>
</tr>
<tr>
<td>Secondary Discourse</td>
<td>Type of talk conveyed to demonstrate the social constructs of identity integral to definition of self.</td>
<td>“Macho talk,” for some men, talk that asserts the speaker as the successful breadwinner and protector</td>
</tr>
<tr>
<td>Big C Conversations</td>
<td>Conversations or debates that occur in politics, the news, media and in national discussion.</td>
<td>Political conversations such as the debate on nutrition assistance and welfare programs</td>
</tr>
<tr>
<td>Collocational Patterns</td>
<td>Patterns of words that “hang together,” for people in a specific group (i.e. racial, ethnic, religious, regional, occupational or locational).</td>
<td>The way participants often answer questions about money or funds and include their SNAP or EBT budget interchangeably</td>
</tr>
<tr>
<td><strong>Context</strong></td>
<td>Setting in which the language is used; not limited to physical location but can include everything in the physical space, and what is socially in the space.</td>
<td>The act of interview consent by a participant or the site where an interview or observation occurs.</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Figured World</strong></td>
<td>A story, model, or image of a simplified world that embodies normalcy.</td>
<td>A participant labeling people as simply good or bad and that they deserve governmental help or, are criminals.</td>
</tr>
<tr>
<td><strong>Intonation</strong></td>
<td>Denoted including a final intonation contour, which is how a sentence ends.</td>
<td>See Table 2 for a full list.</td>
</tr>
<tr>
<td><strong>Politics Tool</strong></td>
<td>Demonstrations of the exchange of social goods. It includes conversation about how social goods are shared or ought to be shared.</td>
<td>Conversations discussing how people on welfare are or should be, how they are treated or should be treated.</td>
</tr>
<tr>
<td><strong>Position Design</strong></td>
<td>How an individual builds his or her identity, significance, and connections to the world and people around them.</td>
<td>A man defining himself as a father, a provider, someone willing to sacrifice himself for the wellbeing of the family.</td>
</tr>
</tbody>
</table>

** Based on the works of J. Paul Gee\textsuperscript{80,81,84}
Table 4.2: Discourse Analysis Coding Techniques

<table>
<thead>
<tr>
<th>Tool Name</th>
<th>Code</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significance Building</td>
<td>/</td>
<td>the way the line ended was not final, i.e. more to come</td>
</tr>
<tr>
<td></td>
<td></td>
<td>// closed off, intonation implies sentence ended</td>
</tr>
<tr>
<td>CAPS</td>
<td></td>
<td>emphatic stress (extra loudness or pitch change)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>how are words and grammatical devices being used to build up or lessen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>significance (importance, relevance) for certain things and not others. i.e.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a sound was lengthened</td>
</tr>
<tr>
<td>?</td>
<td></td>
<td>a final intonation rising contour</td>
</tr>
<tr>
<td>(. )</td>
<td></td>
<td>Each period represents 1 second of pause</td>
</tr>
<tr>
<td>(inaud)</td>
<td></td>
<td>A portion of the speech was inaudible on the tape</td>
</tr>
<tr>
<td><strong>Bolded text</strong></td>
<td></td>
<td>Represents raised voice or...</td>
</tr>
<tr>
<td><strong>Lexical Tool</strong></td>
<td>Tier 1 language/Germanic</td>
<td>Informal/everyday language. Alive, dog, tell,</td>
</tr>
<tr>
<td><strong>Tier 2 Language/Latinate</strong></td>
<td>Language influenced by books/reading. Animate, canine, narrate</td>
<td></td>
</tr>
<tr>
<td><strong>Tier 3 Technical/Specialist Terms</strong></td>
<td>Specific nutrients?</td>
<td></td>
</tr>
</tbody>
</table>

| **Identities Building Tool** | *Text in italics* | Uses how people express their sense of who they are, the research asks what socially recognizable identity or identities the speaker is trying to enact or to get people to recognize. What language the speaker uses in the treatment of other’s identities? |

| **Relationship Building Tool** | *Text in italics and underlined* | In what ways does the participate build or describe the relationships people have, i.e. with buying food, preparing food, making |
money, making ends meet and ascribing roles to relationship genders?

<table>
<thead>
<tr>
<th>Connections Building Tool</th>
<th>Text underlined</th>
<th>How the words and grammar being used in the communication connect or disconnect things or ignore connections between things? How the words or grammar make things relevant or irrelevant?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Body Language Description</strong></td>
<td>[]</td>
<td>Body language is described within brackets</td>
</tr>
<tr>
<td><strong>Tool</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sound Change Tool</strong></td>
<td>[]</td>
<td>Description in brackets</td>
</tr>
</tbody>
</table>

** Based on the works of J. Paul Gee ⁸⁰,⁸¹
<table>
<thead>
<tr>
<th>Tool</th>
<th>Excerpt</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>Jes:</em> We definitely are, are budgeters. So, whatever they give us on the EBT, we make it work. But with that being said, we have to go to certain stores that make that budget work. So, like I have to drive literally to Springfield to hit the meat market, and sometimes it’s not exactly what we want, but it’s what we get, we gotta get, what we have to have. Um (..) like I like certain foods I just can’t afford to get ‘em.</td>
<td><em>Italicized text examples identified through the identities building tool</em></td>
</tr>
<tr>
<td></td>
<td><em>Jes:</em> I, I just—to me, any, anybody, [could not understand], any person that when I go to sleep at night, I gotta (Tier 1 language) be sure they’re straight [gestures], I consider my household.</td>
<td><em>Position Design/Identity Building: Identity as a protector and provider</em></td>
</tr>
<tr>
<td></td>
<td><em>Jes:</em> It’s more, it’s more by design (Tier 2 language), I’m just, like I’m, I got eight years in the house, so literally [crosses arms], my first baby mom [gestures], after that relationship [gestures], it, I pretty much do everything I knew the way [gestures], learned from them [gestures], put myself in a situation [gestures] where I KNEW [gestures] I wasn’t gonna go through that again. Interview 1: Right. Jes: So I literally like, when I, when I met her [points towards the room his wife is in] I was looking for a specific type of female (Tier 2 language) [gestures, puts hands together and points with them]. Interviewer 1: Mm hmm. Jes: That didn’t have a LOT [gestures] of stuff that reminded me of my baby moms [crosses hands]. So I had, [gestures] like I knew this was gonna be straight for me, I knew I was gonna have no problems [crosses hands]. I’m the type of person, you smack me, if it don’t hurt, I’m not gonna say nothing.</td>
<td><em>Bolded text is the Relationships Building Tool</em></td>
</tr>
<tr>
<td></td>
<td>INTERVIEWER 2:What about your husband? (..) Do you</td>
<td><em>Identity Building Tool</em></td>
</tr>
</tbody>
</table>
think he worries?
RAIN: *I think he worries, but I don't think he's gonna express it. Like, I will sit there like, what are we gonna do?*
RAIN: *And, he won't sit there and do that, it's just, somehow we'll make it work/*
INTERVIEWER 2: Mm hmm. Can you like, tell if he’s worrying, and he just won’t say anything, or do you think that he really like, doesn’t think about it as much as you do?
RAIN: *I think that he worries and kind of, gets inside of himself. And kinda like, tries to stay away. [laughs a little bit] So I’m not sitting there saying like, what are we gonna do? Tell me what you’re thinking. You know, type of thing. [Voice gets quiet]*
INTERVIEWER 2: Yeah. Um, so did you notice changes in your health or mental health as a result of the worry?
RAIN: Um… no, I mean, *I tend to be one of those people that worry about (..)missing keys or—*
INTERVIEWER 2: Yeah.
RAIN: Anything. *More so than probably my husband, so I think I generally carry a lot of worry anyway.*

<table>
<thead>
<tr>
<th>Sometimes my husband may not eat, sometimes if there’s only enough to eat for the kids, my husband, I might eat cereal.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I don’t know how he feels, um, I think he tries to be like a, a man, macho type of person [Shrugs, voice gets quieter]. Like, eh, I’m fine.</td>
</tr>
</tbody>
</table>

Um, I think it’s just something I’ll, I’ll just do... Just for the kids.

And for me, I think just as long as the kids are fine, I’ll tell myself, I’ll be fine. I can make it, just as long as the kids have.

Identity Building Tool, Relationship Building Tool & Connections Building Tool: there role is as parents, who will do anything for their kids, and are willing to sacrifice

Identity Building Tool: Husband as macho

Identity Building Tool & Connections Building Tool: Identity as mother whose role is instinctual

Identity Building Tool & Connections Building Tool: Kids come first

Identity Building Tool: Jes is strong and stoic

Identity Building Tool

Identity Building Tool: Rain is the worrier
Jes: Because my baby moms, me and her are not on the same page, so she, whatever she say goes, goes with those two. So I try not to walk over her?

Jes: And both the, my baby mama, she take care of them as far as the physical part. They up there, definitely need to be careful in that part. [runs hands over hair, rests them on top of head]

In response to a question about money running out to buy food:

Jes: So we got a budget, and every month it’s that same budget. And if we go to the store and the meat done went up 50 cent, uh, you know, all the stuff, by pennies, it affects our shopping. So we might not be able to get as much, and we’re USED to a certain amount [gestures] you can just do that month. So it, it, come times when maybe say like, at that last week we’re really low/ Interview 1: Mm hmm.

Jes: We’re really trying to portion [gestures] stuff, make it a little bit more reasonable. You know, we may, you know, cut back on um, how much we cook [gestures] during that week just to make that little bit last until we can get our food stamps. Sometimes I have to come up my pocket and actually go buy stuff [gestures].

Rain: [in reference to money running out] you’re waiting for benefits to start.

