

Alternative Construction of a Food Insecurity and Hunger Measure from the 1995 Current Population Survey Food Security Supplement Data

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US Hunger and Food Security Survey Module (HFSSM)

- § Developed by USDA
- § Input from: Federal agency representatives, researchers, advocates
- § Included in Current Population Survey every year since 1995
- § 18-item scale

HFSSM Scale

- § Developed using Rasch modeling (IRT)
- § Number of Questions answered affirmatively places household into one of four categories.

	Households with Children	Households with No Children
Food Secure	0-2 questions	0-2 questions
Food Insecure with No Hunger	3-7 questions	3-5 questions
Food Insecure with Moderate Hunger	8-12 questions	6-8 questions
Food Insecure with Severe Hunger	13-18 questions	9-10 questions

Assumptions made during the development of HFSSM

- § The measure from the HFSSM should be expressed as a scale in a single dimension
- § The scale should be composed of multiple items that range in severity
- § Severity should be primarily captured across items, not within items
- § The items should further have a Guttman property (i.e., affirmation of a more severe item should mean that all less severe items were also affirmed)
- § An indicator should be created by choosing cut-points along the scale

Why reconsider analyses of the HFSSM?

- § Evidence food insecurity and hunger is not a unidimensional phenomenon
 - § Qualitative research (Radimer et al., 1992)
 - § Three dimensions – 1. Household Hunger; 2. Adult Hunger; 3. Child Hunger
 - § Quantitative research (Froelich, 2002; Nord, 2002; Nord and Bickel, 2002)
 - § Two dimensions – 1. Household Food Insecurity and Adult Hunger; 2. Child Hunger

- § Difficulty using the single dimensional scale to ascertain and understand the consequences of food insecurity and hunger for families, adults and children

Why reconsider analyses of the HFSSM?

- § Lack of concordance between the labels assigned to households using the current HFSSM scale and the meaning of the actual items that a household may have affirmed
 - § Concordance depends on households answering items in a modal pattern.
 - § 72% of households with children have non-modal response pattern (Ohls et al., 1999)

- à For conceptual clarity, restricted analyses and discussion to families with children.

Methods

- § Review of qualitative and quantitative literature relevant to the conceptualization of the characteristics, coping strategies, and consequences of food insecurity as it is experienced in North America (Conceptual Model)
- § Cluster analysis of the HFSSM data to understand how the questions grouped together.
- § Iterative process -- discussed the meaning of each item included in the HFSSM and, working with Conceptual Model and the results of the cluster analysis, determined its conceptual location

Statistical Methods

§ Hierarchical Cluster Analysis (HCA)

§ Each item starts out in separate cluster

§ At each stage, two clusters with the smallest proximity are combined.

§ Final stage, all items are in one cluster.

§ Item Pair Proximity Matrix (CCPROX)

§ Calculated using Conditional Covariances between item pairs.

§ Conditioned on Total Score on other items.

§ Smallest Proximity between clusters found using an unweighted pair-group method.

Statistical Methods

§ HCA/CCPROX (Roussos, Stout, Marden; 1998)

§ Exploratory Analysis

§ Items combining in early stages are closer dimensionally than items combining in later stages.

§ No determination is made whether the clusters are actually dimensionally distinct.

§ No determination is made of which stage is the correct cluster solution.

Results from HCA/CCPROX Output

§ First Main Cluster

§Q55, Q56, Q57, Q58

§ Second Main Cluster

§Q25, Q29, Q32, Q35, Q38

§ Third Main Cluster

§Q40, Q44, Q47, Q50

§ Fourth Main Cluster

§Q53, Q54, Q18, Q21

Development of Conceptual Model

§Radimer et al.

§Campbell and Desjardins

§Hamelin et al.

