



Can experience-based household food security scales help improve food security governance?

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ABSTRACT

Experience-based food security scales (EBFSSs) have been shown to be valid across world regions. EBFSSs are increasingly being included in national food and nutrition assessments and food hardship items have been added to regional and global public opinion polls. EBFSSs meet the SMART criteria for identifying useful indicators. And have the potential to help improve accountability, transparency, intersectoral coordination and a more effective and equitable distribution of resources. EBFSSs have increased awareness about food and nutrition insecurity in the court of public opinion. Thus, it's important to understand the potential that EBFSSs have for improving food and nutrition security governance within and across countries. The case of Brazil illustrates the strong likelihood that EBFSSs do have a strong potential to influence food and governance from the national to the municipal level. A recent Gallup World Poll data analysis on the influence of the "2008 food crisis" on food hardship illustrates how even a single item from EBFSSs can help examine if food security governance in different world regions modifies the impact of crises on household food insecurity. Systematic research that bridges across economics, political science, ethics, public health and program evaluation is needed to better understand if and how measurement in general and EBFSSs in particular affect food security governance.

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1. Introduction

Global health governance reform based on the recognition of primary health care as a basic capability or public good (Sen, 1999) to achieve positive global health outcomes has been proposed for decades (Ruger, 2011) and has led to calls for reforms in major public institutions such as the World Bank (Ruger, 2007). The recent food crises brought about by major food inflation have underscored the need to also improve the governance of the complex web of governmental and non-governmental programs that conform the often chaotic architecture of national and global food and nutrition security systems (FAO, 2011, 2005; International Planning Committee for Food Sovereignty, 2010). At the 1996 Food Rome World Food Summit, food security was defined as a condition that exists when "all people, at all times have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO, 2005). Thus for households to be food secure the following conditions need to be met: physical availability of food, economic and physical access to food, and adequate food utilization that relies heavily on the ability of the body to process/use nutrients as well as on dietary quality and the

safety of the foods consumed. Because of the central role that food security plays in human development this condition has been recognized as a universal human right (FAO, 2005). There is now increasing recognition that the adequate implementation of this right depends heavily on good food security governance systems (FAO, 2011; Ruger, 2011) as reflected in The Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security (FAO, 2005).

Efforts at promoting improved governance of food security systems in a highly globalized world have been in place since the beginning of the 21st century (FAO, 2005; Paarlberg, 2002) and have recently gained significant traction. According to the FAO 'Food security governance' relates to formal and informal rules and processes through which interests are articulated, and decisions relevant to food security in a country are made, implemented and enforced on behalf of members of society' (FAO, 2011). The four conditions that need to be met for good food security governance to occur are: (a) clear, participatory and responsive planning, decision making and implementation; (b) efficient, effective, transparent, and accountable institutions; (c) respect for the rule of law, and equality and fairness in resource allocation and service delivery; (d) coherent and coordinated policies, institutions, and actions.

Ultimately, food security governance quality needs to be determined by how it impacts the food and nutrition security and overall wellbeing of households and individuals. A considerable effort has

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been in place for decades to identify the best suite of indicators needed for assessing food and nutrition security at the household and individual level (Barrett, 2010; Frongillo, 1999; Pérez-Escamilla and Segall-Corrêa, 2008; Swindale and Bilinsky, 2006; Webb et al., 2006). Experience-based household food security scales (EBFSSs) are theory grounded (Radimer et al., 1992) and collect the perceptions or experience of a household with different aspects of food insecurity as reported by a member of the household. EBFSSs usually include questions on worries of not having access to food, as well as lack of access to sufficient food or to a high quality diet due to constrained economic or other food acquisition resources. Questions can be asked in reference to the whole household, adult(s) or children living in the household. Each household is categorized according to their level of food insecurity based on an additive score (number of affirmative answers to scale questions) and corresponding cut-off points (Pérez-Escamilla and Segall-Corrêa, 2008).

It is important to examine the potential that EBFSSs have to influence food security governance since overall, EBFSSs have been found to have strong construct, face, psychometric, predictive and convergent validity in diverse socio-economic and cultural settings in low and middle income countries (e.g., Becquey et al., 2010; Frongillo and Nanama, 2006; Knueppel et al., 2010; Melgar-Quinonez et al., 2008, 2006; Mohammadi et al., 2011; Muñoz-Astudillo et al., 2010; Pérez-Escamilla et al., 2009, 2007, 2004; Sampaio et al., 2006; Segall-Corrêa et al., 2009a; Usfar et al., 2007; Vianna et al., 2012). EBFSSs have been included in national surveys in the US since 1995 and their use at the national level has rapidly spread in low and middle income countries since 2004, especially in Latin America (Brazil (Kac et al., 2012; Segall et al., 2010; Segall-Corrêa et al., 2009b), Colombia (Instituto Colombiano de Bienestar Familiar (ICBF), 2011), Guatemala (Secretaría de Seguridad Alimentaria y Nutricional de la Presidencia de la República (SESAN), 2012), Mexico (Consejo Nacional de Evaluación de la Política de Desarrollo Social (CONEVAL), 2010a, 2010b)) and selected scale items have been included in the Gallup World Poll (2012).

