

This is the final pre-publication version of an article submitted to *Quarterly Review of Economics and Finance*. The full version of the article is available at <http://www.sciencedirect.com/science/article/pii/S1062976914000489>

Published details:

Renu Singh and Sudipa Sarkar (2014) Children's experience of multidimensional deprivation: Relationship with household monetary poverty, *Quarterly Review of Economics and Finance* 56: 43-56.

Children's Experience of Multidimensional Deprivation: Relationship with Household Monetary Poverty

Renu Singh[‡] and Sudipa Sarkar[§]

Abstract

Using longitudinal data set from Young Lives this paper aims to measure multidimensional childhood deprivation in the state of Andhra Pradesh, India. In this paper we employ Alkire and Foster (2007) counting approach to estimate multidimensional childhood deprivation. We use household and child related data of 975 children in two different age points (12 and 15 year) and seek to establish the fact that childhood deprivation is not confined only to monetary poor households. Our analysis is based on 15 indicators cutting across 4 major dimensions – education, health, housing quality and subjective well-being. Comparison has been made between households who have been consistently in the bottom most quartile (*chronically poor*) and top most quartile (*least poor*) of monthly per capita consumption expenditure (MPCE) in the two rounds of survey conducted in 2006 and 2009. Among the child related indicators, schooling, ability to read and write, thinness and nutrition have emerged in general as important contributors towards children's total deprivation. Overall child deprivation is higher for *chronically poor* households across all the indicators, as compared to those belonging to the *least poor* in our sample. However, 95 percent of children belonging to least poor

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households face one or more deprivation at age 12 and 15. The estimates have also been decomposed by rural and urban location as well as by gender. Rural children in *chronically poor* as well as *least poor* households experience higher deprivation which remains static across rounds. Boys at age 12 are more deprived than girls in the *chronically poor* households, though boys show substantial decrease in deprivation over time. An ordered probit model also confirms that rural children are significantly more likely to be deprived than urban children, though we do not find significant difference between boys and girls.

Key words: Multidimensional poverty, Deprivation, Childhood deprivation, Counting measurement

JEL codes: I3, I30, I32

1. Introduction

It is increasingly noted that monetary measures of income or expenditure provide only partial insights into standards of living or wellbeing. Many researchers have noted that poverty is multi-dimensional, reflecting a range of deprivations (Bourguignon and Chakravarty, 2003; Foster, 2009) and monetary measures are merely one-dimensional (Sen, 1983). Sen (1999) further developed this argument by emphasizing that ‘real’ poverty can be sensitively identified in terms of ‘capability deprivation’, which refers to deprivation of opportunities, choice and entitlements. The sole use of monetary measures of poverty have been criticized for ‘poverty of measurement’ (Greeley, 1994) and researchers have highlighted the need for not relying on simple ‘basic needs’ measures and rising to the challenge by combining methods, indicators and thresholds (Streeten, 1994).

India has witnessed a sustained economic growth that has been notable, particularly when the economic downturn negatively affected economic growth in some of the most developed countries. The Planning commission based on the 66th round of the National Sample Survey (2009-10) data on household consumer expenditure survey estimates that the number of poor in India was 29.8 percent in 2009-10, down from 37.2 percent in 2004-05. However, a large number of Indians continue to live in poverty and disparities in income and human development are on the rise.

As debates about the development agenda after 2015, following the expiry of the Millennium Development Goals (MDGs) take place, it is increasingly clear that general indicators measuring macro-level development, which remain the focus of large national and state datasets, miss vital information about inequalities between and within households. Missing from these datasets are child-specific data based on location, gender and indicators relevant to children's non-monetary quality of life. Very poor children suffer from the negative consequences of being exposed to multiple risks, as a result of the interaction of multiple deprivations, while less poor children may suffer from limited access to services and resources and face deprivations in specific domains.

1.1. Children and Poverty

According to The State of the World's Children (UNICEF, 2005), the lives of over 1 billion children are blighted by poverty, despite the wealth of nations. The report warned that not one of the Millennium Development Goals – those idealistic objectives of the international community will be attained, if childhood continues under the current level of attack. UNICEF in the report set out a working definition of child poverty inspired by the United Nations Convention on the Rights of Child (UNCRC):

'Children living in poverty experience deprivation of the material, spiritual, and emotional resources needed to survive, develop and thrive, leaving them unable to enjoy their rights, achieve their full potential or participate as full and equal members of society'

The importance of studying childhood deprivation has grown in recent years due to the evidence that childhood poverty has lifelong consequences, as also because it differs from adult poverty (Bradbury et al, 2001; Minujin, 2009; Children's Health Insurance Programme, 2004; UNDP, 2004; Grantham-McGregor et al, 2007).