Jes: And for some reason, she thinks it’s real EASY, she think it’s as simple as just saying I need money and people GIVE it to her. So I didn’t even know about the GoFundMe account, I mean I knew what it was but I didn’t know she signed up for one, so come to find out when her teachers put some money on her account. Now me—

My daughter’s 17 years old. And I’m tryna teach her that there ain’t no handouts.
<table>
<thead>
<tr>
<th>Page</th>
<th>Statement</th>
<th>216</th>
<th>114</th>
<th>192</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I and we- statements</td>
<td>I and we- statements</td>
<td>I and we- statements</td>
<td>I and we- statements</td>
</tr>
<tr>
<td></td>
<td>I Statements by Jes</td>
<td>I Statements by Jes</td>
<td>We - Statements by Jes</td>
<td>I Statements by Rain</td>
</tr>
</tbody>
</table>
|        | I always had the kids  
I knew this was gonna be straight for me  
I don’t worry because we, we know the money coming the next month.  
I gotta make it work  
I gotta go through the system  
I have to literally go back down and wait in line  
I do it because at the end of the day, without that, it ain’t gon’ work.  |
|        | We don’t want to be in a situation where we got our lives and we got no means of making it work  
we move down with her parents  
we DID come down to a point where we have nothing because they gonna be there to help out  
we budgeting our food stamps so it lasts  
we do a big dinner  
we couldn’t get [food], mainly because we just didn’t have [money/SNAP]  |
|        | I have to worry about consistently  
in reference to when money runs out to buy food] I wanna say maybe right around, um, the kids’ birthdays actually  
I’ve done some tricks with the meats, I think, to get him to try different meats  
I think he worries, but I don’t think he’s gonna express it.  
I tend to be one of those people that worry about (..)missing keys or—  
I think I generally carry a lot of worry anyway.  
I don’t think I’ve ever thought about it affecting my health or  
But me, I grew up [shrugging], my mother would tell me, it’s not a meal, it’s not a good meal unless you have a vegetable on the plate. And don’t have two starches on the plate. So don’t have mashed potatoes and corn on the plate. I’m a say no because I always try to make sure they always have. [quietly]  |
we buy it because we can make that stretch, [Puts hand to chin again] we can put that in the freezer or something and make it stretch, you know what I’m saying? [Moving head back and forth] **we don’t discuss our weights that much.**

We have canned, so… ugh, I try to get a combination like, one month I might get some canned vegetables/ we have, and how much we have of it, and what, what’s missing for what part of the day. [Gestures] we buy what we can that will stretch we buy the cheapest thing of rice, the bag of rice, big bag of rice, if we can, to last us. Um, along with the brown rice that [WIC] give[s] us.

---

*a* Unless otherwise specified **bolded** text represents raised voice or pitch  
*b* [] -description of body language or sounds in brackets  
*c* ? -final intonation rising  
*d* / - trails off or implied more left unsaid  
*e* // - closed off, conclusive sentence end  
*f* CAPS – emphatic stress
References


Chapter 5: A qualitative investigation into the USDA 18-item Household Food Security Module; variations in interpretation, understanding and report by gender.
Introduction

Food security is defined as access to culturally appropriate, socially acceptable and nutritionally sound food that is sufficient to maintain health and wellbeing. Food insecurity is typically associated with poverty, but not all low-income households experience food insecurity. In developed countries, measurement of food insecurity not only considers the experience of hunger but also the psychological consequences related to worrying about where your food will come from. In the US, it is measured using the USDA’s 18-item Household Food Security Module (HFSM). This tool was originally developed using qualitative techniques to create statements that participants could agree or disagree with using a Likert scale (Appendix A). There are limitations in the understanding of the experience of food insecurity within a household and in fact, recent literature has suggested that food insecurity might be differentially experienced or reported by gender. Phrases in the HFSM were drawn from the Radimer-Cornell Index, which was developed from in vivo quotes from food insecure mothers interviewed by Radimer and colleagues. There have been demonstrated differences in the communication patterns of men and women, and in some fields, gender alternate diagnostic criterion are utilized to allow for men who underreport. In a variety of health related measures, such as the Nottingham Health Profile (NHP) and the Short-Form 36 Health Status Questionnaire, researchers have expressed concerns about how participants are interpreting of the measures. In both of these measures, researchers observed occasions where respondents struggled to select a single response on a Likert scale, or where their discussion of response selection suggested a different interpretation from that intended by the researcher. Similarly, in independent work by Burke and colleagues and Smith and colleagues researchers observed that responses to the 18-item HFSM varied based on gender
of the respondent and discussion related to difficult responding the items suggest concern in measurement.\textsuperscript{1,184}

A variety of qualitative techniques can be used to assess content validity of measures by testing the language. This framework can lay the groundwork for assessing whether men and women differ in their interpretation of key terminology in the measure. This is noteworthy for the HFSM because both male and female respondents complete the measure in national assessments, and the assumption to date has been that the gender of the participant does not influence the results. However, recent literature has suggested gender might play a role in responses.\textsuperscript{59} Specifically, several terms may be interpreted differently by different respondents: ‘household’, ‘balanced meal’, ‘food just didn’t last’, and ‘low cost foods.’ If gender does in fact influence response selection, it will be important to revise how these data are interpreted so that the gender composition of the sample is taken into account. The main objective of this study is to use the cognitive interview think-aloud method to investigate how cohabiting male and female parents of young children interpret the questions of the HFSM and select responses.

In response to questions on a standard questionnaire, decision-making processes can vary due to any number of reasons (including gender). Understanding how an individual selects a survey response option from a provided selection can be ascertained through a mental model. Mental models have been described as a method for researchers to conceptualize an individual’s thought process in learning, reasoning, problem-solving or decision making. However, mental models are internal and deeply varied between individuals. Thus, elicitation techniques were developed to better understand a participant’s description of their mental model.\textsuperscript{185} A commonly utilized elicitation method is the think-aloud interview.\textsuperscript{185} In this process, a research participant
is asked to describe their thought process in-depth as they complete a task or decide on an answer to a survey question.

**Method**

**Participants.** Following approval by the University of Connecticut IRB, pairs (n=25) of low-income, food-insecure, cohabiting parents of children ages 2.5-10 years old were recruited to participate in individual, one-on-one interviews to assess household food security status and ascertain interpretation of and meaning of terminology in the USDA’s 18-item HFSM. Dyads were considered low income if they reported eligibility for certain federal food assistance or related programs. Food security status was ascertained prior to participation in interviews by at least one parent per household responding affirmatively to one of the first three items on the HFSM. Both parents did not need to report food insecurity to qualify for participation. Pending eligibility, interviews were scheduled and written informed consent was obtained.

**Measures.** A demographics questionnaire developed for this study was used to ascertain descriptive variables (i.e. race, ethnicity, employment status, marital status, nutrition assistance program participation) about the parents and is used to describe the sample population.

The interview script was developed using the think-aloud method to elucidate interpretation of the food security questions and rationale behind responses (Script included in Table 1). Questions were designed to assess how or why parents within a household may perceive or respond differently to the food security issues. Open-ended questions were used to probe for rationale behind response choice, emotions related to providing specific response, barriers to providing honest or candid responses and, interpretation of key terms in the questionnaire. Over the course of the study, repeatedly administered probes that were not part of the original script were added to the standard script.
Researchers trained in cognitive interviewing techniques conducted the interviews in a private location such as the parents’ home or a community partner site serving low-income families. Interviews were videotaped (with audio-record for backup) and transcribed verbatim. Videotaped footage was used to capture non-verbal responses to the food security interview questions to help elucidate varying responses between partners within a household. Mothers and fathers were interviewed and videotaped separately in private rooms to ensure parents did not influence each other’s responses. Each parent was provided with a $20 gift card incentive for participation in the interview.

As part of the reflexivity process, interviewers routinely debriefed following interviews to reflect on commonalities and discrepancies in reports of mothers and fathers and additional probes were discussed for future interviews when appropriate. Further, interviewers kept reflective memos following all interviews and debriefs that provide context that may have not been depicted in the videos or demographic questionnaires (e.g. disclosures of recent life events, changes in job status, explanation that occurred after the recorder or camera was turned off or, context that parents provided when they came back together to receive gift cards at the end).

**Analysis**

Descriptive statistics were aggregated to describe the sample population and analyzed using SPSS version 20. Findings from Study 1 guided this qualitative investigation into differences in interpretation or responses to items that are correlated between parents within a household. The interviews were coded using an inductive, basic interpretive approach. This approach allowed for investigation into frequently occurring patterns. Codes were derived either in vivo, using key words or phrases from parents, or by researcher discretion to capture a concept more broadly. Codes were collected and organized in the qualitative software program NVivo.
Pro (Version 11, Melbourne, Australia, 2017). Using this software allows the data to be easily stratified in several unique ways. This software organizes data in “nodes,” so that specific probes and their corresponding responses can be sorted by participant gender. Discussions about household food availability and insufficiencies are often emotional, and meaning is conveyed in unspoken ways. Facial expressions, significant pauses, and meaningful gestures are described in brackets to allow the reader to understand the gravity of the respondent’s communications. These descriptions utilized techniques styled from a discourse analytical approach, which allow a researcher to draw meaning from forms of communication that exceed the spoken or transcribed words in an interview. Accordingly, a coding scheme was developed for this analysis to capture changes in body language during the interview. Body language and significant changes in volume or cadence are described in brackets (i.e. [grimaces]); emphasis is indicated in whole words capitalized (i.e. we REALLY try to avoid that); and pauses are denoted by ellipses (i.e. a three second pause (…).

**Results and Discussion**

Key demographic characteristics describing the sample population are shown in Table 1. Overall, these couples were diverse, low-income, cohabiting, heterosexual couples with at least one child between the ages of 2.5 and 10 years old who they raise together. Most parents participated in SNAP and Medicaid health insurance programs. However, programs such as WIC and Head Start (who specifically serve families with children in this age range) were underutilized by the participants in this sample despite their eligibility, which is consistent with national data of similar populations.
**Key Terms and Jargon**

In order for questionnaires to yield valid data, the population answering the survey instrument must share a common vocabulary with the researchers. The HFSM contains several key words and phrases that are jargon; definitions not only vary by knowledge and expertise, but also by life experience. Terms that have been previously identified as problematic\(^{138}\) and themes related to participant’s definitions of those terms are included below.