§Fitchen

§Young

§Others

Levels and components of the concept of hunger
(Radimer et al., 1992)

	<u>Household</u>	<u>Individual</u>
Quantitative	Insufficient intake	Food depletion
Qualitative	Nutritional inadequacy	Unsuitable food
Psychological	Lack of choice and feelings of deprivation	Food anxiety
Social	Disrupted eating patterns	Food acquisition in socially unacceptable ways

Characterization of household food insecurity (Hamelin et al., 2001)

Core characteristics		Potential Reactions		
A lack of food in the present and in the future	Alienation			
Shortage of food	Lack of control over the food situation and the need to hide it	Socio-familial perturbations	Hunger and physical impairment	Psychological suffering
Unsuitability of food and diet				
Preoccupation with access to enough food				
Dynamic Nature of the Whole Experience				
General sequencing of events A strong parent-child vector Variation over time				

Cultural aspects of food insecurity **(Fitchen, 1988)**

§ “Despite what they may learn about nutritional needs and smart shopping, low-income people will continue to purchase convenience foods, snack foods, holiday foods and status foods because they continue to classify themselves first of all as Americans and only second as poor Americans”.

Low-income food management **(Campbell and Desjardins, 1989)**

Household food management strategies:

- § Self-reliant
 - § Optimization of family food resources

- § Informal bartering (social exchange network)
 - § Support from friends and family

- § Formal institutions
 - § Market/wage economy
 - § Public assistance
 - § Private charity

Coping tactics:
Analyses of 1988 and 1993 Cornell data
(Young, 1998)

- § Accumulation of financial risk factors was associated with more severe level of food insecurity
- § Lack of a support system and not knowing where to turn to for help are significant risks for increasing severity of food insecurity

Classification System of Household and Individual Strategies for Coping with Food Insecurity (Young)

§ **Augmentation tactics:** tactics to obtain supplemental food resources (household level strategy)

§ Government programs

§ Personal Resources/Social support

§ Charity/Emergency resources

§ **Optimization tactics:** tactics to stretch food and food money

§ Stretching food, budgeting

§ **Restriction tactics:** restrictions of food intake

§ "Going without", skipping meals

***Social Capital is associated with
decreased risk of hunger
(Martin et al., 2004)***

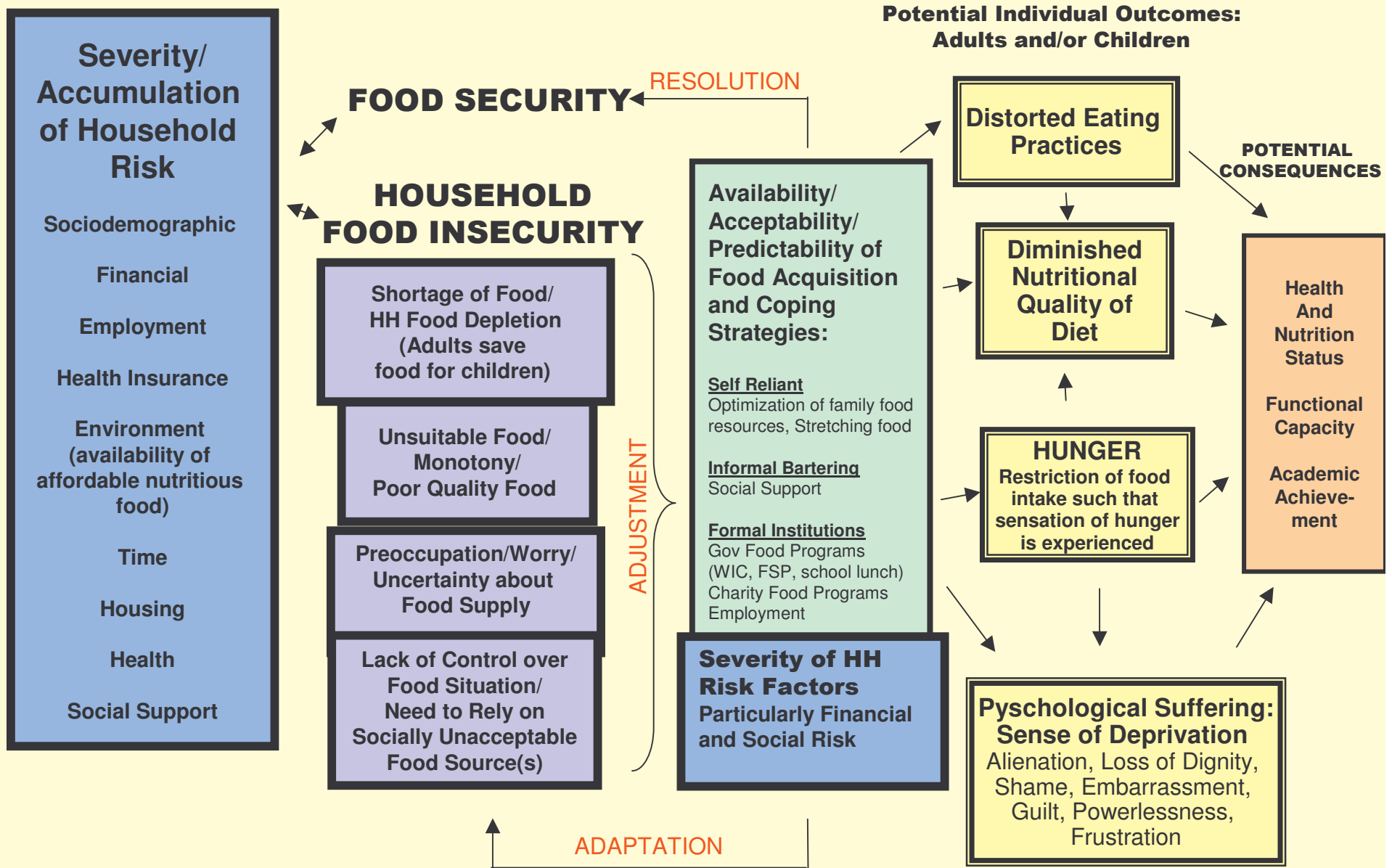
- § **Social capital:** “the resources available to individuals through their social behaviors and membership in community networks”
- § Community-level social capital is significantly associated with decreased odds of experiencing hunger while controlling for socioeconomic status

