Relationship Between Hunger and Psychosocial Functioning in Low-Income American Children

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ABSTRACT

Objective: Using large-scale surveys from nine states, the Community Childhood Hunger Identification Project (CCHIP) estimates that 8% of American children under the age of 12 years experience hunger each year. CCHIP operationalizes child hunger as multiple experiences of parent-reported food insufficiency due to constrained resources. The current study examined the relationship between food insufficiency and school-age, low-income children's psychosocial functioning. The study also assessed the interinformant (parent versus child) reliability and time-to-time reliability of the CCHIP measure. **Method:** Two hundred four school-age children and their parents from four inner-city public schools were interviewed using parent, teacher, and clinician report measures of psychosocial functioning. Ninety-six children and their parents were reinterviewed 4 months later. **Results:** Hungry and at-risk for hunger children were twice as likely as not-hungry children to be classified as having impaired functioning by parent and child report. Teachers reported higher levels of hyperactivity, absenteeism, and tardiness among hungry/at-risk children than not-hungry children. Parent and child reports of hunger were significantly related to each other, and time-to-time reliability of the CCHIP measure was acceptable. **Conclusions:** Results of this study suggest that intermittent experiences of food insufficiency and hunger as measured by CCHIP are associated with poor behavioral and academic functioning in low-income children. The current study also supports the validity and reliability of the CCHIP measure for assessing hunger in children. *J. Am. Acad. Child Adolesc. Psychiatry,* 1998, 37(2):163–170. **Key Words:** hunger, low-income children, school breakfast, psychosocial functioning.

Are food insufficiency and hunger a real problem for poor children in the United States, as some child advocates have claimed? Or, as skeptics have argued, are the experiences of food deprivation and poor-quality nutrition that children from low-income families sometimes experience merely mild exacerbators of other and far more devastating problems such as violence, drug addiction, and family breakdown? For the past decade, an academic and political debate over these questions has taken place in the fields of public health and public policy. Recent efforts to diminish or even eliminate the National School Breakfast and Lunch programs, as well as other programs that provide food for low-income children, have highlighted the issue of hunger for growing children and the potential relevance for clinicians who work with low-income children and their families.

Our understanding of the epidemiology of hunger among children in the United States advanced significantly in the early 1980s when several different groups of academic and policy researchers began to use the constructs of "food insufficiency" (Wehler et al., 1992) or "food insecurity" (Radimer et al., 1992) as a proxy for hunger. The most widely used measure of this sort was developed by the Community Childhood Hunger Identification Project (CCHIP), which conducted a series of studies using large, rigorously selected samples in 21 communities across the United States (Wehler et al.,

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1991, 1996a). CCHIP categorizes families and children as "hungry," "at risk for hunger," or "not hungry" on the basis of parent answers to eight standardized questions about child and family experiences of food insufficiency due to constrained resources.

The most recent summary of CCHIP's findings, based on the data from nine U.S. states, reports that 8% of children under the age of 12 experience hunger and that an additional 21% are at risk for hunger (Wehler et al., 1996a). According to CCHIP, hunger is most prevalent in children from the lowest-income families (e.g., recipients of Aid to Families With Dependent Children). In such samples, as many as 21% of children are found to be hungry and an additional 50% are classified as at risk for hunger on the CCHIP measure, suggesting that more than two thirds of all of the poor children in this country have had at least one experience of food insufficiency/hunger in the past year.

Studies from nonindustrialized countries have shown that *severe* undernutrition is associated with increased anxiety, attention deficits, school absence, and tardiness in school-age children (Barrett et al., 1982; Mora, 1979) and lower levels of social responsiveness in young children (Chavez and Martinez, 1979; Graves, 1976, 1978). Aggression has also been linked to undernutrition in both human and animal studies, although the human evidence has been largely anecdotal and/or poorly controlled (Gray, 1986; Halas et al., 1975). The only data currently available on the impact of intermittent episodes of food insufficiency and hunger comes from the CCHIP surveys (Wehler et al., 1991, 1996a), which have consistently shown that children who are classified as hungry are more likely to have mood and attention problems and more likely to be absent from school than poor children who are classified as not hungry. One limitation of these data has been that the information about child functioning, like the CCHIP measure itself, is based solely on parental report.