While a lot of literature has been generated regarding child poverty and deprivations in developing countries, very little has been written regarding the same in the Indian context, even though children under the age of 18 years constitute more than a third of the population (Census, 2011). The way 'childhood poverty' is defined and understood, has tremendous bearings on how it is measured and analyzed. Feeney and Boyden (2003) point out that poverty is a deeply relational and relatively dynamic, and view child poverty as embracing three interrelated domains (i) deprivation (a lack of material conditions and services generally held

to be essential to the development of children's full potential), (ii) exclusion (the result of unjust processes through which children's dignity, voice and rights are denied, or their existence is threatened) and (iii) vulnerability (an inability of society to cope with existing or probable threats to children in their environment).

A common approach adopted to deal with the multidimensionality of poverty has been the use of aggregated indices. Foster (2009) proposed a class of chronic poverty indices that rely on aggregation across time. He introduced the concept of duration sensitivity to identify chronically poor based on the number of periods an individual is poor. While some of the poverty research has combined monetary indicators with deprivation indicators, others have discussed monetary poverty as related but conceptually distinct from deprivation (Bradshaw et al, 2012). Bastos (2001) emphasised that child poverty concept cannot assume the classic form of the poverty concept, founded on a threshold of monetary poverty and that the concept of child poverty must be based on the analysis of the child's living conditions and not on the family level of income.

In line with this and for clarity of expression, we use the term 'poverty' when referring to monetary measures and 'deprivation' to capture a broader sense of the multidimensional impacts on children. Despite various perspectives on childhood poverty and deprivation and varied approaches adopted, there is a consensus that the two concepts of childhood poverty and deprivation are inter-linked. The most important global attempt to measure childhood poverty with a focus on rights was conducted by the United Nations Children's Fund (Gordon et al, 2003), using a methodology of measuring deprivation known as the Bristol Methodology or the Bristol Indicators. The study measured absolute poverty amongst children by defining eight threshold measures of severe deprivation of basic human need encapsulating food, safe drinking water, sanitation facilities, health, shelter, education, information and access to services. Using these eight severe deprivations, the Bristol approach estimated a 'poverty headcount' and the term 'absolute poverty' was used in instances where children experienced two or more deprivations. The study highlighted that the distribution of income among members of a household is not always fair and does not always obey the controversial principle of 'equal sharing' assumed by equivalence scales and therefore poor children do not necessarily live in (monetary) poor households. This may well be because children have some needs that are specific to them and the forms of deprivations which affect them may be different from those affecting adults (Bastos, 2001). Pierre and Dodzi (2009) developed a Composite Poverty Index (using five dimensions of nutrition, potable water, health, education and lodging), and

explored explanatory factors of child multidimensional poverty and put it in relation with the poverty status of the households to which they belonged. They believed that although a relationship may exist between child poverty and household poverty, the two phenomena can be studied independently. Their study of children less than 5 years old in Cameroon demonstrated that though the correlation between child poverty and household poverty is very strong, 27.6 percent of children living in least-poor households are also affected by childhood poverty.

The recently developed Multidimensional Poverty Index (MPI) (Alkire and Santos, 2010) which particularly incorporated a few child specific indicators in the context of multidimensional deprivation, ranked India 74th among 104 countries with a MPI value of 0.29 (UNDP,2010). It is interesting to note that research in developing countries has revealed that one child out of two is considered to be poor (Minujin et al., 2009). On the other hand, the recently published UNICEF-Institute of Human Development report (Rustagi et al, 2012) on India reports that 62 percent of the children experience at least two forms of deprivation. It also notes that the difference in deprivations of children living in households in the middle wealth quintiles and those in the bottom quintiles is not very significant.

Despite the growth in child poverty research, most studies are focused on developed countries and are most often cross-sectional, which do not allow for consideration of life trajectories and the way in which individual child's own beliefs, expectations and resilience play a critical role.

Drawing upon previous work done by UNICEF and the Oxford Poverty and Human Development Initiative (OPHI), this paper analyses childhood deprivation, utilising longitudinal data collected by Young Lives in Andhra Pradesh, India¹. The theoretical underpinning of this paper is that monetary income alone is insufficient to provide us a complete picture of children's lived experiences since it fails to take into consideration unequal sharing of material resources amongst family members as well as locational, social and persisting gender bias. While majority of the research on child deprivation and poverty have utilised cross-sectional data, we believe that child poverty is not static, since families also experience 'transient poverty' and move in and out of poverty. The necessities of life vary over time and space and as changes occur in society and the products of society (Townsend, 1985).

¹ Young Lives is a longitudinal study in four countries (Peru, Ethiopia, Vietnam and Andhra Pradesh, India) that seeks to improve understanding of the causes and consequences of childhood poverty and of the factors that contribute to breaking cycles of poverty and reducing the inequality that underpins poverty.

Therefore a dynamic analysis of deprivation over time allows us to understand how children experience poverty when their families remain poor over a long period of time. The panel data is particularly valuable since it allows exploration of household dynamics and longitudinal disparities and deprivations experienced by children. It allows us to take into account inter temporal poverty, since negative effects of poverty are reported to be cumulative. Children who have been poor for a long time are reported to be worse off than those who are poor in a single period only (Bradbury et al, 2001). By using a time dimension and panel data, we are able to distinguish between transient and chronic poverty and focus on children in households that have remained 'persistently poor' or 'chronically poor' as well as those 'persistently non-poor' or 'least poor' between the years 2006 and 2009. Cognisant of the fact that poverty comprises not only the material dimensions of deprivation, but also social and subjective well-being dimensions, this paper attempts to analyse the following two questions:

-Whether childhood multidimensional deprivation is confined only to monetary poor households,

-Are there any specific patterns of multidimensional deprivation for different groups of children- by age, rural, urban, boys and girls?

