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Differences in Food Insecurity between Girls and Boys

Evidence from Zimbabwe

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Abstract

Using data from a 2004 household-based survey of children, we examine differences between boys and girls in self reports of food insecurity in Zimbabwe. Previous studies have taken only the views of the household head into consideration in categorizing the food insecurity status of the household. By so doing, the possibilities of differential experiences of food insecurity by individual household members were ignored. Results show no gender differences in food insecurity for the children surveyed across all three measures of food insecurity utilized in this paper. Probit and ordered probit regressions were also carried out to further investigate if any differences existed after controlling for other factors. While gender still did not matter, there was some evidence that age did, in addition to other household characteristics. In particular, children in wealthier households were less likely to report food insecurity.

Keywords: food insecurity, gender, orphans, HIV/AIDS, poverty, Africa, Zimbabwe
JEL classification: I32, O15, O55

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1 Introduction

Household-based food insecurity measures have become the standard tool for measuring food security. In almost all cases, however, only the head of household is surveyed regarding his or her impression of household food security. This response is then used to categorize the entire household's food security status. In the process, the impressions of other household members – notably those of the children – are not considered. Neglecting other household members' assessment of their food security status may well skew our estimates of overall food security, food security within different groups, and the determinants of food security. Of particular relevance for this paper, neglecting the assessments of children may tend to obscure differences in food insecurity by gender of child. Given the evidence that, in some contexts, girls are disadvantaged in terms of nutrient intakes in certain contexts (e.g., Dréze and Sen 1989; Harriss 1990; Dasgupta 1993; Strauss and Thomas 1995), disadvantages may carry over to food insecurity, a measure correlated with food intakes. To date, however, due to limited information regarding food insecurity for individual children within a household, these intrahousehold differences in food insecurity among children have not been examined. In this paper we address this research lacuna by addressing the following questions using data from a survey of over 6,000 households across Zimbabwe in 2004.

How does the overall incidence of food insecurity differ by whether boys or girls are the respondent? This is the first step towards delineating how reports of food insecurity differ by the sex of the child. In principle, since the children are chosen at random, the incidences of food insecurity between girls and boys should be the same. Thus, the reports of food insecurity by children established here will indicate whether reports of girls and boys differ.

How do the determinants of food insecurity differ by whether a girl or a boy responds to the questions? Even if reports of food insecurity differ by who is reporting, it is still an open question as to whether the gender of the child matters after controlling for other factors. Therefore, we estimate models which allow us to control for these additional determinants of household food security.

Does gender influence the food insecurity status of orphans? In a manner similar to the methods we employ for the previous question, we address this question. The question seems particularly relevant in Zimbabwe where the best estimates are that 20 per cent to 30 per cent of children are orphans (UNAIDS 2004). Previous work has demonstrated that orphan status in some instances does matter for food insecurity (Gundersen and Kelly 2006); our work contributes to this literature by investigating whether the influence of orphan status differs by gender of child.

We begin this paper with some background on household resource allocation differences by gender. We then describe our data and methods followed by our results. In general, we find little evidence of differences in food insecurity between boys and girls in Zimbabwe.

2 Background

This study can be placed in the broader literature as to whether there are differences by gender in resource allocations at the household level. As has been variously documented, the unitary model of household allocation (see Becker 1981) has been rejected in a large number of settings (see Quisumbing and Maluccio 2000 for a more complete discussion). In many developing countries, differences have been found in the allocation of household resources based on power or position within the household. In many of these settings, women are found to be disadvantaged mostly because of cultures that value them less than men (Derose et al. 2000). This gender bias may also be reflected in the allocation of resources for children. For instance, boys were found to have an advantage in the allocation of nutrients in the Philippines (Senauer et al. 1988) and in the distribution of food resources in India (Behrman 1988) and Nepal (Gittelsohn et al. 1997).

In Africa there is evidence of differential allocation of resources other than food. For example, boys were found to be advantaged in school enrollment, attendance and educational attainment in South Africa (Townsend et al. 2002) and Botswana (Chernichovsky 1985). In addition, Filmer (1999) reported a large female disadvantage in education in countries in Western and Central Africa, North Africa and South Asia. Also, Thomas (1994), using data from the United States, Brazil and Ghana found gender differences in the allocation of the household resources, as mothers were likely to favour daughters and fathers to favour sons.