The fact that CCHIP data on the prevalence of food insufficiency and hunger are based on parent reports raises several issues. First, a parent report of multiple family experiences of food insufficiency does not necessarily mean that each child in the family has had the same experience. And even if the child has experienced food insufficiency, it does not follow that he or she has suffered from a clinically significant state of undernutrition. For now, however, short of inducing hunger in children in a laboratory setting to develop physiological measures, CCHIP appears to provide an acceptable way of estimating the prevalence of hunger and its relationship to other factors. One indicator of CCHIP's acceptability has been its wide use in the public policy arena and the adoption of its questions by a number of large-scale governmental surveys such as the National Health and Nutrition Examination Survey (NHANES) and by federal agencies such as the U.S. Department of Agriculture (Wehler et al., 1991, 1996a) and the U.S. Census Bureau (Bickel et al., 1996).

Since another study by the authors demonstrated a relationship between child hunger on CCHIP and a single measure of psychosocial impairment, the current study examined the relationship between child hunger as measured by parent reports on CCHIP and psychosocial problems assessed using standardized measures and multiple informants and academic functioning using school records of attendance and tardiness. Two secondary goals were to determine whether parental reports of food insufficiency were confirmed by a second informant and whether the CCHIP measure was stable over time. Toward these ends we examined the extent of agreement between parent and child answers to CCHIP questions and between parent answers to the CCHIP questions at two different administrations 4 months apart.

METHOD

Study Population and Sampling

Data for the current analyses came from a collaborative study of a free breakfast program in the Philadelphia and Baltimore Public Schools. Students and their parents in four schools (two in Philadelphia and two in Baltimore) were assessed on a battery of psychosocial, academic, and food sufficiency/hunger measures before the start of a free breakfast program in the schools. Teachers of all the students in the study were asked to complete a standardized behavior problem questionnaire before and after the free breakfast program began. The free breakfast program was made possible by Provision 2 of the U.S. Department of Agriculture school meal guidelines which permits free meals for all children in a given school under certain conditions in low-income areas. In Philadelphia more than 150 other schools had already implemented Universal Feeding, while in Baltimore only three other schools had tried the program at the time of this study.

In all four schools, the regular school breakfast was made available for free for all students at the beginning of the second semester. For the current study, students and their parents were interviewed in late January or early February prior to the start of Universal Feeding and then again in late May–early June after the program was implemented. In all four schools, children in grades 3 and higher were invited to participate in the study, although all children were eligible for a free breakfast. Two schools included kindergarten through

grade 6, the third included kindergarten through grade 8, and the fourth included grades 5 through 8.

In Philadelphia, the parents of all 186 students in the fourth and fifth grades of an elementary school and 126 fifth- and eighth-grade students in four classrooms of a middle school were invited to participate in the study through letters that were sent home with students. After an additional invitation letter and follow-up phone calls, 125 (40%) of the 312 parents agreed to participate. When interviews were scheduled, 31 of the initially agreeing parents could not be scheduled, resulting in 94 complete parent/child interviews (75% of the agreeing sample and 30% of the total sample). In the two selected schools in Baltimore, the parents of all 367 students in the third through eighth grades were asked to participate in the study through invitation letters that were sent home with students. After an additional invitation letter and follow-up phone calls, 41% (149/367) of the parents agreed to participate. When interviews were scheduled, 39 of the parents who initially agreed to participate could not be scheduled, leaving a sample of 110 children from the two Baltimore schools (74% of the agreeing sample and 30% of the total sample). Data on the 110 children from Baltimore and the 94 children from Philadelphia were combined, resulting in a sample of 204 children.

To save time and expense, the study design called for only half of the initial sample of 204 children to be reinterviewed at the end of the school year in late May, 4 months after the initial interviews. The parents of 106 children who had participated in the initial school breakfast interview were sent invitation letters for another interview. Students were randomly selected within three groups based on their pre–Universal Feeding school breakfast participation (rarely, sometimes, often) in order to yield a reinterview sample that had the same proportion of participants from the three breakfast groups at the time of the initial interviews (50% ate breakfast rarely, 25% sometimes, 15% often). After follow-up phone calls, 101 (96%) agreed to participate. When interviews were set up, five of the initially agreeing parents could not be scheduled, leaving a reinterview sample of 96 parents and children (91% of the agreeing sample and 95% of the parents who were recontacted).

