Essays on Households' Long-term Trajectories in Welfare and Human Capital

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THESIS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

IN ANALYSIS AND POLICY IN ECONOMICS

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ESSAYS ON HOUSEHOLDS' LONG-TERM TRAJECTORIES IN WELFARE AND HUMAN CAPITAL

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Date of the Defense: November 21st, 2019

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A mis padres, reconociendo la importancia de la transmisión intergeneracional de su disciplina, esfuerzo y cariño

ACKNOWLEDGEMENTS

When I first arrived at PSE to obtain the master's degree (a medium distance race) I wasn't certain I would pursue the PhD (run the full marathon). The invigorating research environment I found in the field of development economics at PSE, in particular under Karen's supervision of my master's thesis, had a lot to do with the subsequent decision of staying to proceed onto the PhD. Little did I know it would prove to be such a challenging feat at all levels. When it comes to the set of constraints faced during any endurance race of this sort, the only constant is change. Now that the 42- kilometer banner is finally in sight; it is clear that I am not crossing the finish line on my own. Plainly put, 'No one can whistle a symphony. It takes a whole orchestra to play it'[1].

To Karen my utmost gratitude for her guidance and patience over the course of this eventful journey. The road has indeed been long and winding. But beyond being grateful for her help in bringing my thesis to fruition, I deeply appreciate the unique and enriching opportunities granted to me through her; from teaching at Los Andes, to attending a high-level summer school in Tuscany, and conducting fieldwork and enumerator training in Africa.

I am also sincerely thankful to all the members of the jury for their valuable input. Their advice and contributions had been valuable not only due to their technical quality, but especially given their constructive nature. A referee's impact on a researcher's work should never be underestimated (it can 'make or break' a scholar). In my case, the jury's positive and formative undertone was essential for me in maintaining the motivation needed for the final, toughest kilometers. Moreover, their comments were instrumental in improving upon earlier versions of each chapter and the pending revisions suggested will likely enhance the papers research quality further.

I dedicate this milestone to my parents. In this dissertation I studied the importance of parental aspirations and investments in their children. It's no wonder I have come to acknowledge and appreciate so deeply my own parents' dedication and effort. None of the pages here would have been possible without their support at every level; emotional, psychological and material. Support which I have received not just during the doctoral years but throughout my childhood and to date.

Throughout my research, as I delved deeper into the study of the intergenerational transmission, underlying the formation of human capital, my gratitude towards my parents continued to grow. Speaking of long-term

[1] Quote by Halford E. Luccock

trajectories (as I do in my thesis) I must note that this transmission mechanism runs further back to my grand-parents' generation. In a somewhat atypical distribution of opportunities, given the gender norms of their day and age, my two grand-mothers (as oppose to my grand-fathers) were the ones who went on to pursue university degrees while raising their families. My grandfathers on their part, both self-made men, compensated for their lack of academic degrees with a profound work ethic and humble yet relentless effort. Each, in their own way, have shaped my identity both directly and indirectly through my parents. To them I also extend this acknowledgement.

Finally, to Diego, my partner in all adventures, you have made this journey endurable and, more importantly, you have made it most exciting. We have such a wealth of stories to share with our children (maybe even our children's children). What a ride! From DC to Paris, to Kenia, all the way to Turkey and back… where to next? Gracias. Te amo.

ABSTRACT AND KEYWORDS

This dissertation comprises the research I conducted over the course of my doctoral studies at the Paris School of Economics. The underlying common theme between the chapters is the microeconomic study of poor rural households over the course of time. I focus on changes in these households' welfare level (intragenerational mobility) and the development of their human capital (intergenerational transmission). The first essay examines whether the timing of a cash transfer program could have an impact on the household's long-term welfare trajectory. The results suggest that a short time differential in exposure to the program had an impact on the household's likelihood of remaining stuck in poverty in the long-run. The second essay investigates the intergenerational relationship between parental non-cognitive skills and subsequent child outcomes. In this paper I examine how informative and malleable these measures are within a poor rural setting, where respondent educational attainment is low and measurement may be rife with error. The results indicate there is an association that between the parent's non-cognitive skills and the child's outcomes that is still detectable after several years. The third essay investigates the risk factors (near birth) associated to children's developmental trajectories into youth, with a focus on maternal mental health. The results show the development gaps, between poor and stable mental health mothers, widen with time. This finding points to the importance of maternal mental health as a risk factor in the early stages of a child's development. Overall, the ensemble of studies highlight the research insight which may be gained from following households' or individuals' trajectories over the longer term with a focus on specific periods identified as critical for development.

Key words: Household long-term trajectories, welfare, human capital development

RESUME ET MOTS CLES

Mes travaux de recherche menés durant mon doctorat au sein de l'Ecole d'Economie de Paris et de l'Ecole des Hautes Etudes en Sciences Sociales ont pour thème commun l'étude de l'évolution au cours du temps des ménages ruraux pauvres. J'analyse l'évolution d'une part, du niveau de bien-être de ces ménages au sein d'une génération (mobilité intragénérationnelle) et d'autre part, de leur capital humain d'une génération à l'autre (transmission intergénérationnelle). Le premier chapitre examine si la durée d'exposition à un programme d'aides financières (*cash transfer program*) a une incidence sur la trajectoire de bien-être à long terme du ménage. Les résultats suggèrent qu'une faible différence d'exposition à un tel programme augmente la probabilité que le ménage reste pauvre à long terme pour ceux moins longtemps exposés. Le deuxième chapitre étudie la transmission intergénérationnelle, notamment comment les compétences non-cognitives des parents influencent les caractéristiques anthropométriques et capacités cognitives de leurs enfants. Je montre que les effets sont significatifs et perdurent dans le temps. Le troisième chapitre étudie les facteurs de risques, notamment la santé mentale des mères qui peuvent survenir proche de la naissance et leurs effets sur les trajectoires des enfants. Les résultats montrent que les écarts de développement entre les enfants dont les mères sont stables ou instables mentalement se creusent avec le temps, ce qui suggère l'importance de la santé mentale maternelle comme facteur de risque dans les premiers stades du développement de l'enfant. Dans l'ensemble, cette thèse apporte différents éclairages sur ce que nous apprend l'analyse longitudinale.

Mots clés: trajectoires de ménages à long terme, bien-être, accumulation de capital humain

FOREWORD

When I embarked in my doctoral research, I considered it a timely opportunity to conduct long-term studies given the increasing availability of high-quality longitudinal data. Data of this sort was not readily available back when I was pursuing my undergraduate degree as an economist close to two decades ago; in particular for developing countries[2]. Therefore, in all three chapters I use panel data to follow households over various rounds, tracing their trajectories along different dimensions of welfare.

The underlying common theme between the chapters is thus the microeconomic study of poor rural households over multiple time periods. In particular, I focus on changes in these households' welfare level in the first chapter (intragenerational mobility) and the development of their human capital in the other two chapters (intergenerational transmission).

In the first paper I was interested in examining the long-run impacts which a conditional cash transfer program could have on the household's socioeconomic mobility. The primary interest in the study of the sustained impacts of a CCT program (or lack thereof) emerged as a continuation from the research I conducted on the pioneering Mexican program (Progresa) during my master's at PSE (Clavijo, 2011). To date, a large literature has documented the short and medium-term impacts of the Mexican experience and its successors (cf. Fiszbein and Schady, 2009; and more recently Baird, et al, 2014). Meanwhile, the jury is still out with regards to the long-term impacts. The evidence which has emerged so far is mixed and still limited (Molina-Millán, et al. 2019a). The question about the impacts from cash transfers in general, which are sustained in the long-term, therefore remains high on the research agenda. In fact, development researchers focused on the study of poverty have been called upon to double-down on long term studies to understand whether impacts from cash transfers are sustained over time (Blattman et al, 2019)[3].

Moreover, in the first paper I set out to combine this research theme on long-term effects of transfers with a personal interest in distributional analysis; in particular mobility dynamics[4]. Admittedly, the hybrid study proved to be a challenge in its application of traditional impact evaluation techniques to the study of welfare dynamics.

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[2] The Living Standards Measurement Study (LSMS) may be considered the pioneering initiative in this field (Ravallion, 1998). Led by Professor Martin Ravallion the LSMS was established by the World Bank in 1980 to explore ways of improving the type and quality of household data collected by statistical offices in developing countries. Anecdotally, I first came to know of the LSMS after finishing my undergraduate studies and working at the Poverty and Gender Unit at the World Bank (with Renos Vakis as my supervisor, and mentor from whom I learned a great deal about poverty measurement). Some years later, I had the privilege of attending class with Professor Ravaillion at PSE and was further interested in distributional and longitudinal analysis.

[3] Blattman and co-authors (Faye, Karlan, Niehaus and Udry) emphasize that further evaluation of subgroup analysis is needed to understand how impacts differ depending on beneficiary characteristics. They note that these characteristics should expand beyond the usual heterogeneity variables such as gender, age and wealth, towards less studied context dimensions such as mental health or conflict.

[4] An interest which was fueled in large part by the lecture on Distribution and Inequality (offered by Professor Gary Fields), which I had the opportunity to attend while at PSE.

In this respect, the guidance provided by the members of the jury, and specially by my adviser, was instrumental in improving upon earlier versions of the chapter.

Given the evaluation design of the Mexican transfer scheme, I exploited the random allocation to early treatment in order to evaluate the impact of differential exposure to the program on the welfare path followed by the household. In particular, I focused on the likelihood that a household presents a path of sustained poverty or downward mobility among other trajectories, as outcome variables to describe the welfare path. At the more conceptual level I was interested in understanding whether the impacts varied according to the households' constraints. To do so, I examined how the impacts of the differential timing varied according to the heterogeneity between the households (in terms of physical and human capital and exposure to shocks.) The rationale for the heterogeneity analysis stemmed from the premise that the household's binding constraints are not constant over time. Rather, the heterogeneity between households, in terms of their access to and accumulation of physical and human capital, as well as the unexpected shocks they may encounter, renders these constraints dynamic. As such, the specific moment at which a household enters the program may affect the extent to which the CCT has an impact on its welfare.

Overall, the results showed that the households that randomly received the transfers first displayed on average a higher likelihood of sustaining high welfare levels and a lower probability of remaining stuck in poverty. The heterogeneity analysis indicated that early receipt of the program impacted households to differing degrees according to their characteristics at baseline relating to physical capital (for land and homeowners and those close to markets) and human capital (for primary and secondary aged members). However, the heterogeneity between households in terms of their exposure to shocks does not seem to affect the impact of the timing of the CCT in the long-run. At the broader level, I concluded that understanding how the timing of transfers may affect the extent of their impact can be important for targeting purposes, taking into account households' heterogenous and dynamic constraints.

The second paper of my dissertation investigated the intergenerational relationship between parental non-cognitive skills and subsequent child outcomes. Subjective measures of non-cognitive skills are now widely used and there is increasing evidence about their importance in skill formation. However, these measures have mainly been validated in developed countries. During my second year in the Ph D I had the privileged opportunity to do field work in Kenia by participating in a study aimed at testing the reliability and validity of some the most commonly used skills measures in a rural developing context (Laajaj and Macours, 2019). The research idea for this second chapter spawned in large part from this field experience.

The main objective of this paper was precisely to investigate how informative and malleable certain measures of non-cognitive skills are within a poor rural setting, where respondent educational attainment is low and measurement may be rife with error. To this end, I exploited a rich panel dataset that spans a decade in time across four developing countries to examine the predictive validity of a number of non-cognitive skills on final child outcomes. I focused on parental aspirations and psychosocial wellbeing (as determinants) and parental investments and observed child human capital quality (as dependent variables).

The results indicated there was still a systematic positive association between the non-cognitive skills and the subsequent child outcomes, detectable even up to 8 years after. At the broader level, understanding the role of parental psychosocial wellbeing in the decisions about their children's future human capital could prove to be useful input to inform policy interventions that directly aim to shape these so-called 'soft skills'.

Finally, the third chapter of my dissertation also dealt with measures of subjective wellbeing with a focus on maternal mental health. More specifically, I investigated the risk factors associated to children's developmental trajectories into youth, featuring caregiver depression as a risk factors on which there is less evidence to date. The results shed light on the development gaps between poor and stable mental health mothers, indicating these gaps widen with time. This result points to the importance of maternal mental health as a risk factor in the early stages of a child's development.

Taking a step back, the ensemble of my research highlights the valuable insight which may be gained from following households' or individuals' trajectories over the longer term. In other word, there is much to be learned from watching the 'full movie' rather than just looking at the 'snapshot'. The notion that constraints are dynamic and are shaped by changing household circumstances, and unexpected shocks, emphasizes the need for longitudinal analysis with a focus on specific periods identified as critical for development. Further studies examining the trajectories traced by households in poverty, whether within the same generation or into the next, will continue to enrich our understanding of their welfare and the development of their human capital.

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Chapter 1

Long-term Impacts of the timing of Conditional Cash Transfers on Households' Economic Mobility

Abstract

Could the timing of an intervention affect its impact? More specifically, could a small time-differential in the entrance into a CCT program have an impact on the household's long-term welfare trajectory? This could be the case if households' binding constraints are not constant over time. These constraints are likely to be dynamic due to the heterogeneity between households. This paper exploits the randomized evaluation design of a renowned CCT program to evaluate the impact of an 18-month differential in exposure to the program on the likelihood that a household presents a path of sustained poverty or downward mobility, among other trajectories. Furthermore, I explore how the impacts of the differential timing vary according to the heterogeneity between the households (in terms of physical and human capital and exposure to shocks.) The heterogeneity analysis indicates that early receipt of the program impacts households to differing degrees according to their characteristics at baseline relating to physical capital (for land and homeowners and those close to markets) and human capital (for primary and secondary aged members). However, the heterogeneity between households in terms of their exposure to shocks does not seem to affect the impact of the timing of the CCT in the long-run. Overall, understanding how the timing of transfers may affect the extent of their impact can be important for targeting purposes, taking into account households' heterogenous and dynamic constraints.

1. Introduction

For nearly a decade now there has been a wave of optimism about the increase in socioeconomic mobility in Latin America. According to comparable regional estimates, two in five Latin Americans were upwardly mobile between 1995 and 2010, resulting in an expansion of the middle class of approximately fifty percent over that period. Some of the cross-country descriptive evidence suggests that targeted interventions, specifically conditional cash transfers (CCTs), might have played a key role in promoting upward mobility. In contrast, general social spending (on untargeted schemes such as pensions or unemployment) showed little correlation to mobility in the region (Ferreira et al, 2013).

