

Background

The Current Population Survey Food Security Supplements (CPS-FSS) have, since 1995, collected information on food security-related conditions, behaviors, and experiences that occurred in the respondents' households during the 12 months prior to the survey. For a subset of questions, respondents were also asked whether the condition occurred during the last 30 days. Initial USDA-sponsored research and analysis based on the 1995 CPS-FSS included development of scales measuring the food security of interviewed households for both 12-month and 30-day reference periods (Hamilton et al. 1997a; Hamilton et al. 1997b). The 12-month scale has been the primary monitoring tool and the focus of most of the research on food security and food security measurement to date (Hamilton et al., 1997a; Bickel et al., 1999; Andrews et al., 2000; Nord et al., 2002a). However, development work has continued on the 30-day scale, which may also have important monitoring and research uses. In this report a slightly revised 30-day food security scale for use with CPS-FSS data is described and assessed.

Households' food security, defined as "assured access by all household members at all times to enough food for an active, healthy life" (Anderson, 1990), is assessed in the CPS-FSS by a series of 18 questions about behaviors and experiences known to characterize households that are having difficulty meeting their food needs. The questions cover a wide range of severity of food insecurity. For example, questions at the least-severe level of food insecurity ask whether respondents worried that their food would run out before they got money to buy more and whether they were able to afford to eat balanced meals. Questions at the midrange ask about reductions in food intake, such as whether adults in the household cut the size of meals or skipped meals because there wasn't enough money for food. Questions tapping the more severe levels of food insecurity ask whether children skipped meals because there wasn't enough money for food, and whether adults did not eat for a whole day because there wasn't enough money for food. Each question specifies a lack of money or other resources to obtain food as the reason for the condition

or behavior. Voluntary fasting or dieting to lose weight are thereby excluded from the measure. (A complete list of the questions in the food security scale is available in Bickel et al., 2000, or at <http://www.ers.usda.gov/briefing/foodsecurity/surveytools/>).

Responses to the food security questions are combined into a scaled measure of the severity of food insecurity experienced by each household using statistical methods based on the Rasch measurement model (Fischer et al., 1995; Baker 1992; Hambleton et al., 1991; Wright 1983). Interviewed households are also classified into one of three categories corresponding to ranges of severity on the food security scale—food secure, food insecure without hunger, food insecure with hunger.¹

Little use has been made of the 30-day food security scale. It has not been included on the CPS-FSS public-use files since 1995, and it has not been used in any published studies since the report on the 1995 CPS-FSS data (Hamilton et al., 1997b).² Two characteristics of the scale account for this paucity of use. First, while the 12-month food security scale measures food insecurity across a wide range, from mild to severe, the 30-day scale does not measure mild food insecurity at the less severe end of the range. The questions that are sensitive to that range were asked only with reference to the previous 12 months (table 1). Second, the 30-day scale was judged by Hamilton et al. to be somewhat less reliable than the 12-month scale.

¹ The thresholds that demarcate these food security status categories were specified based on the judgment of a panel of researchers with expertise in nutrition, health, and measurement of well-being. Under the assumptions of the Rasch model, households that affirm the same number of items (i.e., that have the same raw score) are assigned the same food security scale score irrespective of which items they affirm. Therefore, classification as to food security status can also be related directly to the number of items affirmed by the household. Those that answer yes to 3 or more of the 18 food security questions are classified as food insecure. At a minimum, food-insecure households have affirmed all of the following three items or items indicating more severe conditions:

- They worried whether their food would run out before they got money to buy more;
- The food they bought didn't last, and they didn't have money to get more;
- They couldn't afford to eat balanced meals.

Households classified as food insecure with hunger have affirmed, in addition to the three items above, both of the following items or items indicating more severe conditions:

- The respondent ate less than he/she felt he/she should;
- Adults cut the size of meals or skipped meals in three or more months.

