RUNNING HEAD: Cumulative Family Risks and Food Insecurity Status

The Impact of Cumulative Family Risks on Food Insecure Households with Young Children

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Abstract

The study uses the Fragile Families and Child Well-being Study (N = 2,025) to examine the relationship between four cumulative family risk indices and various levels of food insecurity among poor and non-poor households with young children. Regression analyses indicate that cumulative family risk indices are useful in differentiating various levels of food insecurity. Specifically, the financial strain index is pertinent in differentiating between marginal food secure and food secure among non-poor households. In addition, the maternal poor health and risky health behaviors index is pertinent in distinguishing (1) food insecure from marginal food secure households and (2) very low food secure from low food secure households. Implications for improving the resiliency of families at risk for experiencing food insecurity are discussed.

The Impact of Cumulative Family Risks on Food Insecure Households with Young Children

Food insecurity is a type of economic hardship that focuses on a household's lack of access to adequate food because of insufficient money and other resources for food (Coleman-Jensen, Nord, Andrews, & Carlson, 2012; Nord, 2007). In 2011, 21% of households were food insecure. In about half of the households only adults were food insecure, but in 10.0% of the households (3.9 million households) one or more children who were food insecure (Coleman-Jensen, et al., 2012). Among food insecure households with children the severity of food insecurity varies. For instance, in 2011 9.0% of households experienced low food security (i.e. LFS; households that reduce the quality, variety, or desirability of their diet) and 1.0% experienced very low food security (i.e. VLFS; households experienced a more severe type of food insecurity where individuals reduce their food intake *and* have experienced disrupted eating patterns) (Coleman-Jensen, et al., 2012). However, these numbers do not capture the number of children that experience marginal food insecurity, a less severe condition of food insecurity that is traditionally categorized as food secure, but is still related to food hardship. Recent literature suggests that children and adults who experience marginal food insecurity are at risk for impaired health and nutritional outcomes, just like children who are categorized as food insecure (Cook et al., 2013).

To develop a clearer and more comprehensive understanding of why households with young children experience different levels of food insecurity in the United States, the family environment must be investigated. The prevalence of food insecurity among households with children is influenced by the household structure and various demographic, economic, and geographic factors. Families that experience economic hardship also face *multiple family-level risk factors* that adversely influence the families' overall well-being. The cumulative risk theory

postulates that it is the accumulation of risk factors (e.g., maternal unemployment and mothers having less than a high school education), rather than any one particular risk factor that influences a particular outcome (e.g., food insecurity) (Rutter, 1979; Sameroff, 1998; Sameroff, Seifer, Baldwin, & Baldwin, 1993). Empirical research has suggested that a cumulative risk aggregate is a stronger correlate than any individual risk factor (MacFadyen, MacFadyen, & Prince, 1996). The accumulation of family-level risk factors associated with economic hardship could negatively impact the finances and resources, such as reducing the time needed to shop for food and cook adequate amounts of food, leaving families to experience reduced food intake and disrupted eating patterns. In other words, the accumulation of family risk factors could derail the ability of families to maintain food security.

The current study contributes to the family and food insecurity literature by focusing on *cumulative family risk indices within the family environment* rather than examining individual demographic and economic risk factors. The current study also contributes to the literature by focusing on poor and non-poor households. Traditionally food insecurity has been perceived as an economic hardship experienced solely by the poor and working poor [i.e. households < 200% Federal Poverty Line (FPL)]. However, research demonstrates that non-poor households (≥ 200% FPL) are also not immune from experiencing food hardship, and thus, not as resilient as once thought to be. In 2008, 7.5 percent of non-poor households with children experienced food insecurity (Wight, Thampi, & Briggs, 2010). Compared to poor households, even less is known about family-level characteristics that are associated with non-poor households with young children experiencing various levels of food insecurity. Thus, the current study is innovative in that previous work has not considered using cumulative family risk indices to assess various levels of food insecurity among poor and non-poor households with young children. Four types

of family risk indices that are relevant to household environments of children that have been used in previous research as determinants of childhood obesity (Garasky, Stewart, Gundersen, Lohman, & Eisenmann, 2009; Gundersen, Lohman, Garasky, Stewart, & Eisenmann, 2008), but not explored together in relation to different levels of food insecurity in households with young children are utilized: (1) financial strain; (2) maternal poor health and risky health behaviors; (3) family disruption and conflict; and (4) parenting disruption. Below the literature on family risks factors for food insecurity is reviewed.

Family Risk Factors

Financial Strain. Household food insecurity is associated with various forms of financial instability (Tarasuk, 2001), including things such as difficulty paying bills or having the inability to make necessary purchases (Gundersen & Garasky, 2012). Among households with children, food insecurity is more prevalent among households with an unemployed or disabled adult (Coleman-Jensen & Nord, 2013). Further, food insecurity is ten times more prevalent in households which an adult has not completed high school compared to households where an adult has completed college (Nord, 2009). In order to attempt to make ends meet, it is not uncommon for low-income parents to work more than one job; however, working multiple jobs enables only a small percent of these households to avoid poverty (Gardiner & Millar, 2006). Thus, various forms of financial strain are associated with experiencing food insecurity.