The focalized nature of social protection is understood to be a key component to enhance progressive socioeconomic results, such as providing opportunities for upward mobility and combating poverty persistence. Indeed, for conditional transfers there is direct evidence that targeting based on the household's characteristics affects considerably the impact and efficiency of the program (de Janvry and Sadoulet, 2006).

In addition to targeting at the household level, could the *timing* of an intervention of this sort matter for it to have an impact on socioeconomic mobility? By definition a research question examining socioeconomic mobility requires a prolonged time dimension, whether referring to mobility over time within a generation (intrageneration) or into the next generation (intergenerational). In the case of CCTs, a large literature has documented the short and medium-term impacts of the pioneering Mexican program Progresa[5] and its successors (cf. Fiszbein and Schady, 2009; and more recently Baird, et al, 2014). The evidence is now emerging about the long-run impacts though it is mixed and still limited, thus remaining high on the research agenda (Molina-Millán, et al. 2019a)[6].

Understanding how the timing of CCTs and transfers in general may affect the extent of their impact, on human capital and subsequent outcomes, can be important for targeting. This proves particularly relevant as some of the more recent transfer programs target narrower populations and objectives (e.g. Filmer and Schady, 2014 in Asia or Baird et al., 2011 in Africa). The emerging long-term evidence has accordingly laid the focus on certain critical age ranges of exposure to the intervention (Barham et al, 2013; Molina Millán, et al, 2019b; Parker and Vogl, 2018). The majority of existing evaluation studies for CCTs identify average treatment effects, even if the focus is on intergenerational impacts (Araujo, et al. 2018; Parker, Vogl, 2018). The evidence of the program's

[5] The program was initially called *Progresa* in 1997; the name was later changed to *Oportunidades* in 2002, and more recently rebranded as *Prospera*. In this study I adhere throughout the paper to the program's original name.

[6] The review study by Molina-Millán, et al. (2019a) finds consistent positive long-term impacts on schooling but less so for cognitive skills, learning or socio-emotional skills. The results for impacts on earnings and employment are mixed, possibly because former beneficiaries were still too young. A number of the studies reviewed find estimates which are not statistically distinguishable from zero. However, the authors caution that it is often not possible to distinguish whether this is due to an actual lack of impact or the methodological challenges facing all long-term studies.

specific effect on distributional measures remains scant. A recent exception examining the impact on inequality of opportunity is the study by Van de gaer and Figueroa (2014).

This paper uses the randomly assigned differential exposure between early and late treatment groups of Mexico's renowned CCT program Progresa to evaluate the impact of the timing of the transfers on the households' socioeconomic mobility within the same generation. The hypothesis that the timing of the conditional transfer may impact the household's socioeconomic mobility follows from the premise that the household's binding constraints are not constant over time. Rather, the heterogeneity between households, in terms of their access to and accumulation of physical and human capital, as well as the unexpected shocks they may encounter, renders these constraints dynamic. As such, the specific moment at which a household enters the program may affect the extent to which the CCT has an impact on its welfare. This impact will depend on the constraints faced by the household at that given point in time and whether these constraints are effectively lifted by the CCT. Moreover, the small time differential (less than two years) may potentially have lasting effects if the CCT affects not only the household's contemporaneous welfare but rather the welfare trajectory on which the household is set.

In particular, in this paper I exploit the information from the panel's middle survey rounds to construct 3-period *welfare trajectories*. A trajectory is defined as the sequence of a household's position along the welfare distribution. More specifically I evaluate the impact of differential exposure to the program on the likelihood that a household presents a path of sustained poverty, sustained downward mobility, or temporary downward mobility (or the analogous upward mobility paths). The evaluation data allows the inclusion of the (ineligible) non-poor population in the mobility rankings (as opposed to simply gauging impacts on beneficiaries against the eligible poor in the control group). This ranking sets a higher bench mark against which to measure impacts - closer to the non-vulnerable, whom are too wealthy to qualify for the program.

The trajectories estimates indicate that the beneficial welfare impact on the early recipients does persist into the long term. In particular, the households that randomly received the transfers first displayed on average a higher likelihood of sustaining high welfare levels and a lower probability of remaining stuck in poverty. Thus, the persistence effects stand the test of time while the impacts on mobility decay (upward and downward movement, sustained as well as temporary).

Furthermore, I explore how the impacts of the differential timing vary according to the heterogeneity between the households (in terms of physical and human capital and exposure to shocks.) The heterogeneity analysis indicates that early receipt of the program impacts households to differing degrees according to their characteristics at baseline relating to physical capital (for land and homeowners and those close to markets) and human capital (for primary and secondary aged members). However, the heterogeneity between households in terms of their exposure to shocks does not seem to affect the impact of the timing of the CCT in the long-run.
The rest of the paper is organized as follows. Section 2 provides the basic relevant background information on the program, including the program design and data set used. In section 3 I present some definitions regarding the measure of intragenerational mobility used and the conceptual framework to motivate the hypothesis that the timing of the transfers may affect their impact on economic mobility. The empirical strategy, leveraging the

experimental design and constructing welfare trajectories to evaluate the impact of timing on socioeconomic mobility, is laid out in section 4. The aggregate results for the short, mid and long-term trajectories are presented in section 5, followed by the heterogeneity analysis with focus on the long-term estimates in section 6. Concluding remarks are presented in section 7.

2. Background of the Program

2.1 Program design

As one of the most renowned and studied CCT programs the rules and evaluation design of Progresa have been extensively documented (Behrman and Todd, 1999a, 1999b; Skoufias and McClafferty, 2001). In this section I therefore limit the information to the program's most basic, relevant aspects. Progresa started operating in the most marginal rural communities in Mexico in 1997, covering approximately 300,000 beneficiary households. Subsequently, the program expanded into urban areas covering six million families by 2016[7], or about one quarter of families in Mexico. Its broad coverage and prolonged tenure - as opposed to other randomized evaluation trials (RCTs) consisting of small, temporary pilot interventions-suits well the distributional focus of this study on long-term mobility.

The program provided cash transfers to mothers, conditioned on children's enrollment in school and regular attendance (85 per cent of the time) as well as scheduled visits to health centers. Originally the program provided grants only for children between the third grade of primary and the third year of secondary school (i.e. ninth grade) aged eight to seventeen years[8]. Under the original grant structure, cash amounts (adjusted every six months for inflation) increased as children progressed to higher grades to reflect the increased opportunity cost of schooling as children grow older. In addition, at the secondary level of education (grades seventh through ninth) cash amounts were slightly higher for girls than boys (by about 13 percent; Table 1.1)[9]. Students benefiting from the program are allowed to fail each grade once, but if a same grade is repeated twice, the schooling grant is discontinued permanently. Finally, the program also provides subsidies for school supplies and a fixed transfer for nutritional support linked to health clinic attendance. However, in terms of magnitude the school grants represent the majority of the program benefits.

[7] According to official figures by 2016 the latest version of the program, including conditional and unconditional schemes (*esquema sin corresponsabilidad*), covered close to 7 million Mexican families. https://www.gob.mx/prospera/documentos/que-es-prospera

[8] In 2001 the program was extended to include high school (upper secondary) grants and the age limit increased to 21 years.

[9] By the end of 1999 the educational grants ranged from 80 pesos (about $US8) in the third grade of primary to 265 pesos ($US26) for boys and 305 pesos ($US 30) for girls in the third year of secondary school (all nominal prices). For further details on the program rules see Skoufias and Parker (2001).

2.2 Evaluation design and data

As documented in several previous studies on Progresa, the original evaluation and sample design for the program consisted of 506 rural communities[10] (localidades) of which 320 were randomly assigned to receive benefits immediately and the other 186 to receive benefits at a later point in time. The eligible households in the original treatment localities (henceforth referred to as the treatment or early treatment group) began receiving program benefits in the spring of 1998, while the control group (also referred to as the late treatment group) started receiving benefits at the end of 1999. Program eligibility depended on poverty status of the household as determined by a proxy means test. In particular, households in both treatment and control villages were classified as being eligible or ineligible according to an assessment of their permanent income from information collected in a census of localities carried out in September 1997. As a result of this selection process slightly over half of the households in the evaluation sample were initially classified as eligible in 1997.[11]

This census, the 1997 Survey of Household Socio-Economic Conditions (ENCASEH 97), provided the pre-program data for the evaluation[12]. In March 1998 before any transfers were distributed a specially designed baseline (Wave 1) evaluation survey (ENCEL survey) was applied to all households in both treatment and control communities to collect detailed information on demographics, schooling, health, employment, income and expenditures. The first follow-up ENCEL survey was conducted in October 1998 (Wave 2). From then until November 2000 ENCEL surveys (Waves 2 through 6) were applied every six months. Since control households started receiving benefits between November and December 1999 the experimental variation phase comprises Waves 2, 3 and 4. A new follow-up survey (ENCEL 2003 or Wave 7) was conducted in 2003 which included all the households that could be located in the original 320 treatment localities and the original 186 control communities. Finally, the most recent follow-up survey was carried out in 2007 (ENCEL 2007 referred to as Wave 8), though this final survey was only carried out in a subset of the original evaluation localities[13]. Given the long time-span between the base and end-line, and notably the administrative issues concerning data collection for the final round, attrition is of particular concern as I discuss next.

For this study I build on the household panel dataset used in Gertler et al. (2012) which linked the ENCASEH97 to the ENCEL surveys between Wave 2 and 7. To this panel I added Wave 1 (the baseline ENCEL) and Wave 8 to obtain a ten-year span. I mainly focus on the changes in household consumption between the baseline and

[10] From the following seven states: Guerrero, Hidalgo, Michoacan, Puebla, Queretaro, San Luis Potosi, and Veracruz.

[11] There were actually two rounds of selection of eligible households in Progresa. In the first selection 52 percent of households were initially classified as eligible. A few months later, still before the program began, the list of eligible households was revised and 54 percent of the households originally classified as ineligible were added to the beneficiary group. This reclassification procedure was known as the '*densification*'. However, around 60 percent of reclassified (or *densified*) households did not receive transfers because of administrative problems. In this study I adhere to the original classification of households (i.e. the ineligible group constitutes 48 percent of the sample). This has mostly been standard practice in studies using the Progresa evaluation dataset since the incorporation of the *densified* households is less well documented (see for example Gertler et al., 2012; and Angelucci and Di Giorgi, 2009).

[12] See INSP 2006 for further details on the three successive phases of the targeting process, ie. [(i) Geographic targeting of marginal areas with adequate access to education and health facilities; (ii) targeting based on discriminant analysis applied to the ENCASEH survey; and (iii) Verification and modification of the beneficiary roster at a community assembly.]

[13] Due to budgetary and operation cost issues, only localities with more than 20 dwellings (viviendas) in 2003 were revisited in 2007. As a result, 37 of the 320 early treatment localities and 10 of the 186 late treatment localities were excluded from the survey sample in 2007 (Instituto Nacional de Salud Pública, 2007). In terms of the households from the original sample included in the ENCEL 2003, but excluded in ENCEL 2007, this amounts to 2.9 percent overall sample loss, slightly higher for the treatment group (3.1 versus 2.3 percent for the control) (see Clavijo, 2011 for further details on the survey sampled in Wave 8).

Waves 2 and 4 (for the short-term analysis), and the changes between baseline and Waves 6, 7 and 8 (for the long-term heterogeneity analysis)[14]. I concentrate on the household as the unit of analysis primarily to address non-random attrition concerns which are more salient at the individual level[15]. The complete unbalanced panel contains 20,670 households with consumption data at baseline, of which 52 percent (i.e. 10,676 households) were originally classified as eligible.

Of these eligible households approximately 2 thirds belong to the early treatment group and the other third to late treatment. Table 1.2 details the sample of households used for the core of the analysis in this study (i.e. households, present at baseline [Wave 1] and at each follow-up, for which consumption data is available). Note that the all regression estimates in the paper use the sample of eligible households at each period (column 3 in Table 1.2) to measure the impact on mobility of differential exposure to the program (i.e. early versus late treatment households). However, the mobility outcomes (measured at the household level) are constructed using the entire consumption distribution (including all the households originally classified as ineligible [column 7] in addition to the original treatment and control households (column 3)[16].

The attrition rates indicated in Table 1.2 show there is already considerable sample loss between the first two periods. Attrition amounts to 9 percent at the aggregate level by Wave 1 and 4 and is higher for the treatment group (10 percent versus 6 percent for the control). After this period the cumulative attrition remains stable up to Wave 7. The steepest hike in attrition (amounting to 48 percent at the aggregate level) happens between the last 2 periods; in the transition between the mid and long term. In all, attrition in the long-term panel is highest among the ineligible households (52 percent), followed by the treatment group (46 percent) and slightly lower among the control group (42 percent). However, beyond comparing the raw attrition rates, in order to understand the bias this sample loss may generate, it is necessary to determine whether there is differential attrition between the treatment groups based on their initial characteristics. Table 1.3 displays the estimates at each wave of attrition as a function of treatment status and the interaction term with a number of baseline characteristics at the head, household and community level. While attrition is associated to a few baseline characteristics (e.g. education of the head/spouse, household composition, and access to electricity), the results indicate there is no evidence of differential attrition according to treatment status. None of the point estimates for the intent-to-treat variable alone are statistically significant and, in all, less than five percent of the point estimates for the interacted terms are significant in the short term (columns 2, 4 and 6). By Wave 7 (5 and a half years since the beginning of the program) this proportion increases only slightly and is still less than 10 percent (columns 8 and 10). Access to electricity is the only variable which is consistently associated to a lower likelihood of attrition throughout the ten-year span, and to a greater extent for the early treatment group.

[14] I do not use Wave 5 (i.e. May 2000) since the consumption data is not available for this round.
[15] In previous research I conducted using the preprogram census and the last round of the ENCEL (ie. the ENCASEH linked to Wave 8) I found substantial attrition especially among the sample of youths I studied (74 percent overall attrition and 76 percent among the male youth; see Clavijo, 2011).
[16] For further clarity, when constructing the household mobility measures, I use the entire universe of households in the evaluation villages (i.e. the original eligibles plus the original ineligibles; column 9 in Table 1.2). In contrast to other studies that drop the *densified* households from their sample altogether, in this study, although I adhere to the original classification into treatment and control, I still use the information of all the original ineligibles in order to characterize the welfare distribution in these villages at each period.