Stress and Coping

§ **Adjustment:** short-term response by families to manage or buffer family life changes, transitions and demands

§ **Adaptation:** long-term restructuring of family's responses to stress

*Figure 1: Conceptual Model of Food Insecurity**



**Adapted from Campbell and Desjardins, Radimer et al., Hamelin et al., Young, and Fitchen*

Data

§ CPS April 1995 Data

§44,286 households completed FSS

§16,885 were households with children under 18

§ Internal Screener

§18,174 households passed screener

§7,888 were households with children under 18

Food Insecurity

§ Affirmative response to at least 3 Food Insecurity Questions.

§ Questions = Q20, Q22, Q23, Q24,
Q32, Q53, Q54, Q55,
Q56, Q57, Q58

Food Insecurity Categories

§ Worry

§ Socially Unacceptable Food Sources

§ Food Depletion

§ Household Quality

§ Child Quality

Preoccupation/Worry/
Uncertainty about
Food Supply

Preoccupation/Worry Uncertainty about Household Food Supply

§ Affirmative Response to Q53

§ **Q53** “(I/We) worried whether (my/our) food would run out before (I/we) got money to buy more.”

Lack of Control over
Food Situation/
Need to Rely on
Socially Unacceptable
Food Source(s)

Lack of Control over Food Situation/ Socially Unacceptable Food Source

§ Affirmative Response to Q22 or Q23

§ **Q22** In the last 12 months, did you (or other adults in your household) ever get food from a church, a food pantry, or food bank?

§ **Q23** In the last 12 months, did you (or other adults in your household) ever eat meals at a soup kitchen?

Shortage of Food/
HH Food Depletion
(Adults save
food for children)

Shortage of Food/Food Depletion

§ Affirmative Response to Q54, Q24, Q32

§ **Q54** “The food that (I/we) bought just didn’t last, and (I/we) didn’t have money to get more.”

§ **Q24/Q25** In the last 12 months, since last (name of current month), did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food?

§ **Q32** In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money to buy food?

Unsuitable Food/
Monotony/
Poor Quality Food

Household Unsuitable Food/ Monotony/Poor Quality

Diminished
Nutritional
Quality of
Diet

§ Household Quality – Affirmative Response to Q55 or Q20

§ **Q55** “(I/we) couldn’t afford to eat balanced meals.”

§ **Q20** In the last 12 months, did you ever serve only a few kinds of low-cost foods – like rice, beans, macaroni products, bread or potatoes – for several days in a row because you couldn’t afford anything else?