Maternal Poor Health and Risky Health Behaviors. Previous studies have found a positive association between food insecurity and poor health, depression, anxiety, and obesity among adult women.(Adams, Grummer-Strawn, & Chavez, 2003; Gooding, Walls, & Richmond, 2012; Heflin, Siefert, & Williams, 2005; Olson, 2005; Siefert, Heflin, Corcoran, & Williams, 2001; Tarasuk, 2001; Townsend, Peerson, Love, Achterberg, & Murphy, 2001; Whitaker,

Phillips, & Orzol, 2006). Further, research indicates that there is a bidirectional relationship between maternal depression and food insecurity among rural, low-come families (Huddleston-Casas, Charnigo, & Simmons, 2009). Thus, other indicators of health may be predictive of different levels of food insecurity. Mothers who experience poor physical and mental health and engage in risky health behaviors may not be in the physical nor mental condition that is required to obtain the necessary food to avoid reduced food intake and disrupted eating patterns, increasing their households' risk of experiencing food insecurity.

Family Disruption and Conflict. Previous research that has focused on family risk factors has considered children who do not grow up in two-parent households as having experienced family disruption (Garasky, et al., 2009). Family disruption could be a result of a relationship separation or a parent being incarcerated. Single mother households are the dominant family structure among households with children who experience VLFS (Coleman-Jensen, et al., 2012). Further, paternal incarceration is correlated with increase use of food stamp participation (Sugie, 2011) and food insecurity (Cox & Wallace, 2013), suggesting families experience food hardships when fathers are incarcerated. However, food hardships can continue long after fathers re-enter into society as incarceration reduces employment opportunities, earnings, and limits economic mobility (Geller, Garfinkel, & Western, 2011; The Pew Charitable Trusts, 2010; Visher, Debus, Yahner, & Center, 2008).

Aside from physical separation, family disruption can also be observed through conflict. According to family systems theory, parents have dynamic, dyadic relationships that influence each other (Cox & Paley, 1997; Minuchin, 1974). When the quality of the dyadic relationship is harmonious, the relationship is considered a resource that can contribute towards the overall well-being of the household; however, when the quality of the dyadic relationships is filled with

hostility or conflict, it can be detrimental to the overall well-being of the household. A severe form of conflict among parents is intimate partner violence. Intimate partner violence is associated with economic hardship (Benson, Fox, DeMaris, & Van Wyk, 2003; Jewkes, 2002; Strube & Barbour, 1983) and food insecurity (Hernandez, Marshall, & Mineo, in press; Spencer-Walters, 2011). The cumulative nature of disruption and conflict within the family may be contributing to households with children experiencing different levels of food insecurity.

Parenting Disruption. Parenting complexity arises when adults have children with more than one partner (i.e. multiple-partner fertility, MPF). MPF is correlated with economic hardship (Monte, 2011). One possible reason is that 16-33% of young, non-custodial fathers lack the financial resources needed to pay child support (Mincy & Sorensen, 1998). Fathers' inability to pay child support, along with having parenting responsibilities in multiple households, weakens the shared responsibility of parenting in any one household.

Further, the ability to navigate parenting responsibilities (regardless of the number of partners) is dependent on parents' overall parenting relationship. Previous research has suggested that mothers and nonresident fathers who have contentious or disengaged relationships participate in *parallel* parenting rather than cooperative parenting. In other words, these parents minimally support each other's parenting role (Furstenberg, 1988; Maccoby & Mnookin, 1992). Parenting can also be disrupted if mothers experience high levels of parenting stress, or role strain. Navigating parenting between multiple fathers, low levels of cooperative parenting, and high levels of parenting stress may lead to mothers not having the time or the resources needed to make sure that the household has adequate amounts of food and consistent eating patterns. The cumulative nature of disruptive parenting may be contributing to households with children experiencing different levels of food insecurity.

The Present Study

The goal of the current study was to examine the family environment by investigating how four cumulative family risk indices are related to various levels of food insecurity among poor and non-poor households with young children. Based on previous research that suggests that the family environment is negatively influenced in presence of economic hardship (Conger, Ge, Elder Jr, Lorenz, & Simons, 1994; Conger et al., 2002; McLoyd, 1998; Parke et al., 2004; Wadsworth & Compas, 2002), it is hypothesized that various cumulative family risk indices are positively associated with food insecurity, with all four family risk indices being related to the most severe type of food insecurity, VLFS. Understanding which cumulative family risk index contributes to different levels of food insecurity (and whether this varies by household income) may help public and private administrators of food assistance programs decide whether other forms of assistance, aside from food assistance, such as mental health services, need to be included through food assistance program participation. The addition of services to already existing food assistance programs may help prevent young children from experiencing the negative health and developmental consequences of residing in food insecure households (Bronte-Tinkew, Zaslow, Capps, Horowitz, & McNamara, 2007; Cook et al., 2004; Cook et al., 2006; Hernandez & Jacknowitz, 2009; Park et al., 2009; Perez-Escamilla & Pinheiro de Toledo Vianna, 2012; Rose-Jacobs et al., 2008; Skalicky et al., 2006; Whitaker, et al., 2006; Zaslow et al., 2009).