**“A household”**

The HFSM is a measure of a respondent’s perception and self-report of their household’s food security status. Thus, defining the unit of interest, which is the household, is important. In this sample, some key concerns arose about the definition of household. Mothers consistently referred to their immediate family members who lived with them. Examples include: *M004: “my three children and my husband and myself, M012: the people in the house where I live, M017: the family.”*

Fathers’ definitions were variable and suggest that this terminology might not share a common definition. Fathers who had adult children no longer living at home, or non-custodial children they still provided for, would include those family members in their discussion of providing food for their families. Some fathers defined a household consistently with mothers such as *D005: “my immediate family.”* Other fathers thought a household referred to the physical structure they lived in, *D014: “My household, um, actual home you know? The physical being of a house.”* But noticeably, fathers often offered those definitions with an upward intonation indicating they were questioning the definition they delivered. Further, many fathers could not define a household when asked to describe it in their own words, such as *D08: “who’s the boss, or something like that?”* These differences by gender might suggest that cohabiting
parents, those that share a “household,” interpret and answer the HFSM differently. Based on these interviews, other terms that parents used as an alternative to household could be “my family” or “my immediate family”. Several fathers discussed “the people I’m responsible for” in describing who they provided for, fed or ate with, which could be an alternative phrase to use with parents.

Mothers’ definitions were consistently accurate. They define a household similarly to Merriam-Webster’s definition that states, “those who dwell under the same roof and compose a family, also, those living together in the same dwelling.” Fathers’ definitions lack consistency. Further, perhaps as societal pressures change the differentiation between men and women’s gender roles in maintaining a home and caring for a family, there are some fathers who view a household similarly to mothers and others who define a household as the structure, of which they are responsible as a man for maintaining.187,188

“A balanced meal”

Food security is defined as access to nutritionally sound and culturally appropriate food that is sufficient in quality and quantity to support health and wellbeing. Thus, the HFSM aims to address whether or not a household can afford “balanced meals.” Mothers often defined balanced meals in a way that is consistent with The Dietary Guidelines for Americans. Examples included: M04: “a meal is like I said, a meat, a starch, a vegetable. Even better if you have a fruit, or M012: your meats, your vegetables, your starches, and that, I really think a well-balanced meal.” Often mothers would reference food groups or the Food Guide Pyramid. Some made specific reference to cultural requirements for a meal to seem balanced such as, M09: “to me, I’m Hispanic, so it would be rice, um, beans, uh, I’m talking about dinner.” Alternatively, fathers’ definitions of balanced meals fell into one of three categories. First, there were those
who were consistent with the mothers and referenced food groups or the dietary guidelines like: 

*D01: Nutritional guidelines.* Second, nearly half of the dads made reference to the importance of variety in reference to meals being balanced, *D08: More about amount, variety and quality, less about food groups.* This category of fathers in interesting, because balance from a nutritional standpoint seemed not to matter at all, as long as the diet was not boring and there were options. One father even listed out a balanced meal example from the previous week being “*D014: potatoes, rice, pasta... you know different things to choose.*” The third group of fathers stated that balance had no importance to them. For example, *D04: I don’t know, to me, food is food.* The idea of defining a balanced meal is not just a challenge for food insecure families. Conceptually, a balanced meal is relative and subjective. Perhaps evident by the fact that Americans vastly under consume foods encouraged in the Dietary Guidelines and overconsume foods those guidelines discourage.189

There are notable differences in the way that mothers and fathers define a balanced meal, which may shed light on differential responses between parents within a household. These inconsistencies may be related to gender differences in health literacy. Perhaps, men are not reacting to the impact of financial strain on their diet quality because they are less literate about healthy eating standards. Consistent with previous data, men have lower health literacy rates compared to their female counterparts.77,78,141,142 Alternatively, perhaps men are less often reporting impairment because even if they faced less financial strain, their eating would be similar. Literature supports women have greater nutrition knowledge, eat more fruits, vegetables, cereals and low-fat dairy.190 Men are less likely to elect to change eating patterns, for example to lose weight or impact their health status they are more likely to attempt to do so through physical activity rather than dietary changes.190
**Balanced Meals for a Child**

Healthy eating is a subjective construct, but adding to the complexity is the concept of healthy eating for a child. In the HFSM, parents (or an adult in the household) were asked to describe the adequacy of children’s meals in the second child reference question, CH2. “(I/We) couldn’t feed (my/our) child/the children) a balanced meal, because (I/we) couldn’t afford that.” This question was largely inconsistent in parental response. For mothers, some offered definitions of a balanced meal that were consistent with definitions for a balanced meal for an adult, for example, M010: “Like, in my mind, you have to have a vegetable and a meat and um, some type of starch or dairy product, too.” For others, they noted that the health value of the food was important but similarly important was that the child would eat and enjoy what they were served, M011: “Um you know that they have enough energy food. You know there’s lots of food that is designed to just fill you up instead of like actually being used as energy so um you know they’re trying to eat as many vegetables as they can. Trying to find vegetables that kids like is a whole new challenge.” For other mothers, they seemed more worried about child safety in eating than in nutritional quality, for example worrying that foods were not a choking hazard or checking that food was a safe temperature, M002: “right now we feel (implying to check the temperature) whatever he’s going to eat. Fathers, even those who didn’t mention food groups in reference to defining a balance meal for an adult, suggested that children’s meals should include multiple food groups, such as D005: “making sure that you mix and mingle with your protein, your carbohydrates, your uh, all the necessary things like that;” or another father D017: “I mean I think for a child I think healthier stuff for them. You know dairy products, milk for them. Um vegetables, you know fruits, stuff like that.” For some fathers, they shared that balanced for an adult and child were the same, while others share that for adults, a balanced meal is what will
keep an adult healthy, D019: “I would think it’s the same thing as an adult, for others, healthy eating is based on a child’s preferences, D022: Um, for an adult, a balanced meal is something that’s healthy for him. Healthy meal for a kid is typically, what I like best.”

From these data, it is apparent that many people are unclear about what is healthy or balanced for a child. Previous research suggests that there is a disconnect between child feeding messages and parental interpretation and actions. The lack of consistent and accurate messaging, confounded by lower educational attainment in low income populations might contribute to the difficulty of defining a balanced meal for a child. Further, low-income status has been associated with lower diet quality which could be a function of bother price or poor nutrition knowledge. Defining a balanced meal seems to lack consistency and further, responses to providing a balanced meal for a child might not accurately assess a family’s ability to provide nutritionally sound food to their child as is intended by the HFSM.

Low cost foods

One of the child questions refers to low cost foods: “(I/we) relied on only a few kinds of low-cost food to feed (my/our) child/the children) because (I was/we were) running out of money to buy food.” As a part of the interview procedures, parents were asked to describe examples of low cost foods or meals prepared with low cost foods. Figures 5.1 and 5.2 are word clouds depicting the frequency of word use in description of the low-cost foods. In interpreting these graphics, the larger words are used the most often and the smaller words are used less frequently. Mothers more often referenced specific foods that were frequently affordable, while fathers reference brands and stores to purchase foods at lower prices. Commonly, mothers and fathers referenced pasta dishes like macaroni and cheese and the most commonly mentioned food for both mothers and fathers was hot dogs. Whether or not a parent interprets low cost foods as
being synonymous with low quality, calorically dense, nutritionally void foods or they interpret low cost foods as simply the brand name food or store brand food, could meaningfully alter results yet again. One mother stated, M011: ”... low quality, low cost. They are both one of the same”, while a father described purchasing store brand as no particular hardship, but an example of them relying on low cost foods. Interestingly, some nutrient dense foods were commonly listed as a low-cost food, for example many mothers used eggs as an example.

This item, and the term “low cost foods,” is intended to measure whether or not, or with what frequency financial strain is contributing to a family sacrificing the nutrient density of foods. Perhaps, measuring the frequency of use of less preferred generic brands compared to name brands is meaningful, but that is likely not the intention. This item is intended to measure whether or not financial strain is contributing to a family sacrificing the nutrient density of foods.

**Worry**

The psychological constructs of depression and loneliness are reported differently by men and women\(^{65,180}\), therefore, it was expected that the construct of worry might similarly vary by participant gender. Interestingly, in this sample, depression and anxiety scores were significantly correlated between parents within a household. For the following responses, please note that the nonverbal communication of participants can juxtapose how emotion might play a role in the ways men and women respond to this question, and nonverbal communication can convey a different meaning than the words alone. In discussing what worrying about their food running out meant to each parent, mothers described their worry using terms such as: stressful, nerve wracking, depressing, hard, and difficult. Despite worry, they seemed forthcoming and to communicate openly about their worry, what caused it and its consequences. One mother said, M06: “I mean that, you know, if you go to the store, you go shopping, and you thought that
would take you to the next, uh, paycheck, and then you realize that um, you know, you’re probably coming up a little bit short.” Another mother said, M015: “I know that I’ve worried about that before, just that, um...money is really tight, you know. And am I gonna be able to get what we need at the store? Mothers often discussed worrying about being at the store and coming up short, or worrying the last few days before their next benefits came through. Fathers on the other hand redirected the conversation to how it could be worse or offered reason for optimism. For example, one father admitted stress but offered optimism, D02: “It can be stressful at times. But... as time goes on, it’s getting less and less, ‘cause financially we’re getting better and better.” This father, started with how he was optimistic that God would provide, but did admit to stress, D004: “I believe that God blessed this Earth, we always survive, no matter what. You just, you try to work hard to be sure the kids not, getting whatever, they needed. Especially food, they have enough to eat. But sometimes if you get that, you’re like, what am I going to do? How to you know, face them, or... [trails off].” Worry could also be a difficult emotion to admit to, it seemed to be for this father who simply offered D018: Sometimes. [grimace], and declined further probing. Another father thought that although he worried, he felt that worry was part of the shared human experience, D011: “I think it’s been a concern just because it’s like a part of humanity, just like--the idea of food anxiety and not knowing where, even if you’ve got piles of food, you know, it’s, it’s lentils and, you know, stuff that might not be your first choice.” Although few fathers came out and directly stated that food insecurity was a difficult topic for a man to discuss, this father did share that his worry was mostly, because he viewed food insecurity as him not reaching his potential as a father and provider, D012: “It don’t feel good, for one. It, it, it makes you feel, as a parent and as a provider, it makes you feel powerless, you know what I mean?” Overall, for mothers, although the experience is hard,
discussing it with someone appeared therapeutic and mothers seemed open to answering in a way that appeared forthcoming. Fathers on the other hand often offered a dissenting response, denying the experience of worry, but later through probing they would admit to the experience of worry, and on occasion decide that they should have offered a different response. Interestingly, fathers through probing would retroactively change their response, for example if they described their home food environment and then a researcher restated the question using language similar to the respondent they would answer affirmatively. Future work should investigate complementary questions that could be developed through fathers’ words.