For some research purposes, however, the 30-day scale would be more appropriate than the 12-month scale. For example, in the CPS-FSS, questions about participation in some Federal food assistance programs are asked with reference to the previous 30 days. Assessing the association of food security status with participation in those programs would, most appropriately, use the 30-day food security scale. The CPS-FSS alternated between Spring and Summer during the first seven years of data collection. Analysis of the prevalence of hunger during the 30 days prior to each survey might provide information about seasonal differences in food security. The 30-day scale might also be used in combination with the 12-month scale to provide additional insight into dynamics of food security by comparing annual and monthly prevalence rates. Therefore, important research purposes could be achieved by making a standardized 30-day food security scale available for the CPS-FSS data files.

In the years since the initial development of the food security scales, understanding of the phenomenon of food insecurity and of both conceptual and statistical issues relevant to its measurement have increased. In light of this increased understanding, it is appropriate to review the conceptual and statistical underpinnings of the original 30-day scale proposed by Hamilton et al. (1997b), to reassess the validity of those foundational assumptions, and to revise the scale if appropriate. The purpose of this paper is to carry out that assessment and to propose a revised 30-day food security scale based on the findings.

In this paper, the original scale as described in Hamilton et al. (1997b) is examined. On theoretical grounds a somewhat simplified scale is proposed that includes only items that correspond to items in the 12-month scale. Both the original and simplified 30-day scales are then calculated using data from the 1998 and 1999 CPS-FSS. The scale items are assessed in terms of their goodness-of-fit to the statistical measurement model; the effects of the inclusion of a large number of frequency follow-up items in the

² The 30-day items were, however, used to assess the frequency and duration of food insecurity and hunger by Nord et al. (2000; 2002).

original scale are assessed; and the appropriate number of days of occurrence for identifying frequent recurrence of conditions is investigated. Based on these findings, a revised 30-day scale is proposed, and household scores and categorical assignments are calculated. The metric of the proposed 30-day scale is adjusted to the metric of the 12-month scale so that equal scores on the two scales describe equivalent conditions and behaviors occurring during the previous 30 days and during the previous 12 months.

The 30-day scale proposed here was developed specifically for the set of questions asked in the CPS-FSS. It is only applicable to surveys that ask the same subset of 30-day-referenced food security questions that are asked by the CPS-FSS.³ It is distinct from the standard, or “full range” 30-day scale (described in Bickel et al., 2000, p. 58) that includes all 18 questions in the U.S. Food Security Survey Module, modified to refer to the previous 30 days rather than to the previous 12 months. For surveys that collect all 18 items referenced to the previous 30 days, food security scale values and categorical assignments for the standard 30-day scale should be based on the same methods and specifications that are used for the 12-month scale (Bickel et al., 2000, p. 34), not on the methods described in the present paper.⁴ The need for the CPS-FSS 30-day scale, and the analytic problems addressed in this paper, arise because the standard full-range 30-day scale cannot be calculated from CPS-FSS data since only 12 of the 18 questions comprising the standard scale are asked with reference to the previous 30 days.

³ At present, only the CPS-FSS collects this limited subset of 30-day referenced food security items. Typically, a survey either asks all of the food security questions referenced to the previous 12 months or asks all of the questions referenced to the previous 30 days. The CPS is unique in that it asks all questions with reference to the previous 12 months, then, for a subset of the questions, follows up affirmative responses by asking whether the condition or behavior occurred during the previous 30 days. The less severe questions in the scale are, however, asked only with reference to the previous 12 months because the form in which they are asked does not accommodate the 30-day follow-up. The Fourth National Health and Nutrition Examination Survey (NHANES IV) is asking a set of 30-day, individually referenced questions for which the methods described in this paper may also be appropriate.

⁴ The findings described in the present paper, do, however, provide guidance as to the appropriate coding of the “How many days did that occur?” follow-up questions that is applicable also to the standard full-range 30-day scale. This amends slightly a technical detail that was only provisionally specified in Bickel et al. (2000). That is, responses of three or more days should be coded as indicating recurring conditions.