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http://dx.doi.org/10.1016/j.worlddev.2013.06.002

Child Labor Variation by Type of Respondent: Evidence from a Large-Scale Study

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Summary. — This study uses a nationally representative survey to analyze a key survey design decision in child labor measurement: self-reporting *versus* proxy interviewing. The child/proxy disagreement affects 20% of the sample, which translates into a 17.1 percentage point difference in the national rate of child labor. Marginal effects from standard child labor supply functions show child/proxy differences, particularly when the household experienced negative shocks. We find that attitudes and social perceptions toward child labor are not related to the likelihood of disagreement. A modified bivariate choice model reports statistically significant probabilities of misclassification that range between 9% and 30%.
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Key words — child labor, self/proxy designs, maximum likelihood, survey design, Peru

1. INTRODUCTION

Child labor is widespread in today's world. According to the International Labor Organization (ILO), at least 211 million children were working around the world in 2001, mostly in developing countries, with over 8 million engaged in hazardous and exploitative forms of child labor (ILO, 2002). Many authors argue that child labor deserves attention because it has long-lasting consequences for the economic development of countries through its interaction with education. Not surprisingly, an extensive empirical literature has focused on the determinants of child labor to assess the relative importance of factors that influence choices about child labor and schooling (see Bhalotra & Tzannatos, 2002; Brown, Deardorff, & Stern, 2003; Edmonds, 2008).

Yet, in contrast to adult labor studies, there is scant evidence on how child labor information should be collected or how survey designs affect the measurement of child labor. Most of the literature has focused on the conceptual and operational definitions of child labor, working children, and economically active children (e.g., ILO, 2004), without attending to the measurement of child labor itself. Although child labor measures vary by a child's age or differences between market and domestic work, there is considerable unexplained inconsistency in child labor statistics between and within countries (Guarcello, Kovrova, Lyon, Manacorda, & Rosatti, 2010). Related to our paper, the study by Dillon, Bardasi, Beegle, and Serneels (2012) addresses measurement error in child labor statistics based on a randomized survey experiment of 566 children aged 10 to 15 in seven districts across Tanzania. The main findings show that survey design matters for the measurement of child labor.

Our study investigates the role of survey design and type of respondent in explaining variations in child labor statistics. We exploit a controlled self/proxy survey design implemented on a large-scale, nationally representative survey that targets child labor in Peru. So far, the standard practice in developing countries is to use proxy respondents (generally, the head of household) to elicit information on children's activities due to budgetary constraints. Much less frequently, child labor measures come from the children themselves. The selection of survey respondent is particularly important in this setting because of the inherent tradeoffs between children's and prox-

ies' responses. For instance, the literature on adult labor markets has emphasized the challenges of measuring irregular and marginal labor activities due to job seasonality and the absence of steady work schedules and wage rates (e.g., Bardasi, Beegle, Dillon, & Serneels, 2012; Campanelli, Rothgeb, & Martin, 1989; Martin & Polivka, 1995).

The propensity to error in child labor settings is even more significant if one considers social desirability and normative values on one hand, and children's cognitive processes on the other. If child labor is viewed as "bad" for social, institutional, or cultural reasons, proxy underreporting of the true status is more likely to happen. For example, child labor is considered illegal for children under 14 years of age in most developing countries, although enforcement is far from strict. At the same time, child-based measures do not necessarily provide accurate information on children's labor participation since cognitive processes may be an important source of misreporting (Bound, Brown, & Mathiowetz, 2001; Borgers, de Leeuw, & Hox, 2000). Therefore, this study does not claim that one method of data collection provides better information than the other; rather, it assumes that both children's and proxies' reports are affected by error. [1]

We investigate how the self/proxy distinction affects the determinants of child labor supply functions, as changes in these coefficients may alter the way we understand the economic forces that are behind child labor decisions. This study uses rich data on the child, proxy, and household attributes deemed important in the literature. Most importantly, we provide evidence on how exposure to a variety of weather and economic shocks affects child labor, and we further analyze how this relationship varies by type of respondent. A recent

stream of the literature has highlighted the role of child labor in buffering income shocks (Beegle, Dehejia, & Gatti, 2006; Duryea, Lam, & Levison, 2007; Yang, 2008). Exposure to adverse shocks may affect the way proxy (or child) respondents answer child labor survey questionnaires—either because the former are more aware of the child involvement in market activities, or because attitudes and social perceptions toward child labor may change in times of crisis.

Furthermore, we analyze different factors that explain the discrepancies between child and proxy reports. While there is a general agreement that child labor is responsive to the household's economic and social environment, it is less clear how this responsiveness is shaped by parental attitudes and social perceptions toward child labor (Edmonds, 2008; Parsons & Goldin, 1989). We then exploit a module on parental attitudes and social perceptions toward child labor that includes questions about the parents' own experiences as child laborers, along with subjective (normative) statements regarding child labor.