To attempt to determine how much EBFSSs could impact food security governance, the paper first presents a discussion on food and nutrition information systems followed by the “food security governance properties” of EBFSSs, a national case study based on the Brazilian experience and a global application based on Gallup World Poll before and after the 2008 food crisis. The paper concludes with recommendations regarding future empirical research in this area.

2. Results

2.1. Experience-based scales as part of food and nutrition information systems

Over the past decades the food security data collection emphasis has shifted from simply assessing the food supply to assessing food supply and demand and to understanding how to develop and maintain sustainable food and nutrition systems (Mock et al., 2011). This systems approach is key for understanding how to improve food security governance. Food and nutrition systems are formed by a complex web of intersectoral policies and government and non-government programs with strong influences from the global to the national, regional and municipal level. Characterizing these systems and how the intersectoral forces interact within and across levels to affect food and nutrition security of households and individuals poses major measurement challenges. The systems approach requires new analytical frameworks for understanding how food and nutrition programs work (Kim et al., 2011; McCullum et al., 2004; Pelletier

et al., 2011) and valid and useful “rapid response” food and nutrition security measures that can be obtained at a relatively low cost (Mock et al., 2011). EBFSSs have been shown to generate valid household food security measures from the national to the municipal level (Vianna et al., 2012) and thus are likely to help with program targeting and assessing the impacts of policies and programs when carefully applied (Becquey et al., 2010; Frongillo and Nanama, 2006; Knueppel et al., 2010; Melgar-Quinonez et al., 2008, 2006; Mohammadi et al., 2011; Muñoz-Astudillo et al., 2010; Pérez-Escamilla et al., 2009, 2007, 2004; Sampaio et al., 2006; Segall-Corrêa et al., 2009a, 2009b; Usfar et al., 2007; Vianna et al., 2012). Low and middle income countries as diverse as Brazil, Colombia, Guatemala, Mexico, now include EBFSSs as part of the suite of indicators to target programs and assess food insecurity trends at the national and regional level. In all four countries, results from EBFSSs have received widespread media coverage. EBFSSs are also being included in “rapid” surveys and public opinion polls such as the Latin American Public Opinion Polls led by the University of Vanderbilt and the Gallup World Poll. EBFSSs also lend themselves to easy application through mobile wireless electronic devices and inclusion in GIS systems. Thus, a key question to answer is if EBFSSs have the right indicator properties to contribute towards improved food security governance.

2.2. Experience-based scales and food security governance

Though there are no published studies to date examining the specific contribution of EBFSSs to improving food security governance, based on the health governance empirical work (Wachira and Ruger, 2011) there are strong reasons to hypothesize that EBFSSs are likely to be able to contribute toward this end. However, for this to happen it is important to understand that an inclusive process must be followed when deciding if, when and how to make use of these type of scales. Of the methods most commonly used for assessing food security at the individual and/or household (dietary intake, anthropometry, EBFSSs) EBFSSs is the only one that directly measures the phenomenon of interest, closely adhering to the food security definition adopted at the 1996 World Food Summit (Pérez-Escamilla and Segall-Corrêa, 2008). Indeed, it is the only method that allows individuals to express their perception of the food security situation in their households. And, as previously described, valid EBFSSs measures can be obtained in reasonable amounts of time and at a reasonable cost.

Of the SMART criteria used to judge the utility of indicators EBFSSs have been shown to be specific (and valid), measurable (frequent data collection), achievable (technically possible), and timely (rapid application and sensitive to changes including seasonality and pre/post program) (Becquey et al., 2010; Frongillo and Nanama, 2006; Knueppel et al., 2010; Melgar-Quinonez et al., 2008, 2006; Mohammadi et al., 2011; Muñoz-Astudillo et al., 2010; Pérez-Escamilla et al., 2009, 2007, 2004; Sampaio et al., 2006; Segall-Corrêa et al., 2009a, 2009b; Usfar et al., 2007; Vianna et al., 2012). Because only one study has examined the reliability (replicability or precision) of an EBFSS (Mohammadi et al., 2011) more research is still needed to assess this SMART criteria. But there are four reasons why EBFSSs appear to have indicator properties likely to contribute towards improved food security governance. First, EBFSSs can facilitate clear, participatory and responsive planning, decision making and implementation. Second, EBFSSs can help develop/oversee efficient, effective, transparent, and accountable institutions. Third, EBFSSs can help uphold the rule of law, through equity in resource allocation and service delivery. Fourth, EBFSSs can help develop/sustain coherent and coordinated policies, institutions, and actions. The following section examines the case study of food

and nutrition security governance (FNSG) in Brazil illustrating the potential of EBFSSs to contribute towards improved FNSG.