The paper is organised as follows. Section 2 presents the data. Section 3 describes the methodology used in this paper. Section 4 provides the empirical results and Section 5 offers a conclusion and recommendations.

2. Data

Young Lives study takes a multidimensional approach to poverty which is described as a complex, dynamic phenomenon that is subject to both contextual specificity and multiple, interacting causes. Young Lives approach to poverty and well-being was influenced by participatory research, enabling multi-dimensional and often non-material conceptions of poverty (Dercon and Cooper, 2007). The study captures children's responses to poverty as well as their perspectives regarding subjective well-being. Young Lives is concerned about the persistent disadvantage and exclusion in some groups of children (Boyden and Dercon, 2012), and the longitudinal data has supported analysis of factors leading to chronic poverty amongst certain households (Vennam and Anandharia, 2012).

We analyse the panel data from Young Lives¹ India, following three thousand children in Andhra Pradesh. Andhra Pradesh is the fifth largest state in India with a total population of 84.6 million (Census, 2011). During the 11th Five-Year Plans of India (2007-08 to 2011-12), the state registered an average gross state domestic product growth rate (at 2004-05 prices) of 8.33 percent, surpassing the all-India's gross domestic product growth rate of 7.94 percent during the same period (Planning Department, Andhra Pradesh, 2012). Two cohorts of children aged 8 year old (older cohort) and 1 year old (younger cohort) in 2002 have been followed since 2002 and three rounds of data have been collected at child, household and community level. The Young Lives panel data allows us to explore children's status across time, which is crucial, given the dynamic nature of poverty and the fact that a static poverty profile fails to address questions concerning changes over time and persistence of poverty (Addison, Hulme and Kanbur, 2009). This paper analyses quantitative panel data collected in the state of Andhra Pradesh, India related to older cohort children from round 2 (2006) and round 3(2009) when the children were around 12 year (in 2006) and 15 year old (in 2009)². The rationale for choosing older cohort is that some of the dimensions of childhood deprivation explored through this paper are not available for the younger cohort. For example, indicators of subjective well-being are not available for the younger cohort children. Because Young Lives is a panel study, changes between rounds reflect both societal changes (including economic growth) and 'age-stage' factors (household members becoming more established). In this paper, we seek to measure multidimensional childhood deprivation across two different age points, i.e. 12 year and 15 year and examine its relation with household poverty.

The Round Three Survey Report (2011), stated that while absolute poverty (measured by consumption levels) declined from 24 percent of Young Lives households in 2006 to 16 percent in 2009, inequalities among the Young Lives sample remained more or less the same between 2006 and 2009 (Galab et al, 2011). Table 1 presents the percentage of absolute poverty and monthly per capita consumption expenditure among Young Lives sample children (older cohort) in round 2 and round 3. The percentage of children below poverty line has decreased for every category, but gaps between Scheduled Tribes (ST's), Scheduled Caste (SC) and Backward Classes (BC) as compared to Other Caste (OC)³ continue to persist. The average

¹For detailed information on Young Lives sampling see Young Lives Technical Note 2 by Kumra (2008).

²The final sample consists of 975 children who are there in both the rounds of survey.

³ Scheduled Tribes, Scheduled Castes, and Backward Classes are official groupings recognised in the Constitution of India as historically disadvantaged. Other Castes are more privileged and socially and educationally advantaged class

real monthly per capita expenditure (MPCE)¹ of Young Lives older cohort children has increased from 900 to 1076 rupees between two rounds. However, it is important to note that the average MPCE of ST households is almost half of the average MPCE of other caste households in both the rounds and reflects the inequities that persist.

[Insert Table 1 here]

3. Methodology

According to Sen (1976), measurement of poverty involves two steps: identification of the poor, and derivation of some aggregate measure of poverty in the economy. The approach taken within Young Lives highlights the potential for exploring multiple dimensions of childhood deprivation, positioning the importance of children's well-being at the core of the research design. The strong moral underpinnings are that research should focus on children's strengths, connect with their visions of a good life and explore how they understand and make sense of their experiences. Thus poverty is manifested primarily by diverse material deficiencies, susceptibility to risk, uncertainty and infringement, and constraint on choice (Dornan and Boyden, 2011). Table 2 shows the variables we have chosen based on the literature related to multi-dimensional deprivation across the four dimensions related to 'education', 'health', 'housing quality' and 'subjective well-being' drawing on the data available in both the survey rounds. Out of a total of fifteen variables there are ten child level variables which include education, health, as well as subjective well-being indicators. The subjective well-being indicators cover trust, leisure, agency, inclusion and support networks. Four variables cover household factors related to housing, electricity, drinking water and toilet facility. Unlike Alkire and Foster (2011), we give equal weight to each of the 15 indicators not the dimensions. The dimension of education consists of enrolment status of children and their ability to read and write². Children's BMI-for-age or thinness, which is a widely used indicator to measure child health, is included in the health dimension. Additionally we have information on child's fruits and vegetables consumption in last 24 hours which is a very important measure of balanced diet and has an implication on micro-nutrient status of children. Housing quality is

¹ Monthly per capita expenditures are real (at 2006 price level) and adjusted for price differences between communities.