In the work by Addis on the relationship between masculinity and depression, he theorizes that differences in report of depression are likely related to one of four frameworks.62 The first suggests that there are sex differences in prevalence but the disease and it’s presentation are similar in men and women. Another, suggest that men “mask” depression with other negative externalizing behaviors like substance abuse. The third suggests is that there is a phenotypic differentiation in the presentation of depression by sex. And the final framework suggest that gender norms influence the way that men can discuss and demonstrate their depression altering its phenotype and measurement.62 The theories most likely related to food insecurity are the masking example, as there are examples of the commonly listed attributes of masculinity including: anti-femininity, competitiveness, emotional stoicism, self-reliance and physical toughness.62,181 These attributes could then in turn influence how men respond to worry and food insecurity and the way that they would report on it. The final framework also might relate to food insecurity, suggesting that socialization might differ the way that men experience worry, anxiety or depression because over time they are asked to bury their soft emotions and deal with them without outward expression, and thus there is no symptom to report or measure. Regardless of
the cause, these gender differences contribute men under-reporting worry, depression and anxiety as it relates to a household food security status.

**The food just didn’t last**

The concept of food not lasting and a family not having enough money to purchase more is paradigmatic of food insecurity. “The food that (I/we) bought just didn’t last, and (I/we) didn’t have money to get more,” is one of the experiences that a participant can express agreement to on a Likert scale (HH3 on the 18-item household food security module). This phrase was particularly emotional for participants to discuss, and the pauses and facial descriptions were particularly poignant.

For this specific phrase, one couple provides an illustrative example. Both members of the pair were forthcoming in their responses and did not require significant probing to elicit their mental model. Both members of the couple reported sharing equally the food preparation and shopping responsibility. Thus, they reported on their shared household with a similar experience related to food purchase and preparation. Similar to other mothers in this sample, this mother describes that this phrase could mean that the foods left in their home were not sufficient to create an appealing meal or to eat alone, M001: “yeah that would pretty much be being left with like a few bags of frozen stuff(..) um (...)but nothing particularly that anybody really wants,[shrugs] like you know what I mean (..) like broccoli and green beans and then some like random things. That’s like you know what I mean(..) um that’s the other thing too, is like a lot of times we’ll have a few ingredients for something but like not one thing so I can’t make anything [shrugs and sighs].” Her husband, D001, offered a very different perspective of their household. He explains why he would never agree to such a statement, D001: ‘I mean, that would have to be(..) you know[takes a deep breath](..) there’s literally NOTHING [shouted]
consumable(.........)[is choked up struggling to speak]and there’s a backyard, so there. You know what I mean? You can eat dandelions.” Overall, this mother and father are representative of the sample of mothers and fathers as a whole. Mothers discussed food running out as a reflection of certain rate limiting ingredients, for example one mother discussed having pasta sauce and rice, but not having pasta or beans to make complete meals with what she had. This mother selected the “sometimes” response, indicating that when their SNAP allotment runs out each month, she experiences this. Fathers, on the other hand, often referenced how much worse it could be, or how much worse it was for them growing up, indicating that they would not agree with that statement. For example, one father discussed growing up in a war zone, and splitting bread and broth for dinner with his family when he was a child. He viewed his father skipping meals as heroic and knew that his current family is far better off than he was as a child. Another father reflected on his time incarcerated when he could not provide and was certain that his family was worse off then. Now he felt couldn’t, or shouldn’t complain; D008: “Ok, because, you know(...) being honest, [looks down at the ground]I’ve been, I’ve been having a difficult life (...)You know, [looks up makes strong eye contact and sits up straight] I make a lot of mistake in my life. And that caused me to go to jail(...)And so those kind of times when I’ve been in jail,[looks down again, voice softens] there’s no way that I can do nothing for nobody.. Because it’s sort of, me, myself, I’m trying to survive there(...) Um(.) and even(.) even the once in a while in jail, instead my wife take care of me when I’m locked up. It’s impossible like(...) but(.) now I can help...[trails off].” Of note, in this question, fathers were often complimentary of their partners, the mothers. Several indicated that it was because of their wives that they did not experience a worse scenario. For example D003: “Because my wife always makes sure that we always have enough—and that—it’s healthy and it’s not just, thrown around and junk food.”
Based on this sample and corresponding data, it appears that the statement as written, “The food that (I/we) bought just didn’t last, and (I/we) didn’t have money to get more,” elicits quite different interpretation for mothers and fathers. For fathers, the scenario they are offered to agree or dissent with is more severe than their present scenario, which they imagine could be worse. Some contextualize their response in life experiences to minimize their present undesirable situation. In other work, fathers who experienced corporal punishment as children were more likely to report use of corporal punishment as an adult. Further, fathers were more likely to justify or minimize the consequence of corporal punishment based on previous experiences. Mothers, on the other hand, seem to have a standard in mind for how they want to feed their children and if limited finances prevent them from meeting it, they offered an affirmative response. The manner in which fathers are complimentary to mothers when describing making do with less, seems to deflect from the insufficiency in the households. Perhaps, women are more susceptible to altering their responses related to social desirability and because worrying for women is socially acceptable and even desirable they can offer an affirmative response.

Does emotion make it difficult to answer these questions?

One concern when conducting interviews about painful topics is that people may not be comfortable answering the questions honestly. For that reason, all participants were asked about worry and related emotions, and if their feelings made it difficult to answer those questions. For mothers, they often used the word honesty, in the reply such as M009: “No. Um, I’m answering as honest as I can.” Mothers often mentioned that the interview process felt therapeutic, though this might not be the case if the questionnaire was traditionally administered. Many fathers said that they were honest, but they’d imagine for other men it would find it difficult to respond.
honestly. For example, D003: “Yes, absolutely. Because you, you embarrassed, you don’t want other people to know, or D008: Today you are here, tomorrow you can be down. And you know, maybe some, some people don’t wanna show to the other person, like, what he been through right now.” Overall, responses to this question indicate that for some men, machismo or stoicism might contribute to difficulty responding to these questions honestly, although most men said it wouldn’t affect them personally.

Conclusions

For a research tool to be valid, it requires that all possible participants and researchers share a common vocabulary, particularly for key terms in the measure. The HFSM relies on terms and phrases that are jargon and do not meet this standard. The HFSM is a subjective, self-report measure, however, variations by gender have been previously unnoticed.

In the present investigation, varying interpretation of key terms and jargon presented indicate poor content validity. When comparing mothers’ and fathers’ definitions of key terms, variations were observed. Further, there were also examples of where both mothers’ and fathers’ definitions differed from the intention of the measure. Of particular concern is that men and women differ in their definitions of the key term, “the household.” This is concerning because the household is the unit of reference for all questions in the measure. Further, previous literature has cited gender differences in health literacy, which may play a role in how parents define a “balanced meal.” Women often define health related concepts based on expert advice, while fathers determine parenting and health decisions based on peers and personal experience. This is particularly important because food security is defined as access to nutritionally sound food, and this terminology is in the item that assesses a balanced meal.
Finally, it appears that life experience and male stoicism or machismo might alter the responses provided to the more severe items and those related to worry for men. Interestingly, regardless of gender, there were many participants who were unsure how to define a balanced meal for a child. There is a theory that children who live in food insecure households may be shielded from the negative effects of food insecurity. Although this may be true, it is also possible that there are unreported instances where a child’s diet quality is negatively impacted because parents do have define a “balanced meal” for a child as one that is consistent with the Dietary Guidelines for Americans.

This study is the first to date to investigate how the gender of a participant may be related to responses to the HFSM. Suggestions from the present data include the addition of several items that can be used when the measure is administered to men in order to give men the same opportunities for affirmative responses. Changing terminology in questions such as those containing the terms “balanced meal,” and “household,” could allow for consistent interpretation and corresponding responses. Because the current measure is used in longitudinal assessment, the best approach moving forward could be to create, develop and validate an additional, complementary measure that might allow for the more thorough and consistent evaluation of food security by gender.
Table 5.1. Demographic Variables of Food Insecure, Low Income Parents of Young Children.