2.3. Case studies

2.3.1. Food and nutrition security governance in Brazil

Following a highly inclusive process of adaptation and validation of the US Household Food Security Survey Module (HFSSM) (Pérez-Escamilla et al., 2004; Segall-Corrêa et al., 2009a, 2009b) Brazil was able to include the Brazilian Food Security Scale (EBIA) in national surveys since 2004 (Segall et al., 2010). As a result the country was able to document a 25% decrease in the prevalence of hunger (severe food insecurity) at a national level between 2004 and 2009 (Kepple et al., 2012) with the most significant improvements occurring in the poorest regions of the country. These findings have been attributed in large measure to the positive economic growth in the country along with the 'Zero Hunger' strategy that includes about 30 different specific programs/actions involving 19 ministries and other government bodies (Kepple et al., 2012; Schmitz et al., 2011). Whereas extreme poverty alleviation through the 'Bolsa Familia' conditional cash transfer program receives the largest share from the 'Zero Hunger' strategy, other strategies including family agriculture, food banks, and low-cost popular restaurants (Kepple et al., 2012; Schmitz et al., 2011).

The Brazilian Food and Nutrition Security Governance system strongly emphasizes well integrated monitoring, management, evaluation, horizontal (across federal level entities involved) and vertical (federal, state and municipal level) information systems. The National Food and nutrition Security System (SISAN) was officially launched in 2006 once the National Food Security Law was approved by congress. SISAN goals include: (a) formulation and implementation of food and nutrition security (FNS) policies and programs, (b) integration of efforts from government and civil society, and (c) promotion, monitoring, an evaluation of FNS nationwide. As defined by the 2006 law SISAN strongly empowers The National Council on Food and Nutrition Security (CONSEA), an advisory council directly linked with the executive branch with strong representation from civil society as well as government. CONSEA is mandated to organize and report on the quadrennial National FNS Conference that includes representation from local and regional FNS councils. CONSEA plays a central role monitoring the implementation of FNS actions in coordination with the Interministerial FNS group formed by 19 ministries and special secretariats. Government institutions at the state and local (municipal) levels as well as private nonprofit and other non-governmental organizations are also key actors within SISAN (Kepple et al., 2012).

Given its multilevel and multisectorial structure with strong expectations for social participation, decentralization, the monitoring and evaluation of SISAN activities on food and nutrition security represents an extraordinarily complex task that requires the availability and inclusion of valid rapid response low-cost monitoring and evaluation tools. This niche has been filled at least in part by the EBIA as reported by the Minister of Social Development and Hunger Abatement at the 35th UN Standing Committee on Nutrition (SCN) sessions "One important step [for the Zero Hunger strategy] was the creation in 2004 of a baseline measuring the various levels of food insecurity in Brazil, based on the Brazilian Scale of Food Insecurity (EBIA). This will allow subsequent impact evaluations of Brazilian food and nutrition security policies." (Ananias, 2008).

The development of EBIA began in 2003 when a team of Brazilian-USA researchers identified the need to identify an instrument suitable for generating a baseline before the large 'Fome Zero' strategy investments and programs were put into

effect (Pérez-Escamilla et al., 2004; Segall-Corrêa et al., 2009a, 2009b). The goal was to identify an instrument that directly measured household food security and that could be validated and applied in a relatively short period of time at a reasonable cost from the national to the local level. Through a highly inclusive consultation process the team concluded that the only viable option was to attempt to adapt the US HFSSM to the Brazilian context as this scale met all the selection criteria. Maternal-child anthropometry were considered as choice indicators but given the fact they are indicators of nutrition security and not necessarily food security and that food insecurity may lead to both underweight or overweight ruled them out from consideration for the intended application. Nationally representative dietary intake assessments were also considered. However they were also ruled out as the method of choice (although they were used for validating EBIA) because the country had not conducted nationally representative dietary intake assessments in 30 years as a result of the complex logistics and high cost involved. In addition the fact that EBFSSs were perceived by the key stakeholders as representing the "voices of the community" was the final decisive factor favoring the selection of this approach for measuring food security in a country where food security is recognized as a human right.

In the spring of 2003 work began in earnest based on mixed-methods approaches including focus groups with food insecure individuals followed by quantitative applications in four urban convenient samples (Pérez-Escamilla et al., 2004; Segall-Corrêa et al., 2009a, 2009b). The initial promising results in urban areas led to a replication of the process in convenience samples in rural areas across Brazil (Sampaio et al., 2006; Segall-Corrêa et al., 2009a, 2009b). At the same time representative sample data in urban areas was collected. The overwhelming validity and usefulness evidence led the government to agree to invest US\$2 million to include EBIA in the 2004 National Household Survey (PNAD 2004) and to repeat the national application in the National Demographic and Health Survey (PNDS 2006) and in PNAD 2009. Through these applications of the EBIA, Brazil was able to develop a timely baseline (i.e., right before the massive expansion of 'Fome Zero' strategies took place) and to document the downward secular trends on hunger rates in the country. Evidence derived from the EBIA has also been generated to suggest that the 'Bolsa Familia' program is likely to be responsible, at least in part for the country's improvements in food security, especially in the poorest areas being heavily targeted by the program (Kepple et al., 2012; Segall-Corrêa et al., 2008).