²Children's reading and writing skill have been tested in round 2 survey when majority of the children were 12 year old. In round 3, for the same children cloze test has been administered. Children who cannot read and write will either not be able to give the test or score zero.

measured by a set of indicators— availability of tap drinking water, access to flush/septic toilet, ‘pukka’ or solid roof in their homes and access to electricity. Safe dwelling, access to drinking water, electricity and sanitation are basic necessities that provide protection as well as protection from infection and disease. Besides the above mentioned indicators, we examine subjective well-being indicators, which aims to capture child’s self-reported feeling about different aspects of their life and ensures that children ‘remain at the centre of the poverty debate’. Stiglitz, Sen and Fitoussi Commission report (2009) specially recommended inclusion of ‘subjective well-being’ measures along with ‘objective’ measures on national surveys. Young Lives survey collects both objective and subjective information on children’s lives. Time spent on leisurely activities like playing, watching TV, chatting with friends on a typical day, along with children’s perceptions on social support available at home and amongst friends and safety issues have been reported by the children. Important information on whether children get respect from the adults in their community, their self-esteem and their own self-perception about the household situation are added indicators that draw upon the data available from Young Lives child questionnaires.

[Insert Table 2 here]

We begin the analysis by counting the percentage of children deprived in each indicator. However, this does not reveal the depth and severity of deprivation in terms of multidimensional deprivation. So, in the second stage of analysis, following Alkire and Foster (2007), we employ the counting approach to measure head count ratio (H), proportion of maximum possible multidimensional deprivations for poor children (A) and adjusted head count ratio (M).

At this point, for ease of presentation, let us introduce some notations. At any time period, let D be the matrix of observations on N children for I (15, in our case) indicator variables. An element of this matrix is denoted by D_{ni} , which is a dummy variable indicating whether the n th child ($n = 1, \dots, N$) is deprived in the i th dimension ($i = 1, \dots, I$). We first look at the proportion of children deprived in each indicator ($\sum_n D_{ni}/N$) to analyse the trend in deprivation over time in terms of each of these indicators. Then for each child, we calculate the total number of indicators in which s/he is found deprived¹. Let us denote this number by:

$$P_n = \sum_i D_{ni} \dots \dots \dots (1)$$

¹ For this aggregation exercise, we use equal weight (1/15) on each indicator.

Thus, P_n indicates the extent of multi-dimensional deprivation the n th child has experienced. In the next step, we estimate the multi-dimensional headcount ratio (H) and compare it between the richer and the poorer section of the households by their location and gender of the children in two rounds. We do this as follows: for any multidimensional poverty cut-off $c \in \{1, \dots, 15\}$, a child is considered to be multi-dimensionally deprived if he/she is deprived in at least c indicators, i.e., $P_n \geq c$. Then, the headcount ratio is defined as:

$$H(c) = \frac{\sum_n 1(P_n \geq c)}{N} \dots \dots \dots (2)$$

where $1(\cdot)$ is an indicator function which takes the value 1 if the argument ($P_n \geq c$) is true, and zero otherwise.

Now we consider only the multi-dimensionally poor children (based on the cut-off c) and calculate the average number of deprivation as a proportion of maximum possible deprivation experienced by them:

$$A = \frac{\sum_n 1(P_n \geq c)P_n}{N H(c)} \dots \dots \dots (3)$$

Next we calculate the adjusted head count ratio (M) which can be expressed by the following formula:

$$M = \frac{\sum_n 1(P_n \geq c)P_n}{N I} \dots \dots \dots (4)$$

Therefore, the adjusted head count ratio (M) is defined as the average number of deprivation experienced by the poor as a proportion of the total number of deprivation experienced by all the children (poor and least-poor). Thus, it can also be written as a combination of $H(c)$ and A :

$$M = H(c) A \dots \dots \dots (5)$$

Therefore, headcount ratio (H) is the proportion of children suffering from multidimensional deprivation in the sample and adjusted head count ratio is the combination of H and A . Note that all the measurements of multidimensional deprivation depends on the cut-off c . When c equals to one, according to the head count measure a child is considered to be 'poor' if he/she is deprived in any one indicator. In the literature, the corresponding head count ratio is called as the *union* head count ratio (Atkinson, 2003). However, this approach does not differentiate between the person who is poor in one indicator and a person who is poor across many indicators. Similarly, if c is 15, then a child is considered to be deprived multi-dimensionally