In terms of food allocation however, past research has found little evidence for differences in food allocation by gender of child in Africa. For example, in Côte d'Ivoire, Strauss (1990) found no significant difference between boys and girls in preschool children's nutrition; in Burkina Faso, Haddad and Reardon (1993) carried out a disaggregated outlay equivalent analysis to test for gender differentials in household resource allocation, but were unable to find any evidence in favour of boys; and in Ethiopia, Kimhi (2004) reported little evidence of gender bias in allocation of calories in households. One of the few exceptions is in Madagascar where Hardenbergh (1997) reported an advantage in calorie intake for young females. These studies are consistent with the work of DeRose et al. (2000) who carried out a comprehensive global review of the literature on differences in food intake by gender and concluded that there was no conclusive evidence of gender bias in allocation of nutrients in any studies outside of South Asia. While they found it true that women were disadvantaged in many cultures in most developing countries, this disadvantage did not seem to manifest in allocation of nutrients, but more in access to health and educational facilities.

3 Data and methods

3.1 Data description

The data being used in this study are taken from a survey of over 6,000 households across Zimbabwe in 2004. The survey was conducted by Catholic Relief Services (CRS) with funding from the US Agency for International Development (USAID). The sample comprised five districts, selected to represent the five basic areas of community life in Zimbabwe: urban, peri-urban, rural, commercial farm, and resettlement. The sample frame was derived from the 2002 national census. In each district a sample of

households was selected by taking a sample of wards within these districts; a sample of villages within each ward; a sample of Enumeration Areas (EAs) within each village; and a sample of households in each selected EA. Finally, the household was retained in the sample if it contained a child between 6 and 18 years of age.

For each household, an adult was asked various demographic and economic questions pertaining to the household. In addition, within each household, a child between the ages of 6 and 18 was randomly selected from those children present in the household to answer several questions. For this paper, we use information from the adult regarding the economic and demographic characteristics of the household. Central to our analyses are the questions posed to the child in the household regarding his or her food insecurity status. The food insecurity questions asked of the child are as follows: How often do you have enough food? (Responses are always, sometimes, rarely, never); How many meals did you eat yesterday? (Responses are 0, 1, 2, 3, 4); and Has someone in your household ever gone without food for an entire day? The first two measures reflect individual intakes of food while the third reflects impressions of the intakes of all household members.

For the first measure we construct a binary indicator whereby the variable takes on a value of 1 if an individual responds 'rarely' or 'never'. We say food intake is *inadequate* if it takes on a value of 1. For the second measure we construct a variable which takes on values of '1 or less', '2', or '3 or more'. For the third measure, the variable takes a value of 1 if an individual responds affirmatively to the question.

Our use of multiple measures of food insecurity is consistent with the recommendations of Maxwell et al. (1999). Many measures of food insecurity involve measuring physiological measures of food deprivation (Barrett 2002) and can be captured by anthropometric measures. If these physiological measures are unavailable, as is the case in this survey, then self reported measures of adequacy of diet are used. The first and third measures in this paper can be seen as a characterization of these physiological aspects. Our second measure can be characterized as measuring one aspect of households' rationing strategies in response to limited food supplies.

3.2 Model description

To answer our first question, we provide bivariate comparisons of the children's responses. For the second question we estimate probit and ordered probit models. The ordered probit relates observed categorical information for child i to an underlying latent index for the food insecurity measure, FI_j where j denotes the food insecurity measures described above.

$$(1) \quad FOODINSECURE_{ij}^{*}=\boldsymbol{\beta}\mathbf{X}_i+\boldsymbol{\gamma}\mathbf{AGE}_i+\varphi GIRL_i+\boldsymbol{\alpha}GIRL_i*\mathbf{AGE}_i+u_i$$

$$FOODINSECURE_{ij}=k \text{ if } m_{k-1}<FOODINSECURE_{ij}^{*}\leq m_k,\ k=1,\ldots,N$$

where **X** is a vector of covariates reflecting a household's economic and non-economic conditions; **AGE** is a vector reflecting the age of a child (these ages are expressed in ranges of 6-9, 10-12, and 13-15); GIRL=1 if a child is a girl, 0 otherwise; and u is an error term. We assume $m_0=-\infty$ and $m_N=\infty$. The value of N is equal to 3 for the second measure of food insecurity described above. For the first and third measures of food

insecurity described above, N is equal to 2. As a consequence, in this case these models are the same as a probit model. While we are interested in the coefficients on each of the variables, our primary concern is whether the coefficients differ depending on whether the child is a girl or a boy.

