TITLE: Food Insecurity and the Well-Being of Children and Mothers in Low Income Mother Headed Households

ABSTRACT

Nearly half of single mother families are food insecure, meaning that they do not always have access to enough food for active, healthy living. Although researchers consistently find that food insecurity has negative consequences for children and adults, the mechanisms underlying these relationships are unclear. Drawing upon a sample of low-income mother-headed households from the 2002 National Survey of America's Families (NSAF), we investigate interrelationships between food insecurity and children's and mothers' physical, social, and emotional health. Our preliminary results indicate that food insecurity is consistently positively associated with fair or poor physical health in mothers and children, low school engagement and high emotional and behavior problems in children, and poor mental health and high parental aggravation in mothers. Future analyses will examine these relationships in a multivariate context controlling for relevant sociodemographic factors.

INTRODUCTION AND RATIONALE

In 2003, over three million children who resided with a single mother were food insecure, meaning that they did not always have access to enough food for active, healthy living (Nord, Andrews & Carlson, 2004). About one in ten (11.2%) of all U.S. households are food insecure. Access to food is a concern particularly for low-income single mothers with children; nearly half (45%) of them are food insecure (Nord et al., 2004). Single mothers and children are more likely to be food insecure than other family types, even after the effects of income are accounted for (Nord, Andrews, & Carlson, 2003).

Our study uses the 2002 National Survey of America's Families (NSAF) to investigate the interrelationships between (1) food insecurity, (2) the physical, social, and emotional well-being of children, and (3) the physical, social, and emotional well-being of mothers in low-income mother-headed families. Our analysis addresses three research questions. First, we ascertain the relationship between food insecurity and the child's well-being as indicated by physical health status, emotional and behavioral problems, and school engagement. Second, we ascertain the relationship between food insecurity and the child's mother's well-being based physical health status, mental health, and parenting aggravation. Third, we examine the extent to which the well-being of the child's mother mediates (and moderates) the effect of food insecurity on the well-being of the child. Similarly, we plan to examine whether food insecurity negatively affects the well-being of the child's mother through its negative effect on the child. Our overarching goal is to provide a better understanding of how food insecurity affects the well-being of parents and children in households with highest risks of being food insecure.

BACKGROUND AND THEORETICAL FOCUS

The negative health, behavioral, and educational consequences of food insecurity for children have been well established in the literature using a variety of data sources including the National Health and Nutrition Examination Survey, The Survey of Income and Program Participation, and the Community Childhood Hunger Identification Project. Food insecurity, food insufficiency, and/or hunger are positively related to fair/poor health status and more frequent stomachaches, headaches, colds and hospitalizations in both very young and school-age children (Alaimo, Olson, Frongiloo, & Briefel, 2001; Cook et al., 2004), child behavioral, emotional, and academic problems, chronic illness (Dunifon & Kowalski-Jones, 2003; Kleinman et al., 1998; Reid, 2005; Weinreb et al., 2002), and depression and suicidal symptoms in adolescents (Alaimo, Olson, & Frongillo, 2002).

The well-being of adults in food insecure families has been studied far less systematically and investigations tend to be based on small and select samples. In one study of rural, high-risk adults in the Lower Mississippi Delta region, household food insecurity was associated with poorer self-reported health status and lower scores on assessments of physical and mental health (Stuff et al., 2004). Olson (1999) found household food insecurity to be positively correlated with higher body mass index (BMI) in small sample ($N = 193$) of women of childbearing age. Low income and homeless single mothers in Worcester, Massachusetts who reported severe hunger were more likely to have been diagnosed with post-traumatic stress disorder, major depression, anxiety disorder, and substance abuse (Weinreb et al., 2002). In a sample of mothers in Washington DC whose children were seen by hospital clinics and emergency departments, maternal depression to be associated with the loss or reduction of welfare or food stamps, and household food insecurity (Casey et al., 2004). Hamelin, Habicht, and Beaudry's (1999)

qualitative interviews with 98 low-income families in Quebec city revealed substantial physical, psychological, and social stresses associated with of food insecurity for adult respondents including hunger pangs and fatigue, regret that meals were no longer happy gatherings, regret over not being able to invite friends over, disrupted parent-child relationships, and non-normative and deviant practices such as visiting food pantries and restaurants for low income people, selling personal belongings, using credit cards to purchase food, borrowing money, poaching animals, and stealing.