The parent and child were interviewed separately, one by a master's-level research assistant and the other by a lay interviewer from the community. Lay interviewers were part-time or full-time employees of the school and had associates' or bachelors' degrees. They were trained in the administration of the simple measures prior to the start of the interviews, and their work was checked by the research assistant. All clinical coding was done by one of the authors. Parents and children were asked questions about food security and children's psychosocial, behavioral, and academic functioning; other questions about food and eating; and questions about the family's functioning and background. CCHIP hunger questions were asked at the end of the interviews after the other measures had been administered, and interviewers were blind to the family's CCHIP hunger status. The study was approved by the Human Studies Subcommittee at the Massachusetts General Hospital and by the research committees of the Philadelphia and Baltimore Public Schools. Participation of parents, children, and teachers was voluntary, and access to school records was made possible through a separate consent signed by parents.

Measures

Background Data. For the current study, the children's grade level, ethnicity, gender, and parental marital status were assessed from questions in the parent interview.

TABLE 1
Community Childhood Hunger Identification Project Survey

Eight questions asked of the parent

Thinking about the past 12 months:

*1. Did your household ever run out of money to buy food to make a meal?
2. Did you or adult members of your household ever eat less than you felt you should because there was not enough money to buy food?
*3. Did your child(ren) ever eat less than you felt they should because there was not enough money to buy food?
*4. Did your child(ren) ever say they were hungry because there was not enough food in the house?
*5. Did your child(ren) ever go to bed hungry because there was not enough money to buy food?
*6. Did you ever cut the size of your child(ren)'s meals or did they skip meals because there was not enough money to buy food?
7. Did you or adult members of your household ever cut the size of your meals or skip meals because there was not enough money to buy food?
8. Did you ever rely on a limited number of foods to feed members of your household because you were running out of money to buy food for a meal?

Five questions asked of the child constituting the Child Hunger Interview Child Report

Thinking about the past 12 months:

1. Did your household ever run out of money to buy food to make a meal?
2. Did you ever eat less than you felt you should because there was not enough money to buy food?
3. Did you ever tell your parent(s) that you were hungry because there was not enough food in the house?
4. Did you ever go to bed hungry because there was not enough money to buy food?
5. Did you ever cut the size of your meals or did you skip meals because there was not enough money to buy food?

*Questions comprising the Child Hunger Index Parent Report scale.

CCHIP Hunger Scale. The eight-item CCHIP hunger measure assesses experiences of food insufficiency in households in order to classify them as "hungry," "at risk for hunger," or "not hungry" (Table 1). Principal-component factor analyses have shown the content validity of the CCHIP measure to be excellent (Wehler et al., 1996b). Since there have been no published data on CCHIP's validity and time-to-time reliability, the current study addressed these issues.

Four of the eight questions on the CCHIP scale concern the children in the household, two concern hunger in adult members of the household, and two concern household food insufficiency. Children are classified as "hungry" if the parent responds positively to five or more of the eight questions concerning hunger in the past year. With a score of five, the parent must have responded positively to at least one question about the child's hunger, thus providing face validity that CCHIP is a measure of child hunger. Children are classified as at risk for hunger if the parent responds positively to one or as many as four of the eight food insufficiency questions. If the

parent does not respond positively to any of the eight food insufficiency questions, the household and child are classified as not hungry.

Child Hunger Status. The eight-item CCHIP scale was administered to parents at the time of the initial interviews and again after 4 months in the reinterview phase of the study to assess the time-to-time reliability of CCHIP. The full set of eight CCHIP questions was not administered to children because the investigators believed that the children would not have knowledge of three of the (parent/household hunger) questions. Instead, we asked children the five CCHIP questions that we thought that children as well as parents would have knowledge of, and then we assessed the inter-informant agreement (convergent validity) of this modified CCHIP measure.

Solely for the purpose of this assessment, we created a five-item scale, the Child Hunger Index Parent (or Child) Report (CHI-P/CHI-C) (see Table 1). For parents and children, a total CHI-P or CHI-C score was computed by summing the yes answers to the five CCHIP questions. In an effort to match the relative distribution of hunger categories on the new measure with the distribution of categories on the standardized eight-item CCHIP measure, children who (or whose parents) responded positively to two or more of the above questions were classified as "hungry." When the child or parent responded positively to one of the questions, the child was classified as at risk for hunger on the CHI-P/CHI-C. Those who did not respond positively to any of the items were classified as not hungry. The degree of agreement between parent and child reports of the child's hunger (CHI-P versus CHI-C) could then be calculated. The degree of association between the child's report of hunger on the CHI-C and the parent's report of child hunger on the full eight-item CCHIP measure was also assessed.