<table>
<thead>
<tr>
<th>Household Level Variables</th>
<th>N</th>
<th>%</th>
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<tbody>
<tr>
<td>SNAP Participant</td>
<td>18</td>
<td>72</td>
</tr>
<tr>
<td>WIC Participant</td>
<td>12</td>
<td>48</td>
</tr>
<tr>
<td>Head Start Participant</td>
<td>12</td>
<td>48</td>
</tr>
<tr>
<td>Medicaid Participant</td>
<td>22</td>
<td>88</td>
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<table>
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<tr>
<th>Marital Status</th>
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<tr>
<td>Living with Partner</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>Married</td>
<td>17</td>
<td>68</td>
</tr>
<tr>
<td>Divorced</td>
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<td>4</td>
</tr>
<tr>
<td>Other</td>
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<td>8</td>
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<table>
<thead>
<tr>
<th>Parental Variables</th>
<th>Mother</th>
<th>Father</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Employment Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stay at home parent</td>
<td>11 (44)</td>
<td>2 (8)</td>
</tr>
<tr>
<td>PT</td>
<td>4 (16)</td>
<td>4 (16)</td>
</tr>
<tr>
<td>FT</td>
<td>1 (4)</td>
<td>11 (44)</td>
</tr>
<tr>
<td>Not employed</td>
<td>9 (36)</td>
<td>8 (32)</td>
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<table>
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<tr>
<th>Race</th>
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<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>15 (60)</td>
<td>14 (56)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Mother</td>
<td>Father</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>Black</td>
<td>3 (12)</td>
<td>5 (20)</td>
</tr>
<tr>
<td>Asian</td>
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<td>1 (4)</td>
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<tr>
<td>America Indian/Alaska Native</td>
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<td>1 (4)</td>
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<td>Other</td>
<td>6 (24)</td>
<td>4 (16)</td>
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<td>Ethnicity (Hispanic)</td>
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<tr>
<th>Categorical Report of Food Security</th>
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<th>Father</th>
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<tr>
<td>High food security</td>
<td>7 (28)</td>
<td>12 (48)</td>
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<tr>
<td>Marginal food security</td>
<td>14 (56)</td>
<td>10 (40)</td>
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<td>Low food security</td>
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<tr>
<td>Very low food security</td>
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<th>Household Food Security Scores</th>
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<th>Mean (SD)</th>
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<tr>
<td></td>
<td>4.3 (2.6)</td>
<td>3.3 (2.6)</td>
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Figure 5.1: Word cloud of commonly used words by low-income fathers in reference to low cost foods
Figure 5.2: Word cloud of commonly used words by low-income mothers in reference to low cost foods
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Chapter 6: Conclusions and Future Directions
Conclusions

The HFSM is a self-reported measure that is possibly influenced by the respondent’s history of poverty or personal experiences of food insecurity, knowledge, education, SES, and gender.\textsuperscript{69-72,90-92} However, a fundamental assumption of the HFSM is that it is valid, reliable and performs similarly on all respondents regardless of gender or culture. Further, the Rasch model, of which this tool is based on, requires that the instrument function invariantly regardless of gender.\textsuperscript{53} Prior to this work, confidence in the reliability of the HFSM has already wavered. For example, Dr. Christopher Barret suggests, “[c]ontinued reliance on a contested national food availability measure reflects the limited availability and timeliness of household and individual data collected in nationally representative surveys.” \textsuperscript{96} Further, this measure, which is based solely on only individuals report of their household and self-report individual data, produced higher estimates of food security prevalence than more empirically generated aggregate data which can reflect that either aggregate data underestimates prevalence or this self-report measure overestimates prevalence or some combination of both.\textsuperscript{94}

In the present investigation, it appears that the HFSM has lower levels of content validity for men compared to women. Several questions were flagged as having particularly low inter-rater reliability. It is possible that this measure’s function might result in differential misclassification of a condition or state.\textsuperscript{134} For example, fathers are consistently less forthcoming in discussing a condition that is perceived as emasculating.

This investigation also demonstrates that Discourse Analysis and its forms can significantly contribute to the nutrition field, particularly as inductive, thesis generating work. DA as a technique, permits researchers to view transcribed interviews through a lens that allows for the interpretation of more than words, but the meaning behind the words used in
communication, even when word choice is not always a conscious selection. Particularly useful was the investigation into the use of I- and We-Statements and the Position Design and Identity Building forms, which allowed the communication patterns of a mother and father to be juxtaposed. DA has implications for further application in nutritional research. Researchers need to consider audio and visual recording interviews and analytical memoing as standard practices.

Finally, the HFSM contains several words and phrases that are jargon with definitions that might not only vary between researchers and the target population, but by gender within the target population as well. Concerns were highlighted for the following phrases: “the household,” which is the unit of reference for the measure; “balanced meal,” which assesses a key tenant to food security; access to nutritionally sound food, and “food running out,” which is definitive of food insecurity; and questions about “worry,” which seem impacted by male stoicism or machismo. It is undeniable that these differences observed are likely related to a more complicated interplay of gender, socioeconomic status, race and culture. Thus, it would be prudent for future investigations to acknowledge intersectionality, or the theory that social identities, intersect to create a whole that is different from the component identities.199

Ultimately, when compared to mothers, the HFSM as a tool may underestimate food security in the 8% of US households with minors led by fathers200 because they tend to report lower estimations of food security than mothers. This is problematic because fathers are already underserved by our nutrition safety net, which means they are missing out on both resources for food and nutrition education opportunities. Thus, it is unknown if household level data estimates are valid when different respondents varying by gender answer for a household. Notably, much research related to food insecurity focuses on mothers, perhaps making these findings less problematic. However, if the reality is that fathers’ food insecurity is underestimated, more
attention and additional research is needed to better understand the experience of food security by fathers. This line of investigation is timely because the role of the father at home and at meal times has shifted, and there can no longer be reliance on a mother as the consistent and sole provider of household information. Further, households with children face nearly double the risk of food insecurity compared to their childless counterparts, and food insecurity has lasting, negative impacts on the health, psychological and educational development of children.25,95,103,104,201

Future directions include the need to validate the HFSM through observational studies, comparing the report between mothers and fathers living in poverty. If fathers are in fact inaccurately assessed using the HFSM, it would be prudent to develop a measure that could accurately assess food insecurity for households headed by men. Surveys that vary for participant gender, or can be adjusted according to a participant’s gender, are available in other fields, such as the Faces Survey for assessing job satisfaction.202 Further, there are surveys that vary systematically by gender like measures for depression,62 loneliness65 and fear203 measures. In fact, assessing gender (not just sex) differences has garnered growing attention in epidemiological work.60,64,204,205 The work by Moerman and colleagues suggests that the best approach to systematically explore gender sensitivity in a measure requires obtaining data regarding the construct available by sex, such as through using the National Health and Nutrition Examination Survey (NHANES) or census data.204 Then, a review of the literature is needed to define observed sex/gender differences in food insecurity experience and report. Further, observation of the home food environment and quantifiable assessment of the household food availability in conjunction with assessment of self-report food security status would be an important additional step. With a larger sample, Differential Item Function (DIF) or multiple
group analysis in Structural Equation Modelling (SEM) would be valuable next steps. Finally, it
may be useful to operationalize the understanding of sex and gender differences in the
experience of a construct such as demonstrated in Figure 6.1.

To the author’s knowledge, this study is the first to date to investigate how gender of a
participant may be related to responses to the HFSM. Suggestions from the present data include
the addition of several items that can be used when the measure is administered to men, to offer
the same opportunities for affirmative responses as existed through probing in this interview
process. Changing terminology in questions such as those containing the terms “balanced meal,”
and “household,” to allow for consistent interpretation and corresponding responses may be
needed. Because the current measure is used in longitudinal assessment, a best approach moving
forward could be to create, develop and validate an additional, complementary measure that
might allow for the more thorough and consistent evaluation of food security by gender.
Figure 6.1. An operationalized depiction of the gender and sex differences in the report and measurement of food insecurity
Appendices
Appendix A. USDA Household Food Security Module (HFSM)

Optional USDA Food Sufficiency Question/Screener: Question HH1 (This question is optional. It is not used to calculate any of the food security scales. It may be used in conjunction with income as a preliminary screener to reduce respondent burden for high income households).

HH1. [IF ONE PERSON IN HOUSEHOLD, USE "I" IN PARENTHETICALS, OTHERWISE, USE "WE."]

Which of these statements best describes the food eaten in your household in the last 12 months: —enough of the kinds of food (I/we) want to eat; —enough, but not always the kinds of food (I/we) want; —sometimes not enough to eat; or, —often not enough to eat?

[1] Enough of the kinds of food we want to eat

[2] Enough but not always the kinds of food we want

[3] Sometimes not enough to eat

[4] Often not enough to eat

[ ] DK or Refused

Household Stage 1: Questions HH2-HH4 (asked of all households; begin scale items).

[IF SINGLE ADULT IN HOUSEHOLD, USE "I," "MY," AND “YOU” IN PARENTHETICALS; OTHERWISE, USE "WE," "OUR," AND "YOUR HOUSEHOLD."]

HH2. Now I’m going to read you several statements that people have made about their food situation. For these statements, please tell me whether the statement was often true, sometimes true, or never true for (you/your household) in the last 12 months—that is, since last (name of current month).
The first statement is “(I/We) worried whether (my/our) food would run out before (I/we) got money to buy more.” Was that often true, sometimes true, or never true for (you/your household) in the last 12 months?

[ ] Often true
[ ] Sometimes true
[ ] Never true
[ ] DK or Refused

HH3. “The food that (I/we) bought just didn’t last, and (I/we) didn’t have money to get more.” Was that often, sometimes, or never true for (you/your household) in the last 12 months?

[ ] Often true
[ ] Sometimes true
[ ] Never true
[ ] DK or Refused

HH4. “(I/we) couldn’t afford to eat balanced meals.” Was that often, sometimes, or never true for (you/your household) in the last 12 months?

[ ] Often true
[ ] Sometimes true
[ ] Never true
[ ] DK or Refused

**Screener for Stage 2 Adult-Referenced Questions:** If affirmative response (i.e., "often true" or "sometimes true") to one or more of Questions HH2-HH4, OR, response [3] or [4] to question HH1 (if administered), then continue to Adult Stage 2; otherwise, if children under age 18 are present in the household, skip to Child Stage 1, otherwise skip to End of Food Security Module.
NOTE: In a sample similar to that of the general U.S. population, about 20 percent of households (45 percent of households with incomes less than 185 percent of poverty line) will pass this screen and continue to Adult Stage 2.

**Adult Stage 2: Questions AD1-AD4** (asked of households passing the screener for Stage 2 adult-referenced questions).

AD1. In the last 12 months, since last (name of current month), did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food?

[ ] Yes

[ ] No (Skip AD1a)

[ ] DK (Skip AD1a)

AD1a. [IF YES ABOVE, ASK] How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

[ ] Almost every month

[ ] Some months but not every month

[ ] Only 1 or 2 months

[ ] DK

AD2. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?