only if he/she is deprived in all the indicators, and this gives the concept of *intersection* head count ratio. According to Burguignon and Chakravarty (2003) this method is very extreme to define poor as it can exclude many persons from the ‘poor’ category. The choice of c in determining who is deprived multi-dimensionally and who is not, is not straightforward. Therefore, using Alkire and Foster approach we estimate the headcount ratio for each value of c , and plot them to see how the multidimensional measurements move along the multidimensional poverty cut-off. This approach will capture the severity of deprivation in terms of the number of indicators that show deprivation (P_n). The larger is the number of indicators in which the child will be deprived, the more overall deprivation she/he will face. Any two groups can be compared for a range of c . Though we look at the entire sample of children at two time points (2006 and 2009) one of our major objectives is to explore the relationship between childhood deprivation and household poverty. Therefore, we also compare a sub-sample of children in ‘chronically poor’ and ‘least-poor’ households taking the advantage of Young Lives longitudinal data set. The selection of households as ‘chronically poor’ and ‘least-poor’ has been discussed in the following section. We further use an ordered probit regression, to understand how the extent of deprivation is determined by factors such as location, gender, time, expenditure etc. after controlling for the effect of other factors.

3.1. *Identifying Chronically Poor and Least Poor Households*

In India, households are selected as ‘poor’ based on a poverty line cut-off determined by monthly per capita consumption expenditure (MPCE). A household is labelled ‘poor’ if it has MPCE less than the poverty line, and children belonging to that household are also considered poor. In this paper we seek to establish the fact that childhood deprivation is multidimensional and may not be confined only to monetary poor households i.e., children from monetary rich families may also experience deprivation. We, therefore, divide the households of sample children (975) into four quartiles, based on the values of their monthly per capita expenditure (MPCE) in each of 2006 and 2009 surveys. For the purpose of the analysis, we focus on those children who belong to households that have persistently been in the bottom most MPCE quartile and children who belong to households which have persistently been in the top most MPCE quartile in both 2006 and 2009 surveys. The average MPCE of these two sets of households in both the rounds have been presented in Figure 1 along with the respective poverty lines of rural and urban location of Andhra Pradesh.

[Insert Figure 1 here]

Figure 1 clearly shows that an average household belonging to bottom most quartile in both rounds lies just below the poverty line across both the rounds, in both rural and urban locations. On the other hand, an average household belonging to top most quartile in both rounds is placed far above the poverty line and shows improvement in terms of MPCE across time. We label the households that have persistently been in the bottom most MPCE quartile in both 2006 and 2009 surveys as “*chronically poor*” and those in the top most MPCE quartile in both the rounds as “*least-poor*” households. By plotting the deprivation of children belonging to *chronically poor* and *least poor* households, we compare the incidence of (multidimensional) childhood deprivation between these two sets of households, in rural and urban areas as well as for boys and girls. Using panel data we are able to draw upon the dynamic nature of childhood poverty as children move into late adolescence.

In Table 3 we present the summary statistics breaking up the sample into overall, chronically poor and least-poor households. As presented in Table 3, least-poor households have on an average five times higher MPCE than that of chronically poor households. Forty seven percent of households belonging to chronically poor category, are SC and ST, and more than 80 percent are located in rural areas. On the contrary, almost half of the least-poor households belong to Other Castes or upper castes, while they constitute less than 10 percent of the chronically poor. In terms of education, both parents in least poor households are seen to have spent many more years in school, than in chronically poor households. It is important to point out that Young Lives has a ‘pro-poor’ sample and, considering the difference in deprivation as revealed in the analysis between ‘chronically poor’ and ‘least poor’, societal differences between children from the poorest households and children from middle class and wealthy families would be much greater.

[Insert Table 3 here]

4. Empirical results

4.1. Indicator Deprivation

The percentage of children deprived in each indicator across both the rounds is presented in Figure 2. This reveals that the incidence of childhood deprivation varies for different indicators. Children belonging to both chronically poor as well as least-poor households show a reduction in most deprivations, with the clear exception of education and social support, which has shown

a negative trend across the two rounds i.e. when they are aged 12 and 15 years. Childhood deprivation with reference to school enrolment reveals that 23 percent of the children are no longer enrolled in school as they turn 15 years old, an increase of deprivation for 13 percent of children. The deprivation percentage for enrolment stands at 31 percent in 2009 (an 18 percentage point increase from 2006 when children were 12 years old) for chronically poor households. This is largely due to children moving from elementary to secondary education, when a large number of children are observed to drop out of school.

There are many causal factors that might be attributed for this phenomenon. Many children drop out of school, on failing school and board exams, particularly as they move from elementary to secondary education. This may be caused due to both in-school factors such as distance of secondary school as well as extraneous factors e.g. sudden shock such as death of a family member or frequent absenteeism from school to work on their own land.

Young Lives Round 3 Survey report revealed that more girls had left education between ages of 12 and 15 years (15 percent) as compared to boys (10 percent), because of long distance to school, inadequate transport and lack of basic amenities like toilets at school (Galab et al, 2011). The analysis also highlights that while 35 percent of the children were unable to read and write at the age of 12, this deprivation decreased to 16 percent as the children turn 15 years of age. However, the fact that 35 percent of the children are unable to read and write at age of 12 years, raises major concern about the quality of education and learning imparted in elementary schools, particularly since 90 percent of the cohort was enrolled in school in 2006.