EBIA has been instrumental for the generation of the food insecurity/hunger maps that can help improve targeting and program delivery. At the local (municipal) level estimates have been generated from the national surveys to predict household food insecurity risk at the municipal level (Gubert et al., 2010a, 2010b). But perhaps even more important, EBIA has now been shown to be strongly valid when applied at the municipal level by local teams of interviewers (Vianna, et al., 2012). And it has now been demonstrated to have a strong potential to help track households FS longitudinally through local applications (Vianna et al. (in press)).

Even though no studies have been published specifically linking EBIA to the design/modification of specific policies or corresponding programs, the national media attention generated by the EBIA results is a clear indication that at the very least this EBFSS elevated the issue of food insecurity in the court of public opinion and helped the Brazilian government to claim at least some degree of success as a result of their 'Fome Zero' strategies. Indeed the EBIA experience has played a central role with the growing interest and expanding use of EBFSSs by governments and academic researchers in other countries in the Region as well

as public opinion pollsters (FAO, 2010; Pérez-Escamilla et al., 2007).

In summary the EBIA experience strongly suggests that EBFSSs have the potential to contribute to address the four key components of FAO's framework proposed for analyzing and integrating governance in food security interventions. The inclusive and mixed-methods approach used in the development of EBIA not only led to a highly valid scale but also brought to the forefront a national multisectorial discussion on the definition of food security, the understanding of the key dimensions of food insecurity by affected individuals, and their expectations from the government programs as documented through wide media coverage and national forums. Thus, EBIA's development process itself has contributed to several key objectives of SISA that went beyond monitoring and evaluation.

2.3.2. *Global food and nutrition governance: Public opinion polls*

Due to globalization instability in a country or region can quickly spread to neighboring as well as distant countries or regions. Thus, a key step for understanding how to improve food security governance is to measure if and how economic shocks and food purchasing power [amount of disposable income used for food consumption] affect food insecurity. Recently, Heady (2011) analyzed data from the Gallup World Poll to find out if the "2008 Global Food Crisis" led or not to increased food insecurity. He compared simulation analyses results previously conducted by The World Bank and USDA/FAO with self-reported food hardship measured with the question "Have you or your family had any trouble affording sufficient food in the last 12 months?" The later analyses were conducted with cross-sectional data collected from 70 low and middle income countries in 2005/2006 (i.e., pre-crisis) and in the latter half of 2008, once international food prices had peaked. Findings were striking as they indicated opposite results as a function of the method used. Whereas simulation findings indicate that the number of individuals without access to sufficient calories **increased** from 60 to 160 million; the self-reported food hardship data indicates that the number of hungry people actually **decreased** from 60 to 130 million. Further analyses of the food hardship results indicated strong variability across regions. Whereas food hardship decreased in Asia it increased in Sub-Saharan Africa, Latin America and the Caribbean, and the Middle East. The author hypothesized that the food hardship results, but not the simulation analyses, were able to capture the fact that households in many countries in Asia were likely to have been protected from the "2008 Global Food Crisis" shocks due to the countries' strong economic growth and ability to limit food inflation.

The Gallup World Poll analyses also demonstrate the resolution that self-reported food insecurity indicators can have even in public opinion surveys characterized by sampling frameworks that maximize representation keeping sample sizes relatively small (which translates into relatively large estimates' margins of errors). On average, food hardship decreased in the group of most populated developing countries included (India, Indonesia, Brazil, Pakistan, Bangladesh, Nigeria, Mexico, and Vietnam). However, when the analyses were disaggregated by country, food hardship actually increased in Mexico, Bangladesh and Pakistan between 2008 and 2006/2007, in full consistency with the lack of increase or actual declines in food disposable income. Overall, the poll findings suggest that the experience-based food insecurity (represented by a single food hardship item in this instance) measure was not only valid but quite useful for questioning a strong assumption directly related to global food security governance. First, changes in food insecurity were strongly consistent with changes in food disposable income (representing a balance

between economic growth and food inflation) at the country level. Second, cross-country regressions confirmed that economic growth has a large and negative and food price inflation has a large and positive association with food hardship. Although many questions remain as to the utility of experience-based food insecurity scales to track the impact of economic shocks on food insecurity on a global basis (in many ways a "stress" test of global food security governance), this first approximation with data from a global poll provides reasons for optimism.