[ ] Yes

[ ] No

[ ] DK
AD3. In the last 12 months, were you ever hungry but didn't eat because there wasn't enough money for food?
   [ ] Yes
   [ ] No
   [ ] DK

AD4. In the last 12 months, did you lose weight because there wasn't enough money for food?
   [ ] Yes
   [ ] No
   [ ] DK

**Screener for Stage 3 Adult-Referenced Questions:** If affirmative response to one or more of questions AD1 through AD4, then continue to Adult Stage 3; otherwise, if children under age 18 are present in the household, skip to Child Stage 1, otherwise skip to End of Food Security Module.

**NOTE:** In a sample similar to that of the general U.S. population, about 8 percent of households (20 percent of households with incomes less than 185 percent of poverty line) will pass this screen and continue to Adult Stage 3.

**Adult Stage 3: Questions AD5-AD5a** (asked of households passing screener for Stage 3 adult-referenced questions).

AD5. In the last 12 months, did (you/you or other adults in your household) ever not eat for a whole day because there wasn't enough money for food?
   [ ] Yes
[ ] No (Skip AD5a)

[ ] DK (Skip AD5a)

AD5a. [IF YES ABOVE, ASK] How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

[ ] Almost every month

[ ] Some months but not every month

[ ] Only 1 or 2 months

[ ] DK

Child Stage 1: Questions CH1-CH3 (Transitions and questions CH1 and CH2 are administered to all households with children under age 18) Households with no child under age 18, skip to End of Food Security Module.

SELECT APPROPRIATE FILLS DEPENDING ON NUMBER OF ADULTS AND NUMBER OF CHILDREN IN THE HOUSEHOLD.

Transition into Child-Referenced Questions:

Now I'm going to read you several statements that people have made about the food situation of their children. For these statements, please tell me whether the statement was OFTEN true, SOMETIMES true, or NEVER true in the last 12 months for (your child/children living in the household who are under 18 years old).

CH1. “(I/we) relied on only a few kinds of low-cost food to feed (my/our) child/the children) because (I was/we were) running out of money to buy food.” Was that often, sometimes, or never true for (you/your household) in the last 12 months?

[ ] Often true
CH2. “(I/We) couldn’t feed (my/our) child/the children) a balanced meal, because (I/we) couldn’t afford that.” Was that often, sometimes, or never true for (you/your household) in the last 12 months?

[ ] Often true
[ ] Sometimes true
[ ] Never true
[ ] DK or Refused

CH3. "(My/Our child was/The children were) not eating enough because (I/we) just couldn't afford enough food." Was that often, sometimes, or never true for (you/your household) in the last 12 months?

[ ] Often true
[ ] Sometimes true
[ ] Never true
[ ] DK or Refused

**Screener for Stage 2 Child Referenced Questions:** If affirmative response (i.e., "often true" or "sometimes true") to one or more of questions CH1-CH3, then continue to **Child Stage 2**; otherwise skip to **End of Food Security Module.**
NOTE: In a sample similar to that of the general U.S. population, about 16 percent of households with children (35 percent of households with children with incomes less than 185 percent of poverty line) will pass this screen and continue to Child Stage 2.

**Child Stage 2: Questions CH4-CH7** (asked of households passing the screener for stage 2 child-referenced questions).

**NOTE:** In Current Population Survey Food Security Supplements, question CH6 precedes question CH5.

CH4. In the last 12 months, since (current month) of last year, did you ever cut the size of (your child's/any of the children's) meals because there wasn't enough money for food?

[ ] Yes
[ ] No
[ ] DK

CH5. In the last 12 months, did (CHILD’S NAME/any of the children) ever skip meals because there wasn't enough money for food?

[ ] Yes
[ ] No (Skip CH5a)
[ ] DK (Skip CH5a)

CH5a. [IF YES ABOVE ASK] How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

[ ] Almost every month
[ ] Some months but not every month
[ ] Only 1 or 2 months
[ ] DK
CH6. In the last 12 months, (was your child/were the children) ever hungry but you just couldn't afford more food?

[ ] Yes

[ ] No

[ ] DK

CH7. In the last 12 months, did (your child/any of the children) ever not eat for a whole day because there wasn't enough money for food?

[ ] Yes

[ ] No

[ ] DK
Appendix B- Cognitive Interview Script with Scripted and Unscripted Probes

USDA Household Food Security Questionnaire Interview Script

[Note: The questions below are a standard set of questions from USDA. The “questions probes” are the additions that we are making as part of this research project.]

“I am about to ask you several questions. I would like you to think out loud as you decide on your answer. Often people answer questions quickly and we don’t discuss how you came to that answer. For today, I’d like you to take your time and talk through each question with me. I want to know how you choose answers. Please tell me why you are selecting a response, and why and how other answers don’t work for you. I would like you to tell me how you feel answering these questions. If our talking reminds you of a story or something that is happened to you, please feel free to tell me about that. ”

Before with get started, let’s try a practice question so you can used to the process.

Icebreaker question: What is your favorite season of the year?

[1] Spring
[2] Summer
[3] Fall

HH1. [IF ONE PERSON IN HOUSEHOLD, USE "I" IN PARENTHETICALS, OTHERWISE, USE "WE."]
Which of these statements best describes the food eaten in your household in the last 12 months: —enough of the kinds of food (I/we) want to eat; —enough, but not always the kinds of food (I/we) want; —sometimes not enough to eat; or, —often not enough to eat?

[1] Enough of the kinds of food we want to eat
[2] Enough but not always the kinds of food we want
[3] Sometimes not enough to eat
[4] Often not enough to eat
[ ] DK or Refused

**Question Probes**

a. What do you consider your household?

b. Who lives in your household? How did you decide who is part of your household?

c. How did you arrive at that answer?

d. [If answered 2-4] What kinds of foods did you want but don’t have access to or can’t afford?

**Household Stage 1: Questions HH2-HH4** (asked of all households; begin scale items).
[IF SINGLE ADULT IN HOUSEHOLD, USE "I," "MY," AND “YOU” IN PARENTHETICALS; OTHERWISE, USE "WE," "OUR," AND "YOUR HOUSEHOLD."]

**HH2.** Now I’m going to read you several statements that people have made about their food situation. For these statements, please tell me whether the statement was often true, sometimes true, or never true for (you/your household) in the last 12 months—that is, since last (name of current month).

The first statement is “(I/We) worried whether (my/our) food would run out before (I/we) got money to buy more.” Was that often true, sometimes true, or never true for (you/your household) in the last 12 months?

[ ] Often true
[ ] Sometimes true
[ ] Never true
[ ] DK or Refused

**Question Probes**

a. [If applicable] How do you decide between choosing often or sometimes?
b. What did it feel like to worry about your food?
c. When you worry about running out of food, are there other changes in your health or mental health as a result?” Does anyone else in your household worry about running out of food?
   
i. If yes, how do you know? What do they do or say?

HH3. “The food that (I/we) bought just didn’t last, and (I/we) didn’t have money to get more.” Was that often, sometimes, or never true for (you/your household) in the last 12 months?

[ ] Often true
[ ] Sometimes true
[ ] Never true
[ ] DK or Refused

**Question Probes**

a. How did you feel when I asked you this question?

b. Does that emotion or feeling make it hard to answer honestly?

c. What does it mean to you that the “food just didn’t last.”

HH4. “(I/we) couldn’t afford to eat balanced meals.” Was that often, sometimes, or never true for (you/your household) in the last 12 months?
[ ] Often true

[ ] Sometimes true

[ ] Never true

[ ] DK or Refused

**Question Probes**

a. What does the term ‘balanced meal,’ mean to you?

b. What foods would you need to balance your meal?

c. How do you feel when you can’t eat a balanced meal?

**Screener for Stage 2 Adult-Referenced Questions:** If affirmative response (i.e., "often true" or "sometimes true") to one or more of Questions HH2-HH4, OR, response [3] or [4] to question HH1 (if administered), then continue to Adult Stage 2; otherwise, if children under age 18 are present in the household, skip to Child Stage 1, otherwise skip to End of Food Security Module.

**NOTE:** In a sample similar to that of the general U.S. population, about 20 percent of households (45 percent of households with incomes less than 185 percent of poverty line) will pass this screen and continue to Adult Stage 2.

**Adult Stage 2: Questions AD1-AD4** (asked of households passing the screener for Stage 2 adult-referenced questions).
AD1. In the last 12 months, since last (name of current month), did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food?

[ ] Yes

[ ] No (Skip AD1a)

[ ] DK (Skip AD1a)

**Question Probes**

a. What meals did you have to cut or skip? Can you describe them for me?

b. Who in the household cut or skipped meals?

c. How did this make you (and/or them) feel?

AD1a. [IF YES ABOVE, ASK] How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

[ ] Almost every month

[ ] Some months but not every month

[ ] Only 1 or 2 months

[ ] DK

**Question Probes**

a. How easy or difficult is it to remember cutting and skipping meals?
b. Are there times when the cutting or skipping is more or less difficult? If “yes,” tell me about those times

c. How does it feel to talk about this?

**AD2.** In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?

[ ] Yes
[ ] No
[ ] DK

**Question Probes**

a. Can you describe to me what was missing or how your portion sizes changed?

b. How did “eating less than you felt you should” impact your life, if at all?

**AD3.** In the last 12 months, were you ever hungry but didn't eat because there wasn't enough money for food?

[ ] Yes
[ ] No
[ ] DK
Question Probes

a. How often did this happen?

b. What meals did you skip?

c. Did other members of your household not eat?

d. How did the hunger affect other parts of your life?

a. Did you being hungry affect your relationship with other people in your household?

e. Did you notice hunger affecting other people in your house?

AD4. In the last 12 months, did you lose weight because there wasn’t enough money for food?