To consider the effect of orphan status on differences in food insecurity reports by girls and boys, our third question, we estimate the following:

(2) $FOODINSECURE'_{ij}{}^{*}=\boldsymbol{\beta}'\mathbf{X}_i+\boldsymbol{\gamma}'\mathbf{AGE}_i+\varphi'GIRL_i+\boldsymbol{\alpha}'GIRL_i*\mathbf{AGE}_i+\zeta'ORPHAN_i+\tau'GIRL_i*ORPHAN_i+u_i$

$FOODINSECURE'_{ij}=k$ if $m_{k-1}<FOODINSECURE_{ij}{}^{*}\leq m_k$, $k=1,\ldots,N$

where ORPHAN=1 if a child is an orphan, 0 otherwise.

Within our model we portray the economic status of the household via the employment status of the household head and by the surveyor's perception of the quality of the housing unit. In terms of the former, we create variables which reflect if a household member is employed in the formal sector, the agricultural sector, or the trading sector. The omitted group is all other professions, with most of these under the category of 'casual labour'. Demographic variables in our model include household size and the age of the child. Since interviews were conducted in several different places, we control for the location of the interview.

We define an orphan as a child (a) who does not live with either of his or her parents and (b) for whom no evidence of a mother being alive is available. This method of identifying orphan status is based on the structure of the survey. Out of concern for the interviewed child, the surveyors did not ask about the status of a child's mother or father. Through other questions on the survey, however, we are able to ascertain whether or not the mother is alive. Unfortunately, we cannot do the same for the father. To use the definitions used in other studies, the orphans in this paper are maternal orphans who do not live with their fathers (who may or may not be alive).

4 Results

Our comparison of reports of food insecurity status by respondent begins in Table A1. In column (1) are the results for girls and in column (2) are the results for boys. Approximately 1 in 3 children report having inadequate food intakes with the results similar for girls and boys. In terms of number of meals per day, about 10 per cent have one or fewer meals per day, 60 per cent have 2 meals per day, and 30 per cent have three or more meals per day. Again, there are no differences between girls and boys. Finally, about three-in-five girls and boys report that someone in the household went without food for a full day at some point.

We now consider whether this lack of differences between girls and boys remains after controlling for other factors. The results of this exercise are shown in Table A2 – column (1) is for the food inadequacy measure, column (2) is for the number of meals eaten per day, and column (3) is for whether someone in the household went without food for a full day. As seen there, girls and boys are equally likely to report being food insecure. This lack of difference remains across the age gradient as seen in the

insignificance of the interaction terms between the age ranges and gender. There is some evidence of an age effect in general, however, insofar as children aged 6-9 are 6.5 per cent less likely to report having inadequate food than children aged 16-18 (the omitted group).

In light of the limited number of studies examining the determinants of food insecurity in Zimbabwe, we also briefly describe some of our other findings. Household size has no impact on food insecurity. As would be expected, children in households with someone with a better job are less likely to be food insecure across all three of our measures. For example, in comparison to a child in a household with an adult employed in the omitted category (most of whom are in the casual labour sector), a child in a household with an adult employed in the formal sector is 9.7 per cent less likely to report someone having gone without food for a full day, a child with an adult employed in the agricultural sector is 3.1 per cent less likely, and a child with an adult who trades for goods and services is 5.3 per cent less likely. Another metric of household economic well-being, the assessment of the quality of the house, shows similar effects: a child living in a good or fair quality house (versus a poor or extremely poor quality house) is 18.1 per cent less likely to report inadequate food intakes and 19.6 per cent less likely to report that someone in the household went without food for a full day.

In Table A3 we present our results for the estimations of equation (2). The inclusion of the orphan variable and its interaction has little effect on the effects of gender and the gender-age interaction on food insecurity. The effect of orphan status itself is insignificant as its interaction with gender.

5 Conclusions

Using data from a large scale survey in 2004 in Zimbabwe, we find that gender is not an important factor in determining the self-reported assessment of food security among children. Boys and girls report roughly the same level of food insecurity across different measures of food insecurity and these reports are roughly similar across the age gradient. We further find that orphan status is not an important determinant of food insecurity among children.

The results from this study are not surprising given studies carried out in other countries in Africa (e.g., Kimhi 2004; Sauerborn et al. 1996, DeRose et al. 2000) which point to the egalitarian gender allocation of food resources within homes in sub-Saharan Africa, as opposed to South East Asia. An important subject for further research would be to investigate whether or not this egalitarianism extends to adult versus child food allocations.

Appendix

Table A1: Food insecurity status by reports of girls and boys

	Girls (1)	Boys (2)
Inadequate food intakes	33.92	35.14
Number of meals per day		
1 or less	10.95	10.95
2	59.63	60.66
3 or more	29.42	28.39
Someone in household without food for entire day	60.43	58.86

Notes: The number of observations is 5,752.