Moreover, in the long-term, households are less likely to attrite if the head is of indigenous descent (i.e. speaks an indigenous language). This sample selection due to ethnicity only appears in the final round of the survey. It is important to bear in mind that in this final wave only localities with more than 20 dwellings (*viviendas*) in 2003 were revisited in 2007. However, this administrative sample selection does not seem to be driving the ethnicity result since indigenous predominance is likely to be higher precisely in the smaller and thus excluded localities. Rather the negative association between ethnicity and attrition is more consistent with a lower likelihood of migration among the indigenous population. The interaction term indicates this effect is augmented among the early beneficiaries.

The potential biases from the two sources of non-random attrition seem to work in opposite directions. On the one hand indigenous descent is likely associated with lower levels of welfare while access to electricity correlates to higher living standards. Thus, it will be important to bear these factors in mind when interpreting the impact results. In any event, the ensemble of estimates for all the baseline characteristics across the five separate survey rounds suggests there is no evidence of differential attrition along treatment status, even in the long-run, despite the high rate of sample loss (48 percent) examined above. To summarize, even though the evidence suggests the attrition is mostly random, in moving forward, I will control for all these baseline characteristics[17] in the estimates and remain mindful of the selection due to sample loss over the survey rounds. Further attrition checks are presented in the Appendix section (see section A.1.1 at the end). For the sample of households under study, treatment status (early treatment or late treatment for the control group) denotes 'intention-to-treat' (ITT).

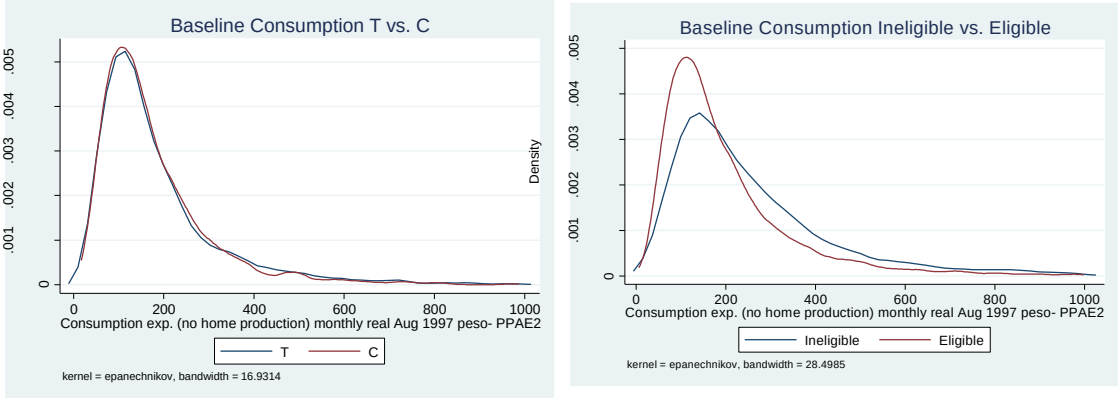
Given that I will be including the entire census of households to construct the mobility measures (i.e. using the full consumption distribution of the evaluation villages), it is important to examine how the ineligible 'non-poor' initially compare to the eligible poor. Figure 1 below plots the consumption distributions for the households in the sample at baseline by treatment status (left panel: T vs. C) and eligibility status (right panel: Ineligibles vs. Eligibles). As expected, given the successful village randomization[18], treatment and control households have nearly identical consumption distributions (the kernel densities essentially overlap at all points the distribution). The consumption distribution for the ineligible households is mildly skewed to the right indicating a slightly higher mean consumption as expected given they were classified as non-poor. However, the distribution suggests they are not very well off, since there is still considerable overlap of their consumption distribution to that of the poor (eligible) household, in particular at the upper and lower tails. This similarity in terms of consumption at the extremes of the distribution reflects the fact that the program eligibility was based on a means test, to proxy for households' permanent income, and not on actual consumption. The main take-away from this comparison (showing an overlap in consumption between the eligible and non-eligible households) is that when constructing the mobility trajectories, based on a household's position along the entire consumption distribution, we can do not expect the wealthiest tercile at baseline to consist exclusively of the ineligible population. Rather, the distributions' overlap suggests there will be some marginal ineligibles even at the lowest tercile, and some eligible

[17] Following to a large extent Gertler et al. (2012) in the choice of control variables.

[18] Indeed, throughout the analysis that follows, the validity of the intent-to-treat estimates using the evaluation design of Progresa hinges on the randomization of households into treatment status. Thus, non-compliance and/or changes in the classification of eligible households may attenuate the detectable impacts. These potential concerns are addressed in the Appendix section at the end (see section A.1.2. on compliance and the 'densification process' surrounding Progresa).

at the top. It will be important to take into account this initial distributional set-up when interpreting movements in the subsequent analysis.

Figure 1. Consumption distributions by Treatment and Eligibility status



3. Conceptual definitions, Framework and Hypotheses

3.1. Intragenerational Socioeconomic mobility

Up to now I have used the term mobility loosely but an important distinction must be made regarding the concept of mobility I will use in this study. As reviewed in an influential taxonomy by Fields (2000 and 2006) the literature on economic mobility is vast and the different indices are not measures of the same underlying conceptual entity. Ideally the *space, domain* and *concept* of economic mobility should be well defined (Ferreira et al, 2013). The *space* indicates the choice of variable in the distribution under consideration (in this study, household consumption[19]), and the *domain* indicates how far apart in time the two (or more) distributions are observed. In the present context this distance is close to ten years (between 1997 and 2007) depending on the specific welfare trajectory under study.

It is key to distinguish between two very different domains of economic mobility: the intragenerational (for which the unit of observation, e.g. individuals or households, is tracked over time) and the intergenerational (for which the unit of observation indicating lineage is followed across generations, e.g. fathers and sons, mothers and daughters, etc.) Both domains are important in their own right and the distinction is fundamental since the key desirable properties for a measure of mobility across generations may differ from those for mobility over a person's lifetime. Also, the two domains may portray diverse pictures since it is possible for a given society to exhibit high mobility within generations while remaining almost completely immobile across them, or vice versa.

[19] More precisely, I use per capita adult equivalent household consumption. Household consumption includes food and nonfood expenditures. From Wave 2 onwards, the food consumption data is based on a direct question about the amount of each food item consumed and purchased. In particular, respondents are asked about consumption of 36 food items grouped into 4 types ("Fruit and Vegetables", "Cereals and Grains", "Meats, Fish and Dairy", and "Other processed foods"). However, the consumption questionnaire differed slightly in Wave 1 (food expenditures were not recorded for each item separately but aggregated by type. In any case, the comparability of the consumption variable in levels between the waves is not a particular concern since the outcomes of interest (the mobility measures) are constructed using the tercile positions along the distribution.

The unit of analysis used in this study is the same household observed at baseline and up to a decade later. Thus, the domain of mobility is strictly *intragenerational*.

Following the taxonomy of mobility measures defined by Fields (2005)[20] the underlying *concept* of mobility I adhere to in this study is one of 'mobility as movement' (as opposed to 'mobility as origin independence' or 'mobility as equalizer of long-term incomes'). In particular, within this concept of 'mobility as movement', I will focus on 'positional movement' (as opposed to 'directional or non-directional consumption movement' or 'share movement'). The rationale for this choice of mobility concept is given by the strict focus in this study on intragenerational mobility.

As discussed in the review on mobility concepts by Ferreira et al (2013) *across* generations mobility is often associated with the notion of equality of opportunity, where a mobile society is one in which the outcomes of one generation do not substantially determine that of the next generation. As such, the concept of mobility most closely associated (in axiomatic terms) with this notion is that of origin independence (Shorrock, 1978). However, this is not necessarily the case *within* generation. For a given household, the lack of serial correlation between consumption at one period and another is not a particularly meaningful measure of mobility. There are ethical and incentive-related reasons why a certain degree of temporal persistence in the rewards to effort would be desirable within a generation (e.g. compensation for successful investments in human and physical capital). Origin independence therefore is not a suitable concept of mobility in this study. Rather, given the interest in tracing and understanding the pathways followed by the households that received the timely transfers and their standing relative to others, positional movement is arguably a more adequate measure of socioeconomic mobility.

More specifically, I build a simple outcome measure of *each* household's trajectory[21] in terms of its position (tercile) along the consumption distribution. Thus, it is important to note that in this study I am not constructing a mobility measure for a *population* as a whole, as is common for descriptive analysis on mobility. Rather, I construct a welfare trajectory for each *household* to obtain an outcome measure of the household's individual economic mobility[22].

Having established the space, domain and concept of intragenerational mobility used in this paper, for brevity, the term 'mobility' hereafter entails this specific definition.

3.2. Conceptual Framework and Hypotheses

In this section I lay out the conceptual underpinnings which sustain the hypothesis that the timing of the conditional transfer may impact the household's socioeconomic mobility (i.e. affect its long-term welfare trajectory). This hypothesis stems from the main premise that the household's binding constraints are not constant over time. Rather, the heterogeneity between households, in terms of their access to and accumulation

[20] In addition to Fields (2000 2006) and more recently Ferreira et al. (2013), other reviews of the mobility literature include Atkinson et al., (1992) and Fields and Ok (1999).
[21] The method used for the construction of the welfare trajectories is explained further below (Section 4; Estimation strategy).
[22] A mobility outcome measure is needed for each individual household in order to perform the impact evaluation (of differential exposure to the CCT). Specifically, the impact evaluation in this context consists of comparing between early and late treatment households the (mean) likelihood of following a given trajectory (more details provided in Section 4; Estimation strategy).

of physical and human capital, as well as the unexpected shocks they may encounter, renders these constraints dynamic. As such, the specific moment at which a household enters the program may affect the extent to which the CCT has an impact on its welfare. This impact will depend on the constraints faced by the household at that given point in time and whether these constraints are effectively lifted by the CCT. Moreover, the small time differential (less than two years) may potentially have lasting effects if the timely access to the CCT affects not only the household's contemporaneous welfare but rather the welfare trajectory on which the household is set.

The premise that the households' binding constraints are dynamic over time, thereby affecting the welfare impact of the transfer program, derives from the heterogeneous conditions surrounding each household; in particular from three sources of heterogeneity:

i. Heterogeneity in Human capital

To hypothesize about the household's constraints in terms of its human capital it is useful to think about an underlying lifecycle of earnings of the household (Ben-Porath, 1967). The constraints faced by the household can be thought to be dynamic since they are shaped by the household's changing demographic composition. As modeled in a number of studies, on the production of human capital, the constraints on the household's earnings capacity is expected to change as members age (cf. Ben-Porath, 1967; and subsequently Basu and Van, 1998; and Baland and Robinson, 2000).

Taken to the rural, high poverty context where Progresa operated, for example, households with very young-aged children may be burdened to some extent, taxing their income earning capacity. Rearing new-born infants in particular may place a significant time-constraint on the caregiver attending the child's needs and the corresponding income opportunity cost of that time. This income opportunity cost could be lower during the child's primary school age, both because school fees are not as high as in secondary school (thus the lower transfer values of the CCT in primary) and because the opportunity cost of child wages are expected to be lower given the young primary- aged child's (lack of) abilities. Consequently, the constraints imposed on the household's earnings capacity would be lowest in the case of prime-aged members, having passed the stage of investment in their own human capital and being able to offer their labor supply to the household.

Indeed, early evidence on Progresa suggests the CCT had a safety net value for child schooling but not for labor (de Janvry, et al, 2010). Moreover, the heterogeneity between the households implied large differences in the impact of the conditional transfer (on enrollment) across categories of children. The largest effects detected were at the transition stage from primary school to secondary school (de Janvry & Sadoulet, 2006).

ii. Heterogeneity in Physical Capital

The prediction that the timing of the transfer may affect the program's impact, depending on the household's possession of physical capital (at the time of treatment), follows initially from the existing evidence that Progresa allowed households to invest part of the transfer in productive activities (Gertler et al 2012). This would be expected if the cash injection, for example, helped recipient households afford the start-up costs associated with entrepreneurial activities (McKenzie and Woodruff, 2006). Also, risk-averse beneficiary households could have

been more willing to invest in riskier, but higher return, activities if the transfers were perceived as a secure and steady source of income. Naturally, the capacity to successfully invest the transfers would depend on the household's existing physical capital at the time of treatment (e.g. asset holdings that serve as start-up or complementary resources for the productive activity). In other words, the household's investment constraints and therefore the CCT's potential impact on welfare is expected to vary as a function of the household's initial physical capital.

In fact, the evidence for Progresa shows that, during the experimental phase, beneficiary households increased ownership of productive farm assets and that agricultural production increased faster for beneficiary households than non-beneficiary households (Gertler et al, 2012). This resulted in significantly higher agricultural income (an estimated 9.6 percent increase as a result of an 18-month exposure period). Moreover, the returns on these investments were estimated to persist (beyond the experimental period), raising long-term living standards as measured by consumption. According to the estimates by Gertler et al., four years after households in the late treatment group were incorporated into the program, consumption levels for the early treatment households were still five percent higher. This particular finding motivates the hypothesis that the timing of the transfer might affect the program's welfare impact. If the early impacts on productive activities were not sensitive to the timing of the transfers, then the late treatment households would be expected to eventually catch-up. However, the program's impact could be time-sensitive if innovative investment opportunities are seized to a greater extent by early recipients.