Despite this research, the *mechanisms* underlying the relationship between food insecurity and children's and mothers' well-being have not been examined. Although Weinreb et al. (2002) control for the emotional distress of the mother in their analysis of how hunger affects children's health, they do not explore potential mediating and moderating effects. Thus, our understanding of *how* food insecurity negatively affects children's and mothers' well-being remains limited. For instance, we hypothesize that the effect of food insecurity on children's well-being is at least partially mediated by the well-being of the child's mother. Single mothers have higher rates of depression and lower levels of psychological functioning than other mothers (Lansford et al., 2001; McLanahan & Adams, 1987; McLoyd, 1990), and mothers' mental health has been shown to negatively affect child well-being (Carlson & Corcoran, 2001; Downey & Coyne, 1990). The quality of parenting in the home is also consistent predictor of child well-being (e.g., Bradley & Caldwell, 1987; Bradley, Caldwell, & Rock, 1988). Parental responsivity, control, management, and self-efficacy are related to positive child outcomes whereas hostile control and negative communication are associated with negative outcomes (Buchanan et al., 1996; Hill & Bush, 2001; Jackson & Foshee, 1998). Qualitative research reveals that worries about food and not having enough to eat create stress and anxiety for parents, especially single

mothers with children (Edin & Lein, 1997; Schwartz-Nobel, 2002; Seccombe, 1999). With respect to the quality of parenting, research indicates that when a family's economic situation becomes worse, parents become less nurturing and more authoritarian and are more likely to use inconsistent and harsh discipline (e.g., Conger et al., 1992, 1993; Dodge et al., 1994). Thus, the effect of food insecurity may affect children indirectly through its effect on the child's mother. Likewise, we think that the negative effects of food insecurity on the child have the potential to negatively affect the child's mother. A child's mother is likely to become distressed if her child becomes sick as a result of not having enough to eat.. Finally, we examine the possibility that that the mothers' well-being moderates the effect of food insecurity on children's well-being and vice versa. For instance, we expect food insecurity to have a greater negative effect on children's well-being in families with highly aggravated, as opposed to less aggravated, mothers.

DATA AND METHODS

Data

This study is based on data from the 2002 National Survey of America's Families (NSAF), which provides a range of information on the economic, health, and social characteristics of children and adults in thirteen states: Alabama, California, Colorado, Florida, Massachusetts, Michigan, Minnesota, Mississippi, New Jersey, New York, Texas, Washington, and Wisconsin. Together, these states are home to more than half the nation's population (Urban Institute, 2005). When weighted, survey responses are representative of the civilian, noninstitutionalized population of the United States under age 65 (Converse, Safir, Scheuren, Steinbach, & Wang, 2001). This data set is ideally suited for this investigation because the NSAF contains an oversample of disadvantaged families with incomes below 200% of the federal poverty level, a group that is more likely to be food insecure (Gundersen & Gruber, 2001) and includes

indicators of food insecurity among a broad range of economic, health, and social dimensions of well-being. The analysis utilizes the Focal Child File, which includes information on up to two randomly selected children per household (one less than age 6 and one age 6 to17). This information is provided by the *most knowledgeable adult* (MKA), defined as the adult considered most knowledgeable about the focal child's health and education. Typically this person is the child's biological parent or stepparent, but the MKA may also be a grandparent, other relative, or unrelated adult. In the present sample, the MKA is the child's mother in over 95% of cases.

Analytic Sample

The analytic sample is comprised of 5,451 children between the ages of 0-17 who live with a biological (or adopted) mother and who are not living with a biological (or adopted) father. Initially, we limit our sample to children with a total family income of 200% of the federal poverty line and below. However, we will also investigate the proposed relationships in a sample limited to families with incomes below 130% of poverty, the level necessary to qualify for food stamp benefits (Food and Nutrition Service, 2004) and 100% of poverty.

