

REACHING FOR THE STARS?: IDENTIFYING UNIVERSAL MEASURES OF FOOD INSECURITY

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The *Old* Challenge

“The most problematic aspect [of determining indicators of ‘food, health, and care’] was identifying indicators of household food security.”-- Pelletier, et al. 1995

“An important constraint in evaluating the food-security impacts of food availability and access interventions is the lack of meaningful and informative indicators” -- Bonnard et al 2002.

“We do not yet have good, direct measures of food security of the third generation sort” -- Barrett 2002

A Maturing Solution

Arimond and Ruel
(2004)

Frongillo and Nanama
(2006)

Melgar-Quinonez (2006)

Coates et al (2006)

Webb et al (2006)

Swindale and Bilinsky
(2006)

WFP/SENAC (2006, 2007,
2008)

Maxwell et al (2008)

FANTA (forthcoming)

Maxwell et al
(2003)

FANTA (2006)

FANTA (2007)

SCN M&E

Taskforce (2008)

FAO (2007)

WFP (2009)

A '4th Generation' Question: Can We Identify Universal Food Security Measures?

1. What is the purpose and use of universal food security measures?
1. What are the criteria for a universal measure of food insecurity?
2. To what extent do these food security measures demonstrate cross-cultural equivalence?

Demands for Universal FS Indicators

Necessary for:

Resource Allocation/Targeting **FAO “Food Security Information to Action”**

Standards for Accountability **SPHERE**

Desirable for:

Cross-country Program Impact Assessment **USAID/FFP Title II NGOs**

Early Warning **Integrated Phase Classification System**

Less Necessary for:

Situation/Needs Assessment **WFP CFSVA/EFSA**

Program/Policy Monitoring **National Governments**

Types of Cultural Variation in Measures

	DIFFERENCES IN:	AFFECTS :	EXAMPLE:
1	Construct definition and relevance	Content of what we measure	Food safety is not considered important part of food security everywhere.
2	Expression of concepts and language	Questions used to measure the content	“Balanced meal” means something very different in US

Types of Cultural Variation in Measures

	DIFFERENCES IN:	AFFECTS:	EXAMPLE
3	Severity, importance, or priority of construct elements	Ability to scale, interpret severity, create thresholds	In some places, worry is a severe manifestation; others a mild one
4	Relationship between the measure and other meaningful variables	Use as a proxy indicator; ability to understand functional consequences	Dietary diversity and caloric adequacy are not consistently related across countries.

6 Criteria for Assessing the Comparability of FS Measures

Equivalence Area	Assessment Method
Construct definition and relevance?	Comparisons of emic qualitative accounts
Expression of concepts and language?	Translation and back-translation Cognitive de-briefing Rasch infits/outfits

6 Criteria for Assessing the Comparability of FS Measures

Equivalence Area	Assessment Method
Severity, importance, or priority of scale elements	Comparisons of relative item frequencies / rankings Rasch DIF modeling
Relationship between the measure and other meaningful variables?	Bivariate and multivariate associations

6 Criteria for Assessing the Comparability of FS Measures



Equivalence Area	Assessment Method
Universal thresholds?	Receiver Operator Curves Sensitivity/Specificity Analysis
Sacrifice in measurement range, reliability, content?	Compare reduced model to full model

Coping Strategies Index



- Locally generated responses to the question “What do you do when you do not have enough food, and do not have enough money to buy food?”.
- 4 broad types of coping strategies:
 - Dietary intake changes
 - increase amount of food available at the household level
 - reduce the number of people to provide for
 - ration food or manage the shortfall
- Frequency and severity weighted index.
- Used to monitor change over time
- Maxwell et al 2008 tested 14 data sets for cultural equivalence.

Maxwell et al. 2008. “Measuring food insecurity: Can an indicator based on localized coping behaviors be used to compare across contexts?” *Food Policy* 33 (2008) 533–540.