For the assessment of time-to-time reliability, CCHIP hunger category based on parental response to the full eight-item CCHIP survey at time 1 and again at time 2 was used.

Parent Report Measures. The Pediatric Symptom Checklist (PSC) is a brief, widely used, parent-completed questionnaire that has been validated as a screening measure to identify children with psychosocial problems (Jellinek and Murphy, 1988; Jellinek et al., 1986; Murphy and Jellinek, 1988; Murphy et al., 1992, 1996). The PSC consists of 35 items that are rated as "never," "sometimes," or "often" present and scored 0, 1, or 2, respectively. A total score is obtained by adding the scores for each of the items and impairment is defined as a total score of 28 or higher.

The Child Behavior Checklist (CBCL) is the most widely used parent report of children's symptoms and behaviors (Achenbach, 1991). It has been validated in normative samples for children aged 4 to 16 years (Achenbach, 1991). The CBCL consists of 118 items scored on a 3-point Likert scale. The parent indicates for each symptom whether it is "often," "sometimes," or "never" present. The individual symptoms are given scores of 2, 1, or 0 (often, sometimes, or never present), and a total score is obtained by adding the scores for each of the items. Following standard practices with the CBCL, cutoff scores based on the Total Behavior Problems item set were also used as a criterion of case/noncase rating (Achenbach, 1991).

Teacher Report Measure. The Conners Teacher Rating Scale-39 (CTRS-39) is one of the most frequently used teacher-reported symptom checklists. It consists of 39 items that assess hyperactivity and other behavioral problems in school-age children. Teachers check each item as not at all present, just a little present, pretty much present, or very much present, with numerical scoring weights of 0, 1, 2, and 3, respectively.

Although there are seven subscales on the CTRS-39, the most frequently used scale and the one that is recommended for behavior problem change studies is the Hyperactivity Index. The Hyperactivity Index is based on a subset of 10 items and has been demonstrated to be a valid and useful assessment tool (Boyle and Jones, 1985; Sandoval, 1981). Total scores on the CTRS-39 Hyperactivity Index have been shown to correlate reliably with the amount of observed motor activity in the classroom among normal school-age children (Kivlahan et al., 1982) as well as ratings of excessive talking (Minde, 1980). For all CTRS-39 subscales, a higher score indicates more symptomatology. The total symptom T score of the CTRS-39's Hyperactivity Index is the only one reported in the current study because the other subscales were not found to be significantly associated with hunger levels.

Interviewer-Rated Measure. After the interviews were completed, the researchers reviewed all parent and child questionnaire data for each case (excluding the hunger questions) and provided ratings of each child's overall functioning using the Children's Global Assessment Scale (CGAS). Using the cutoff defined by Shaffer and associates (1983), CGAS scores of 70 or below were considered indicative of a clinical range of impairment. The CGAS has been widely used for more than a decade, and the validity and reliability of the measure have been demonstrated (Green et al., 1994).

School Records. Data on each child's absence and tardiness rates were collected from official school records for the fall term prior to the implementation of the free school breakfast program.

RESULTS

Background Characteristics and CCHIP Hunger

Of the 204 children in this sample, 82% (168) were from elementary grades (3 through 5) and 18% (36) were from middle school grades (grade 8). Eighty percent of children (164/204) were from African-American backgrounds. Approximately half of the children were male (47%; 96/204) and from single-parent families (47%; 95/204). According to the eight-item CCHIP scale, 65% (132/204) of children were classified as not hungry, 27% (56/204) were classified as at risk for hunger, and 8% of the children (16/204) were classified as hungry.

Children in the three CCHIP hunger groups did not differ significantly from each other with respect to grade, ethnicity, parental marital status, or city. Hunger category scores did differ significantly by gender, with female children somewhat more likely to be at risk for hunger than male children and somewhat less likely to be classified as hungry or not hungry ($\chi^2 = 15.4$, $df = 2$, $p < .001$).