Variables

Well-Being of the Child

The child's physical well-being is reported by the MKA is and is assessed through responses to the question, "In general, would you say your child's health status is excellent, very good, good, fair, or poor?" Despite the apparent simplicity of the measure, this item has been shown to be both reliable and valid for the identification of serious physical health problems and mortality (Idler & Angel, 1990). We use pre-constructed measures of the child's social and emotional health, the Child School Engagement Scale and the Child Behavioral and Emotional Problem Scale. The School Engagement Scale is based on the MKA's report of how much of the time the

child cares about doing well in school, only works on schoolwork when forced to, does just enough schoolwork to get by, and always does homework, from none of the time, to some of the time, most of the time, and all of the time. This scale ranges from 4 to 16, with scores less than or equal to 10 indicating "low" school engagement. The Child Behavioral and Emotional Problem Scale is the MKA's report of the extent to which the child doesn't get along with other kids, can't concentrate or pay attention for long, has been unhappy, sad, or depressed, feels worthless or inferior (age 6-11), has been nervous, high-strung, or tense (age 6-11), acts too young for his/her age (age 6-11), has trouble sleeping (age 12-17), lies or cheats (age 12-17), does poorly at school (age 12-17) in the past month. Responses are never true, sometimes true, and often true. This scale ranges from 6-18 with scores less than or equal to 12 indicating a "high" level of problems. All pre-constructed measures of well-being (both child and mother) have been benchmarked by the Urban Institute for validity and reliability (Ehrle & Moore, 1999).

Well-Being of the Child's Mother (MKA)

The physical well-being of the MKA (usually the child's mother) is self-reported and is assessed through responses to the question, "In general, would you say your health is excellent, very good, good, fair, or poor?" See the note above regarding the validity and reliability of this measure as an assessment of physical health. The NSAF contains two pre-constructed indices that can be used as indicators of the stress of the mother. The first is a measure of the mental health of the MKA. The scale ranges from 25 to 100, with scores less than or equal to 67 indicative of "poor" mental health. The items in the scale assesses the amount of time in the past month the MKA felt (1) they were a very nervous person, (2) calm or peaceful, (3) downhearted or blue, (4) they have been a happy person, and (5) so down in the dumps that nothing could cheer them up. Possible responses are all, most, some, or none of the time (items 2 and 4 were

reverse coded). Second, The NSAF contains a pre-constructed measure of the MKA's aggravation with respect to parenting. The scale ranges from 4 to 16 with scores less than or equal to 11 is indicative of "high" aggravation. The scale assesses how much in the past month the MKA felt (1) the children were harder to care for than most, (2) the children do things that really bother them a lot, (3) they are giving up more of their life to meet the children's needs than they ever expected, and (4) angry with the children. Responses are none of the time to some of the time, most of the time, and all of the time.

Food Insecurity

The NSAF food insecurity questions focus on the respondent's and their family's food situation over the last 12 months. Questions include (1) worrying whether food would run out before getting money to buy more, (2) food not lasting and not having money to get any more, and (3) adults in the family ever cutting the size of meals or skipping meals because there wasn't enough money for food, and the frequency with which this happened. First, we treat each response as an independent indicator of food insecurity and measure frequency dichotomously (ever true or ever happened versus never true or never happened). We also assess the severity of food insecurity using our three indicators to create three new dichotomous variables: (1) ever experienced at least one of the above aspects of food insecurity, (2) ever experienced at least two of the above aspects of food insecurity, and (3) ever experienced all three food insecurity indicators. Alternative measurement strategies will be investigated.

Control Variables

The following variables are among those being explored as potential controls: characteristics of the focal child (sex, age, race, born within marriage/cohabitation, involvement with the nonresident parent [visitation, child support, child support order], characteristics of the MKA

(sex, age, education, employment, foreign born, religious service attendance), and characteristics of the child's family such as the presence of other children, relatives, and stepparents in the household and family income.

Analysis Plan

We first conduct bivariate analyses to examine the relationship between each of our six measures of food insecurity and our measures of child and maternal health. The analysis of children's social and emotional health (school engagement and emotional and behavior problems) is restricted to children age 6 to 17 because these measures do not pertain to very young children. Moreover, analyses of these variables are conducted separately for children age 6 to 11 and children age 12 to 17 because adolescence has emerged as a discrete lifestage from childhood, with unique behaviors, concerns, and peer and family relationships (Furstenberg, 2000). In bivariate analyses, significant differences in child and maternal health by food insecurity are detected using chi-square tests and t-tests. Multivariate analyses will be conducted using ordinary least squares (OLS) or logistic regression, depending on the measurement of the dependent variable. Our indicators of child and maternal health will be separately regressed on our indicators of food insecurity. In the analysis of children's well-being, subsets of variables (namely the physical and mental health and parenting aggravation of the mother) will be included in the regression models sequentially to identify mediators of the effect of food insecurity. Mediating effects will be identified using the Clogg et al. (1995) method, which tests empirically whether the difference in the size of a regression coefficient across models is statistically significant. Moderating effects will be detected using F-tests between models with and without interaction terms between food insecurity and child/mother's well-being. Because the NSAF employs a complex cluster sampling design, all analyses employ special weighting