Coping Strategies Index

Equivalence Area	Result	Criteria Met?
Severity	Results comparable when grouped loosely by: 1.Lowest severity (L), 2.Moderate severity (M) and 3.High severity (H)	
Relationship to other meaningful variables?	Correlations w/consumption and expenditure measures mostly significant and in expected direction.	

Coping Strategies Index Results

Equivalence Area	Results	Criteria Met?
Universal thresholds?	Categorical variable still untested (even with the full CSI)	
Sacrifice in measurement range, reliability, content?	Smaller range Less severe end of the spectrum.	

Household Food Insecurity Access Scale

Process to Identify a Comparable Measure of Food Insecurity for Cross-Cultural Use

Phase 1. Development of Initial Food Insecurity Scale - HFIAS

- Background concept paper
- Multi-year field validation studies
- Literature review on use of HFSSM in resource-poor areas

Phase 2. Validation and Refinement of HFIAS

- Identify partners and datasets for validation study
- Assess internal, external and cross-cultural validity of scale



Household Food Insecurity Access Scale

- PHASE I: 9 scale items (I) and 4 Frequencies (F) defined:
 - Worry that the household would not have enough food
 - No food to eat of any kind in your household
 - Not able to eat the kinds of food preferred
 - Eat a limited variety of foods
 - Go to sleep at night hungry
 - Eat some foods that you really did not want to eat
 - Go a whole day and night without eating
 - Eat a smaller meal than you felt you needed
 - Eat fewer meals in a day




- PHASE II: Deitchler, et al. (forthcoming) tested cross-cultural validity in 7 country data sets.

Deitchler, Ballard, Swindale, Coates (forthcoming). Identifying a Measure of Household Hunger for Cross-Cultural Use. Washington D.C. USAID/FANTA II.

HFIAS Results



Equivalence Area	Result	Criteria Met?
Construct definition?	Same 3 core dimensions in all: 1.worry and uncertainty 2.insufficient quality 3.insufficient quantity	
Concepts and language?	1-2 concepts and items were difficult to translate. Rasch infit/outfit confirmed that these items were not working well	

HFIAS Results

Equivalence Area	Result	Criteria Met?
Severity?	<p>Cross-cultural equivalence in item severity calibrations showed 9 item scale not appropriate.</p> <p>3I 3 F scale was determined to meet the criteria.</p>	 
Relationship w/other meaningful variables?	<p>Association with HH income, wealth and dietary diversity was statistically significant and in the expected directions.</p>	