Furthermore, and related to productive activity, the access to markets could also emphasize the importance of the timing of the transfers. For example, it is expected that within and across localities the increased consumption demand be met by an increase in production. Whether this translated into a welfare enhancing mobility opportunity for the program recipients would depend on which households managed to seize the production opportunity raised by the increased consumption demand. If the demand was met by the wealthier ineligibles, the program beneficiaries would be less likely to move up in the welfare distribution. Alix-Garcia et al (2013) provide evidence that the production increase within localities depended on the connection to surrounding markets. Specifically, in localities with good road infrastructure there was no production-side response among local ineligible households because the demand was met by surrounding localities. In contrast, where poor infrastructure localizes economic activity the increased consumption caused by the program was indeed met by an increase in output. However, this boost in output was driven primarily by the wealthy ineligible households, thus making upward mobility *less* likely for the program beneficiaries' in these remote areas. Bearing this evidence in mind, I hypothesize that heterogeneity between household proximity to market centers may affect the program's impact on the household's welfare mobility. In particular, transfer recipients could be in better conditions to take advantage of the mobility opportunity in better-connected areas, with early beneficiaries enjoying a head-start to seize innovative investment opportunities.

iii. Heterogeneity in Exposure to Shocks

The notion that a household's response to short-run shocks may have long-term consequences on the household's welfare path rests on the premise of state-dependence in household decisions (de Janvry et al., 2006) and the evidence that temporary shocks may trigger poverty persistence (Premand and Vakis, 2010). In particular, disinvestments decisions, both in terms of human and physical capital (e.g. pulling children out of school or asset liquidation), taken in the face of transient events, may have lasting effects on households due to re-entry costs (e.g. school re-enrollment or lumpy asset expenses). In this respect, the CCT program may potentially attenuate the adverse lasting effects of shocks. This hypothesis builds on the evidence provided by de Janvry et al (2006), which suggests that Progresa had a strong mitigating effect on the school enrollment response to an income shock[23]. More recently, Adhvaryu et al. (2018) analyzed the heterogeneity of differential impacts for the Mexican program. In particular they compared the impacts between individuals who had experienced pre-program negative rainfall shocks during their first year of life, and all others. For educational and labor outcomes (i.e. labor force participation and employment stability), the authors find larger differential impacts for those exposed to negative shocks during childhood. These pieces of empirical evidence, focusing on children who were age eligible for the schooling transfer, complement the early results showing that beneficiary households managed to smooth their consumption in the face of adverse shocks (Skoufias and McClafferty, 2001).

Thus, the heterogeneity between households in their exposure to shocks is expected to affect the CCT's impact on the welfare path the household follows. Finally, the program's impact on the household's welfare path is also expected to be time-sensitive. In this context, even a small time-differential in the receipt of the transfer could have lasting effects on the welfare trajectory followed. For a given household hit by a negative incident, receiving the cash at that moment could mitigate the adverse effect while receiving the transfer a year later would send the household on different (likely downward) trajectory.

To sum-up, the life-cycle of earnings framework and the existing evidence on the differential impact of CCTs depending on capital accumulation and shocks incidence support the postulate that households' constraints are heterogenous and dynamic over time. On the human capital plane, the rearing costs (including income opportunity costs) associated to the different stages of the household members' life-cycles are predicted to be high at early ages, possibly peaking around the transition between primary and secondary school, and falling towards prime-age (i.e. that of adult entrance into the labor market). In the case of physical capital welfare impacts of the program are predicted to vary depending on initial household wealth and the timing of the transfer could make a difference if innovative investment opportunities are seized to a greater extent by early recipients. Lastly, the CCT's shock mitigating capacity, and hence its impact on the welfare trajectory, is expected to be sensitive to the timing of the transfers in proximity to the moment when the household is hit by an unexpected negative event.

[23] As shown in the dynamic model the authors develop households may still choose to send children to school with a negative utility for schooling but a high utility for cash as a consequence of an income shock. By contrast, since the conditionality applied to school and not to work (and the two activities were not time incompatible), the CCT did not have much of an effect in refraining parents from responding to an income shock by increasing child labor.

Overall, the main corollary from this framework is that the dynamic nature of the constraints faced by the household may imply that the timing of an intervention to lift some of those constraints could affect the impact of the intervention. That said, even a small difference in the time of receipt of the transfers could affect the program's potential impact on welfare if the household's conditions and constraints change over the course of that time difference.

4. Estimation Strategy

The rationale for using welfare trajectories is discussed at length by Premand and Vakis (2010). From a descriptive standpoint, welfare trajectories are the most comprehensive presentation of households' mobility patterns in a three-round panel since the universe of welfare trajectories traces all possible mobility outcomes. In the present study, the trajectories approach allows me to exploit the long-term panel further beyond just looking at differences between the baseline and end-line. By characterizing three-period trajectories I can retain information about the pathways leading up to the final period. This approach can be especially useful in the evaluations of temporary interventions, such as CCTs, in order to gain insight about the mid-term results leading to the long-term outcomes.

On practical grounds, trajectories spanning large time-windows are employed in empirical mobility analyses in order to characterize longer-term welfare trends (Baulch and Hoddinott, 2000). Moreover, trajectories provide a summary measure of welfare over multiple periods following, for example, the work on long-term poverty measurement by Calvo and Dercon (2009), which uses a single index of intertemporal poverty based on trajectories of households' standard of living.

On structural grounds, as underlined by Premand and Vakis, trajectories may prove superior to using round-to-round transition matrices. In the present case, traditional two-period transition matrices would only yield an appropriate representation of the underlying welfare process if all the households in a given consumption tercile have the same transition probabilities regardless of their past history (i.e. if the first order Markov assumption holds [Shorrocks, 1976].) However, this assumption is not likely to hold since there is reason to believe that a household's probability of poverty in a period $t+1$ is not only affected by its poverty state in period t but also by the household's entire history of poverty states prior to t. Indeed, Premand and Vakis demonstrate that there are visible deviations from the first-order Markov assumption in the frequency distributions of the trajectories in the 3-wave panel of their study.

Building on Premand and Vakis (2010) I also construct welfare trajectories which describe the sequence of a household's position along the welfare distribution as time unfolds. Specifically, I make use of three rounds of data (t=3) such that trajectories take the form {ijk} where i,j,k correspond to each household's position along the welfare distribution in period 1 (i), period 2 (j) and period 3 (k)[24]. The household's position in a given round is determined by the tercile of the consumption distribution it falls into. For the aggregate estimates below

[24] I limit the number of waves conforming the trajectories despite having access to up to 5 rounds of information because the number of possible trajectory combinations increases excessively over longer trajectories. This renders the frequency of sustained patterns near negligible (below 5%). I therefore focus on three-period trajectories which suitably capture the short, mid and long-term effects of differential exposure to the CCTs.

(section 5) I also present the welfare trajectories for the food and non-food components of consumption to understand which drives the overall welfare dynamics. Based on Engel's law and given the acute poverty levels of the population in question, for which food expenditures constitute around two thirds of total consumption, the food component is expected to drive the poverty persistence pathways.

It is worth noting that the consumption distribution used to define each household's position (tercile), at each wave, is the one based on all eligible and non-eligible households in the marginal communities in Mexico that were targeted by the program. The trajectories I construct therefore characterize each household's mobility within this specific population and given the context of exposure to the program in all communities (by the end of the experimental phase; i.e. by November 1999). The rationale for including the ineligible households in the consumption distribution is precisely that they provide a higher benchmark, in terms of living standards, against which to gauge the socioeconomic mobility of the program beneficiaries. These ineligible households, whom were too wealthy to qualify for the program, constitute - in principle - the non-vulnerable population. This non-poor population is arguably a suitable referent in welfare standards given the program's poverty alleviation aim (in the current generation). The data confirm that the ineligible households have a slightly higher mean consumption level, though there is some overlap of their consumption distribution to that of the poor (eligible) households (as discussed in section 2; Figure 1). That said it is important, when interpreting the results, to bear in mind that the welfare trajectories describe the households' mobility within this particular (relatively) poorer part of the overall Mexican population.

Expanding beyond the negative trajectories characterized by the authors (poverty persistence and downward mobility), in this paper I am also interested in whether the conditional transfers may lead to positive patterns of welfare. Hence, I focus on two additional welfare trajectories {ijk} over three rounds of data to characterize separately patterns of persistence and movement:

Persistence patterns

(1) Sustained Poverty: $\{ijk\} = \{111\}$;

(2) Sustained High Welfare: $\{ijk\} = \{333\}$;

Movement patterns

(3) Downward mobility (weak): $\{ijk\}$ such that $\{ i \geq j > k \quad \text{or} \quad i > j \geq k \}$;

(4) Upward mobility (weak): $\{ijk\}$ such that $\{ i \leq j < k \quad \text{or} \quad i < j \leq k \}$;

(5) Temporary upward: $\{ijk\}$ such that $\{ i < j > k \}$;

(6) Temporary downward: $\{ijk\}$ such that $\{ i > j < k \}$;

The general specification for the trajectories estimates is thus:

$$traj_i = \beta_0 + \beta_1 T_i + \beta_2 X_i + \varepsilon_i$$

Where the dependent outcome $traj_i$ is a binary variable indicating whether the household i exhibits each of the six trajectories outlined above. For example, in the case of Sustained Poverty (High Welfare), $traj_i$ takes the value of 1 for households with trajectories {111} ({333}), i.e. remaining in the lowest (highest) tercile of consumption throughout the 3 survey rounds, and 0 otherwise. The first two movement patterns, (3) and (4), describe monotonic trajectories while the last two, (5) and (6), characterize changes in the direction of mobility. More specifically, for Downward (Upward) Mobility, $traj_i$ takes the value of 1 whenever a household consistently moves to a lower (higher) tercile in the consumption distribution between the first and second wave and the second and third wave; and 0 otherwise. Note that in the weak version of this condition presented above, one of the two transitions (either between period 1 and 2 or between period 2 and 3) may hold with the equality sign[25]. The Temporary Upward trajectory describes pathways in which households initially ascend in the distribution (i.e. move up between period 1 and 2) only to fall back down in the subsequent period (i.e. move downward between period 2 and 3). As such, these are households that, despite making an initial progress slip back into poverty. Conversely, the Temporary Downward trajectory describes patterns of initial decline followed by recovery. As such, these are households that are capable of escaping poverty despite an initial descent.

T is a dummy variable indicating intention-to-early-treatment status for household i and β_1 is therefore the coefficient of interest reported in each regression result capturing the impact of the differential exposure to the conditional transfer. X_i is a vector of pre-program characteristics (including household head, household demographic and community variables[26]) I will control for to gain precision.

Lastly, the clustering of households within villages implies that household-specific error terms are likely to be correlated within each village (and across time). If this correlation is not taken into account it may lead to a considerable bias in the estimated standard errors of the program impact (Skoufias and Parker, 2001). The regression models I estimate therefore account for the clustered nature of the sample and report the robust standard error estimates for the impact of the program.

5. Aggregate Results

The regression results for the aggregate trajectories outcomes are presented in Table 2. Panel A displays the impact estimates during the short-term, experimental period (Waves 1, 2, 4). The coefficients indicate that the early treatment households are less likely to move downward (and more likely to move upward) in the distribution. These results are consistent for the aggregate consumption trajectories as well as the subcomponents (food and non-food). Moreover, the early treatment group also presents a lower likelihood of exhibiting patterns of sustained poverty and a higher chance of remaining in the highest terciles of the consumption and the food

[25] Again, the weak condition is the preferred version presented in the main results since the strict condition, which requires both transitions (periods 1- 2 and 2-3) to hold with the strict inequality, yields a very low frequency (2%) of success cases.
[26] The notes in the tables indicate the full set of control variables and variable definitions; I follow Gertler et al. (2012) to a large extent in the choice of control variables.

expenditure distribution. The non-monotonic movement patterns (i.e. temporary upward and temporary downward mobility) are presented in columns 13 through 18. The trajectories estimates indicate that in the short run the early beneficiary households are more likely to present patterns of only temporary decline; that is trajectories in which they are able to recover (by November 1999) after suffering a fall between (March and October 1998). This result is robust for both the aggregate consumption measure as well as its subcomponents. By contrast, there are no significant early impacts of the program on the likelihood of presenting a temporary ascent.

Panel B presents the results for the welfare trajectories extending past the experimental variation period for the mid-term (Waves 1, 4, 7). There are no detectable impacts on the upward mobility pattern for the three period trajectories (and in the case of downward mobility the impact is only significant for food expenditure). However, with regards to the persistence patterns, the trajectories estimates do indicate that the households with longer program tenure are on average less likely to remain stuck in poverty and more likely to remain at the top of the consumption (and food) distribution.

The long-term trajectories estimates are presented in Panel C (Waves 1, 4, 8). Though the magnitudes of the coefficients are slightly lower, there are still a significant number of positive differential impacts for the early treatment group even for these trajectories that span well beyond the experimental period. These results are driven by the outcomes for sustained patterns (111 and 333), more so than for the movement outcomes. The estimates show that early treatment households are less likely to remain in sustained poverty and more likely to maintain high living standards throughout the entire 3-round period. In particular, the magnitudes of the coefficients are higher, in absolute terms, for the outcomes relating to poverty persistence compared to those for sustained high welfare. Furthermore, in the case of total consumption the magnitude of the impact on poverty persistence remains stable (at -0.04 percentage points) between the mid and long-term, while the impact on sustained high consumption halves.

Interestingly, and contrary to the findings for the short run, the mid and long-term results (Panels B and C) suggest the early treatment group is more likely to follow a path of temporary upward movement (followed by a decline) and less likely to follow a path of initial decline followed by an ascent. These results are indeed illustrative of the reshuffling of positions along the distribution once the control group starts receiving benefits. It is important to note that this phase-in occurs after the middle round in these trajectories (after period *j* of the three-period trajectory {ijk}). The negative mobility effects for the early beneficiaries is explained by the fact that, once their counterparts enter the program, they predictably move down in the distribution between period *j* and *k*, mechanically making it more likely for the early treatment group to fall between these two time periods.

The trajectories results so far suggest that the beneficial impacts (in terms of avoiding poverty persistence and sustaining high welfare standards), which are born by the households receiving the transfers first, are maintained in the long term. However, given path dependency, it is important to ensure that these results aren't just driven by the initial effect already detected during the experimental period. To examine this point, the final panel focuses on the trajectories for the post-experimental period alone (i.e. Waves 6, 7 and 8; Panel D) when the late treatment group have been receiving transfers for up to a year.