procedures to adjust standard errors (Flores-Cervantes, Brick, & DiGaetano, 1997). We plan to investigate alternative modeling strategies (e.g., simultaneous regression equations) for assessing the anticipated relationships.

PRELIMINARY FINDINGS

Table 1 provides a distribution of the key variables in the study. In this sample of low-income children and their families, 59% of MKA's reported that they had ever worried about food running out, half (51%) reported having ever had food not last, and about a third (32%) had to cut or skip meals. In term of severity, two-thirds of respondents (63%) reported having experienced one of the above food problems in the previous year, half (51%) reported having had two of the above problems, and over one-quarter (28%) reported having had all three of the food problems occur in the previous year. About one in ten (11%) of the children in this sample are reported as being in fair or poor health. Among younger children (age 6-11), 12% score high on behavioral and emotional problems and 25% score low on school engagement. Among older children (age 12-17), 13% score high on behavioral and emotional problems and 41% score low on school engagement. In terms of characteristics of the MKA (most of whom are the child's mother), 26% report being in fair or poor health, 18% score high on parental aggravation, and 28% are in poor mental health.

Table 2 examines the bivariate relationships between food insecurity and children's and mothers' health. Food insecurity is significantly positively associated with the fair or poor physical health of children and mothers. Having experienced any of the types of food insecurity listed roughly double the percentage of children who are in fair or poor physical health. Most indicators of food insecurity are positively associated with high behavior and emotional problems in children and low school engagement for both young and old children. Most of the

indicators of food insecurity are associated with high parenting aggravation and poor mental health among mothers. The effect of food insecurity on mothers' mental health appears particularly strong.

REFERENCES

Alaimo, K., Olson, C.M., Frongillo, E.A. (2002). Family food insuffiency, but not low family income, is positively associated with dysthymia and suicide symptoms in adolescents. *Journal of Nutrition, 132,* 719-725.

Alaimo, K., Olson, C.M., Frongillo, E.A., & Briefel, R.R. (2001). Food insufficiency, family income, and health in US preschool and school-aged children. *American Journal of Public Health, 91,* 781-786.

Bradley, R. H., & Caldwell, B. M. (1987). Early environment and cognitive competence: The Little Rock Study. *Early Child Development and Care, 27*:307-341.

Bradley, R. H., Caldwell, B. M., & Rock, S. L. (1988). Home environment and school performance: A ten-year follow-up and examination of three models of environmental action. *Child Development, 59*:852-867.

Buchanan, C. M., Maccoby, E. E., & Dornbusch, S. M. (1996). *Adolescents after divorce*. Cambridge, MA: Harvard University Press.

Carlson, M. J., & Corncoran, M. E. (2001). Family structure and children's behavioral and cognitive outcomes. *Journal of Marriage and Family:63*:779-792.

Casey, P., Goosby, S., Berkowitz, C., Frank, D., Cook, J., Cutts, D., Black, M. M., Zaldivar, N., Levenson, S., HEeren, T., Meyers, A., & The Children's Sentinal Nutritional Assessment Program Study Group. (2004). Maternal depression, changing public assistance, food security, and child health status. *Pediatrics, 113,* 298-304.

Conger, R. D., Conger, K. J., Elder, G. H. , Lorenz, R.O., Simons, R. L., & Whitbeck, L. B. (1992). A family process model of economic hardship and adjustment of early adolescent boys. *Child Development, 63*, 526-541.

Conger, R. D., Conger, K. J., Elder, G. H. , Lorenz, R.O., Simons, R. L., & Whitbeck, L. B. (1992). Family economic stress and adjustment in early adolescent girls. *Developmental Psychology, 29,* 206-219.