2.4. *Discussion*

International development scholars, policy makers, and non-governmental organizations largely endorse the concept of 'good' or 'shared' global health governance as a key component for robust national development (FAO, 2011; Ruger, 2011). Even though food security governance is a relatively new concept that builds upon the idea of 'good governance', socially progressive countries like Brazil as well as the FAO and other UN agencies strongly embrace and promote the idea of food security governance (FAO, 2011). One of the key conditions that must be met for attaining food security governance is the capacity to measure household food security (i.e., the main governance outcome in this instance) directly and reliably. Without this information it is simply not possible to develop responsive, accountable, and transparent food security governance. Systematic studies have not been conducted with the purpose of understanding if and how EBFSSs influence good food security governance. However, the global experience and in particular the case study of Brazil strongly suggest that EBFSSs are likely to be playing a role towards this end. In Brazil, EBIA itself has not only generated data useful for food security governance but the highly multi-sectoral, inclusive, and iterative consensus process followed during its development significantly raised the level of interest in the country's poverty reduction and hunger eradication policies. Thus, an adequate process of adaptation and incorporation into national measurements can strongly facilitate consensus on inclusion of EBFSSs as one of the key food and nutrition security indicators. This level of consensus on indicators is one of the key elements that has been identified for adequate food (FAO, 2011) and global (Ruger, 2011) health governance. EBFSSs have been shown to provide valid information not only at the national but also at the municipal level when collected by trained local community members. Furthermore, they may also be useful for evaluation of conditional cash transfer (Segall-Corrêa et al., 2008) as well as other food and social programs. Thus, EBFSSs have the potential to assist with evidence-based decision making from the national to the local level. Although no single indicator by itself can be expected to supply all information needed for assessing food security governance policy the evidence thus far strongly supports the inclusion of EBFSSs as a choice indicator in the suite of indicators selected for tracking food and nutrition security.

This review focused on low and middle income countries. However, evidence from the USA strongly supports the conclusion that EBFSSs have a strong potential to improve food security governance in developed nations as well. After the USA economic crisis of 2008 The American Recovery and Reinvestment Act (ARRA) of 2009 increased Supplemental Nutrition Assistance Program (SNAP) benefit levels and facilitated eligibility for jobless adults without children. This policy decision was made to buffer the negative impact of the recession from on vulnerable households, to generate and protect jobs, and to stimulate the economy. Nord and Prell (2011) recently documented, using data derived from the HFSSM applied through the annual Continuing Population Survey, that as a result of this policy participation in SNAP increased, food expenditure increased and HFI decreased among

low-income households. During the same period of time HFI did not decline among low income households who were slightly above the SNAP income eligibility criteria.

Another piece of evidence that strongly suggests that data from the HFSSM is likely to influence food security governance was the decision by the US Government to convene an expert scientific panel in 2003 to re-examine the validity of the measure (National Research Council (NRC), 2006). An interesting outcome from this project was the recommendation for eliminating the use of the terms 'hunger' or even 'food insecurity' when describing findings derived from HFSSM data. The panel specifically recommended the use of the terms 'low food security' and 'very low food security' to describe these conditions. This recommendation was widely adopted in government documents, and has been interpreted by some as an attempt by government to minimize the problem of food insecurity and hunger in the country, and thus for the need to fulfill this important obligation.

Studies examining the influence of different factors on food security governance should build upon the empirical testing of health governance models. For example, Wachira and Ruger (2011) recently surveyed key governmental and non-governmental stakeholders to examine if and how the International Monetary Fund and World Bank-coordinated national Poverty Reduction Strategy Paper 2000–2004 process had influenced HIV/AIDS shared governance in Malawi, one of the poorest nations extremely affected by the HIV/AIDS pandemic. Findings indicate that whereas some measurement-dependent factors such as accountability improved substantially other factors, such as access to information needed to influence resource allocation (that also relies on adequate measurements) did not improve. Once food security governance model(s) get better defined they can then be empirically tested using a similar approach placing a special emphasis on the role of measurement and information in the decision making process (Mock et al., 2011).

To conclude, systematic research that bridges across economics, political science, ethics, public health and program evaluation is needed to better understand if and how measurement in general and EBFSSs in particular affect food security governance.