Parent Report Measures and CCHIP Hunger

As shown in Table 2, CCHIP hunger group was significantly associated with both parent report

TABLE 2
Child Adjustment Scores by Community Childhood Hunger Identification Project Categories

	Total		Hungry		At Risk		Not Hungry	
	n or Mean	(%)	*n* or Mean	(%)	*n* or Mean	(%)	*n* or Mean	(%)
	204	(100)	16	(8)	56	(28)	132	(65)
Parent report measures								
CBCL impaired*	31	(15)	3	(19)	15	(27)	13	(10)
CBCL mean score†	51.5		56.8		56.3		48.8	
PSC impaired	28	(14)	5	(31)	9	(16)	14	(11)
PSC mean score***	16.2		21.5		18.9		14.4	
Teacher report measure								
CTRS-39 HI mean score†	54.6		71.5		51.7		53.5	
Interviewer rating of child functioning								
CGAS impaired (<71)***	80	(40)	13	(81)	23	(41)	44	(34)
Mean CGAS score**	72.5		66.3		72.2		73.4	
School record measures[a]								
Days absent*	2.8		5.2		3.2		2.3	
Days tardy*	0.8		1.8		1.0		0.7	

Note: CBCL = Child Behavior Checklist; PSC = Psychosocial Screening Checklist; CTRS-39 HI = Conners Teacher Rating Scale/Hyperactivity Index; CGAS = Children's Global Assessment Scale.
[a] Absences/tardiness from school records for first semester.
* $p < .05$; ** $p < .01$; *** $p < .001$; † $p < .0001$.

measures of children's symptoms. Total CBCL score was significantly associated with CCHIP hunger status ($F = 34.1$, $df = 2$, $p < .0001$), and impairment on the CBCL was also significantly associated with CCHIP hunger category, with rates of impairment that were twice as high in hungry and at-risk for hunger children as in not-hungry children ($\chi^2 = 8.5$, $df = 2$, $p < .05$). Total PSC score was significantly associated with CCHIP hunger status ($F = 22.3$, $df = 2$, $p < .001$). Although the PSC impairment rate was nearly three times higher for hungry children than for not-hungry children, this finding did not reach statistical significance.

Teacher Report Measures and CCHIP Hunger

The mean CTRS-39 Hyperactivity Index *T* score for children classified as hungry was significantly higher (71.5) than for children who were classified as at risk for hunger (51.7) or not hungry (53.5; $F = 37.5$, $df = 2$, $p < .0001$). Although the not-hungry children had slightly higher mean CTRS-39 Hyperactivity Index *T* scores than at-risk for hunger children, post hoc analysis (Duncan's multiple-range test) indicated that this difference was not statistically significant, whereas the differences between children classified as hungry versus at risk and hungry versus not hungry were statistically significant.

Interviewer Ratings and CCHIP Hunger

Interviewer-rated CGAS scores were significantly related to parent-reported CCHIP hunger status ($F = 4.1$, $df = 2$, $p < .01$). The mean total CGAS score was worst for hungry children, followed by at-risk for hunger children. Not-hungry children had the highest mean total CGAS score (indicative of the best functioning). Hungry and at-risk for hunger children were also more likely to be cases on the CGAS ($\chi^2 = 25.4$, $df = 2$, $p < .001$).

School Record Measures and CCHIP Hunger

Hungry and at-risk for hunger children were absent from school significantly more days than not-hungry children ($F = 4.2$, $df = 2$, $p < .05$) (Table 2). Hungry and at-risk for hunger children also had significantly higher rates of tardiness than not-hungry children ($F = 4.1$, $df = 2$, $p < .05$).

Time-to-Time Reliability of the CCHIP Hunger Scale

Table 3 shows the distribution of CCHIP hunger classifications at time 1 and time 2 based on the reports of the 96 parents in the reinterview sample. Comparison of CCHIP hunger status by parent report at initial interview and reinterview showed exact agreement for 73% of the subjects (70/96). Partial agreement was

found for 22% of the subjects (21/96) and complete disagreement was found in only 5% of the subjects (n = 5), which was statistically significant (χ^2 = 39.4, df = 4, p < .0001; κ = .43). The correlation between CCHIP total score at time 1 and time 2 was r = .56, indicating a rate of time-to-time reliability that would be considered acceptable.