The results for this final period zoom-in further into the pathways traced in the post-experimental period. Starting at Wave 6, both early and late treatment households have received the transfers for at least a year. Compared to the long-term estimates in Panel C (for Waves 1, 4, 8,) these estimates show slightly lower magnitudes of impacts, though there are still a number of significant coefficients. The results, in particular in the mid and long term, are driven by the expenditure on food items. This was expected given the acute poverty levels of the population in question for which food expenditures constitute around two thirds of total consumption. More importantly, these post phase-in results are also driven by the outcomes for sustained patterns, as oppose to the movement outcomes. Interestingly, the differential impact on downward and upward mobility paths detected in the short term, with magnitudes as high as a 0.12 percentage point reduction in the probability of descending in the welfare distribution, disappear altogether in the post-experimental phase but not the impacts on the persistence patterns. In other words, the early treatment group is less likely to be chronically poor and more likely to remain at the top even once their counterparts have received the transfers. Thus, the persistence effects stand the test of time while the impacts on upward and downward mobility (both sustained and temporary) decay.

The ensemble of results suggests that once the late treatment group receives the transfers these households may manage to catch-up to the early treatment group in terms of their capacity to move upward (or avoid moving downward). Not only do they catch-up, the late beneficiaries temporarily enjoy a mobility advantage with respect to their counterparts (i.e. they are more likely to present a path of initial descent followed by recovery). However, this mobility advantage for the late treatment group also dissipates with time.

To recap, the only impacts, from the timing of the transfers, which persist in the longer run are the impacts on sustained poverty and sustained welfare. Indeed, tracing the trajectories after all households have benefited from the program for at least a year, those who received the program early still exhibit a greater ability to escape and remain out of poverty and to consistently maintain a high standard of living. This transcending result is suggestive of the importance of the timely assistance received by the early treatment group.

The distinction in my results, between persistence and movement patterns, is noteworthy to the extent that it resonates with the findings by Premand and Vakis (2010). In particular, in the Nicaraguan case the authors find stronger impacts of shocks on poverty persistence than on downward mobility, in particular among the poorest of the poor. My present findings also signal that the timing of the transfers may be especially meaningful for households stuck at the bottom of the distribution. As noted by Premand and Vakis, the fact that the causes of poverty persistence differ from those for downward mobility is a key finding since it suggests the two may require distinct sets of policy options. I explore this notion further in the next section where I investigate how the impacts on persistence and movement vary according to initial heterogeneity between households.

To synthesize, the trajectories estimates indicate that the beneficial welfare impact on the early recipients does persist into the long-term. In particular, the households that randomly received the transfers first displayed on average a higher likelihood of sustaining high welfare levels and a lower probability of remaining stuck in poverty. In the following section I intend to delve further into the mechanism which may be driving these results.

6. Heterogeneity Analysis

Based on the conceptual framework described above the focus in the empirical examination is set on the analysis of heterogeneity. In particular, in this section I explore how the impacts of the differential timing in the transfer vary according to the initial heterogeneity between the households. This empirical specification is driven by the hypothesis that the constraints faced by a household are time dynamic; i.e. change along the household's economic lifecycle, as a function of asset accumulation and due to transient shocks. As argued in the conceptual frame, these constraints are shaped by the household's access to and formation of physical capital and human capital, as well as the household's exposure to shocks.

To investigate this empirically I perform heterogeneity analysis along a number of baseline household assets (relating to physical capital), sociodemographic characteristics (relating to human capital) and preprogram adverse events reported by the household (exposure to shocks). I focus on the long-term trajectories after phase-in of the control group; that is once both groups have received the transfers for at least a year (Waves 6,7 and 8). The reason is that I am interested in zooming-in on the conditions which may have set households on differing paths in a sustained manner; above and beyond the immediate, mechanical initial shift in consumption caused by the entrance of each group into the program (i.e. the early treatment group in Wave 2 and the late treatment by Wave 5). Rather, I am interested in detecting diverging trajectories which are maintained further in time.

The heterogeneity results for the variables relating to physical capital are presented in Table 3.1. The first panel shows the results for heterogeneity between the households in terms of their distance from market centers. The intention-to-early-treatment (itt) coefficient on its own shows the effect of receiving the transfer early for households living closer to market centers (i.e. households for which the distance dummy is 0)[27]. The significant coefficients indicate that, among the households living closer to market centers, receiving the treatment early made them less likely in the long term to follow a trajectory of downward mobility and more likely to follow an upward trend (columns 3 and 4). Importantly, the interaction terms indicate that the impact of the timing of the transfers is entirely reversed for households residing further away from those market centers.

This result is consistent with the existing evidence on the market-mediated increases in local demand brought about by Progresa in the short term (during the experimental phase). In particular, Alix-Garcia et al. (2013) provide evidence that the consumption increases caused by Progresa were similar across localities with different connection to markets. However, the corresponding production increases among nearby wealthier households were not. Specifically, in localities with good road infrastructure there was no production-side response among local ineligibles. In contrast, in areas where poor infrastructure localizes economic activity the increased consumption caused by the program was indeed met by an increase in output. In other words, in well-connected localities, the richer ineligible households (which are included in the consumption distribution used in my estimates) did not increase their production capacity because the demand was met by neighboring markets. As such, it was in these well-connected localities that the early-program recipients managed to seize the mobility

[27] The distance dummy is equal to 1 if the household's minimum distance to an urban center is greater than or equal to 71km (i.e. indicating households in the top 3 quintiles of the distance distribution).

opportunity. This may explain why the early treatment had a differential effect on the economic mobility depending on the household's proximity to markets.

Given the hypothesis that part of the transfer is invested in productive activities (Gertler et al., 2012) one might expect the asset holdings at baseline to predict the upward movers. This effect could potentially be sensitive to the timing of the transfer if investment opportunities are seized to a greater extent by early recipients. This seems to be the case with landholding and homeownership for the sustained high welfare outcome (column 2). In particular, the interaction terms indicate that the impact of receiving the transfer early is augmented for households owning more land (over 3 hectares), for agricultural households and for homeowners. However, this differential effect is not observed in the case of assets in the form of animal value.

The heterogeneity analysis along the human capital variables for the trajectories outcomes is presented in Table 3.2. In the first panel the point estimate for the itt coefficient on its own indicates the effect of receiving the transfers early for the households whose heads had less than three years of education at baseline (i.e. for zero-values of the education dummy). The result in column 2 shows that, among households with less education, the timing of the transfer affected the welfare trajectory followed; the early recipient households were more likely to follow a path of sustained high welfare. Moreover, the interaction term suggests this effect of the timing of the transfer was differential depending on the household head's years of education, i.e. the effect was lower for higher-educated households. Given the above results suggesting augmented mobility impacts for the households with a richer physical capital base, this other result showing lower impacts for the more educated heads is possibly indicative of the substitutability between the two forms of capital (physical and human).

The estimates in the second panel present the heterogeneity between households with and without any young children at baseline (aged between zero and seven years old). The point estimates for the itt coefficient are overall statistically insignificant. This result therefore does not support the hypothesis that households with very young-aged children are burdened to some extent, in particular due to the time constraint and the corresponding income opportunity cost faced by the child's caregiver(s) whom must attend the children's needs.

The significant itt coefficient in the third panel indicates that, among households without any primary aged children (8 to 12 years old), early treatment increases the likelihood of presenting a sustained high-welfare level (column 3). This is also the case for households without any children of secondary age, i.e. among households without children aged 13 to 17 years old at baseline, early treatment increases the chances of sustained high welfare (column 3 in the fourth panel). The interaction terms for these two age groups- primary and secondary school age- indicate that the timing of the program indeed affected the likelihood of sustained welfare depending on the household members' age composition. For example, the impact of the timing of the CCT on the likelihood of having sustained high-welfare is lower for households with secondary school-aged minors with respect to the impact on households without members of this age group. In contrast, having members of prime-age or elderly members in the household (well beyond the age eligibility for the schooling transfers) does not affect the impact

of the timing of the transfer in a meaningful way, as suggested by the coefficients in the last two panels of Table 3.2.

The heterogeneity analysis by shocks to the household is reported in Table 3.3. Given that the information about shocks is self-reported a potential concern is whether there is endogenous reporting according to the treatment group. The direction of the potential bias is not a priori clear. The early treatment group may be more inclined to over-report adverse events if they think it will affect the amount of the transfers they receive. Conversely, the control group could have an incentive to over-report shocks if they are under the impression that it will accelerate the onset of the program in their locality. In any event, to account for this possibility of endogenous reporting I construct measures of the severity of the climatic shocks based on the reports by the ineligible households. Therefore, this alternative severity measure for each locality is defined as the percentage of households from the ineligible population in the locality reporting the shock.

The estimates in Table 3.3 indicate that in the post-experimental phase, once both groups have received the program for at least a year, there are some, though few, detectable differences between the early and late program recipients related to shock exposure at baseline. For events relating to unemployment of the household head the interaction term does indicate that the impact of receiving the transfer early is augmented in some cases for households suffering this type of shock. In particular, early treatment households are more likely than late treatment households to follow a sustained high-welfare trajectory (column 2) and to recover from a downward trend (column 6). These impacts are intensified in the case of households hit by an unemployment spell at baseline. This differential impact of the timing is only detected in the case of natural disasters for the sustained poverty outcome (column 1; with marginal significance). In the case of drought, none of the point estimates for the interaction terms suggest a significant difference in the impact of timing conditional on exposure to this type of shock.

To understand further these lacks of significant results, I run the heterogeneity analysis for the short and mid-term trajectories (displayed in Table A.3 in the Appendix). Overall the short-term estimates (Panel A) yield the expected significant coefficients for the sustained welfare trajectories. As intuited, the households that experience higher shock incidence from natural disasters between November 1998 and 1999 are more likely to remain trapped in poverty throughout this period and less likely to present a trajectory of sustained high welfare. The coefficients for the interaction terms indicate that the effect of these natural disasters on households' likelihood of remaining in poverty (column 1) is mitigated for the early recipients of the CCT. Put differently the CCT's protective effect against shocks suffered at baseline is highly sensitive to the timing of the transfer. Indeed, the negative impact of natural disasters is fully mitigated for the early beneficiaries of the program. This result remains robust when using the disaggregated components of consumption, i.e. food and non-food (not displayed in Table A.3. for brevity).

The mitigating effect for the early recipients of the program extends beyond the short and midterm. Panel C shows the results for the long-term including the period before the control group is phased-in (Waves 1,4,8). The estimates indicate that, even in a trajectory spanning from the moment of the shock (baseline) up to ten years

later, the differential timing still affects the magnitude of the impact, mitigating fully the effect of natural disasters for early recipients of the CCT.

In sum, heterogeneity in shock-exposure at baseline does seem to affect the impact of the timing of the transfers but only for trajectories starting at baseline. In contrast, this heterogeneity in impacts is much less evident for the long-term trajectories that trace post phase-in periods (Waves 6, 7, and 8).

To recap, the heterogeneity analysis indicates that early receipt of the program impacts households to differing degrees according to their characteristics at baseline and the shocks they endure. Several variables relating to physical capital affect the timing of the program's effect on mobility. Proximity to an urban center, in particular, affects the extent to which early treatment households manage to seize productive opportunities. Heterogeneity in terms of human capital also affects the impacts of differential timing on households' trajectories. The interaction terms indicate that the timing of the program indeed affected the trajectory followed depending on the household members' age composition. Finally, heterogeneity between households in terms of their exposure to shocks seems to affect the impact of timing only temporarily, mainly for the period before the late treatment receives the program.

7. Concluding remarks

Could the timing of an intervention affect its impact? More specifically, could a small time-differential in the entrance into a CCT program have an impact on the household's long-term welfare trajectory? In this paper I examined the hypothesis that the timing of a CCT could affect its impact, provided that the households' binding constraints are not constant over time. Rather, these constraints are likely to be dynamic due to the heterogeneity between households.

To examine this hypothesis empirically, I exploit the randomized evaluation design of a renowned CCT program. I evaluate the impact of an 18-month differential in exposure to the program on the likelihood that a household presents a path of sustained poverty or downward mobility, among other trajectories. Furthermore, I explore how the impacts of the differential timing vary according to the heterogeneity between the households (in terms of physical and human capital and exposure to shocks.)

The heterogeneity analysis indicates that early receipt of the program impacts households to differing degrees according to their characteristics at baseline relating to physical capital (for land and homeowners and those close to markets) and human capital (for primary and secondary aged members). However, the heterogeneity between households in terms of their exposure to shocks does not seem to affect the impact of the timing of the CCT in the long-run.

Understanding how the timing of CCTs, and transfers in general, may affect the extent of their impact can be important for targeting; in particular now that some of the more recent transfer programs target narrower populations and objectives. At this stage, it seems key for researchers to learn more about how interventions of this sort affect not only outcomes at a given point in the short or mid-term, but rather the long-term trajectories on which households are set. Further insight about the interplay between timed and/or targeted transfers and

households' dynamic constraints, may provide a valuable input to policymakers in the design of antipoverty programs as these continue to evolve.

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Tables

Table 1.1. Progresa monthly cash transfer schedule (nominal pesos)

	January-June 1998	July-December 1998	January-June 1999	July-December 1999
Educational grant per child 1				
Primary				
3rd grade	65	70	75	80
4th grade	75	80	90	95
5th grade	95	100	115	125
6th grade	130	135	150	165
Secondary				
1st-male	190	200	220	240
2nd-male	200	210	235	250
3rd male	210	220	245	265
1st-female	200	210	235	250
2nd-female	220	235	260	280
3rd-female	240	255	285	305
Grant for school materials per child				
Primary-September	–	In-kind	–	110
Primary-January	40	–	45	–
Secondary-September	–	170	–	205
Grant for consumption of food per household 2				
Cash transfer	95	100	115	125
Maximum grant per household	585	625	695	750

Source: Skoufias and Parker (2001)

1/ Conditioned on child school enrollment and regular attendance

2/ Conditioned on attending scheduled visits to health centers

Table 1.2. Sample of Households used in the analysis:

Attrition rates, Treatment and Eligibility status

		Eligible					Ineligible			TOTAL	
		Proportion of Eligible households by treatment status		No. of households	Attrition by treatment status (cumulative)		Proportion of total households	No. of households	Attrition (cumulative)	No. of households	Attrition (cumulative)
Survey rounds	Time Period	Treatment	Control		Treatment	Control					
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Waves 1 & 2	Mar 98 - Nov 1998	0.63	0.37	**10,676**	0%	0%	0.48	**9,994**	0%	**20,670**	0%
Waves 1 & 4	Mar 98 - Nov 1999	0.62	0.38	**9,783**	10%	6%	0.48	**8,947**	10%	**18,730**	9%
Waves 1 & 6	Mar 98 - Nov 2000	0.63	0.37	**9,692**	10%	9%	0.47	**8,443**	16%	**18,135**	12%
Waves 1 & 7	Mar 98 - Nov 2003	0.62	0.38	**9,456**	12%	10%	0.47	**8,319**	17%	**17,775**	14%
Waves 1 & 8	Mar 98 - Aug 2008	0.61	0.39	**5,960**	46%	42%	0.45	**4,785**	52%	**10,745**	48%
Balanced panel (1,2,4,6,7,8)		0.61	0.39	**5,022**	55%	50%	0.42	**3,700**	63%	**8,722**	58%

Note: The number of households (indicated in columns 3, 7 and 9) corresponds to households, present at baseline (Wave 1) and at each follow-up, for which consumption data is available. The main estimates in the Results section of the paper (Section VI) use the sample of eligible households at each period (column 3) to measure the impact on mobility of differential exposure to the program (ie. treatment vs. control households). However, the mobility outcomes (measured at the household level) are constructed using the entire consumption distribution (including all the households originally classified as ineligible (column 7) in addition to the original treatment and control households (column 3).