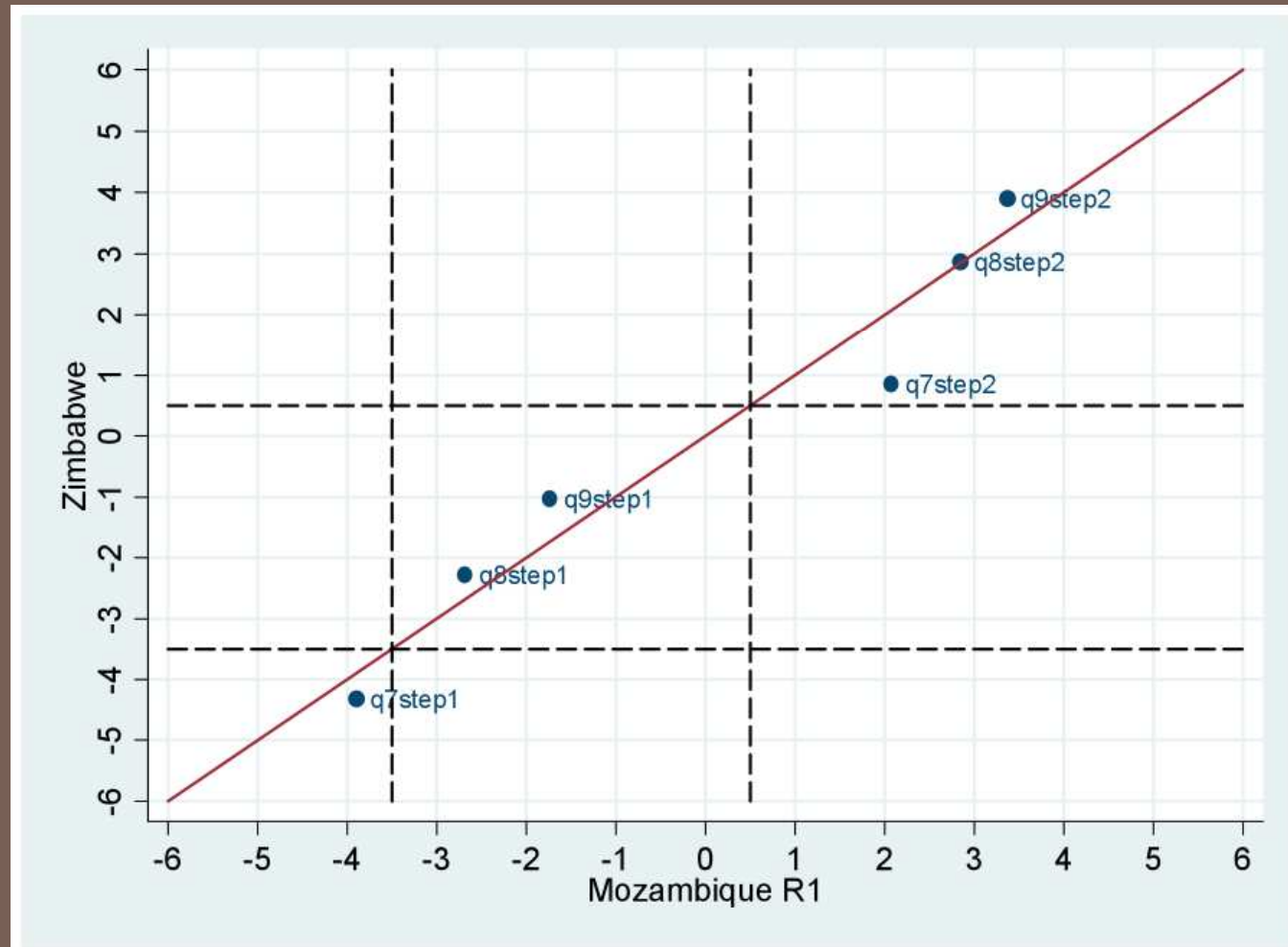
Beitchler, et al. (forthcoming)

HFIAS

Equivalence Area	Results	Criteria Met?
Universal thresholds?	Cross-culturally equivalent cut-points identified NOT universally related to functional outcomes.	
Sacrifice in measurement range, reliability, content?	<ul style="list-style-type: none">• Lower measurement range• Biased toward more severe end of the spectrum.• Loss of information about quality, worry	

Deitchler, et al. (forthcoming)

Household Hunger Scale: Thresholds



Deitchler, et al. (forthcoming)

Household Hunger Scale

3 Item 3 Frequency (3I 3F) Food Insecurity Scale:

How Often in the past 30 days did you:

1. Have no food to eat of any kind in your household?
2. Go to sleep at night hungry?
3. Go a whole day and night without eating?

(Never, Sometimes, Often)