Agreement Between Parent and Child Reports of Hunger

Table 4 shows the agreement between the five-item CHI-P and the five-question CHI-C. Complete pre–Universal Feeding CHI-P and CHI-C data were available for 193 (95%) of the 204 subjects.

Hunger status by child report was significantly related to parent's report of child hunger at time 1 (χ^2 = 71.7, df = 4, p < .0001). Exact agreement between parent and child report was found for 74% (142/193) of the sample, partial agreement was found for 23% (45/193), and full disagreement was found for 3% (6/193) of the subjects. Statistically, the degree of association (κ = .36) was in a range that is generally considered to indicate an acceptable level of agreement. As shown in Table 4, 85% (16/19) of the children whose parents reported hunger on the CHI-P measure were hungry (53%) or at risk for hunger (32%) on the CHI-C. Similarly, of the 14 children who were classified as hungry on the standard eight-item CCHIP measure, 93% (13/14) were classified as hungry (64%) or at risk (29%) by their own report on CHI-C (χ^2 = 80.9, df = 4, p < .0001; not shown).

DISCUSSION

In the current study, the parent-reported CCHIP hunger score was significantly associated with psychosocial dysfunction as assessed by standardized measures filled out independently by parents, teachers, and clinicians, and with school records of absence and tardiness. These findings provide clear evidence of the association between parental report of food insufficiency due to constrained resources and children's behavioral and academic functioning.

In this study of low-income children, as in other samples, about one third of the children were found to have significant problems in psychosocial functioning as measured by the CGAS. Children from families coded as hungry on CCHIP were more than twice as likely to be rated as impaired as low-income children from the same communities whose parents did not report hunger. Hungry children were also two to three times more likely to receive scores in the impaired range on the other measures of emotional problems than not-hungry children. Behavioral and attention problems by teacher report were more prevalent in hungry than in at-risk for hunger or not-hungry children. Academic problems were also associated with hunger status; hungry children were absent and tardy twice as many days as not-hungry children. Since gender has never been related to hunger in other CCHIP studies and since it was not in our CCHIP study in Pittsburgh (Kleinman et al, in press) involving a larger number of cases, we concluded that the observed gender difference was artifactual.

The face validity of the CCHIP measure was shown by significant agreement between parent and child reports of hunger on the child-focused questions of the CCHIP measure, and the time-to-time reliability of the CCHIP measure was good. Descriptively, the fact that 85% of the children classified as hungry on the basis of parent report on the CHI-P measure and 93% of the

TABLE 3
Time-to-Time Reliability of Parent Reports of Hunger on CCHIP Questions

Time 1 CCHIP Hunger Categories†	Total	Time 2 CCHIP Categories[a]					
		Not Hungry		At Risk		Hungry	
Total	96 (100)	73	(76)	19	(20)	4	(4)
Not hungry	59 (62)	55	(93)	3	(5)	1	(2)
At risk	26 (27)	14	(54)	12	(46)	0	(0)
Hungry	11 (11)	4	(36)	4	(36)	3	(27)

Note: Values represent n (%).
[a] Community Childhood Hunger Identification Project (CCHIP) Hunger Scale based on the full eight questions.
† p < .0001.

TABLE 4
Parent and Child Reports of Hunger on Community Childhood Hunger Identification Project Questions

Parent Report (CHI-P)†	Total	Child Report (CHI-C)					
		Not Hungry		At Risk		Hungry	
Total	193 (100)	139	(72)	38	(20)	16	(8)
Not hungry	147 (76)	122	(83)	22	(15)	3	(2)
At risk	27 (14)	14	(52)	10	(37)	3	(11)
Hungry	19 (10)	3	(16)	6	(32)	10	(53)

Note: Values represent n (%). CHI-P = Child Hunger Index Parent Report; CHI-C = Child Hunger Index Child Report.
† p < .0001.

children classified as hungry on the basis of the standard CCHIP measure gave answers that led them to be coded as hungry or at risk on the CHI-C—based on totally independent reports—provides strong evidence for the interinformant face validity of the CCHIP coding of child hunger.

A number of limitations of the study must be taken into account in interpreting its findings. Since only about one third of the parents of eligible students agreed to participate in the study, a sampling bias may have occurred. For example, it is possible that poorer families may have been less likely to participate. That the prevalence rates of hungry and at-risk for hunger children in the current study are lower than those reported in previous CCHIP studies with low-income families (Wehler et al., 1996a) suggests that this in fact may have been the case. However, even if low-income families or some other group were systematically less likely to participate, the relationship between CCHIP hunger and psychosocial impairment in the current sample would remain and would still be an important finding.