Table 1.3. Differential Attrition by Treatment Status and Baseline Characteristics

Dependent variable: Attrition (dummy=1 if hh consumption data is missing)	Wave 2		Wave 4		Wave 6		Wave 7		Wave 8	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intent-to-early-treatment (itt)	0.21		0.06		0.11		0.02		0.15	
	(0.15)		(0.08)		(0.14)		(0.09)		(0.17)	
X = Characteristic at baseline	**X**	**X * itt**	**X**	**X * itt**	**X**	**X * itt**	**X**	**X * itt**	**X**	**X * itt**
Head/spouse										
age of household head (hhh)	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00*	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
female hhh	0.03**	0.01	0.02	0.03	0.02	0.02	0.00	0.02	-0.01	0.05
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.03)	(0.04)
low education hhh (1)	0.02	0.01	0.02	0.01	0.02	0.00	0.04**	-0.02	0.05*	-0.05
	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.03)	(0.04)
ethnicity of hhh (2)	0.03	-0.04	0.02	-0.01	0.02	-0.03	0.01	-0.02	-0.10*	0.14*
	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)	(0.06)	(0.07)
age of spouse	-0.00	0.00	-0.00	0.00	-0.00*	0.00	-0.00***	0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
low education spouse (1)	0.04**	-0.01	0.03*	-0.01	0.02	-0.01	0.04***	-0.02	0.03	0.00
	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.03)	(0.03)
Household										
household size	-0.00	-0.00	-0.00	0.00	0.00	-0.00	0.00	-0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
age 0-7 (3)	-0.01	-0.01	-0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	-0.03
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)
age 8-17 (3)	-0.02	-0.00	-0.03**	0.01	-0.03**	0.01	-0.02	0.01	-0.03	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)
age 18-54 (3)	-0.07*	0.00	-0.05	-0.01	-0.05*	-0.02	-0.07**	0.04	-0.05	-0.04
	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.05)	(0.06)
homeowner (4)	-0.01	-0.00	0.00	-0.01	-0.00	-0.01	-0.01	-0.01	-0.02	-0.05
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.05)	(0.06)
dirtfloor (5)	0.01	0.02	0.01	0.01	0.01	0.02	0.00	0.03*	0.02	-0.03
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.05)
electricity (6)	-0.04*	0.07**	-0.05*	0.07**	-0.04*	0.06**	-0.03	0.05**	-0.13**	0.12*
	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.05)	(0.06)
non-agricultural hh	0.04	-0.02	0.02	-0.01	0.03	-0.02	0.03	-0.00	0.02	-0.00
	(0.03)	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
large farm (> 3 ha of land)	-0.02	0.01	-0.03	0.02	-0.02	0.01	-0.02	0.00	-0.02	-0.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.05)
draft animals (7)	0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	-0.03**	0.01
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
productive animals (7)	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	-0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
land (total owned in hectares)	0.00	-0.01	0.00	-0.01	0.00	-0.00	0.00	-0.00	-0.01	0.01
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
Community										
community organization (8)	-0.01	-0.08	-0.03	-0.05	-0.02	-0.06	-0.04	-0.03	0.08	-0.11
	(0.04)	(0.07)	(0.04)	(0.06)	(0.04)	(0.06)	(0.03)	(0.06)	(0.07)	(0.09)
distance to a large urban center	0.00*	-0.00	0.00**	-0.00	0.00*	-0.00	0.00*	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
male community wage (log)	0.00	-0.02	0.00	0.00	-0.00	-0.00	-0.01*	-0.00	-0.01	0.01
	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Obs.	11,555		10,462		10,361		10,218		10,218	
R-squared	0.04		0.03		0.03		0.04		0.04	

Notes: Robust standard errors in parentheses clustered at the community level. *** p<0.01, ** p<0.05, * p<0.1.

Estimates correspond to a single regression per wave: $\text{attrition}_i = \alpha + \beta\, \text{itt}_i + \delta\, \mathbf{X}_i + \lambda\, \text{itt}_i * \mathbf{X}_i + \varepsilon$

(1) dummy =1 if education <= incomplete primary

(2) ethnicity = 1 if hhh speaks indigenous language

(3) dummy = 1 if hh has a member in this age group

(4) homeowner = 1 if the home is owned by the one of its members

(5) dirtfloor = 1 if hh floor material is dirt

Table 2. Impacts of differential exposure to the CCT on households' Welfare Trajectories

	Sustained poverty {ijk = 111}			Sustained welfare {ijk = 333}			Downward mobility { i ≥ j > k} or { i > j ≥ k }			Upward mobility { i ≤ j < k} or { i < j ≤ k }			Temporary Upward { i < j > k}			Temporary Downward { i > j < k}		
	(1) consump.	(2) food	(3) nonfood	(4) consump.	(5) food	(6) nonfood	(7) consump.	(8) food	(9) nonfood	(10) consump.	(11) food	(12) nonfood	(13) consump.	(14) food	(15) nonfood	(16) consump.	(17) food	(18) nonfood
Panel A: SHORT TERM (Waves 1, 2, 4; Experimental variation period)																		
Intent-to-early-treatment	-0.06***	-0.05***	-0.03**	0.01	0.02**	0.01	-0.08***	-0.09***	-0.05***	0.08***	0.09***	0.04**	0.00	-0.00	0.01	0.03***	0.02*	0.02*
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Observations	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293
R-squared	0.11	0.09	0.07	0.07	0.07	0.06	0.03	0.03	0.02	0.02	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Panel B: MID TERM (Waves 1, 4, 7: Phase-in period by wave 4)																		
Intent-to-early-treatment	-0.04***	-0.04***	-0.02	0.02**	0.02**	0.01	-0.01	-0.02	-0.02	0.02	0.03*	-0.00	0.05***	0.05***	0.04***	-0.05***	-0.05***	-0.02
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Observations	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293
R-squared	0.09	0.06	0.08	0.06	0.06	0.07	0.05	0.04	0.03	0.05	0.04	0.03	0.01	0.01	0.01	0.01	0.01	0.01
Panel C: LONG TERM (Waves 1, 4, 8: Phase-in period by wave 4)																		
Intent-to-early-treatment	-0.04***	-0.02	-0.02*	0.01	0.02***	0.00	0.00	-0.03*	0.01	0.02	0.00	0.03*	0.06***	0.06***	0.02	-0.04***	-0.04***	-0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Observations	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293	5,293
R-squared	0.09	0.06	0.07	0.06	0.05	0.04	0.04	0.04	0.07	0.03	0.03	0.07	0.03	0.02	0.04	0.03	0.01	0.05
Panel D: LONG TERM (Waves 6, 7, 8: Post phase-in period) both groups have benefited from transfers from the onset for up to a year																		
Intent-to-early-treatment	-0.02	-0.03**	-0.01	0.02**	0.02***	0.00	0.01	0.01	0.01	-0.01	-0.03	0.02	0.01	0.01	0.00	0.00	0.00	-0.02
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
Observations	4,990	4,990	4,990	4,990	4,990	4,990	4,990	4,990	4,990	4,990	4,990	4,990	4,990	4,990	4,990	4,990	4,990	4,990
R-squared	0.10	0.05	0.07	0.06	0.04	0.05	0.04	0.03	0.07	0.04	0.02	0.09	0.05	0.01	0.05	0.07	0.02	0.06

Notes: Robust standard errors in parentheses clustered at the community level. *** p<0.01, ** p<0.05, * p<0.1.

All regressions are OLS estimates including the following controls: head's and spouse's age, age squared and baseline education dummies, head's ethnicity (language), baseline household size, dummies controlling for household demographics at baseline, baseline assets (number of draf t and production animals, hectares of land, farmsize, homeowership, dirt floor and electricity) and baseline community characteristics (community organizations, distance to urban center and wages).

Each regression estimates the Intent-to-early-treatment impact on an outcome dummy variable indicating whether the household presents a specific welfare trajectory (e.g. In column (1) the mobility outcome is a dummy equal to 1 if the household remained in the lowest consumption tercile over the three wave period. In column (8) the mobility outcome is a dummy equal to 1 if the household remained in the highest food tercile over the three wave period. In column (12) the mobility outcome is a dummy equal to 1 if the household exhibited a pattern of upward mobility along the non-food distribution as explained in section VI, which describes the estimation strategy in detail.)

Table 3.1 Heterogeneity analysis for baseline characterteristics relating to Physical Capital

Estimates for Consumption Trajectories

LONG TERM (Waves 6, 7, 8: Post phase-in period) both groups have benefited from transfers for up to a year)

	Sustained poverty {ijk = 111}	Sustained welfare {ijk = 333}	Downward mobility { i ≥ j > k} or { i > j ≥ k }	Upward mobility { i ≤ j < k} or { i < j ≤ k }	Temporary upward { i < j > k}	Temporary downward { i > j < k}
	(1)	(2)	(3)	(4)	(5)	(6)
Intent-to-early-treatment	0.00	-0.00	-0.07**	0.05*	0.03	-0.02
	(0.03)	(0.02)	(0.04)	(0.03)	(0.03)	(0.03)
distance	0.04	-0.02	-0.10***	0.09***	-0.00	-0.02
	(0.03)	(0.01)	(0.03)	(0.03)	(0.03)	(0.03)
itt* distance (1)	-0.02	0.02	0.11**	-0.08**	-0.03	0.03
	(0.03)	(0.02)	(0.04)	(0.04)	(0.03)	(0.04)
Observations	5,005	5,005	5,005	5,005	5,005	5,005
R-squared	0.09	0.05	0.04	0.04	0.04	0.07
Intent-to-early-treatment	-0.01	0.01	0.01	-0.01	0.00	0.00
	(0.02)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
land	0.00	-0.02**	-0.01	-0.02	0.02	0.01
	(0.02)	(0.01)	(0.03)	(0.02)	(0.03)	(0.02)
itt* land (2)	-0.02	0.03*	-0.00	-0.00	0.00	-0.01
	(0.03)	(0.01)	(0.04)	(0.03)	(0.04)	(0.02)
Observations	4,990	4,990	4,990	4,990	4,990	4,990
R-squared	0.09	0.05	0.03	0.03	0.04	0.07
Intent-to-early-treatment	0.04	-0.05	0.01	0.05	-0.09**	0.01
	(0.03)	(0.04)	(0.06)	(0.05)	(0.05)	(0.04)
homeowner	0.06**	-0.06**	0.02	0.06*	-0.05	-0.04
	(0.02)	(0.03)	(0.05)	(0.04)	(0.04)	(0.03)
itt* homeowner (3)	-0.06*	0.07**	-0.00	-0.07	0.10**	-0.01
	(0.03)	(0.03)	(0.07)	(0.05)	(0.05)	(0.05)
Observations	5,005	5,005	5,005	5,005	5,005	5,005
R-squared	0.09	0.05	0.03	0.03	0.04	0.07
Intent-to-early-treatment	-0.01	0.02*	-0.00	-0.01	0.00	0.00
	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
animal value	0.02	0.00	-0.04*	0.01	0.02	-0.01
	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)
itt* animal value (4)	-0.02	-0.00	0.02	-0.01	0.00	-0.00
	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)	(0.02)
Observations	5,005	5,005	5,005	5,005	5,005	5,005
R-squared	0.09	0.05	0.03	0.03	0.04	0.07
Intent-to-early-treatment	-0.02	0.02**	0.01	-0.02	0.01	0.00
	(0.02)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
non-agriculture	-0.02	0.00	0.08*	-0.10***	0.01	0.01
	(0.02)	(0.01)	(0.05)	(0.03)	(0.03)	(0.03)
itt*non-agriculture (5)	0.04	-0.01	-0.04	0.07*	-0.04	-0.00
	(0.03)	(0.02)	(0.06)	(0.04)	(0.03)	(0.04)
Observations	4,990	4,990	4,990	4,990	4,990	4,990
R-squared	0.09	0.05	0.03	0.04	0.04	0.07

Notes: Robust standard errors in parentheses clustered at the community level. *** p<0.01, ** p<0.05, * p<0.1.

All regressions are OLS estimates including the following controls: head's and spouse's age, age squared and baseline education dummies, head's ethnicity (language), baseline household

Each regression estimates the Intent-to-early-treatment impact on an outcome dummy variable indicating whether the household presents a specific welfare trajectory (e.g. In column (1) the mobility outcome is a dummy equal to 1 if the household remained in the lowest consumption tercile over the three wave period. In column (4) the mobility outcome is a dummy equal to 1 if the household exhibited a pattern of upward mobility along the consumption distribution as explained in section VI, which describes the estimation strategy in detail.)