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References

- Ananias, P., 2008. Accelerating the reduction of maternal and child malnutrition: contributions to the debate based on the Brazilian experience. United Nations Standing Committee on Nutrition, SCN news 2008, 9 (accessed: May 27, 2012) <<http://www.unsystem.org/scn/Publications/SCNNews/scnnews36.pdf>>.
- Barrett, C.B., 2010. Measuring food insecurity. *Science* 327, 825–828.
- Becquey, E., Martin-Prevel, Y., Traissac, P., Dembélé, B., Bambara, A., Delpeuch, F., 2010. The household food insecurity access scale and an index-member dietary diversity score contribute valid and complementary information on household food insecurity in an urban West-African setting. *Journal of Nutrition* 140, 2233–2240.
- Consejo Nacional de Evaluación de la Política de Desarrollo Social (CONEVAL), 2010a. Acceso a la alimentación. In: 'Metodología para la medición multidimensional de la pobreza en México'. Mexico City, p. 45. <http://www.coneval.gob.mx/contenido/med_pobreza/8803.pdf> (accessed: May 30, 2012).
- Consejo Nacional de Evaluación de la Política de Desarrollo Social (CONEVAL), 2010b. Dimensiones de la seguridad alimentaria: Evaluación Estratégica de Nutrición y Abasto. Mexico City. <<http://www.coneval.gob.mx/contenido/home/8111.pdf>> (accessed: May 30, 2012).
- FAO, 2011. Good food security governance: the crucial premise to the twin-track approach. Background paper for F.A.O. workshop, Rome, December 5–7. <http://www.fao.org/righttofood/project_files/goodFSgovernance/FoodSecurityGovernanceWorkshop_backgroundpaper.pdf> (accessed: May 27, 2012).
- FAO, 2010. Informe sobre el taller regional: Armonización de la Escala Latinoamericana y Caribeña de Seguridad Alimentaria—ELCSA. Report of workshop held at the National Institute of Public Health, Cuernavaca, Mexico, September, 7–10. <http://www.foodsec.org/fileadmin/user_upload/eufao-fsi4dm/docs/ELCSA_report.pdf> (accessed: May 27, 2012).
- FAO 2005. Voluntary guidelines to support the progressive realization of the right to adequate food in the context of national food security F.A.O. Rome. <<http://www.fao.org/righttofood/publi09/y9825e00.pdf>> (accessed: May 27, 2012).
- Frongillo, E.A., Nanama, S., 2006. Development and validation of an experience-based measure of household food insecurity within and across seasons in northern Burkina Faso. *Journal of Nutrition* 136, 1409S–1419S.
- Frongillo, E.A., 1999. Validation of measures of food insecurity and hunger. *Journal of Nutrition* 129, 506S–509S.
- Gallup World Poll. <<https://worldview.gallup.com>> (accessed: May 30, 2012).
- Gubert, M.B., Benício, M.H., Santos, L.M., 2010a. Estimates of severe food insecurity in Brazilian municipalities. *Cad Saude Publica (Brazil)* 26, 1595–1605.
- Gubert, M.B., Benício, M.H., da Silva, J.P., da Costa Rosa, T.E., dos Santos, S.M., dos Santos, L.M., 2010b. Use of a predictive model for food insecurity estimates in Brazil. *Archivos Latinoamericanos de Nutrición* 60, 119–125.
- Heady, D. Was the global food crisis really a crisis?, 2011. IFPRI Research Brief 17. Washington, DC: International Food Policy Research Institute, 2011. <<http://www.ifpri.org/sites/default/files/publications/rb17.pdf>> (accessed: May 27, 2012).
- International Planning Committee for Food Sovereignty, 2010. The reformed Committee on World Food Security: a briefing paper to civil society. Bilbao, Spain. <http://www.foodsovereignty.org/Portals/0/document%20sito/Home/News/reformed%20CFS_english.pdf> (accessed: May 27, 2012).
- Instituto Colombiano de Bienestar Familiar (ICBF), 2011. Evaluación de la seguridad alimentaria en el hogar. In 'Encuesta Nacional de la Situación Nutricional de Colombia, 2010'. <<https://www.icbf.gov.co/icbf/directorio/portel/libreria/pdf/LibroENSIN2010.pdf>> (accessed: May 30, 2012).