Another limitation is that there was a hunger-related feeding intervention between the first and second administrations of the CCHIP parent scale which may have influenced parents' rating of their children's hunger. However, since CCHIP assesses child/family food insufficiency over a 1-year period, it is unlikely, even if children had become markedly less hungry because of the school breakfast program, that their parent-reported CCHIP scores would have changed very much. Even if CCHIP scores had changed by time 2 for this reason, the result would have been an artifactually lower level of time-to-time reliability. Because time-to-time reliability was found to be acceptable even under the current circumstances, it is probable that time-to-time agreement would only be better under nonintervention (and shorter interval) test-retest conditions. Future studies could assess the stability and sensitivity of CCHIP by reinterviewing groups of parents who have lost benefits because of the recent welfare reforms to determine whether CCHIP scores increased.

These limitations notwithstanding, the results of this study suggest that the CCHIP hunger measure accurately documents the intermittent, subcatastrophic experiences of hunger that are common in some low-income families. The current study also shows that these experiences of hunger are associated with increased risk of psychosocial and academic impairment. Because the current study is cross-sectional rather than longitudinal, causality cannot be inferred and it is possible that hunger itself may not be the only or even the major cause of these children's problems. For example, if hunger is more likely to occur in multiproblem families and if these families are also more likely to experience violence, homelessness, or disorganization, then the latter experiences rather than the intermittent experiences of hunger may play a more important role in causing behavioral or academic problems. Whatever the causality, the current study does show that children in families classified as hungry by the CCHIP measure are two to three times more likely to have psychosocial and academic problems than children in low-income families classified as not hungry. These children are at exceptionally high risk, and further research designed to assess the causal links between hunger and psychosocial dysfunction is clearly warranted. Sadly, recent federal budget cuts are likely to increase the number of children who are hungry and in poverty.

Clinical Implications

Although the specific contribution of hunger is unknown, this study demonstrates that hunger is a risk factor associated with psychosocial dysfunction in poor children. During diagnostic evaluations, especially in poverty populations, child psychiatrists should ask about the availability of food and the presence of hunger. Clinicians should ensure that children and parents are fully aware of programs like Women, Infants, and Children (WIC), food stamps, and the National School Breakfast and Lunch programs for which many low-income children are eligible. Childhood hunger, a stress that should be remedied, may also be relevant to clinicians as a potential contributing factor to later aggressive behavior and school drop-out during adolescence.

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Food Intakes of US Children and Adolescents Compared With Recommendations. Kathryn A. Muñoz, PhD, MPH, Susan M. Krebs-Smith, PhD, MPH, RD, Rachel Ballard-Barbash, MD, MPH, Linda E. Cleveland, MS, RD

Objectives: To determine the proportion of youth meeting national recommendations for food group intake and to identify food intake patterns. *Design:* The US Department of Agriculture's 1989–1991 Continuing Surveys of Food Intakes by Individuals were used to estimate food intake. Intake was determined from 3 days of diet by disaggregating foods into their component ingredients and using weights that correspond to servings. *Participants:* The sample included 3307 youth, 2 to 19 years of age, living in the 48 conterminous United States. *Main Outcome Measures:* Mean number of servings and percentage of individuals meeting national recommendations for food group intake according to demographic characteristics, patterns of intake, and nutrient profiles associated with each pattern. *Results:* Mean numbers of servings per day were below minimum recommendations for all food groups except the dairy group (ages 2 to 11). Percentages of youth meeting recommendations ranged from ~30% for fruit, grain, meat, and dairy to 36% for vegetables. Sixteen percent of youth did not meet any recommendations, and 1% met all recommendations. The pattern of meeting all recommendations resulted in nutrient intakes above the recommended dietary allowances and was high in fat. Conversely, meeting none of the recommendations resulted in intakes well below the recommended dietary allowances for some nutrients. Total fat and added sugars averaged 35% and 15% of energy, respectively, and levels were similar among most demographic groups. *Conclusion:* Children and teens in the United States follow eating patterns that do not meet national recommendations. Nutrition education and intervention are needed among US children. **Pediatrics** 1997;100:323–329