[ ] Yes
[ ] No
[ ] DK

Question Probes

a. If yes, how much weight did you lose?

a. How did you notice that weight loss?

b. What does it mean to you to lose weight because there wasn’t enough money for food?
**Screener for Stage 3 Adult-Referenced Questions:** If affirmative response to one or more of questions AD1 through AD4, then continue to *Adult Stage 3*; otherwise, if children under age 18 are present in the household, skip to *Child Stage 1*, otherwise skip to *End of Food Security Module*.

**NOTE:** In a sample similar to that of the general U.S. population, about 8 percent of households (20 percent of households with incomes less than 185 percent of poverty line) will pass this screen and continue to Adult Stage 3.

**Adult Stage 3: Questions AD5-AD5a** (asked of households passing screener for Stage 3 adult-referenced questions).

**AD5.** In the last 12 months, did (you/you or other adults in your household) ever not eat for a whole day because there wasn't enough money for food?

[ ] Yes

[ ] No (Skip AD5a)

[ ] DK (Skip AD5a)

a. You mentioned that you [were or were not] hungry at one point during the year previously. How is this question about being hungry for a whole day different than being hungry such as because of a cut or skipped meal? Do you think of the same experiences or does this question make you think of other experiences?”
AD5a. [IF YES ABOVE, ASK] How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

[ ] Almost every month
[ ] Some months but not every month
[ ] Only 1 or 2 months
[ ] DK

Child Stage 1: Questions CH1-CH3 (Transitions and questions CH1 and CH2 are administered to all households with children under age 18) Households with no child under age 18, skip to End of Food Security Module.

SELECT APPROPRIATE FILLS DEPENDING ON NUMBER OF ADULTS AND NUMBER OF CHILDREN IN THE HOUSEHOLD.

Transition into Child-Referenced Questions:
Now I'm going to read you several statements that people have made about the food situation of their children. For these statements, please tell me whether the statement was OFTEN true, SOMETIMES true, or NEVER true in the last 12 months for (your child/children living in the household who are under 18 years old).
Remember that you are trying to walk me through your thoughts on each question and
please share with me any feelings you have about these questions or feelings they remind
you of.

**CH1.** “(I/we) relied on only a few kinds of low-cost food to feed (my/our) child/the
children) because (I was/we were) running out of money to buy food.” Was that
often, sometimes, or never true for (you/your household) in the last 12 months?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>[ ]</td>
<td>Often true</td>
</tr>
<tr>
<td>[ ]</td>
<td>Sometimes true</td>
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<tr>
<td>[ ]</td>
<td>Never true</td>
</tr>
<tr>
<td>[ ]</td>
<td>DK or Refused</td>
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</tbody>
</table>

**Question Probes**

a. What are some examples of low cost foods?

b. Where did you get the low cost foods?

c. Who eats the low cost foods?

d. Probe for examples why this response was chosen, i.e.

   sample meal with low cost foods

c. Can you describe if you think that your child notices

   changes in his/her diet?
d. How did you feel about making changes in your child’s diet?

**CH2.** “(I/We) couldn’t feed (my/our) child/the children) a balanced meal, because (I/we) couldn’t afford that.” Was that **often**, **sometimes**, or **never** true for (you/your household) in the last 12 months?

[ ] Often true
[ ] Sometimes true
[ ] Never true
[ ] DK or Refused

**Question Probes**

a. What does the term ‘balanced meal,’ mean for a child?

i. What was missing?

**CH3.** "(My/Our child was/The children were) not eating enough because (I/we) just couldn't afford enough food." Was that **often**, **sometimes**, or **never** true for (you/your household) in the last 12 months?
[ ] Often true
[ ] Sometimes true
[ ] Never true
[ ] DK or Refused

**Question Probes**

a. What does “eating enough” mean to you in reference to your child?

b. What was missing in your child’s diet?

c. Can you describe if your child knows that things are missing, or there isn’t enough?

d. What do you think your child thinks about this?

**Screener for Stage 2 Child Referenced Questions:** If affirmative response (i.e., "often true" or "sometimes true") to one or more of questions CH1-CH3, then continue to *Child Stage 2*; otherwise skip to *End of Food Security Module*.

**NOTE:** In a sample similar to that of the general U.S. population, about 16 percent of households with children (35 percent of households with children with incomes less than 185 percent of poverty line) will pass this screen and continue to Child Stage 2.

**Child Stage 2: Questions CH4-CH7** (asked of households passing the screener for stage 2 child-referenced questions).

CH4. In the last 12 months, since (current month) of last year, did you ever cut the size of (your child's/any of the children's) meals because there wasn't enough money for food?

[ ] Yes
[ ] No
[ ] DK

Question Probes

a. If yes, please describe what meals were cut and how they were cut.

CH5. In the last 12 months, did (CHILD’S NAME/any of the children) ever skip meals because there wasn't enough money for food?

[ ] Yes
[ ] No (Skip CH5a)
[ ] DK (Skip CH5a)

a. What does “meal” mean to you in this question?
b. What does it mean for your child “to skip a meal?”
**CH5a.** [IF YES ABOVE ASK] How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

[ ] Almost every month
[ ] Some months but not every month
[ ] Only 1 or 2 months
[ ] DK

**CH6.** In the last 12 months, (was your child/were the children) ever hungry but you just couldn't afford more food?

[ ] Yes
[ ] No
[ ] DK

**Question Probes**

a. How would you describe your child’s hunger?

b. How did you know your child was hungry?

c. How did it affect you and your family for your child to be hungry?

**CH7.** In the last 12 months, did (your child/any of the children) ever not eat for a whole day because there wasn't enough money for food?
[ ] Yes
[ ] No
[ ] DK

**Question Probes**

a. If yes, please describe the day?

b. If yes, how often did this happen?

c. Probe for feelings
Appendix C. Coping Strategies Index

<table>
<thead>
<tr>
<th>In the past 30 days if there have been times when you did not have enough money to buy food, how often has your household had to:</th>
<th>All the time? Every Day</th>
<th>Pretty often? 3-6x/week</th>
<th>Once in a while? 1-2x/week</th>
<th>Never 0x/week</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Rely on less preferred and less expensive foods?</td>
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<tr>
<td>b. Borrow food, or rely on help from a friend or relative?</td>
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<td>c. Purchase food on credit?</td>
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<tr>
<td>d. Gather wild food, hunt or harvest immature crops?</td>
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<td>e. Consume seed stock held for next season?</td>
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<tr>
<td>f. Send household members to eat elsewhere?</td>
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<tr>
<td>g. Send household members to beg?</td>
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<tr>
<td>h. Limit portion size at mealtimes?</td>
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<tr>
<td>i. Restrict consumption by adults in order for small children to eat?</td>
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<tr>
<td>j. Feed working members of household at the expense of nonworking members?</td>
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<tr>
<td>k. Ration the money you have and buy prepared foods?</td>
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<td>l. Reduce the number of meals eaten in a day?</td>
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<td>m. Skip entire days without eating?</td>
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</table>
Appendix D. Center for Epidemiologic Studies Depression Scale (CES-D)

Date:____________________

Below is a list of some of the ways you may have felt or behaved. Please indicate how often you’ve felt this way during the past week. Respond to all items.

<table>
<thead>
<tr>
<th></th>
<th>Circle the appropriate column.</th>
<th>Rarely or none of the time (less than 1 day)</th>
<th>Some or little of the time (1-2 days)</th>
<th>Occasionally or a moderate amount of time (3-4 days)</th>
<th>All of the time (5-7 days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I was bothered by things that usually don’t bother me.</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
</tr>
<tr>
<td>2.</td>
<td>I did not feel like eating; my appetite was poor.</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
</tr>
<tr>
<td>3.</td>
<td>I felt that I could not shake off the blues even with help from my family.</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
</tr>
<tr>
<td>4.</td>
<td>I felt that I was just as good as other people.</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
</tr>
<tr>
<td>5.</td>
<td>I had trouble keeping my mind on what I was doing.</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
</tr>
<tr>
<td>6.</td>
<td>I felt depressed.</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
</tr>
<tr>
<td>7.</td>
<td>I felt that everything I did was an effort.</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
</tr>
<tr>
<td>8.</td>
<td>I felt hopeful about the future.</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
</tr>
<tr>
<td>9.</td>
<td>I thought my life had been a failure.</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
</tr>
<tr>
<td>10.</td>
<td>I felt fearful.</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
</tr>
<tr>
<td>11.</td>
<td>My sleep was restless.</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
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<tr>
<td><strong>12.</strong></td>
<td>I was happy.</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
</tr>
<tr>
<td><strong>13.</strong></td>
<td>I talked less than usual.</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
</tr>
<tr>
<td><strong>14.</strong></td>
<td>I felt lonely.</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
</tr>
<tr>
<td><strong>15.</strong></td>
<td>People were unfriendly.</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
</tr>
<tr>
<td><strong>16.</strong></td>
<td>I enjoyed life.</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
</tr>
<tr>
<td><strong>17.</strong></td>
<td>I had crying spells.</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
</tr>
<tr>
<td><strong>18.</strong></td>
<td>I felt sad.</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
</tr>
<tr>
<td><strong>19.</strong></td>
<td>I felt that people disliked me.</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
</tr>
<tr>
<td><strong>20.</strong></td>
<td>I could not “get going.”</td>
<td>Rarely or none of the time</td>
<td>Some or little of the time</td>
<td>Occasionally or a moderate amount of time</td>
<td>All of the time</td>
</tr>
</tbody>
</table>
Appendix E. **Household Food Inventory**

Please imagine your home right now, or if at home, go through all the places in your house where you store food (such as refrigerator, cabinets, countertops, etc.). Indicate whether or not you currently have each specific food in your house. The amount does not matter; if an item is present, please circle “yes.” For example, on question #1, if you have no apples in your house but you do have 1 jar of applesauce, you would circle “yes” for question #1.