Data and Sample

Data are drawn from the main survey of Fragile Families and Child Well-being (FFCW) study, as well as the In-Home Longitudinal Study of Preschool Age Children, which comprises a subsample of families who participated in the main survey of the FFCW study. The FFCW is a

longitudinal study of the conditions and capabilities of a disadvantaged urban cohort of 4,898 primarily unmarried parents of newborn children born between 1998 and 2000. Mothers and fathers in the main survey were interviewed separately soon after birth of their child (i.e., year 0), then interviewed again by telephone at 1, 3, and 5 years from the child's birth. We extracted data received from mothers in the main survey. The In-Home survey was administered when children were 3 and 5 years of age and included questions regarding household food security that were not available in the main survey. In most cases (96%) the In-Home survey was completed by the child's mother (Bendheim-Thoman Center for Research on Child Wellbeing, 2008b, 2009). Information on sampling and design of the study has been previously reported (Bendheim-Thoman Center for Research on Child Wellbeing, 2008a, 2008b, 2009; Reichman, Teitler, Garfinkel, & McLanahan, 2001).

The analytic sample was restricted to only include families who participated in the year 3 main survey and year 5 In-Home survey (2,041 families excluded). Families were further excluded if they were missing data on the household food security measure at the year 5 survey (25 families) and if they were missing data on the family risk indices (807 families). Although food insecurity rates are substantially higher among low-income households (i.e. <200% FPL; referred to as "poor" households for the rest of the manuscript), near poor and non-poor households are also affected by food insecurity (i.e. ≥ 200% FPL; referred to as "non-poor" households for the rest of the manuscript) (Wight, et al., 2010). Thus, it is important to include both poor and non-poor households into the analytic sample, as well as stratify the analytic sample by poverty status. The final analytic sample consisted of 2,025 families with young children (i.e. 2,025 households with all income levels; 1,283 households with incomes < 200% FPL; 742 households with incomes ≥ 200% FPL).

Families excluded from the analytic sample were more likely than families in the analytic sample to experience food insecurity and greater amounts of cumulative family risks (i.e. financial strain index, maternal poor health and risky health behaviors, and family disruption and conflict). The excluded families were more likely to be minority and poor and have fewer children than families included in the analytic sample.

Measures

Food Insecurity. Mothers reported on household-level food security at the 3- and 5-year In-Home survey. The measure of food security is based on an 18-item scale developed by the US Department of Agriculture (USDA) that assesses both the quality and quantity of food over the past 12 months. The scale captures food hardship due to financial constraints such as running out of food, perceptions that food in a household is of inadequate quality or quantity, and reduced food intake by adults or children (Bickel, Nord, Price, Hamilton, & Cook, 2000). Households were considered food secure if mothers responded affirmatively to 2 or less of the 18 items, and food insecure if mothers responded affirmatively to 3 or more of the 18 items.

The terms “marginal food secure”, “low food security”, and “very low food security,” are used to differentiate the severity of food insecurity. Marginal food security is the least severe type of food hardship as these households are typically categorized with the food secure households. Households whose mothers responded affirmatively to 1 or 2 of the 18 items were categorized as marginal food secure. Mothers who responded affirmatively between 3 and 7 of the 18 items were categorized as LFS households, while mothers who responded affirmatively to 8 or more of the 18 items were categorized as VLFS.

The five categories were used to create dichotomous variables identifying each level of food insecurity (food secure, marginal food secure, food insecure, LFS, VLFS). For comparison

purposes, an additional food security dichotomous variable was created that excluded marginal food insecure households (i.e. 0 items affirmed). The various food insecurity categories were then used to create 4 dichotomous dependent variables where the primary focus was to predict the more severe type of food insecurity: (1) food insecurity vs. food security (includes marginal food security); (2) food insecurity vs. marginal food security; (3) marginal food security vs. food security; (4) VLFS vs. LFS. With the exception for the first dependent variable listed, not all households with young children were included in the above dependent variables. Further, the sample size varied depending on the outcome variable that was used in the analyses because not all families were included in the comparison groups described above.

Cumulative Family Risk Indices. The independent variables comprise of four indices of cumulative family risk factors from the year 3 main survey. Consistent with the cumulative risk theory (Rutter, 1979; Sameroff, 1998; Sameroff, et al., 1993), families that experience multiple risk factors at once may experience a "risk pile-up". The risk pile-up may spillover into other family domains (Gutman, Sameroff, & Eccles, 2002; Jones, Forehand, Brody, & Armistead, 2002; Sameroff, et al., 1993; Sameroff, Seifer, Barocas, Zax, & Greenspan, 1987), including a household's ability to maintain secure levels of food. Thus, the focus of the study is on cumulative family risk indices rather than individual risk factors. Similar to previous research that has examined cumulative family risk indices, each index will be based on aggregate experiences of particular family risk factors (Garasky, et al., 2009; Gundersen, et al., 2008).