Heterogeneity variable definitions

(1) distance = 1 if the minimum distance to an urban center ≥ 71km (top 3 quintiles of the distribution)

(2) land = 1 if the household owns/rents more than 3 hectares of land (top 2 quintiles of the distribution)

(3) homeowner= 1 if the home where the households head lives is owned by the one of its members

(4) animal value = 1 if the household's animal value is in the top two quintiles of the distribution

(5) non-agriculture = 1 if the household's main productive activity is outside of agriculture

Table 3.2. Heterogeneity analysis for baseline characterteristics relating to Human Capital

Estimates for Consumption Trajectories

LONG TERM (Waves 6, 7, 8: Post phase-in period) both groups have benefited from transfers for up to a year)

	Sustained poverty {ijk = 111}	Sustained welfare {ijk = 333}	Downward mobility { i ≥ j > k} or { i > j ≥ k }	Upward mobility { i ≤ j < k} or { i < j ≤ k }	Temporary upward { i < j > k}	Temporary downward { i > j < k}
	(1)	(2)	(3)	(4)	(5)	(6)
Intent-to-early-treatment	-0.01	0.03***	0.01	-0.02	-0.01	0.01
	(0.02)	(0.01)	(0.02)	(0.03)	(0.02)	(0.02)
Education (1)	-0.01	0.04***	0.00	-0.02	0.00	-0.02
(at least 3 years)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)
itt* education	-0.02	-0.02	-0.01	0.01	0.03	-0.01
	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)	(0.02)
Observations	5,003	5,003	5,003	5,003	5,003	5,003
R-squared	0.10	0.05	0.04	0.04	0.05	0.07
Intent-to-early-treatment	0.01	0.03	-0.02	-0.05	-0.01	0.03
	(0.02)	(0.02)	(0.03)	(0.04)	(0.02)	(0.03)
Young children (2)	0.06***	-0.04***	0.04	-0.06**	0.02	-0.04*
(aged 0-7 years old)	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)
itt* Young children	-0.03	-0.02	0.03	0.04	0.02	-0.03
	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)
Observations	5,003	5,003	5,003	5,003	5,003	5,003
R-squared	0.10	0.05	0.04	0.04	0.05	0.07
Intent-to-early-treatment	-0.00	0.03**	-0.03	-0.02	0.02	0.00
	(0.02)	(0.01)	(0.02)	(0.03)	(0.02)	(0.02)
Primary school-aged children (3)	0.03*	0.00	0.01	-0.03	0.02	-0.04**
(aged 8-12 years old)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
itt* primary school-aged children	-0.02	-0.01	0.05**	0.01	-0.03	-0.00
	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)	(0.02)
Observations	5,003	5,003	5,003	5,003	5,003	5,003
R-squared	0.10	0.05	0.04	0.04	0.05	0.07
Intent-to-early-treatment	-0.02	0.03***	-0.01	-0.02	0.01	0.01
	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Secondary school-aged children (4)	-0.02	0.01	-0.00	0.00	-0.00	0.03*
(aged 13-17 years old)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)
itt* secondary school-aged children	-0.01	-0.03***	0.03	0.01	-0.01	-0.01
	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)	(0.02)
Observations	5,003	5,003	5,003	5,003	5,003	5,003
R-squared	0.10	0.05	0.04	0.04	0.05	0.07
Intent-to-early-treatment	0.04	0.01	-0.04	0.10	0.03	-0.16*
	(0.04)	(0.06)	(0.06)	(0.08)	(0.04)	(0.09)
Prime aged members (5)	0.00	-0.02	0.05	0.12*	-0.03	-0.16**
(aged 18-54 years old)	(0.03)	(0.05)	(0.05)	(0.06)	(0.04)	(0.07)
itt*prime aged-members	-0.06	0.01	0.05	-0.12	-0.03	0.17*
	(0.04)	(0.06)	(0.06)	(0.08)	(0.04)	(0.09)
Observations	5,003	5,003	5,003	5,003	5,003	5,003
R-squared	0.09	0.05	0.04	0.04	0.05	0.07
Intent-to-early-treatment	-0.03*	0.02**	0.03	-0.02	0.00	-0.00
	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)
Elderly members (6)	-0.02	0.00	0.02	0.01	-0.02	0.01
(aged above 54 years old)	(0.02)	(0.01)	(0.03)	(0.02)	(0.02)	(0.02)
itt*elderly members	0.04*	0.01	-0.08***	0.01	0.01	0.02
	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)
Observations	5,003	5,003	5,003	5,003	5,003	5,003
R-squared	0.10	0.05	0.04	0.04	0.05	0.07

Notes: Robust standard errors in parentheses clustered at the community level. *** p<0.01, ** p<0.05, * p<0.1.

All regressions are OLS estimates including the following controls: head's and spouse's age, age squared, head's ethnicity (language), baseline household size, and baseline community characteristics (community organizations, and wages).

Each regression estimates the Intent-to-early-treatment impact on an outcome dummy variable indicating whether the household presents a specific welfare trajectory (e.g. In column (1) the mobility outcome is a dummy equal to 1 if the household remained in the lowest consumption tercile over the three wave period. In column (4) the mobility outcome is a dummy equal to 1 if the household exhibited a pattern of upward mobility along the consumption distribution as explained in section VI, which describes the estimation strategy in detail.)

Heterogeneity variable definitions

(1) Education: dummy equal to 1 if the household head has at least three years of education

(2) Young children: dummy equal to 1 if there are any children between the ages of 0 and 7 years in the household.

(3) Primary school-aged children: dummy equal to 1 if there are any children between the ages of 8 and 12 years in the household.

(4) Secondary school-aged children: dummy equal to 1 if there are any children between the ages of 13 and 17 years in the household.

(5) Prime-aged members: dummy equal to 1 if there are any members between the ages of 18 and 54 years in the household.

(6) Elderly members: dummy equal to 1 if there are any members aged above 54 years in the household.

Table 3.3 Heterogeneity analysis by Shocks to the household

Estimates for Consumption Trajectories

LONG TERM (Waves 6, 7, 8: Post phase-in period) both groups have benefited from transfers from the onset for up to a year)

	Sustained poverty {ijk = 111}	Sustained welfare {ijk = 333}	Downward mobility { i ≥ j > k} or { i > j ≥ k }	Upward mobility { i ≤ j < k} or { i < j ≤ k }	Temporary upward { i < j > k}	Temporary downward { i > j < k}
	(1)	(2)	(3)	(4)	(5)	(6)
Intent-to-early-treatment	-0.02	0.01	0.02	-0.01	0.01	-0.01
	(0.02)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Unemployment (household head) (	-0.00	-0.01	0.02	-0.01	0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Unemployment*itt	0.01	0.02**	-0.01	-0.02	-0.01	0.02*
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Observations	4,990	4,990	4,990	4,990	4,990	4,990
R-squared	0.10	0.06	0.04	0.04	0.05	0.07
Intent-to-early-treatment	0.00	0.02	-0.02	0.01	0.00	-0.00
	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)	(0.02)
natural disaster severity	0.03	-0.02**	-0.08***	0.06*	0.02	-0.01
	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)	(0.02)
nat.disaster*itt	-0.04	-0.00	0.03	-0.03	0.01	0.00
	(0.03)	(0.01)	(0.04)	(0.04)	(0.03)	(0.02)
Observations	4,990	4,990	4,990	4,990	4,990	4,990
R-squared	0.10	0.06	0.05	0.05	0.05	0.07
Intent-to-early-treatment	-0.02	0.01	0.00	0.01	0.00	-0.00
	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)	(0.02)
drought severity	-0.01	-0.01**	0.00	0.02	-0.02*	0.01
	(0.01)	(0.00)	(0.02)	(0.02)	(0.01)	(0.01)
drought*itt	0.00	0.00	0.01	-0.03	-0.01	0.01
	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)	(0.02)
Observations	4,990	4,990	4,990	4,990	4,990	4,990
R-squared	0.10	0.06	0.04	0.04	0.05	0.07

Notes: Robust standard errors in parentheses clustered at the community level. *** p<0.01, ** p<0.05, * p<0.1.

All regressions are OLS estimates including the following controls: head's and spouse's age, age squared and baseline education dummies, head's ethnicity (language), baseline household size, dummies controlling for household demographics at baseline, baseline assets (number of draf t and production animals, hectares of land, farmsize, homeowership, dirt floor and electricity) and baseline community characteristics (community organizations, distance to urban center and wages).

Each regression estimates the Intent-to-early-treatment impact on an outcome dummy variable indicating whether the household presents a specific welfare trajectory (e.g. In column (1) the mobility outcome is a dummy equal to 1 if the household remained in the lowest consumption tercile over the three wave period. In column (4) the mobility outcome is a dummy equal to 1 if the household exhibited a pattern of upward mobility along the consumption distribution as explained in section VI, which describes the estimation strategy in detail.)

(1) Household head unemployment reported in Wave 2 (October 1998).

(2) Natural disasters include: flood, frost, fire, plague, earthquake and hurricane. Severity is calculated as the percentage of households within the locality reporting the

(3) Severity of drought is calculated as the percentage of households within the locality reporting the shock.

Appendix sections

Appendix 1: Robustness checks: Further examination of Attrition in estimates and Compliance

A.1.1. Further Attrition checks

Given the long period elapsed between the base-line and the final follow-up survey in 2007, attrition is a potential concern in this study. Despite the fact that the initial examination of sample loss showed no evidence non-random attrition (Table 1.3), it is worth checking whether the impact results reported in the previous section are driven by the selected sample on which they are estimated. This is particularly important given the large jump in sample loss occurring between the mid [Wave 7] and the long run [Wave 8] (from 14 to 48 percent at the aggregate level, Table 1.2). To this end I use an alternative mobility measure (see the ranks measure used in Clavijo, 2017) and re-estimate these results (for the short and mid- run) including a term to indicate whether the household (or its consumption data) is missing in the long-term plus the interaction term with the intent- to-treat variable[28]. This interaction term is the coefficient of interest in order to understand whether the attrition which may be driving the estimated impacts does so to a larger extent for the early treatment household and as such affects the interpretation of the results. The estimates are presented in Table A.1. below. The results indicate that while the attrition in the long term does correlate significantly with the mobility measures in the mid-term (Wave, columns 7 and 8), there is not a differential attrition effect for the treatment group. Thus, there is no evidence that the impacts detected above are driven simply by sample selection. Nevertheless, the above results warrant caution given the high level of attrition (even if random) in the long term. In particular it is important to be cognizant about which type of households the long-term results hold for. That is, one must bear in mind the type of households that remain in the sample, as determined from the initial examination of attrition along baseline characteristics. In the present case the remaining sample constitutes overall less privileged households. In particular since the households that are less likely to leave the sample are those with less educated and younger heads of indigenous descent, as well as those without access to electricity (review Table 1.3 in the main text).

[28] For clarity, I run the following specification for each wave prior to wave 8 (ie. Wave 2, 4 , 6 and 7):
$rank\ mobility_i = \alpha + \beta\ itt_i + \delta\ attrition\ wave\ 8 + \lambda\ itt * att\ w8 + baseline\ controls_i + \varepsilon$

Table A.1.1. Robustness check: Estimates of Mobility Ranks results as a function of long -term attrition

	Wave 2		Wave 4		Wave 6		Wave 7	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variables								
AM= Absolute Mobility /1	**AM**	**RM**	**AM**	**RM**	**AM**	**RM**	**AM**	**RM**
RM= Relative Mobility /2								
itt	4.201***	4.168**	8.180***	9.085***	1.799	1.785	1.889	2.040
	(1.586)	(1.648)	(1.593)	(1.782)	(1.653)	(1.940)	(1.501)	(1.793)
attrition in 8	-0.430	-0.662	-1.381	-1.613	-1.003	-1.313	-2.759*	-3.088*
	(1.508)	(1.574)	(1.491)	(1.661)	(1.451)	(1.733)	(1.514)	(1.799)
attrition_w8 * itt	-1.034	-0.427	-2.214	-2.029	0.593	1.619	1.070	1.277
	(1.940)	(2.038)	(1.922)	(2.188)	(1.910)	(2.283)	(1.993)	(2.436)
Constant	-6.310	-58.22***	10.14	-35.91***	19.83**	-28.39***	23.47***	-30.19***
	(13.85)	(15.09)	(8.012)	(9.422)	(8.578)	(9.976)	(4.519)	(5.770)
Observations	10,643	10,665	9,752	9,757	9,660	9,668	9,427	9,508
R-squared	0.030	0.032	0.044	0.045	0.043	0.049	0.065	0.071

Notes:

1/ Absolute mobility (*AM*) is defined as the rank of the change in log consumption that a household exhibits between two periods (the baseline year and a subsequent wave). The ranking, which includes all the households in the sample (including the ineligible), is normalized so it ranges from 0 to 100.
2/ Relative mobility (*RM*) is defined as the change in the rank of consumption for a household between time t and baseline. To build this measure the entire consumption distribution is ranked and normalized (to range from 0 to 100) at baseline and follow-up. Thus the relative mobility measure is simply the difference between the normalized ranks at the two periods.

Each column corresponds to a single regression: $mobility_i = \alpha + \beta\ itt_i + \delta\ attrition\ wave\ 8 + \lambda\ itt * att\ w8 + baseline\ controls_i + \varepsilon$

Robust standard errors in parentheses clustered at the community level. *** p<0.01, ** p<0.05, * p<0.1.

A.1.2. Compliance and the Densification process

The validity of the intent-to-treat estimate using the evaluation design of Progresa hinges on the randomization of households into treatment status. Thus, non-compliance among the eligible households may attenuate the detectable impacts. Moreover, in my estimates, given that the mobility outcomes are constructed using the entire population of eligible and ineligible households, non-compliance or changes in the classification of the ineligibles may also attenuate the results.

Some of these factors may be at play as a result of certain administrative issues surrounding the early implementation of the program. As mentioned above, and documented by Buddelmeyer and Skoufias (2003), during the early stages of the program (i.e. during 1998) the Progresa beneficiary selection method led to approximately 52% of the households in the evaluation sample to be classified as eligible for the program benefits. By July 1999 Progresa underwent the *densification* process and had added new households to the list of beneficiaries since it was felt that the original selection method was biased against the elderly poor who no longer lived with their children. The revised selection procedure did not simply increase the region-specific thresholds but rather it adjusted the way household-specific discriminant scores were calculated. As a result of the revised selection process the fraction of households classified as eligible for program benefits increased from 52% of the evaluation sample to 78% of the sample. However, after the release of the payment records in late August 2000, it was discovered that in the evaluation sample, many of the households (27% of the eligible households in treatment localities) that were supposed to be added to the updated list of beneficiaries had not received any cash benefits since the start of the

distribution of program benefits in these localities. According to Buddelmeyer and Skoufias (2003) it was confirmed that this was due to an administrative error and thus these households were never incorporated into the program.