§ Child Quality – Affirmative Response to Q56, Q57, Q58, or Q40

§ **Q56** “(I/We) couldn’t feed (my/our) child/the children) a balanced meal, because (I/we) couldn’t afford that.”

§ **Q57** “(My/Our child was/The children were) not eating enough because (I/we) just couldn’t afford enough food.”

§ **Q58** “(I/we) relied on only a few kinds of low-cost food to feed (my/our) child/the children) because (I was/we were) running out of money to buy food.”

§ **Q40** In the last 12 months, since (current month) of last year, did you ever cut the size of (your child's/any of the children's) meals because there wasn't enough money for food?

HUNGER
Restriction of food
intake such that
sensation of hunger
is experienced

Adult Hunger (Restriction)

§ Affirmative Response to Q35, Q28 or Q38

§ **Q35** In the last 12 months, were you every hungry but didn't eat because you couldn't afford enough food?

§ **Q38** In the last 12 months, did you lose weight because you didn't have enough money for food?

§ **Q28/Q29** In the last 12 months, did (you/you or other adults in your household) ever not eat for a whole day because there wasn't enough money for food?

HUNGER
Restriction of food
intake such that
sensation of hunger
is experienced

Child Hunger (Restriction)

§ Affirmative Response to Q40, Q43, Q47, Q50

- § **Q40** In the last 12 months, since (current month) of last year, did you ever cut the size of (your child's/any of the children's) meals because there wasn't enough money for food?
- § **Q43/Q44** In the last 12 months, did (child's name/any of the children) ever skip meals because there wasn't enough money for food?
- § **Q47** In the last 12 months, (was your child/ were the children) ever hungry but you just couldn't afford more food?
- § **Q50** In the last 12 months, did (your child/any of the children) ever not eat for a whole day because there wasn't enough money for food?

Food Insecurity and Hunger

- § 45 Households with Hunger (either Adult or Child) were not labeled as Food Insecure
- § Augment definition of food insecurity to
 - § Affirmative response to at least 3 food insecurity questions **OR**
 - § Placement in Adult or Child Hunger Category

Coping Strategies

§ Affirmative Response to Q18, Q19, Q21

- § **Q18** In the last 12 months, did you (or other adults in your household) ever get food or borrow money for food from friends or relatives?
- § **Q19** In the last 12 months, did you ever send or take the children to the homes of friends or relatives for a meal because you were running out of food?
- § **Q21** In the last 12 months, did you (or other adults in your household) ever put off paying a bill so that you would have money to buy food?

Results (% of 16,885 sampled households with children)

§ Food Insecurity

§ 16.85%

§ Food Insecurity (without Q22 and Q23)

§ 16.52%

Results (% of 16,885 sampled households with children)

Food Insecurity Categories

Worry	21.11%
Unacceptable Sources	4.32%
Food Depletion	18.13%
Children Quality	15.16%
with Q40	15.22%
Household Quality	16.47%

Number of Food Insecurity Categories by Food Insecure Status

Number of Categories	Food Insecure	Food Secure
0	5	3415
1	23	978
2	206	650
3	825	0
4	1410	0
5	376	0

Food Insecurity Categories by Food Insecurity Status

Number of Categories	Most Common Combination	Number of Households
2	Worry, Food Depletion	248 FS 88 FIS
3	Worry, Food Depletion, Household Quality	305
4	Worry, Food Depletion, Household Quality, Children Quality	1279

Food Insecure Households by Category (without Socially Unacceptable Sources)

			Food Depletion			
			Yes		No	
			CQ=Yes	CQ=No	CQ=Yes	CQ=No
Worry	Yes	HQ=Yes	1655	375	149	23
		HQ=No	236	126	27	4
	No	HQ=Yes	117	32	45	6
		HQ=No	22	15	8	5

Results (% of 16,885 sampled households with children

§ Adult Hunger

§ 4.75%

§ Child Hunger

§ 1.90%

§ 2.72% with Q40

Results (% of 16,885 sampled households with children

§ Coping Strategies

§ 22.49%

§ Food Insecurity by Coping Strategies

	No Coping Strategies	Coping Strategies
Food Secure	3570	1473
Food Insecure	521	2324

Prevalence Estimates

- § Weighted average of household weights from HFSSM.
- § Only weights from 16,885 households with children completing HFSSM were used.
- § Estimates within Households with Children under age 18.