Moreover, given that validation data are non-existent in child labor studies, we implement the Hausman, Abrevaya, and Scott-Morton (1998) modified maximum likelihood parametric model to assess the extent of misclassification error in child labor measures for both child- and proxy-reports. This adjusted probit model, which allows for the estimation of false positive and false negative participation probabilities, has been applied in topics as diverse as smoking (Kenkel, Lillard, & Mathios, 2004), education (Caudill & Mixon, 2005) and patents (Palangkaraya, Webster, & Jensen, 2011).

Several findings emerge from this analysis. First, we observe a substantial child/proxy disagreement of 17 percentage points in national-level child labor statistics, as proxy respondents systematically underreport child labor participation relative to child respondents. Child labor activities developed inside the family farm account for more than one-third of the disagreement, while child labor activities executed in workshops/factories/commercial centers account for the least. These results hold independently of the type (parent versus non-parent) and gender of proxy respondents. These results also show that agricultural activities carried out by children aged 6 to 9 are subject to the highest proxy underreporting.

Second, the estimation of standard child labor supply functions reveals important child/proxy differences in the magnitude, sign, and statistical significance for some attributes. While this study supports recent evidence that child labor is used to buffer income shocks (i.e., Beegle et al., 2006), the coefficients associated with some specific shocks vary significantly depending on the type of respondent.

Third, contrary to conventional wisdom, subjective attitudes and social norms regarding child labor are not statistically relevant predictors of child/proxy disagreement. Instead, three variables emerge as the most important determinants of disagreement: rural residence, exposure to adverse weather shocks, and the proxy's own experience as a child laborer. Indeed, parent's labor history is not only an important determinant of child labor status, but also a significant predictor of child/proxy disagreement.

Fourth, the implementation of the adjusted probit model in the context of misclassification in the dependent variable shows statistically significant false positive and false negative probabilities for both child- and proxy-based reports. In particular, proxy respondents are prone to underreport the labor status of children, independently of the hours worked. These results range between 9% and 30% according to alternative definitions of child labor.

The remainder of the paper proceeds as follows: Section 2 presents an overview of misclassification in child labor statistics. Section 3 describes the study design and data used in the empirical section. Section 4 presents a statistical analysis of child labor variation by type of respondent, investigates the determinants of child labor allocation by type of respondent, and analyzes the determinants of disagreement between child and proxy respondents. Section 5 presents the modified maximum likelihood approach to estimate the extent of misclassification in child labor statistics. Finally, Section 6 offers some concluding comments.

2. THE NOISY NATURE OF CHILD LABOR STATISTICS

There is a substantial recognition that child labor statistics are particularly prone to error (ILO, 2008). Information on child labor is collected primarily using standard household surveys that target adult work, i.e., formal jobs rather than unpaid, informal, and seasonal jobs. The adult work literature has shown the inherent difficulty in capturing reliable information on employment, working hours, and salaries of individuals who work in the marginal ranks of the economy (e.g., Campanelli et al., 1989). As a result, underreporting of labor market status is common, particularly when respondents answer short survey design sequences (Anker, 1983; Bardasi et al., 2012). In this type of setting, detailed screening questions have been shown to ameliorate the problem of underreporting adult labor at the expense of higher costs and effort feasibility (Martin & Polivka, 1995).

Due to budgetary constraints in developing countries, collecting information for each individual living in the same household entails an additional key survey design decision: self-reporting versus proxy interviewing. Survey design studies have shown that self-reporting respondents provide more accurate information on topics as diverse as adult labor markets (Hussmanns, Mehran, & Verma, 1990), schooling (Ashenfelter & Krueger, 1994), and health (Mathiowetz & Groves, 1985). [2]

In the context of child labor surveys, the advantages of using child-based rather than proxy-based reports are not quite obvious. On one hand, child-reported information may be more accurate than proxy responses, given that a child knows best how she allocates her time. This point is particularly relevant for children who work outside the family farm or business. At the same time, the cognitive development of children may affect the quality of the information provided, particularly for those aged 9 and younger. Calculations for weekly hours worked, for example, could be an issue for younger children. Similarly, the head of household may be familiar with the children's activities since many child laborers in developing countries work on the family farm or enterprise. Still, the proxy respondent may tend to underreport the true rate of participation if child labor is viewed as "bad" because of social norms and cultural values. In fact, it is widely documented in the measurement error literature that questions regarding socially undesirable behavior and attitudes result in patterns of underreporting because sensitive questions entail strong positive or negative normative responses (Bound et al., 2001; Tourangeau, 1999).

In this regard, the ILO's guidelines for the measurement of child labor suggest that children aged 9 and older should respond to the questionnaires by themselves, while younger children should be assisted by their parents only when they have cognitive difficulties that hinder their ability to understand the questions and communicate the answers (ILO, 2004). These recommendations are based on evidence drawn from