The other indicator which has shown increase in deprivation for both groups of children is the social support indicator. There are more children who report not getting social support from friends and families in 2006 at age 12, as compared to 2009. In 2009, girls belonging to both chronically poor and least poor households experienced a lack of support, with 20 percent reporting deprivation at age 15 years, an increase from 3 percent reporting lack of support at age 12. This is extremely worrisome since young adults need confidantes and support systems to guide them through turbulent adolescence. Also, the absence of significant others as formal and informal social support can cause children immense psychological harm.

Figure 2 clearly shows that children in both chronically poor and least-poor households continue to experience major deprivation in housing indicators, though there is a reduction across rounds. Despite the reduction, deprivations still remain alarmingly high for drinking water, sanitation and roof quality in Round 3. 80 percent of children remain deprived of tap

drinking water at age 15 years in 2009, while 76 percent do not have access to toilets and 56 percent had no pukka or solid roof in their homes.

Availability of basic services such as clean drinking water has a direct impact on health of children, leading to malnutrition which in turn may affect education and long term development of children. Thinness (low BMI for- age) has shown a significant reduction in round 3. This reflects the fact that some children have been able to demonstrate catch up in terms of BMI-for-age as they have got older. However, more than 27 percent of the children aged 15 years in Round 3 still continue to be thin in Round 3, when they were 15. The nutrition indicator further shows that 65 percent of them did not have fruit and vegetables as part of their daily diet, thereby leading to children lacking in micro-nutrients. Both crop failure as well as food price rise are key factors that have a negative impact on the kind of nutrition children are able to partake.

We further analyse the percentage of deprivation for boys and girls in these two sets of households (presented in Appendix Table A2). This shows how different indicators are important for boys and girls at different point of age. There are more boys than girls among chronically poor households who are out of school and who could not read and write a sentence at age 12 as well as age 15. However, this analysis reveals that there is double the number of girls dropping out of school in *least poor* households than boys in the same; though the percentages remain very small for both (4 percent boys and 8 percent girls). BMI-for-age or thinness has emerged as an important indicator in terms of deprivation for boys in both sets of households. Almost half the boys are seen as thin in both chronically poor and least poor households at age 12; though the incidence decreases as the boys get older. Another important finding is the deprivation in subjective well-being indicator increases only for girls, not for boys in both *chronically poor* and *least poor* households. The percentages of girl children who have reported ‘no one to help if teased/bullied by someone’ are equal for both chronically poor and least poor households in round 3.

[Insert Figure 2 here]

4.2. Head count and adjusted head count ratio

Next we move from considering deprivation on individual indicators to considering deprivation multidimensionally. Using head count ratio one can simply look at the percentage of children

who are deprived (presented in Table A3). But this does not take into account the total number of deprivation (in terms of indicators) one is experiencing. Another important measurement is adjusted head count ratio (M) which is defined as the total number of deprivations experienced by the poor divided by the maximum number of possible deprivations experienced by all children in the sample. So M considers head count as well as average share of deprivation together and is a better indicator of depth as well as extent of deprivation.

In Figure 3 we present the adjusted head count ratio (in percentage) for all children, as well as for those from chronically poor and least poor households. We also document the patterns for these two sets of households in rural and urban locations, as well as for boys and girls. The estimates are for both the rounds and for all multidimensional cut-offs. There has been an overall reduction in deprivation across rounds for all children as well as children from chronically poor and least poor households. However on examining adjusted headcount ratio by location, the deprivation trends show a different picture¹. There is a clear reduction in deprivation among children from both chronically poor and least poor households living in urban area. This is not true for rural area as children from least poor households do not experience any reduction. In rural areas children from least poor households face high levels of deprivation and the depth of deprivation can be equated with deprivation faced by chronically poor children in urban areas. However the severity of deprivation among chronically poor children in rural areas remains much higher than among least poor children. The urban least poor children faced the least disadvantage in Round 3 and urban children in both chronically poor and least poor households experienced a substantial reduction in deprivation over time.

[Insert Figure 3 here]

The adjusted headcount graphs for boys and girls in the two sets of households show that boys and girls from least poor households experience very similar multidimensional deprivation in terms of adjusted headcount measure at the age of 12. However, the experience of multidimensional deprivation is higher for boys than girls among chronically poor households. The chart also shows that though boys from both chronically poor and least poor households experienced a reduction in deprivation between 2006 and 2009, girls from both types of

¹ However we also acknowledge the fact that the small size of sample in each group has the potential to influence the results.

household remained at around the same level for every multidimensional cut-off. In short, girls were in a better position at the age of 12 than the boys, but have not shown any particular decrease in deprivation over time.