<p>| | | | | | |</p>
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Apples, applesauce, pears</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Cantaloupe, mango, papaya</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Oranges, grapefruit, tangerines</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Orange juice or grapefruit juice</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Other fruit juices, fortified drinks</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Tomatoes (including pico de gallo), tomato juice</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Broccoli</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Spinach</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Mustard greens, turnip greens, collard greens, kale</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Carrots or mixed vegetables containing carrots</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Lettuce</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Sweet potatoes, yams</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>White bread (including hamburger or hot dog buns, bagels, baguette, pita bread, French bread, sandwich bread, taro bread, English muffins)</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Dark bread (including whole wheat, rye, pumpernickel, other high fiber breads)</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>High fiber, bran or granola cereals, shredded wheat</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Highly fortified cereals such as Product 19, Total or Most</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Other cold cereals that are low in sugar such as Corn Flakes, Rice Krispies, Kix</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Cooked cereals (including oatmeal, cream of wheat, grits, blue corn mush)</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>Beans (including pinto, black beans, black-eyed peas, butter beans, red beans, garbanzo beans, baked beans, adzuki beans)</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>Rice (including white, brown, wild)</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>Beef, pork, lamb</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>Cheese</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>23.</td>
<td>Nuts or peanut butter</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>24.</td>
<td>Butter or margarine</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>25.</td>
<td>Cookies</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>26.</td>
<td>Milk</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>27.</td>
<td>Potato chips, corn chips, tortilla chips</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>28.</td>
<td>Bacon, sausage, or other breakfast meat</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Pastry, such as doughnuts or sweet rolls</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>---</td>
<td>----------------------------------------</td>
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</tr>
<tr>
<td>30.</td>
<td>Mayonnaise</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>31.</td>
<td>Frozen desserts such as ice cream</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>32.</td>
<td>Hot dogs, bologna, lunch meat</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>33.</td>
<td>Cakes and pies</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>34.</td>
<td>Cream or whipped cream</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
Appendix F. Recruitment Flyer

Mother and Father Volunteers Wanted for a Research Study
Understanding Food and Health Issues in a Household

We are conducting one-on-one interviews to talk to mothers and fathers with children ages 3 to 5 years old about their food situation and related issues in their household. A one-time, 60-90 minute interview will be conducted at a convenient community site.

- Each mother and father will be interviewed separately in a videotaped one-on-one interview including questions about themselves and questions related to their relationship and food access.
- Who is eligible?
  - Mothers and fathers (18 years and older) with at least 1 child between the ages of 3 and 5 years old and living together the majority of the week
  - Currently experiencing lack of food in the household
  - Both parents in a household willing to participate
  - Able to speak English

There may not be a direct benefit from this research. However, we hope that the interviews can help us learn more about how mothers and fathers interpret their food situation in their household.

Each mother and father will each receive a $20 gift card after the interview.

To learn more about this project, please contact the Community Nutrition Research Office at the University of Connecticut at amy.mobley@uconn.edu or 860-486-3681.
Appendix G. IRB Approved Consent Form

Consent Form for Participation in a Research Study

UCONN
UNIVERSITY OF CONNECTICUT

Principal Investigator: Amy R Mobley, PhD, RD
Student Researcher: Jaime S Foster, MS, RD
Study Title: Understanding Food and Health Issues in a Household
Sponsor: UConn Scholarship Facilitation Fund

Introduction
You are invited to take part in a research study to see if mothers and fathers within the same home view their food situation differently. You are being asked to take part because you and your partner live together at the same address with your 3 to 5 year old child. You both speak English well, and use one or more of the following programs: SNAP (Food Stamps), WIC or Head Start and answered 'yes' to at least one of the screening questions.

This consent form will give you the information you will need to understand why this study is being done and why you are being invited to join it. It will also describe what you will need to do to take part and any known risks, problems or discomforts that you may have while taking part. We want you to take some time to think this over. You can ask questions now and at any time. If you decide to take part, you will be asked to sign this form and it will be a record of your agreement to participate. You will be given a copy of this form.

Why is this study being done?
We are doing this research study to see if there is a difference in the way that mothers and fathers interpret and respond to a home food survey. We would like to learn if mothers and fathers within homes view their home food status differently. We also hope to find out if there are factors that are related to a family's food situation that vary between mothers and fathers.

What are the study procedures? What will I be asked to do?
If both you and your partner agree to take part in this study, you will be interviewed by a trained researcher. This interview will be videotaped. Your partner will be asked to do the same in a separate space if you are interviewed on the same day. In the first part of the interview you will be asked 18 questions from survey about the food and money for food in your home. You will be asked to 'think aloud,' and describe your thoughts in answering those questions. You will also be asked how you felt answering that questions and how you arrived at your answers.

You will then be read several brief surveys that relate to your personality, your mental health, your relationship with your partner, the finances and other factors in your home, and how you cope with your food situation now. We will also measure you and your 3 to 5 year old child's height and weight with your permission.
The total interview will last 60-90 minutes long.

**What are the risks or inconveniences of the study?**
We believe there are no known risks associated with this research study. However, a possible inconvenience may be the time it takes to complete the study.

**What are the benefits of the study?**
You may not directly benefit from this research. However, we hope that your participation in the study may inform future research on couples and their different experiences about food in their home.

**Will I receive payment for participation? Are there costs to participate?**
There are no costs to being in this study, besides the time involved. To thank you for your time you will each be given a $20 gift card at the end of the interview.

**How will my personal information be protected?**
The following procedures will be used to protect the confidentiality of the data collected from you. You will be assigned a number by the interviewer based on if you are the mother or father. Your family will be assigned a number based on your order in the project and the date you were interviewed. No names or other identifiable information will be used or recorded during the study. The videotapes will be transcribed for responses to the questions but no names will be included on the files.

All documents and videotapes will be stored in a locked file cabinet in room 225 of the Roy Jones Building, Storrs, CT. Data will be entered on a University-owned computer used only by the research lab members and is password protected. Any computers hosting such files will be password protected to prevent access by unauthorized users. Only the members of the research staff will have access to the passwords.

At the end of this study, the researchers may publish their findings. Information will be presented in summary format. Individuals will not be identified in any papers or presentations.

You should also know that the UConn Institutional Review Board (IRB) and Research Compliance Services may inspect study records as part of its auditing program, but these reviews will only focus on the researchers and not on your responses or involvement. The IRB is a group of people who review research studies to protect the rights and welfare of research participants.

**Can I stop being in the study and what are my rights?**
You do not have to be in this study if you do not want to. If you agree to be in the study, but later change your mind, you may drop out at any time. There are no penalties or consequences of any kind if you decide that you do not want to participate.

You do not have to answer any questions that you don’t want to answer. If you refuse to answer a question, the question will be skipped and the next question will be asked.
Whom do I contact if I have questions about the study?
Take as long as you like before you make a decision. We will be happy to answer any question you have about this study. If you have further questions about this project or if you have a research-related problem, you may contact the director, Dr. Amy Mobley, RD at amymobley@uconn.edu or 860-486-5073 or the student researcher Jaime Foster, MS, RD at jaime_foster@uconn.edu or 860-486-3681. If you have any questions concerning your rights as a research subject, you may contact the University of Connecticut IRB at 860-486-8802.

Documentation of Consent:
I have read this form and decided that I will take part in the project described above. Its purpose, the details involved and possible risks and inconveniences have been explained to my satisfaction. I understand that I can withdraw at any time. My signature also indicates that I have received a copy of this consent form.

Participant Signature: ___________________________ Print Name: ___________________________ Date: ____________

Participant Signature for Child ___________________________ Print Child's Name: ___________________________ Date: ____________

Signature of Person Obtaining Consent ___________________________ Print Name: ___________________________ Date: ____________
Appendix H. IRB Approval Letter

DATE: February 2, 2016

TO: Amy R. Mobley, Ph.D.
    Jaime Foster, Student Investigator
    NUSC

FROM: Brandi Simonsen, Ph.D.
      Vice-Chair, Institutional Review Board
      FWA# 00007125

RE: Protocol #H15-370: “Understanding Food and Health Issues in a Household”
    Please refer to the Protocol# in all future correspondence with the IRB.
    Funding Source: VPR Research Excellence Program
    “Expiration Date”

On January 7, 2016, the Institutional Review Board (IRB) reviewed the above-referenced research study by expedited review and determined that modifications were required to secure approval. Those requirements have been met, and the IRB granted approval of the study on February 2, 2016. The research presents no more than minimal risk to human subjects and qualifies for expedited approval under category #7: Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. Enclosed is the validated consent form, which is valid through February 2, 2017. A copy of the approved, validated consent form (with the IRB’s stamp) must be used to consent each subject.

The IRB found that the protocol meets the criteria for approval stated in 45 CFR Part 46, Subpart D, Section 404: The research presents no greater than minimal risk to the minor subjects and adequate provisions have been made to solicit consent of the minor child’s parents or guardians and assent of the minor subject. The IRB decided that only one parent’s permission would be required to carry out the study.

All investigators at the University of Connecticut are responsible for complying with the attached IRB “Responsibilities of Research Investigators.”

Re-approval: It is the investigator’s responsibility to apply for re-appraisal of ongoing research at least once yearly, or more often if specified by the IRB. The Re-appraisal/Completion Form (IRB-2) and other applicable re-appraisal materials must be submitted one month prior to the expiration date noted above.

Office of the Vice President for Research
Research Compliance Services
403 WHITELEY ROAD EXTENSION, UNT 1240
STORRS, CT 06269-1240
phone: 860.486.8002
fax: 860.486.1044
compliance.uconn.edu
Modifications: If you wish to change any aspect of this study, such as the procedures, the consent forms, the investigators, or funding source, please submit the changes in writing to the IRB using the Amendment Review Form (IRB-3). All modifications must be reviewed and approved by the IRB prior to initiation.

Audit: All protocols approved by the IRB may be audited by the Research Compliance Monitor.

Please keep this letter with your copy of the approved protocol.

Attachments:
1. Validated Consent Form
2. Validated Recruitment Flyer
3. Validated Appendix A
4. Validated IRB-1 Application and Study Protocol Forms
5. “Responsibilities of Research Investigators”