Prevalence Estimates (% of Households with Children in U.S.)

§ Food Insecurity

§ 18.34%

§ 18.00% (without Q22 or Q23)

§ Adult Hunger

§ 5.3%

§ Child Hunger

§ 3.05% (with Q40)

§ 2.07%

Prevalence Estimates (% of Households with Children in U.S.)

Food Insecurity Categories

Worry	22.79%
Unacceptable Sources	4.78%
Food Depletion	19.70%
Children Quality	16.35%
with Q40	16.41%
Household Quality	18.04%

Comparison with 1995 CPS estimates (for 7,888 sampled households passing screener)

Food Insecurity

New estimate	1995 CPS estimate	
	Yes	No
Yes	2670	175
No	24	5019

Prevalence Estimates: New – 18.34%; 1995 CPS estimate – 17.6%

Comparison of CPS 1995 estimates to New Adult Hunger estimate

New estimate	1995 CPS estimates			
	0	1	2	3
No Adult Hunger	5180	1694	209	3
Adult Hunger	14	222	437	129

0 = Food Secure

1 = Food Insecure
with No Hunger

2 = Food Insecure
with Moderate Hunger

3 = Food Insecure
with Severe Hunger

Comparison of CPS 1995 estimates to New Child Hunger estimate

New estimate	1995 CPS estimates			
	0	1	2	3
No Child Hunger	5189	1872	486	21
Child Hunger	5	44	160	111

0 = Food Secure
 1 = Food Insecure with No Hunger
 2 = Food Insecure with Moderate Hunger
 3 = Food Insecure with Severe Hunger

Issues Relevant to Measurement of Food Insecurity and Hunger

- § Hunger may not be the only individual level outcome (child and adult) of food insecurity we should care about; diminished nutritional quality, distorted eating practices, psychological suffering may also be important as separate constructs
- § Where does child nutritional quality belong conceptually -- as a component of food insecurity or as an individual level outcome of food insecurity?
- § Hunger (restriction) is both an individual outcome and a coping tactic, i.e. at the same resource level, other families may make different coping choices

Issues Relevant to Measurement of Food Insecurity and Hunger (cont.)

- § The use of socially unacceptable food sources is both a component of food insecurity and a coping tactic
 - § Hamelin et al., 2004: What do we consider socially acceptable? Food banks? Getting food from friends or neighbors?
 - § “Is the regular use of food banks just a short term coping tactic or is it a form of adaptation to a society that now fosters such development since it cannot, or chooses not to, provide adequate means of access to food for all?” (Hamelin, et al. 2004)

- § Do parents/guardians always restrict their own food intake before they allow children to go hungry?

Do Adults Shield Children from Hunger?

Adult Hunger	Child Hunger	
	Yes	No
Yes	217	585
No	103	6983

94 out of the 103 households show at least Food Depletion.

Issues Relevant to Measurement of Food Insecurity and Hunger (cont.)

§ Food Insecurity

§ Is 3 or more affirmative responses the correct cutoff for food insecurity?

§ Role of Coping Questions (Q18, Q19, Q20, Q21, Q22, Q23)

§ Where does Q57 – “Child not eating enough” belong?

§ Cognitive analysis of Q57

§ Is “enough” = quality or quantity?

§ Is Q57 clustering with Q55, Q56 and Q58 because of question format?

Issues Relevant to Measurement of Food Insecurity and Hunger (cont.)

- § Adult Hunger - Affirmative Response to Q28, Q35, or Q38
 - § Ignores Severity follow-up to Q28 (Q29).
 - § Puts Q24 and Q32 into Food Depletion not Adult Hunger.
- § Child Hunger - Affirmative Response to Q43, Q47, or Q50
 - § Ignores Severity follow-up to Q43 (Q44).
 - § Where does Q40 belong?
- § Is one affirmative response enough to show either Adult or Child hunger?

Issues Relevant to Measurement of Food Insecurity and Hunger (cont.)

§ Figure 1 describes a potentially testable hypothesis that the mechanisms for consequences of food insecurity, such as health status, depression and overweight, are a result of specific individual level outcomes associated with household food insecurity (not just hunger).