Overall the headcount ratio, H , (presented in Table A3 in the Appendix) and the adjusted headcount ratio, M , show similar trends. It is observed that there has been reduction in percentage of deprived children across rounds and there are more deprived children in chronically poor households as compared to least poor households. For example, on examining children deprived by 4 or more deprivations we find that four out of five (80 percent) children in chronically poor households were deprived at the age of 12 and three out of four (75 percent) were deprived at 15 as compared to 1 in 3 children in least poor households at the ages of 12 and 15 (36 and 30 percent). But the reduction in deprivation has not shown a monotonic pattern for every category – rural, urban, boys and girls in chronically poor and least poor households. In short the deprivation trends estimated by H are not very clear as those found in Adjusted Headcount Ratio (Figure 3).

4.3. Status of deprivation at age 15

In this section we present the summary findings (H , A and M together) and analyse the chronically poor and least poor households by location and gender in round 3 (Table 4). We also classify the level of deprivation as low, moderate and severe deprivation for the cut-offs $c=2$ or more, $c=4$ or more and $c=6$ or more as low, moderate and severe level of deprivation respectively. Head count (H) and adjusted head count (M) measures decrease as the cut-off level (c) increases. While the share of maximum possible deprivation by a poor (A) increases with the increasing cut-off.

[Insert Table 4 here]

Overall children in chronically poor households experience more deprivation in terms of H , A and M as compared to least-poor households. However, if we rank by location, based on the measurements, rural chronically poor households and least poor households are the most disadvantaged with 100 percent children deprived in 2 or more deprivations. There is no difference between these two sets of households at low level of childhood deprivation while at moderate level and severe level the deprivation is less in least poor households. The analysis shows that children, in urban chronically poor households are better off than children in rural least poor households, since there are more children facing low and severe levels of deprivation

(*H* and *M*) in the former. Based on the statistics presented in Table 4, overall boys in chronically poor households face more deprivation across low, moderate and severe categories at the age of 15 years (except the fact that there are more girls at low level of deprivation in terms of *H*). Girls in least poor households, however are seen to be at a greater disadvantage than boys in terms of *H* and *M*. It is important to understand that many of the boys are expected to start working for wages or on their own farm at an early age, as a result of which a larger number of boys tend to stop attending schools around the age of 10-12 years. Girls on the other hand tend to leave school, once they reach puberty, when families are worried for their safety and girls have to travel out of their villages to secondary schools situated at a distance from home. The fact that larger number of boys in least poor households are seen to be deprived of one hour of leisure per day, indicates that they are probably combining both work and studies, leaving them no free time.

4.4. *Ordered probit estimation*

In the previous section we have discussed how childhood deprivation varies over time, for chronically poor and least poor households, in rural and urban locations as well as for boys and girls. In this section, we estimate an ordered probit model to look at the effect of each of these factors on the extent of deprivation after controlling for the effect of the rest of them. Our dependent variable measures the severity of deprivation in terms of the number of indicators in which a child is deprived, represented by P_n according to our methodology¹. An ordered probit regression is a suitable model for a categorical dependent variable which takes multiple values that have a particular order. In our case, the dependent variable takes higher integer values as the child faces higher levels of deprivation. Hence, we estimate an ordered probit model to analyse the severity of deprivation. Consistent with our previous analyses, we include the following explanatory variables in our regression model: gender, mother's education, father's education, household size, caste, monthly per capita expenditure of the household, location, and time.

We present two sets of results of this analysis. First the coefficients of the explanatory variables in our model are presented in Table 5. Only the direction of the effect can be interpreted from the coefficients. If a coefficient is positive, then it would indicate that an increase in the

¹ P_n varies from 0 to 15 as we have a maximum of 15 indicators in which a child can be deprived. However, in our sample there is no child with more than 10 indicator deprivation. Therefore, the dependent variable captures the extent of deprivation in an ordinal scale of 0 to 10, with 0 indicating the least deprived, and 10 indicating the most deprived in our sample.

associated explanatory variable will make the child more probable to be deprived in terms of all indicators ($P_n = 10$) and less probable to be not deprived in any indicator ($P_n = 0$). Since the coefficients of this ordinal probit estimation can only indicate the direction of the effect, we present the marginal effects in Table A4. These marginal effects are defined for each level of deprivation, from least deprived ($P_n = 0$) to most deprived ($P_n = 10$). Thus, the marginal effects give us the magnitude of how each of the explanatory variables, *ceteris paribus*, affects the probability of childhood deprivation at a particular level. At the same time, we also draw inference about whether the effect is statistically significantly different from zero.

The results of this multivariate ordered probit model gives support to what we have observed in the descriptive part of our analysis. The coefficient of *Rural* is positive and significant, implying that rural children have higher probability of being deprived in 10 indicators than urban children. The negative and significant coefficients of time dummy (2009), mother's education, father's education and monthly per capita expenditure (MPCE) suggest that all these factors increase the probability of a child of facing no deprivation.