Table A2: Probit and ordered probit estimates of the impact of gender and other variables on children reports of food insecurity

	Inadequate food intakes (1)	Number of meals per day (2)	Someone in household without food for whole day (3)
Female	-0.038	0.010	0.058
	(0.076)	(0.066)	(0.074)
6-9 years	-0.181	0.009	-0.084
	(0.073)*	(0.063)	(0.071)
10-12 years	-0.081	0.005	0.053
	(0.072)	(0.063)	(0.070)
13-15 years	0.058	0.023	0.130
	(0.071)	(0.063)	(0.070)
Female* 6-9 years	-0.020	0.025	-0.129
	(0.103)	(0.089)	(0.100)
Female* 10-12 years	0.093	0.011	-0.095
	(0.102)	(0.089)	(0.099)
Female* 13-15 years	0.023	-0.066	-0.068
	(0.102)	(0.090)	(0.099)
Household size	-0.058	0.046	0.004
	(0.031)	(0.027)	(0.030)
Household size squared	0.004	-0.002	-0.001
	(0.002)	(0.002)	(0.002)
Employed in formal sector	-0.110	0.389	-0.260
	(0.054)*	(0.047)**	(0.053)**
Employed in the agricultural sector	-0.163	0.005	-0.081
	(0.041)**	(0.036)	(0.039)*
Trading for goods and services	-0.196	0.243	-0.140
	(0.043)**	(0.037)**	(0.041)**
Quality of house is good or fair	-0.505	0.393	-0.515
	(0.040)**	(0.035)**	(0.039)**
Interview in home	0.180	0.219	-0.060
	(0.086)*	(0.076)**	(0.083)
Interview in school	0.324	0.222	0.029
	(0.100)**	(0.089)*	(0.097)
Interview in street	0.710	0.101	-0.078
	(0.095)**	(0.084)	(0.092)
Pseudo R^2	0.062	0.035	0.041

Notes: The number of observations is 5,752. Standard errors in parentheses. * and ** are used if the p value of the difference from zero for the coefficient is less than 0.05 and 0.01 respectively.

Table A3: Probit and ordered probit estimates of the impact of gender and other variables on children reports of food insecurity, including orphan status

	Inadequate food intakes	Number of meals per day	Someone in household without food for whole day
	(1)	(2)	(3)
Female	-0.050	0.040	0.060
	(0.081)	(0.071)	(0.079)
6-9 years	-0.179	0.002	-0.075
	(0.073)*	(0.063)	(0.071)
10-12 years	-0.080	0.001	0.058
	(0.072)	(0.063)	(0.070)
13-15 years	0.059	0.021	0.132
	(0.071)	(0.063)	(0.070)
Female* 6-9 years	-0.017	0.019	-0.132
	(0.103)	(0.089)	(0.100)
Female* 10-12 years	0.094	0.009	-0.096
	(0.102)	(0.089)	(0.099)
Female* 13-15 years	0.021	-0.063	-0.071
	(0.102)	(0.090)	(0.099)
Household size	-0.058	0.046	0.004
	(0.031)	(0.027)	(0.030)
Household size squared	0.004	-0.002	-0.001
	(0.002)	(0.002)	(0.002)
Employed in formal sector	-0.109	0.386	-0.257
	(0.054)*	(0.047)**	(0.053)**
Employed in the agricultural sector	-0.162	0.004	-0.080
	(0.041)**	(0.036)	(0.039)*
Trading for goods and services	-0.197	0.244	-0.140
	(0.043)**	(0.037)**	(0.041)**
Quality of house is good or fair	-0.505	0.394	-0.515
	(0.040)**	(0.035)**	(0.039)**
Interview in home	0.181	0.216	-0.056
	(0.086)*	(0.076)**	(0.083)
Interview in school	0.323	0.224	0.030
	(0.100)**	(0.089)*	(0.097)
Interview in street	0.710	0.101	-0.076
	(0.095)**	(0.084)	(0.092)
Orphan	0.013	-0.051	0.066
	(0.053)	(0.046)	(0.051)
Female* Orphan	0.033	-0.082	-0.001
	(0.074)	(0.065)	(0.072)
Pseudo R^2	0.062	0.036	0.042

Notes: The number of observations is 5,752. Standard errors in parentheses. * and ** are used if the p value of the difference from zero for the coefficient is less than 0.05 and 0.01 respectively.

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