Financial Strain Index. Five measures comprise the financial strain index. The first measure was based on 10 items where mothers reported on various forms of economic hardship that the family faced because there was not enough money in the past year (e.g., missed mortgage payment). A value of 1 was given to mothers who responded affirmatively to at least 1

item. The second measure consisted of giving a value of 1 to mothers who responded that they were unemployed in the previous year. The third measure consisted of mothers receiving a value of 1 if they responded affirmatively to experiencing a serious health problem that limits the type of work they can do. The fourth measure involved giving a value of 1 to mothers who reported having less than a high school degree. The fifth measure consisted of giving a value of 1 to mothers who responded affirmatively to working more than 1 job in the past year. The five measures were summed to create a financial strain index, was a possible range from 0 to 5.

Poor Maternal Health and Risky Health Behaviors Index. Four measures were used to assess the health and health behaviors experienced by mothers. First, mothers reported on their overall health in the past year. Mothers who reported experiencing "poor" or "fair" health were given a value of 1 (indicating poor health), while mothers who reported "good", "very good", and "excellent" were given a value of 0. The second and third measures were based on diagnoses of major depression and anxiety. Indicators of depression and anxiety were created by the FFCW project as dichotomous measures based on mothers' affirmative responses to items from the Composite International Diagnostic Interview Short Form (CIDI-SF) in the past year (Kessler et al., 2003). The fourth measure consisted of mothers reporting affirmatively to engaging in illegal drugs, such as marijuana or cocaine, or using drugs without a doctor's prescription in larger amounts than prescribed in the past year. A value of 1 was given to mothers who responded affirmatively to any of the drug items, regardless of the number of specific drugs used. The four measures were summed to create a maternal poor health and risky health behaviors index, ranging from 0 to 4.

Family Disruption and Conflict Index. Four measures comprise the family disruption and conflict index. First, the family structure of the household was taken into account. Similar to

previous research that has focused on family risk factors, single mother households were considered to have experienced family disruption (Garasky, et al., 2009). The second item consisted of assigning a value of 1 to mothers who responded affirmatively to whether the child's father was ever incarcerated. Because incarceration can have negative long-term economic impacts (Geller, et al., 2011; The Pew Charitable Trusts, 2010; Visher, et al., 2008) it is important to include families that have *ever* experienced incarceration (and not just recent incarceration). The third measure consisted of mothers reporting on relationship conflict with the father of the child based on 9 items on a 1 = *often* to 3 = *never* scale (e.g. the other parent is fair and willing to compromise). The items were reverse coded so that a higher score indicated greater conflict. The 9 items were averaged, and mothers who scored 1 standard deviation above the mean were given a value of 1, indicating at risk of experiencing relationship conflict. The fourth measure was based on 3 items where mothers reported on intimate partner violence (IPV; e.g., the other parent slaps or kicks you) on a 1 = *often* to 3 = *never* scale. Mothers who responded with "sometimes" or "often" to at least 1 of the 3 items were considered to have been exposed to IPV. The four measures were summed to create a family disruption and conflict index, ranging from 0 to 4.

Parenting Disruption Index. Three measures were used to create the parenting disruption index. The first measure consisted of mothers reporting whether they had children with multiple men. Mothers who reported affirmatively were given a value of 1. The second measure was based on 5 items where mothers responded to the extent to which they felt supported in the parenting role by the other parent using a 1 = *always* to 3 = *never* scale (e.g., "How often does [the child's father] support you in the way you want to raise your child?"). Items were reverse coded so that a higher score indicates less coparenting support. The average of the 5 items was

calculated. Mothers who scored 1 standard deviation above the mean were given a value of 1, indicating at risk for poor coparenting support. The third measure consisted of mothers reporting on her role strain as a parent, based on 4 items on a 1 = *strongly agree* to 4 = *strongly disagree* scale (e.g., I feel trapped by my responsibilities as a parent to the focal child). Items were reverse coded so that higher scores indicated greater role strain. The average of the four items was calculated. Mothers were given a value of 1 if they experience 1 standard deviation above the mean, indicating at risk for role strain. The three measures were summed to create a parenting disruption index, ranging from 0 to 3.

Covariates

The following variables were included as covariates in the models because they reflect selection factors that could relate to households being food insecure as well as experiencing various family risk factors. All covariates were measured in the year 3 main survey, with the exception of race/ethnicity which was measured at year 0. Mothers reported on their child's age (month), gender (1 = female; 0 = male), race/ethnicity [white (reference), black, Hispanic, other], whether mother was an adolescent at the time of the child's birth, nativity (1 = native-born; 0 = foreign-born), health insurance status [uninsured (reference), Medicaid, private], and number of children in the household. Household income was categorized into four federal poverty line (FPL) thresholds [poor (< 100% FPL; reference), working poor (100 – 199% FPL), near poor (200% - 299% FPL), not poor (>= 300% FPL)].