- Kac, G., Velásquez-Melendez, G., Schlüssel, M.M., Segall-Côrrea, A.M., Silva, A.A., Pérez-Escamilla, R., 2012. Severe food insecurity is associated with obesity among Brazilian adolescent females. *Public Health and Nutrition*, Epub ahead of print, Jan 17:1–7.
- Kepple, A.W., Maluf, R.S., Burlandy, L., 2012. Implementing a decentralized national food and nutrition security system in Brazil. In: Per Pinstrup-Andersen and Fuzhi Cheng (Eds.), *Food Policy for Developing Countries: Case Studies*. Cornell University, NY, Case Study #9–10. <<http://cip.cornell.edu/dns.gfs/1329233941>> (accessed: May 27, 2012).
- Kim, S.S., Habicht, J.P., Menon, P., Stoltzfus, R.J., 2011. How do programs work to improve child nutrition? Program impact pathways of three nongovernmental organization intervention projects in the Peruvian Highlands. IFPRI discussion paper 1105, Washington DC. <<http://www.ifpri.org/sites/default/files/publications/ifpridp011105.pdf>> (accessed: May 27, 2012).
- Knueppel, D., Demment, M., Kaiser, L., 2010. Validation of the household food insecurity access scale in rural Tanzania. *Public Health and Nutrition* 13:360–367.
- McCullum, C., Pelletier, D., Barr, D., Wilkins, J., Habicht, J.P., 2004. Mechanisms of power within a community-based food security planning process. *Health Education and Behavior* 31, 206–222.
- Melgar-Quinonez, H.R., Nord, M., Perez-Escamilla, R., Segall-Correa, A.M., 2008. Psychometric properties of a modified US-household food security survey module in Campinas, Brazil. *European Journal of Clinical Nutrition* 62, 665–673.
- Melgar-Quinonez, H.R., Zubieta, A.C., McNelly, B., Nteziyaremye, A., Gerardo, M.F., Dunford, C., 2006. Household food insecurity and food expenditure in Bolivia, Burkina Faso, and the Philippines. *Journal of Nutrition* 136, 1431S–1437S.
- Mock, N., Morrow, N., Papendieck, A., 2011. From complexity to food security decision-support: novel methods of assessment and their role in food security information systems Presented at the international Scientific Symposium on Food & Nutrition Security Information: From valid measurement to effective decision-making. FAO, Rome. webcast: <<http://www.fao.org/economic/food-security-nutrition-symposium/player/en/?stream=ISS-Green-room-20120117-pa-nel2-english>> (accessed: May 27, 2012).
- Mohammadi, F., Omidvar, N., Houshiar-Rad, A., Khoshfetrat, M.R., Abdollahi, M., Mehrabi, Y., 2011. Validity of an adapted household food insecurity access scale in urban households in Iran. *Public Health and Nutrition*. [Epub ahead of print].
- Muñoz-Astudillo, M.N., Martínez, J.W., Quintero, A.R., 2010. Validation of the Latin-American and Caribbean food security scale on pregnant adolescents. *Revista de Salud Publica (Bogota, Colombia)* 12, 173–183.
- National Research Council (NRC), 2006. Food Insecurity and Hunger in the United States: An Assessment of the Measure. The National Academies Press, Washington, DC.
- Nord, M., Prell, M., 2011. Food Security Improved Following the 2009 ARRA Increase in SNAP Benefits. US Department of Agriculture, Economic Research Service, Washington DC. Available at: <http://www.ers.usda.gov/media/127909/err116_reportsummary.pdf> (accessed: September 14, 2012).
- Paarlberg, R., 2002. Governance and Food Security in An Age of Globalization. 2020 IFPRI Brief 72. International Food Policy Research Institute, Washington, DC. (accessed: May 27, 2012).
- Pelletier, D., Corsi, A., Hoey, L., Faillace, S., Houston, R., 2011. The program assessment guide: an approach for structuring contextual knowledge and experience to improve the design, delivery, and effectiveness of nutrition interventions. *Journal of Nutrition* 141, 2084–2091.