For each level of deprivation, the marginal effects presented in Table A4 in appendix give the magnitudes to which the probability of being deprived is affected when an explanatory variable changes its value. We find that rural children, relative to their urban counterpart, have 0.6 percentage points higher probability of being deprived in 10 indicators and 1.6 percentage points lower probability of experiencing no deprivation. The marginal effects for the intermediate numbers of deprivation indicate that the rural coefficient is consistently significant and negative for the lower number of deprivations (0 to 4) and it is significantly positive for the higher number of deprivations (5 to 10). Similarly, children have a higher probability of facing deprivation in 1 to 4 indicators and have lower probability of facing deprivation in 5 to 10 indicators in 2009 at age 15 as compared to 2006 when they were 12 years of age. Parents' education is seen as an important factor affecting children's level of deprivation. The effect of both mother and father's education are similar- i.e., relatively higher educated parents have a positive effect on children's well-being. The marginal effects associated with monthly per capita expenditure, also show that higher expenditure at the household level reduces child deprivation.

[Insert Table 5 here]

5. Conclusion

This paper has estimated childhood deprivation multi-dimensionally and compared the same in chronically poor and least-poor households in two different time points. It identifies children as deprived in each indicator as well as across multidimensional indicators.

On analysing the entire sample, overall deprivation shows a reducing trend between 2006 and 2009 amongst the children aged 12 and 15 years, however there are certain dimensions that show increasing deprivations. While 23 percent of all children aged 15 years faced deprivation in terms of not being enrolled in school, almost 15 percent of the children could not read and write by the time they turned 15 years of age. Social support is another area of concern, since three times the number of children reported having no support when teased at age 15 years, as compared to 12 years of age. Access to basic services also remained obscure for a large number of children and their households. Eighty percent of children aged 15 remained deprived from drinkable tap water and 77 percent were deprived from sanitation/ facilities as against 89 percent and 78 percent respectively three years earlier.

Based on simple headcount, childhood deprivation is not confined to the 'poorest' households, since 95 percent of children belonging to least poor households seem to have faced one or more deprivations at the ages of 12 and 15 (Table A3). Undoubtedly, children from the chronically poor households suffered a much higher concentration of deprivation than those in least poor households and the ordered probit regression results showed that higher consumption expenditure at the household level, results in reducing child deprivation. Looking at the overall figures regarding children aged 15 from both chronically poor and least poor households, there is an overall reduction in deprivation vis-à-vis the same children at the age of 12. The ordered probit analysis also indicates that in 2009, at 15 year age, children are less likely to face deprivation as compared to children in 2006, at 12 year age. This may be due to the increase in household's expenditure (or income) as highlighted in Table 1. Furthermore the adjusted headcount ratio reveals that least poor children in rural areas as well as girls have not experienced any reduction in deprivation across rounds. The probit analysis also revealed that rural children, relative to their urban counterpart, have 0.6 percentage points higher probability of being deprived in 10 indicators and 1.6 percentage points lower probability of experiencing no deprivation. However no difference was revealed in deprivation levels of boys and girls. The ordered probit analysis highlighted rural/urban location, parental education and

household's consumption expenditure as factors that have significant effects on childhood deprivation.

Thus economic growth, witnessed by the sample households in terms of a reduction in absolute poverty, has not translated into corresponding reductions in childhood deprivations for the least poor in rural areas during the period 2006 to 2009.

When examining the multidimensional deprivation of children, we cannot overlook the importance of the policy context. A lack of investment in good-quality education, health and other public services is as significant a cause of child deprivation as low family incomes (Mehrotra et al. 2000; Minujin et al. 2002). It is also important to understand that the quality of children's social, emotional, moral, and spiritual development, especially their feelings about their identity, self-worth, and personal well-being, is highly dependent on how they understand their relative social position, relative competence, and potential to access opportunities for personal, social and economic advancement (Boyden and Dercon 2012). Keeping in view that deprivation across more than one indicator in the dimension of well-being results in severe negative consequences for quality of life, well-being and future life chances for all individuals (Levitas et al. 2007) a convergent and coordinated policy response cutting across sectors and ministries is absolutely imperative. Children deserve a special place on the anti-poverty agenda and specific attention must be given to adolescents, who number 243 million and comprise a quarter of India's population. Dreze and Sen (2013) have highlighted that India's experience with targeting is far from encouraging and that the notion of 'below the poverty line' is problematic since it tends to be a 'hit or miss affair, with plenty of inclusion or exclusion errors'. Perhaps, it is time that social policies were based on alternative principles of universalism and self-selection, such as in the case of the MGNREGS, which is based on families opting to access the scheme, in order to ensure that no child falls between the cracks.

6. Acknowledgement

For helpful comments, we thank Paul Dornan, Maria Ogando Portela, Jacques Silber and two anonymous reviewers and participants of the workshop "Poverty Reduction in Asia: Drivers, Best Practices and Policy Initiatives" organised by Asian Development Bank, Emory University and Sogang University (Seoul). The data used in this paper are from Young Lives, an international study of childhood poverty, following the lives of 12,000 children in four

countries (Ethiopia, India, Peru, and Vietnam) over 15 years (www.younglives.org.uk). The views expressed here are those of the authors and not necessarily those of, or endorsed by, Young Lives, the University of Oxford, the Department for International Development (DFID) or other funders.

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