Cook, J., Frank, D., Berkowitz, C., Black, M., Casey, P., Cutts, D., Meyers, A., Zaldivar, N., Skalicky, A., Levenson, S., Heeren, T., & Nord, M. (2004). Food insecurity is associated with adverse health outcomes among human infants and toddlers. *Journal of Nutrition*, *134*, 1432-1438.

Converse, N., Safir, A., Scheuren, F., Steinbach, R., & Wang, K. (2001). *1999 NSAF public use file user's guide* (NSAF 1999 Rep. No. 11). Washington, DC: The Urban Institute.

Dodge, K. A., Pettit, G. S., & Bates, J. E. (1994). Socialization mediators of the relation between socioeconomic status and child conduct problems. *Child Development, 65,* 649-665.

Downey, G., & Coyne, J. C. (1990). Children of depressed parents: An integrative review. *Psychological Bulletin*, 108:50-76.

Dunifon, R., & Kowaleski-Jones, L. (2003). The influences of participation in the national school lunch program and food insecurity on child well-being. *Social Service Review*, *77*, 72-92.

Edin, K., & Lein, L. (1997). *Making ends meet: How low-income single mothers survive welfare and low-wage work.* New York: Russell Sage Foundation.

Ehrle, J., & Moore, K. (1999). *No. 6 benchmarking child and family well-being measures in the NSAF,* National Survey of American Families, 1997 Methodology Series, March 1999.

Flores-Cervantes, I., Brick, J. M., & DiGaetano, R. (1997). *1997 Variance Estimation*. (NSAF 1997 Methodology Report No. 4). Washington, DC: The Urban Institute.

Food and Nutrition Service, United States Department of Agriculture (2004). *Food Stamp Program*. Retrieved April 20, 2004, from http://www.fns.usda.gov/fsp/default.htm

Furstenberg, F. F. (2000). The sociology of adolescence and youth in the 1990s: A critical commentary. *Journal of Marriage and Family, 62*, 896-910.

Gundersen, C., & Gruber J. (2001). The dynamic determinants of food insufficiency. *Second Food Security Measurement and Research Conference, Volume II: Papers.* M. Andrews and M. Prell, eds. pp. 92-109. Washington, DC: United States Department of Agriculture, Economic Research Service, Food Assistance and Nutrition Report 11-2.

Hamelin, A. M., Habicht, J. P., Beaudry, M. (1999). Food insecurity: Consequences for the household and broader social implications. *Journal of Nutrition, 129,* 542S-528S.

Hill, N. E., Bush, K. R. (2001). Relationships between parenting environment and children's mental health among African American and European American mothers and children. *Journal of Marriage and Family, 63*:954-966.

Idler, E. & Angel, R. (1990). Self-rated health and mortality in the Nhanes-1 Epidemiological Follow-up study. *American Journal of Public Health, 80,* 466-52.

Jackson, C., & Foshee, V. A. (1998). Violence-related behaviors of adolescents: Relations with responsive and demanding parenting. *Journal of Adolescent Research, 13*:343-359.

Kleinman, R.E., Murphy, J.M., Little, M., Pagano, M., Wehler, C.A., Regal, K., & Jellinek, M.S. (1998). Hunger in children in the United States: Potential behavioral and emotional correlates. *Pediatrics, 101*, e3.

Lansford, J. E., Ceballo, R., Abbey, A., & Stewart, A. J. (2001). Does family structure matter? A comparison of adoptive, two-parent biological, single-mother, stepfather, and stepmother households. *Journal of Marriage and Family, 63*:840-851.

McLanahan, S. S., & Adams, J. (1987). Parenthood and psychological well-being. *Annual Review of Immunology, 5*:237-57.

McLoyd. V. C. (1990). The impact of economic hardship on black families and children: Psychological distress, parenting, and socioemotional development. *Child Development*, 61:311-346.

Nord, M, Andrews, M., & Carlson, S. (2003). *Household Food Security in the United States, 2002*. (FANRR No. 35). Washington, DC: United States Department of Agriculture.

Nord, M, Andrews, M., & Carlson, S. (2004). *Household Food Security in the United States, 2003*. (FANRR No. 42). Washington, DC: United States Department of Agriculture.

Olson, C. M. (1999). Nutrition and health outcomes associated with food insecurity and hunger. *Journal of Nutrition, 129,* 521S-524S.