- Pérez-Escamilla, R., Dessalines, M., Finnigan, M., Pachón, H., Hromi-Fiedler, A., Gupta, N., 2009. Household food insecurity is associated with childhood malaria in rural Haiti. *Journal of Nutrition* 139, 2132–2138.
- Pérez-Escamilla, R., Segall-Corrêa, A.M., 2008. Food insecurity measurement and indicators. *Revista de Nutrição (Brazil)* 21 (supplement), 15–26.
- Pérez-Escamilla, R., Melgar-Quinonez, H., Nord, M., Alvarez, M.C., Segall-Corrêa, A.M., 2007. Escala Latinoamericana y Caribeña de Seguridad Alimentaria (ELCSA). Memorias de la 1^a Conferencia en América Latina y el Caribe sobre la medición de la seguridad alimentaria en el hogar. Perspectivas en Nutrición Humana. 2007;(S):117–134. <http://coin.fao.org/cms/media/8/13104915699830/2007_memorias_seguridad_alimentaria_medellin_pnh.pdf> (accessed: May 27, 2012).
- Pérez-Escamilla, R., Segall-Corrêa, A.M., Kurdian Maranhã, L., Sampaio, M.F., Marin-León, L., Panigassi, G., 2004. An adapted version of the U.S. Department of Agriculture Food Insecurity module is a valid tool for assessing household food insecurity in Campinas, Brazil. *Journal of Nutrition* 134, 23–28.
- Radimer, K.L., Olson, C.M., Greene, J.C., Campbell, C.C., Habicht, J.P., 1992. Understanding hunger and developing items to assess it in women and children. *Journal of Nutrition Education* 24, 365–44S.
- Ruger, J.P., 2011. Global health governance as shared health governance. *J. Epidemiol Community Health*. [Epub ahead of print].
- Ruger, J.P. Global health governance and the World Bank. *Lancet*. 370, 1471–1474.
- Sampaio, M.F.A., Kepple, A.W., Segall-Corrêa, A.S., de Oliveira, J.T.A., Panigassi, Maranhã, L.K., Marin-Leon, L., Bergamasco, S.M.P.P., Perez Escamilla, R., 2006. Segurança Alimentar: experiência de grupos focais com populações rurais do Estado de São Paulo. *Segur Alim Nutr (Campinas, Brazil)* 13, 64–77.
- Schmitz, B.A.S., Moreira, E.A.M., de Freitas, M.B., Fiates, G.M.R., Gabriel, C.G., Regina, L.M., Fagundes, R.L.M., 2011. Public intervention in food and nutrition in Brazil. *Archivos Latinoamericanos de Nutrición* 61, 361–366.
- Segall, A.M., Marin-Leon, L., Perez-Escamilla, R. Escala Brasileira de Medida da insegurança Alimentar (EBIA): Validação, Usos e Importancia para as Políticas Públicas. En: 'Fome Zero: Uma história Brasileira', 2010. Ministério do Desenvolvimento Social e Combate a Fome, Brasília, Vol 3:26–43. <<http://www.mds.gov.br/gestaodainformacao/biblioteca/secretaria-nacional-de-seguranca-alimentar-e-nutricional-sesan/livros/fome-zero-2013-uma-historia-brasileira-2013-volumes-1-2-e-3/fome-zero-2013-uma-historia-brasileira-2013-volumes-3>> (accessed: May 27, 2012).
- Segall-Corrêa, A.M., Perez-Escamilla, R., Marin-Leon, L., Yuyama, L., Vianna R.P.T., et al., 2009a. Evaluation of household food insecurity in Brazil: Validity assessment in diverse sociocultural settings. *FAO Iniciativa América Latina e Caribe sin Hambre*, Santiago, Chile. <http://www.bvsde.paho.org/texcom/nutricion/memredsna_3.pdf> (accessed: May 27, 2012).
- Segall-Corrêa, A.M., Marin-León, L., Panigassi, G., Pérez-Escamilla, R. 2009b. Segurança alimentar no domicílio [household food insecurity]. In 'Brasil. Ministério da Saúde, Pesquisa Nacional de Demografia e Saúde da Criança e da Mulher – PNDS 2006: dimensões do processo reprodutivo e da saúde da criança/Ministério da Saúde, Centro Brasileiro de Análise e Planejamento – Brasília: Ministério da Saúde, 2009b, pp 231–248 <http://bvsms.saude.gov.br/bvs/publicacoes/pnds_crianca_mulher.pdf> (accessed: May 27, 2012).
- Segall-Corrêa, A.M., Marin-León, L., Sampaio, M.D.F.A., Perez-Escamilla, R., Pacheco, L., Souza, R.P., 2008. Transferencia de renda e segurança alimentar no Brasil; análise de dados nacionais [cash transfer and food insecurity in Brazil]. *Revista de Nutrição (Brazilian J Nutr)* 21 (supplement), 39–52.
- Sen, A., 1999. *Development as Freedom*. Anchor Books, New York.
- Secretaría de Seguridad Alimentaria y Nutricional de la Presidencia de la República (SESAN), 2012. Prevalencia de inseguridad alimentaria del hogar en Guatemala: Encuesta nacional de condiciones de vida 2011 (ENCOVI). Guatemalan Government. <http://coin.fao.org/cms/media/12/13328840369830/af-inseguridad_alimentaria.pdf> (accessed: May 30, 2012).
- Swindale, A., Bilinsky, P. 2006. Development of a universally applicable household food insecurity measurement tool: process, current status, and outstanding issues. *Journal of Nutrition* 136, 1449S–1452S.
- Usfar, A.A., Fahmida, U., Februhartanty, J., 2007. Household food security status measured by the US-Household Food Security/Hunger Survey Module (US-FSSM) is in line with coping strategy indicators found in urban and rural Indonesia. *Asia Pacific Journal of Clinical Nutrition* 16, 368–374.
- Vianna, R., Lopez, A.G., Cabral, C.S., Silva, C.C.S., Pérez-Escamilla R., in press. Estudo de seguimento da situação de segurança alimentar em famílias residentes em dois municípios do interior do estado da Paraíba—São José dos Ramos e Nova Floresta. *Cadernos de Estudos Desenvolvimento Social em Debate*.
- Vianna, R., Hromi-Fiedler, A., Segall-Corrêa, A.M., Pérez-Escamilla R., 2012. Household food insecurity in small municipalities in Northeastern Brazil: a validation study. *Food Security* [Epub ahead of print].
- Wachira, C., Ruger, J.P., 2011. National poverty reduction strategies and HIV/AIDS governance in Malawi: a preliminary study of shared health governance. *Social Science and Medicine* 72,1956–1964.
- Webb, P., Coates, J., Frongillo, E.A., Rogers, B.L., Swindale, A., Bilinsky, P. 2006. Measuring household food insecurity: why it's so important and yet so difficult to do. *Journal of Nutrition* 136,1404S–1408S.