Household Dietary Diversity Index

	QUESTIONS AND FILTERS	CODING CATEGORIES
I	Now I would like to ask you about the types of foods that you or anyone else in your household ate yesterday during the day and at night. READ THE LIST OF FOODS. PLACE A <i>ONE</i> IN THE BOX IF ANYONE IN THE HOUSEHOLD ATE THE FOOD IN QUESTION. PLACE A <i>ZERO</i> IN THE BOX IF NO ONE IN THE HOUSEHOLD ATE THE FOOD.	
A	Any [INSERT ANY LOCAL FOODS, E.G. UGALI, NSHIMA], bread, rice noodles, biscuits, or any other foods made from millet, sorghum, maize, rice, wheat, or [INSERT ANY OTHER LOCALLY AVAILABLE GRAIN]?	A..... <input type="checkbox"/>
B	Any potatoes, yams, manioc, cassava or any other foods made from roots or tubers?	B..... <input type="checkbox"/>
C	Any vegetables?	C..... <input type="checkbox"/>
D	Any fruits?	D..... <input type="checkbox"/>
E	Any beef, pork, lamb, goat, rabbit wild game, chicken, duck, or other birds, liver, kidney, heart, or other organ meats?	E..... <input type="checkbox"/>
F	Any eggs?	F..... <input type="checkbox"/>
G	Any fresh or dried fish or shellfish?	G..... <input type="checkbox"/>
H	Any foods made from beans, peas, lentils, or nuts?	H..... <input type="checkbox"/>
I	Any cheese, yogurt, milk or other milk products?	I..... <input type="checkbox"/>
J	Any foods made with oil, fat, or butter?	J..... <input type="checkbox"/>
K	Any sugar or honey?	K..... <input type="checkbox"/>
L	Any other foods, such as condiments, coffee, tea?	L..... <input type="checkbox"/>



Coates et al. assessed cross-cultural equivalence of dietary diversity indices from 5 data sets.

Coates J, Rogers B, Maxwell D, Webb P and Houser R. Dietary Diversity Report submitted to SENAC/World Food Programme, November 2007.



Household Dietary Diversity Index

Equivalence Area	Result	Criteria Met?
Construct definition and relevance?	Diversity as an aspect of dietary quality is valued in all cultures examined.	
Expression of concepts and language	Food groups must be defined with local food examples. Concepts like "meal" and "snack" must use language to achieve similar meaning.	

Household Dietary Diversity Index

Equivalence Area	Result	Criteria Met?
Severity, importance, or priority of construct elements?	<p>Dietary diversity does not have an exact Guttman property.</p> <p>Households do not always add the same types of foods with increasing diversity.</p>	
Relationship with other	Correlations between caloric adequacy, nutrient adequacy and food security measures highly	

Household Dietary Diversity Index

Equivalence Area	Results	Criteria Met?
Universal thresholds?	Sensitivity/specificity tests against caloric adequacy thresholds did not find a consistent threshold across data sets.	
Sacrifice in measurement range, reliability, content?	Content and measurement range are similar.	

Conclusions

- ⦿ All 3 of the indicators meet many, but not all, equivalence criteria
- ⦿ The reduced CSI captures less severe food insecurity, while the reduced HFIAS (HHS) captures more severe food deprivation.
- ⦿ With both CSI and HFIAS, there was a trade-off between cross-cultural equivalence and context-specific performance.

Conclusions

- ★ All three are significantly associated, in all data sets, with dietary, SES, and nutritional status indicators – but not consistently.
- ★ The holy grail: functional meaning of indicator scores differs by culture due to different intervening variables, preventing consistent thresholds for categorical indicators.
- ★ HHS created categorical thresholds based on data distribution; not 'externally calibrated'.

Recommendations

- Context-specific versions of these instruments should be used when cross-cultural equivalence is not necessary. Attention to adaptation.
- Forget the holy grail.
 - Thresholds can be based on consensus about inherent undesirability of certain manifestations of food insecurity.
Or
 - Thresholds based on data distribution OR
 - Indicator used as a continuous variable OR
 - Clarify relationship to functional outcomes to set context-specific thresholds.

Recommendations

- Invest more resources toward developing a universal scale that doesn't have to sacrifice content or range.
 - QoL index
 - WHO growth standards.
- More effort to understanding how these indicators complement each other:
 - Differences and limitations in a particular context and across contexts.
- More validation of 'universal measures' in other diverse contexts and populations: e.g urban, acute emergency, PLWHA

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