Reid, L. L. (2005). *The consequences of food insecurity for child well-being: An analysis of children's school achievement, psychological well-being, and health*. Unpublished manuscript.

Schwartz-Nobel, L. (2000). *Growing up empty*. New York: Harper Collins.

Seccombe, K. (1999). *"So you think I drive a Cadillac?"* Needham Heights, MA: Allyn and Bacon.

Stuff, J. E., Casey, P. H., Szeto, K. L., Gossett, J. M., Robbins, J. M., Simpson, P. M., Connell, C., & Bogle, M. L. (2004). *Household food insecurity is associated with adult health status. Journal of Nutrition, 134,* 2330-2335.

Urban Institute. (2005). A*ssessing the New Federalism*. Retrieved July 26, 2005, from http://www.urban.org/Content/Research/NewFederalism/AboutANF/AboutANF.htm .

Weinreb, L., Wehler, C., Perloff, J., Scott, R., Hosmer, D., Sagor, L., & Gundersen, C. (2002). Hunger: Its impact on children's health and mental health. *Pediatrics*, *110*, e41.

Table 1. Distribution of Key Variables

	Mean or Percentage	
Food insecurity in previous year		
Ever worried food would run out	59.3	
Ever had food not last	51.2	
Ever had adults cut size of meals or skip meals	31.8	
Severity of food insecurity in previous year		
Ever experienced at least one of the above	63.1	
Ever experienced at least two of the above	51.2	
Ever experienced all three of the above	27.9	
Characteristics of the Child		
Fair or poor physical health	10.8	
	kids 6-11	kids 12-17
High behavioral and emotional problems[a]	11.7	13.4
Low school engagement	24.6	40.7
Characteristics of the Mother		
Fair or poor physical health	25.5	
High parental aggravation	18.3	
Poor mental health	27.5	
(n)	5,451	

Note: All analyses were weighted using NSAF sample weights.
[a]These measures are limited to children ages 6 to 17 (1,878 children age 6-11 and 1,783 children age 12-17)

Table 2. Relationship between Food Insecurity and Children and Mothers' Well-Being

	Child				Mother		
	Physical health fair or poor	High behavioral and emotional problems		Low school engagement	Physical health fair or poor	High Parenting aggravation	Poor mental health
Food insecurity in previous year		6-11	12-17	6-11 12-17			
Ever worried food would run out							
No	6.7	9.3	8.3	21.8 33.5	19.1	13.0	16.9
Yes	13.6[d]	13.5[b]	16.7[d]	26.5 45.3[c]	33.3[d]	22.0[d]	43.3[d]
Ever had food not last							
No	8.2	8.7	9.4	20.9 33.3	20.9	12.4	18.3
Yes	13.2[d]	14.9[b]	16.8[c]	28.4[a] 46.9[d]	33.8[d]	24.0[d]	46.2[d]
Ever had adults cut size of meals or skip meals							
No	8.9	9.3	10.0	22.7 37.6	22.5	14.4	23.9
Yes	14.9[d]	17.6[c]	20.1[c]	29.0[a] 46.9[b]	38.1[d]	26.4[d]	51.2[d]
Severity of food insecurity in previous year							
Ever experienced at least one of the above							
No	6.7	9.0	7.7	21.0 32.2[c]	18.5	12.4	15.5
Yes	13.1[d]	13.4[a]	16.4[d]	26.7[a] 45.2[c]	32.7[d]	21.8[d]	42.5[d]
Ever experienced at least two of the above							
No	7.6	8.5	7.9	21.2 33.1	20.3	12.4	18.1
Yes	13.8[d]	15.1[c]	18.2[d]	28.0[a] 47.2[d]	34.3[d]	24.9[d]	46.4[d]
Ever experienced all three of the above							
No	9.1	9.6	11.1	22.8 38.1	23.0	14.8	24.4
Yes	15.0[d]	18.1[c]	18.6[b]	29.8[a] 46.8[a]	39.1[d]	27.4[d]	53.6[d]

[a]Differences in well-being by food insecurity are statistically significant at $p < 10$. [b]Differences in well-being by food insecurity are statistically significant at $p < .05$. [c]Differences in well-being by food insecurity are statistically significant at $p < .01$. [d]Differences in well-being by food insecurity are statistically significant at $p < 001$.