Analytic Plan

Descriptive analyses were performed on non-imputed data; multivariate logistic regression models were conducted on imputed data using STATA version 10.0 statistical software (StataCorp LP, College Station, Texas). Bivariate analyses comparing poor (i.e.

households with incomes < 200% FPL) and non-poor households (i.e. households with incomes ≥ 200% FPL) were conducted on all the study variables based on one-way analysis of variance (ANOVA) tests for continuous measures or chi-square tests for dichotomous measures. In addition, bivariate analyses compared the food security subgroups and cumulative risk factors using one-way ANOVAs.

Multivariate logistic regression models where the various dependent variables were separately regressed onto the cumulative family risk indices and covariates were conducted for (a) households with all income levels (b) poor households and (c) non-poor households. Prior to conducting multivariate logistic regression models, multiple imputation techniques were used to impute missing values on four covariates (i.e. race/ethnicity, nativity, number of children in the household, food insecurity status at year 3; 1.5% of values) using switching regression techniques. In the imputation model, variables related to the aims or to the likelihood of being missing were included (Allison, 2002). A strength of multiple imputation is that all relevant cases are kept in the analyses for accurate parameter estimates and the standard errors are corrected for the amount of missing information. This is in comparison to listwise deletion, which results in a sample that no longer represents the population (Graham, 2009; Graham & Schafer, 1999). The multiple imputation process created five imputed datasets that were modeled simultaneously. The unstandardized betas, standard errors, and odds ratio coefficients in the models represent the estimates of the five pooled datasets.

RESULTS

The descriptive statistics for the study variables for the entire analytic sample and for poor and non-poor households are demonstrated in Table 1. On average, 87% of the sample was food secure (77% experience zero food hardship; 10% marginal food secure). Thirteen percent of

the sample was food insecure (10% LFS; 3% VLFS). Marginal food security and food insecurity was more prevalent among poor households compared to non-poor households. Poor households compared to non-poor households also experienced more family risk factors with one exception. A greater percentage of non-poor households experienced economic hardship compared to poor households. Poor households were more likely to be black or Hispanic and mothers were more likely had been adolescents at the time of the birth of their child compared to non-poor households. Poor households were also more likely to have no health insurance coverage or on public insurance compared to non-poor households, along with more children in the household.

Table 2 describes the bivariate differences between cumulative family risk indices and various levels of food insecurity by poor and non-poor households. Among poor households, households that experienced food insecurity were also more likely to experience all four types of cumulative family risk indices compared to households that did not experience food insecurity (Panel A). Compared to households that experienced no food hardship, households that experienced marginal food security also experienced greater financial strain, family disruption and conflict, and parenting disruption. Households that experienced food insecurity compared to households that experienced marginal food security experienced greater maternal poor health and risky health behaviors. Among the poor, food insecure households, the households that experienced VLFS also experienced greater maternal poor health and risky health behaviors and parenting disruption compared to households that experienced LFS. A similar pattern of differences was observed among non-poor households (Panel B).

Multivariate Logistic Regression Models

The results of the multivariate logistic regression models are displayed in Table 3 for the full analytic sample (Panel A) as well for poor (Panel B) and non-poor households (Panel C).

Among the entire analytic sample, households that experienced higher levels of financial strain, maternal poor health and risky health behaviors, and parenting disruption were 28%, 57%, and 26% higher odds respectively to experience food insecurity vs. food security. Households that experienced higher levels of maternal poor health and risky health behaviors were 51% higher odds of experiencing food insecurity versus marginal food security and 48% higher odds of experiencing VLFS vs. LFS. Households that experienced higher levels of financial strain were 24% higher odds of experiencing marginal food security versus food security.

Among poor households (Panel B), households that experienced higher levels of financial strain, maternal poor health and risky health behaviors, and parenting disruption were 22%, 48%, and 23% higher odds respectively to experience food insecurity vs. food security. Households that experienced higher levels of maternal poor health and risky health behaviors were 43% higher odds of experiencing food insecurity versus marginal food security.

Among non-poor households, higher levels of financial strain, as well as maternal poor health and risky health behaviors were 86% and over two times higher odds respectively to experience food insecurity vs. food security. Households that experienced higher levels of maternal poor health and risky health behaviors were over two times higher odds of experiencing food insecurity versus marginal food security ($p < .10$). Households that experienced higher levels of financial strain were over two times higher odds of experiencing marginal food security versus food security.

Sensitivity Models

Additional models were conducted that included recalculating the cumulative family risk indices using principal components factor analysis. Each index was derived by weighing each variable of the index with its respective factor loading obtained from principal components

analysis. These results did not differ from the results presented in Table 3.

DISCUSSION

The purpose of the current study was to take an in-depth examination of the family environment by investigating how four cumulative family risk indices related to various levels of food insecurity among poor and non-poor households with your children. As previously mentioned, the particular family risk indices in this study have been used in prior research to study the association between stress and childhood obesity (Garasky, et al., 2009; Gundersen, et al., 2008), but have not been explored together in relation to different levels of food insecurity experienced by poor and non-poor families with young children. The findings suggest that the cumulative family risk indices are useful in differentiating various levels of food insecurity and confirmed the hypothesis that various cumulative family risk indices are positively associated with food insecurity. The results indicated that three of the four cumulative family risk indices do distinguish food insecure households from food secure households. Although mothers reported on the individual family risk factors and the household's food security status which presents bias, overall the findings suggest that experiencing food insecurity is solely not a circumstance of economic hardship. Instead the determinants of food insecurity are multifaceted and related to financial strain, maternal poor health and risky health behaviors, and parenting disruption. Thus, it is time to consider food insecurity not solely in terms of financial hardship, but as an aggregate of various family risk factors that are related to families having limited access and availability to food.

Although the findings do not support the hypothesis that all four family risk indices would be related to the most severe type of food insecurity, VLFS, the findings do indicate that there are particular family indices that are pertinent to distinguishing the various levels of food

insecurity. The financial strain index is the cumulative family risk index that distinguished marginal food secure households from food secure households, especially among non-poor households. Last, the maternal poor health and risky health behaviors index was a prominent cumulative family risk index that distinguished (1) food insecure from marginal food secure households and (2) VLFS from LFS households. The indices pertinent to differentiating the severity of food insecurity are discussed in greater detail below, along with how the findings contribute to implications for improving family resilience.

Financial Strain

The findings suggest that cumulative financial strain is associated with non-poor households experiencing marginal food security rather than food security. There are several explanations as to why financial strain may be a prominent cumulative risk factor in predicting marginal food security status. Families whose income is 200% or greater of the FPL traditionally are not eligible for public assistance programs that are associated with alleviating economic hardship. Thus, these families may experience economic hardship but have less access to public financial assistance. Further, non-poor families may be unaware of the *private* assistance programs in their area. Most private assistance programs do not have an eligibility criteria based on income that must be met prior to participation. At the same time, these families may find obtaining assistance through private programs to be a less acceptable means. Thus, non-poor households appear to have less access and less acceptable means to coping with food hardship, reducing their resiliency.

In the resiliency literature, non-poor families, defined as families with incomes 200% or greater of the FPL have traditionally been considered to be “resilient” or a non-vulnerable population, resulting in less attention being placed on them. The sample of non-poor households

in the current study is relatively small compared to other data sets, but this is because the FFCW study was designed to focus on primarily unmarried, socio-economically disadvantaged young families in urban areas. Thus, the results in the current study are not generalizable to families with older children and families who reside in rural areas. Because less is known about how non-poor families cope with food hardship, qualitative studies and longitudinal studies with larger samples that include urban and rural families with children and adolescents are needed to further understand this "invisible" vulnerable population.

Further, to improve our understanding family resilience, it would be important to continue to isolate households that experience marginal food security into their own category and not combine these households with households that experience food insecurity nor with food secure households. The findings provide evidence that there are cumulative family risk factors that distinguish marginal food security from the other categories. This provides further justification that marginal food security should be isolated as echoed by recent recommendations (Cook, et al., 2013).

Maternal Poor Health and Risky Health Behaviors

The findings also indicated that maternal poor health and risky health behaviors are strong determinants in differentiating between food insecure and marginal food secure households, as well as VLFS and LFS households. Previous research has suggested that the stress associated with food insecurity diminishes women's physical and mental health (Siefert, et al., 2001; Tarasuk, 2001; Whitaker, et al., 2006). The findings from the current study contribute to the literature in distinguishing the importance that maternal health plays in differentiating between the various levels of food insecurity. Compared to the literature that differentiates food insecure to food secure households, there is a dearth of research that has focused on the factors

that determine marginal food secure households from food insecure households, and even less on the family factors that discriminate VLFS and LFS households. The fact that maternal health plays a key role in differentiating between the most severe type of food insecurity is vital to understanding the needs of families that have least access and availability to food. Thus, expanding food assistance programs to include physical health, mental health, and substance use assistance could help to alleviate food insecurity and increase family resiliency. Further, families in the study all had young children. The addition of services focusing on physical health, mental health, and substance use to already existing food assistance programs may help prevent young children from experiencing the negative health and developmental consequences of residing in food insecure households (e.g., Bronte-Tinkew, et al., 2007; Hernandez & Jacknowitz, 2009; Perez-Escamilla & Pinheiro de Toledo Vianna, 2012).

The current study highlights that various cumulative family risk factors that contribute to poor and non-poor families experiencing various levels of food insecurity. Thus, more widespread assistance for families at risk for food insecurity is needed. Specifically, to increase the resilience among non-poor families who experience food hardship, interventions focusing on reducing financial strain is needed. It is also important to consider targeting women's health problems as a risk factor for food insecurity. Thus, broader interventions, rather than interventions that solely focus on food assistance, are needed to increase the resiliency of food insecure families.

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Table 1. *Descriptive Statistics for Study Variables* [*M* (*SD*) or %]. *Significant Federal Poverty Line Distinctions Identified.*

Characteristics	Analytic Sample (n = 2,025)	< 200% FPL[a] (n = 1,283)	≥ 200% FPL (n = 742)
Household food security status			
Food secure[b] (0 items affirmed)	77%	69%	90%***
Marginal food secure (1 or 2 items affirmed)	10%	13%	6%***
Food insecure (≥ 3 items affirmed)	13%	18%	4%***
Low food secure	10%	13%	3%***
Very low food secure	3%	5%	1%***
Family risk indices			
Financial strain index [0 - 4]	1.37 (0.87)	1.57 (0.87)	1.00 (0.74)***
Economic hardship	72%	41%	63%***
Maternal unemployment	23%	44%	16%***
Health problems/Disability limits employment	8%	30%	5%***
Less than high school education	23%	47%	6%***
Multiple sources of employment	10%	30%	10%
Maternal poor health & risky health behaviors index [0 – 4]	0.41 (0.72)	0.50 (0.77)	0.27 (0.61)***
Poor health	12%	16%	5%***
Depression	20%	23%	14%***
Anxiety	4%	5%	2%**
Drugs	6%	6%	6%
Family disruption & conflict index [0 - 4]	0.68 (0.92)	0.89 (0.96)	0.32 (0.71)***
Single mother household	49%	50%	38%***
Paternal incarceration	29%	34%	17%***
Mother-Father relationship conflict	32%	35%	26%***
Intimate partner violence	28%	31%	21%***
Parenting disruption index [0 - 3]	0.88 (0.80)	1.01 (0.83)	0.66 (0.70)***
Multiple partners	34%	42%	20%***
Poor coparenting support	14%	17%	10%***
Maternal role strain	40%	42%	36%**
Control variables			
Child characteristics			
Age (months)	34.96 (1.95)	35.12 (2.02)	34.69 (1.78)***
Female	49%	48%	49%
Race/Ethnicity			
White	25%	14%	43%***
Black	49%	57%	34%***
Hispanic	26%	29%	23%***
Mother characteristics			
Adolescent at time of child's birth	17%	21%	8%***
Native born	88%	88%	88%
Health insurance			
No insurance	6%	7%	4%**
Public insurance	58%	79%	21%***
Private insurance	36%	14%	75%***
No. of children in household	2.33 (1.30)	2.58 (1.41)	1.91 (0.95)***
Federal poverty line thresholds			
< 100% FPL	38%	60%	---
100 – 199% FPL	25%	40%	---
200 – 299% FPL	15%	---	40%
≥ 300% FPL	22%	---	60%

Note: All values are based on non-imputed data.
[a]FPL = Food Poverty Line. [b]Excludes marginal food secure.
**p < .01. ***p <.001.

Table 2. *Cumulative Family Risk Indices for Households with Young Children by Various Food Security Statuses and Poverty Levels: Mean (SD) [Range]*

Panel A: Households < 200% FPL (n = 1,283)

			Analytic sample			Food insecurity sample	
Cumulative family risk index	Analytic sample (n = 1,283)	Food security[a] (n = 1,052)	Food security[b] (n = 885)	Marginal food security (n = 167)	Food insecurity (n = 231)	Low food security (n = 172)	Very low food security (n = 59)
Financial strain index	1.58 (0.87) [0 – 4]	1.53[c] (0.85) [0 – 4]	1.51[d] (0.85) [0 – 4]	1.66 (0.85) [0 – 4]	1.79 (0.90) [0 – 4]	1.74 (0.86) [0 – 4]	1.93 (1.01) [1 – 4]
Maternal poor health & risky health behaviors index	0.50 (0.77) [0 – 4]	0.43[c] (0.71) [0 – 4]	0.41 (0.70) [0 – 4]	0.51[e] (0.77) [0 – 3]	0.80 (0.96) [0 – 4]	0.69[f] (0.89) [0 – 4]	1.10 (1.10) [0 – 4]
Family disruption & conflict index	0.89 (0.96) [0 – 4]	0.86[c] (0.93) [0 – 4]	0.83[d] (0.93) [0 – 4]	1.02 (0.99) [0 – 4]	1.04 (1.09) [0 – 4]	0.96 (1.06) [0 – 4]	1.27 (1.16) [0 – 4]
Parenting disruption index	1.01 (0.83) [0 – 3]	0.96[c] (0.80) [0 – 3]	0.93[d] (0.79) [0 – 3]	1.14 (0.86) [0 – 3]	1.22 (0.91) [0 – 3]	1.12[f] (0.90) [0 – 3]	1.51 (0.88) [0 – 3]

Panel B: Households ≥ 200% FPL (n = 742)

			Analytic sample			Food insecurity sample	
Cumulative family risk index	Analytic sample (n = 742)	Food security[a] (n = 710)	Food security[b] (n = 668)	Marginal food security (n = 42)	Food insecurity (n = 32)	Low food security (n = 24)	Very low food security (n = 8)
Financial strain index	1.00 (0.74) [0 – 4]	0.98[c] (0.74) [0 – 4]	0.95[d] (0.73) [0 – 4]	1.40 (0.77) [0 – 3]	1.47 (0.62) [0 – 3]	1.50 (0.66) [0 – 3]	1.38 (0.52) [1 – 2]
Poor maternal health & risky health behaviors index	0.27 (0.61) [0 – 4]	0.24[c] (0.56) [0 – 3]	0.23 (0.56) [0 – 3]	0.40[e] (0.63) [0 – 2]	0.91 (1.06) [0 – 4]	0.63[f] (0.88) [0 – 3]	1.75 (1.16) [0 – 4]
Family disruption & conflict index	0.33 (0.71) [0 – 4]	0.31[c] (0.69) [0 – 4]	0.31 (0.69) [0 – 4]	0.40 (0.70) [0 – 3]	0.69 (0.93) [0 – 3]	0.54 (0.93) [0 – 3]	1.13 (0.83) [0 – 2]
Parenting disruption index	0.66 (0.70) [0 – 3]	0.64[c] (0.69) [0 – 3]	0.63 (0.69) [0 – 3]	0.76[e] (0.73) [0 – 2]	1.16 (0.81) [0 – 3]	1.00[f] (0.83) [0 – 3]	1.63 (0.52) [1 – 2]

[a]Group includes marginal food security
[b]Group excludes marginal food security
[c]Indicates food security is significantly different from food insecurity at least at $p < .05$.
[d]Indicates food security is significantly different from marginal food security at least at $p < .05$.
[e]Indicates marginal food security is significantly different from food insecurity at least at $p < .05$.
[f]Indicates low food security is significantly different from very low food security at least at $p < .05$.

Table 3. *Logistic Regressions Predicting the Association between Cumulative Family Risk Indices and Various Levels of Food Insecurity by Poverty Levels*

	Food Insecure vs. Food Secure (N = 2,025)			Food Insecure vs. Marginal Food Secure (N = 472)			Marginal Food Secure vs. Food Secure (N = 1,762)			Very Low Food Security vs. Low Food Security (N = 263)		
	Panel A: Analytic Sample (n = 2,025)											
Cumulative family risk index	*B*	*SE B*	OR	*B*	*SE B*	OR	*B*	*SE B*	OR	*B*	*SE B*	OR
Financial strain index	0.25**	0.09	1.28	0.12	0.12	1.13	0.21*	0.10	1.24	0.03	0.18	1.03
Maternal poor health & risky health behaviors	0.45***	0.08	1.57	0.41**	0.13	1.51	0.11	0.11	1.12	0.39*	0.16	1.48
Family disruption & conflict index	0.03	0.08	1.03	-0.06	0.11	0.94	0.11	0.09	1.11	0.09	0.16	1.09
Parenting disruption index	0.23*	0.09	1.26	0.10	0.13	1.10	0.16	0.10	1.18	0.34	0.20	1.40
Constant	-3.40**	1.27	--	0.65	1.66	--	-3.78	1.39	--	-0.06	2.75	--
	Panel B: Households < 200% FPL (n = 1,283)											
	Food Insecure vs. Food Secure (N = 1,283)			Food Insecure vs. Marginal Food Secure (N = 398)			Marginal Food Secure vs. Food Secure (N = 1,052)			Very Low Food Security vs. Low Food Security (N = 231)		
Cumulative family risk index	*B*	*SE B*	OR	*B*	*SE B*	OR	*B*	*SE B*	OR	*B*	*SE B*	OR
Financial strain index	0.20*	0.09	1.22	0.14	0.13	1.15	0.09	0.11	1.09	0.12	0.19	1.13
Maternal poor health & risky health behaviors	0.40***	0.09	1.48	0.36*	0.14	1.43	0.07	0.12	1.08	0.25	0.17	1.28
Family disruption & conflict index	0.04	0.08	1.04	-0.09	0.12	0.92	0.15	0.10	1.16	0.03	0.17	1.03
Parenting disruption index	0.21*	0.10	1.23	0.08	0.14	1.08	0.19	0.12	1.21	0.33	0.22	1.38
Constant	-.3.33*	1.35	--	0.41	1.76	--	-4.05**	1.54	--	-0.54	2.85	--
	Panel C: Households ≥ 200% FPL (n = 742)											
	Food Insecure vs. Food Secure (N = 742)			Food Insecure vs. Marginal Food Secure (N = 74)			Marginal Food Secure vs. Food Secure (N = 710)			Very Low Food Security vs. Low Food Security[a] (N = 32)		
Cumulative family risk index	*B*	*SE B*	OR	*B*	*SE B*	OR	*B*	*SE B*	OR	*B*	*SE B*	OR
Financial strain index	0.61*	0.27	1.86	-0.10	0.40	0.90	0.75**	0.22	2.12	--	--	--
Maternal poor health & risky health behaviors	0.77**	0.23	2.16	0.78†	0.43	2.18	0.32	0.25	1.37	--	--	--
Family disruption & conflict index	0.02	0.24	1.02	0.32	0.38	1.37	-0.17	0.25	0.84	--	--	--
Parenting disruption index	0.44	0.27	1.56	0.64	0.42	1.89	0.08	0.25	1.08	--	--	--
Constant	-5.73	3.95	--	-0.05	5.91	--	-1.98	3.42	--	--	--	--

Note: Models were conducted on imputed FFCW data. All models include the 12 covariates listed in Table 1, year 3 food insecurity status, as well as the focal items described above.

[a]Too small of a sample for the regression model to coverge.

†$p < .10$. *$p < .05$. **$p < .01$. *** $p < .001$.