Moreover, substantial delays in the implementation of the program were reported for the early treatment communities. Finally, at the beginning of 2001 a new survey to determine eligibility (a new ENCASEH survey) was launched to update the households' proxy mean scores. As a result, many new entrants were admitted into the program in both the treatment and control communities. Indeed, Table A.2. below., based on transfer information from administrative records confirms a substantial number of households (close to 18 percent) from the early treatment communities received their first transfers with delays of up to 9 months after the beginning of the program. This lag in transfer receipt may attenuate the impacts detected at the early stages of evaluation. Table A2 confirms the late entrance of a meaningful proportion of households around the early months of 2001 when the survey to determine eligibility (the ENCASEH survey) was revised.

The implementation issues mentioned above constitute a source of non-compliance with respect to the randomized treatment classification. Given the fact that these subsequent changes fell outside the randomization procedure, it has been standard practice to adhere to the original treatment status classification (albeit excluding the *densified* households altogether; see for example Angelucci and De Giorgi, 2008; and Gertler et al., 2012). In this study I adhere to the original classification for both the eligible and non-eligibles (i.e. I do not exclude the *densificados* in the sense that these household that were originally classifies as ineligible are included in the consumption distribution upon which I construct the mobility measures.) However, the transfer data confirms that the proportion of households that deviated from the original treatment status is non-negligible. In this particular study, the detectable impacts may be considerably attenuated given the fact that the mobility outcomes are constructed using both the eligible and the ineligible population. The delays for the early treatment households compounded with the subsequent inclusion of some of the originally non-poor households work in the same direction against detecting a mobility advantage for the early beneficiaries. Hence, the important take-away message from examining the transfer data, which signals the extent of non-compliance, is that the detected intent-to-treat impacts using the original randomization classification must be regarded as lower bound estimates.

Table A.2. Administrative information on Date of first transfer

(Frequency of households at each month)

		Original classification		New entrants	
Date(month/year)		**C**	T		**Total**
Apr	1998	0	5,113	0	5,113
Jun	1998	0	303	0	303
Aug	1998	0	281	0	281
Dec	1998	0	528	0	528
Feb	1999	0	1	0	1
Aug	1999	0	0	4	4
Nov	1999	2,579	0	1	2,580
Dec	1999	1,761	0	0	1,761
Feb	2000	99	0	20	119
Apr	2000	517	0	2	519
Jun	2000	5	0	0	5
Aug	2000	1	0	255	256
Nov	2000	1	0	6	7
Feb	2001	0	0	1	1
Apr	2001	0	0	848	848
Jun	2001	0	0	13	13
Aug	2001	0	0	16	16
Dec	2001	0	0	2	2
Feb	2002	0	0	4	4
Aug	2002	0	0	4	4
Nov	2002	0	0	1	1
Feb	2003	0	0	1	1
Total		4963	6226	1178	12,367

Source: Own calculations based on administrative transfer records up to 2003.

Table A.3. Heterogeneity analysis by Shocks to the household

Estimates for Consumption Trajectories

Panel A: SHORT TERM (Waves 1, 2, 4; Experimental variation period)

	Sustained poverty {ijk = 111}	Sustained welfare {ijk = 333}	Downward mobility { i ≥ j > k } or { i > j ≥ k }	Upward mobility { i ≤ j < k } or { i < j ≤ k }	Temporary upward { i < j > k}	Temporary downward { i > j < k}
	(1)	(2)	(3)	(4)	(5)	(6)
Intent-to-early-treatment	-0.01	0.01	-0.08***	0.06**	-0.00	0.03
	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)	(0.02)
natural disaster severity	0.06***	-0.02*	0.00	-0.02	0.02	-0.01
	(0.02)	(0.01)	(0.03)	(0.02)	(0.02)	(0.02)
nat.disaster*itt	-0.08**	-0.00	-0.01	0.03	0.02	0.01
	(0.03)	(0.02)	(0.04)	(0.04)	(0.03)	(0.03)
Intent-to-early-treatment	-0.08***	0.01	-0.06**	0.06**	0.01	0.06***
	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)	(0.02)
drought severity	-0.01	-0.02***	0.04*	-0.02	-0.00	0.02*
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)
drought*itt	0.04*	0.01	-0.02	0.02	-0.01	-0.03
	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)	(0.02)
Intent-to-early-treatment	-0.05***	0.01*	-0.09***	0.07***	0.00	0.04***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Unemployment (household head)	0.02	0.00	-0.01	-0.01	0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Unemployment*itt	-0.01	-0.00	0.01	0.01	0.01	-0.00
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)

Panel B: MID TERM (Waves 1, 4, 7: Phase-in period by wave 4)

	(1)	(2)	(3)	(4)	(5)	(6)
Intent-to-early-treatment	0.02	0.02	-0.04	-0.00	0.05**	-0.06***
	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)	(0.02)
natural disaster severity	0.06***	-0.01	-0.02	-0.01	-0.01	-0.00
	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
nat.disaster*itt	-0.08***	-0.01	0.03	0.03	-0.01	0.02
	(0.03)	(0.02)	(0.03)	(0.04)	(0.02)	(0.02)
Intent-to-early-treatment	-0.05**	0.03**	-0.01	-0.01	0.05**	-0.02
	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)	(0.02)
drought severity	-0.02	-0.01	0.02	-0.03**	0.02	0.02*
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
drought*itt	0.02	-0.01	0.00	0.02	-0.00	-0.02
	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Intent-to-early-treatment	-0.03**	0.02***	-0.02	0.01	0.04***	-0.05***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)
Unemployment (household head)	0.00	0.00	-0.01	0.02	-0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Unemployment*itt	-0.01	-0.01	0.01	0.01	0.00	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)

Panel C: LONG TERM (Waves 1, 4, 8: Phase-in period by wave 4)

	(1)	(2)	(3)	(4)	(5)	(6)
Intent-to-early-treatment	-0.00	0.02	-0.03	0.04	0.03	-0.04*
	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)	(0.02)
natural disaster severity	0.03**	-0.01	-0.04	0.05*	-0.03	0.01
	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)	(0.02)
nat.disaster*itt	-0.05**	-0.01	0.04	-0.05	0.04	0.00
	(0.02)	(0.01)	(0.04)	(0.04)	(0.03)	(0.03)
Intent-to-early-treatment	-0.06***	0.01	0.02	0.01	0.05**	-0.04*
	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)	(0.02)
drought severity	-0.02*	-0.00	0.01	0.00	-0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
drought*itt	0.02*	-0.00	-0.03	0.00	0.01	-0.00
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Intent-to-early-treatment	-0.03**	0.00	-0.00	0.00	0.06***	-0.04***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)
Unemployment (household head)	-0.00	-0.00	-0.00	0.00	0.00	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Unemployment*itt	0.00	0.02*	0.00	0.02	-0.02	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Observations	4,990	4,990	4,990	4,990	4,990	4,990
R-squared	0.10	0.07	0.04	0.03	0.03	0.03

Notes: Robust standard errors in parentheses clustered at the community level. *** p<0.01, *

All regressions are OLS estimates including the following controls: head's and spouse's age, age squared and baseline education dummies, head's ethnicity (language), baseline household size, dummies controlling for household demographics at baseline, baseline assets (number of draf t and production animals, hectares of land, farmsize, homeowership, dirt floor and electricity) and baseline community characteristics (community organizations, distance to urban center and wages).

Each regression estimates the Intent-to-early-treatment impact on an outcome dummy variable indicating whether the household presents a specific welfare trajectory (e.g. In column (1) the mobility outcome is a dummy equal to 1 if the household remained in the lowest consumption tercile over the three wave period. In column (4) the mobility outcome is a dummy equal to 1 if the household exhibited a pattern of upward mobility along the consumption distribution as explained in section VI, which describes the estimation strategy in detail.)

Chapter 2

Parental aspirations and psychosocial measures: Evidence on the measurement and meaningfulness of non-cognitive skills

Abstract

Subjective measures of non-cognitive skills are now widely used and there is increasing evidence about their importance in skill formation. However, these measures have mainly been validated in developed countries. This paper aims to investigate how informative and malleable these measures are within a poor rural setting, where respondent educational attainment is low and measurement may be rife with error. To this end, I exploit a rich panel dataset that spans a decade in time across four developing countries to examine the predictive validity of a number of non-cognitive skills on final outcomes. I focus on parental aspirations and psychosocial wellbeing (as determinants) and investments in child human capital (as dependent variables). Moreover, I perform Exploratory Factor Analysis (EFA) to determine whether improving the measurement of the related non-cognitive traits improves their predictive power. Finally, I investigate whether these non-cognitive measures react to shocks suffered by the households in order to determine their degree of malleability.

The results suggest there is a still a systematic positive association between the non-cognitive skills and the subsequent child outcomes, detectable even up to 8 years after (for the psychosocial but not for the aspirations measures). However, accounting for measurement error by using the improved factors did not increase significantly the predictive power of the non-cognitive measures. Lastly, certain psychosocial measures (mainly Trust and Inclusion) show some degree of malleability over time and reacted negatively in some cases to the adverse economic events reported by the households.

1. Introduction

Once confined to the field of psychology, measures of socioemotional wellbeing and their role in decision making, have progressively captured the attention of economists, especially those in the development and behavioral fields (Heckman and Kautz, 2012; Heckman, et. al, 2006[a] and 2006[b]; Borghans, et al, 2008). Encompassed within the broader realm of non-cognitive measures, evidence is now emerging from developing countries about their importance in skill formation and later-life outcomes, above and beyond the traditionally studied cognitive skills (Attanasio, et al, 2015 and Gertler et al, 2014).

The growing interest in these non-cognitive skills, initially studied in-depth only in developed countries, has now expanded to contexts of rural poverty and underdevelopment. The increasing demand for data to analyze these skills quantitatively has spawned a number of measures and a diversity of survey instruments to collect this information (e.g. The Young Lives Surveys, the World Bank STEPS survey, among others). However, in the majority of cases, these measures have only been validated in developed countries (Laajaj and Macours, 2019)[29].

From the policy perspective, understanding how these measures react to changes in circumstances is a key question in developed and developing settings alike. The recent focus on soft-skills (in particular the well-marketed 'grit' aspect of character; Duckworth, 2016) has had direct implications on public education policy. For example, in certain contexts in the US, schools are now measuring, targeting and being held accountable for cultivating this aspect of character, despite doubts about the actual importance of this skill on academic achievement (Rimfeld et al. 2016). In the developing country context, a handful of recent studies suggest certain non-cognitive skills, and notably aspirations, are responsive to different social and economic interventions[30]. However, the evidence on the importance for achievement of these and other measures of non-cognitive skills remains scant.

The main objective of this paper is precisely to investigate how informative and malleable these measures are within a poor rural setting, where respondent educational attainment is low and measurement may be rife with error. To this end, I exploit a rich panel dataset that spans a decade in time across four developing countries to examine the predictive validity of a number of non-cognitive skills on final outcomes. I focus on parental aspirations and psychosocial wellbeing (as determinants) and parental investments and observed child human capital quality (as dependent variables). Abstracting from any causal interpretations, this analysis sheds light on the potential role played by non-cognitive ability in the formation of human capital, and indicates that these measures may be important omitted variables when excluded from the study of education related decision-making. More generally, understanding the role of parental psychosocial wellbeing in the decisions about their children's future human capital can be useful input to inform policy interventions that directly aim to improve or shape these so-called 'soft skills'.

[29] The study by Laajaj and Macours (2019), a skill measurement experiment among farmers, is one of the first studies to investigate this in a poor rural setting.

[30] See for example, Blattman et al. 2017 on the impact of cognitive behavioral therapy on self-control; Macours and Vakis (2017 and 2014), Bernard, et al. (2014) and Beaman et al. (2012) on the effect of diverse programs on aspirations and forward-looking behavior.

In this study I take close care of measurement, since most indices are still pending validation in developing country contexts. Therefore, I perform Exploratory Factor Analysis (EFA) to determine whether improving the measurement of the related non-cognitive traits improves their predictive power. Finally, I investigate whether these non-cognitive measures react to shocks suffered by the households to study their degree of malleability.

The results on predictive validity suggest there is still a systematic positive association between some of the non-cognitive skills and the subsequent child outcomes, detectable even up to 8 years after. This result, suggesting non-cognitive ability predicts to some extent subsequent human capital outcomes, holds more so for the indexes of psychosocial wellbeing than the aspirations measures. Moreover, the factor analysis indicates that several of the constructs commonly used by researchers to measure non-cognitive skills do not adequately capture the intended traits. Thus, this paper contributes additional evidence of the need to validate instruments of this sort in poor and developing contexts. This additional word of caution, when using these indexes in high poverty settings, proves important since poor measurement may misinform policy, for example by wrongly establishing the malleability of these skills or their role in decision making processes.

Finally, the results suggest psychosocial measures do seem to be malleable over time and react negatively to the adverse economic events reported by the households. However, the results in this study suggest a lower level of responsiveness of the aspirations constructs, some of which are by now commonly used in development studies. Thus, this paper highlights further the important distinction between different measures within the realm of non-cognitive ability, namely the difference in malleability and responsiveness to adverse events between measures of psychosocial skills, mental health and aspirations.

The rest of the paper is organized as follows: in the next segment (Section 2) I present the four-country longitudinal dataset I use, provide some conceptual definitions relating to the construction of skills measures and show some descriptive evidence about the shocks suffered by the households. In the first part of Section 3 I follow a measurement-error approach to discuss the potential biases associated to the measurement of non-cognitive skills. Then, in Section 3.2, I discuss the results from the Exploratory Factor Analysis (EFA) which yield improved constructs of the non-cognitive measures under study; namely indexes of psychosocial wellbeing and measures of aspirations. Subsequently in Section 3.3, I use the improved constructs to examine the predictive validity of the non-cognitive measures and assess the gain in predictive power yielded by the factor reduction process. In the last part of Section 3 I investigate the malleability of these skills in response to adverse shocks faced by the households. Finally, in Section 4 I present some concluding remarks.

2. Dataset, conceptual definitions and descriptive evidence

2.1. The Young Lives Survey Dataset

The data source I use is the Young Lives Survey (YLS), a rich panel dataset collected as part of a long-term research program investigating the nature of childhood poverty in four developing countries— Ethiopia, Peru, India (the state of Andhra Pradesh) and Vietnam—over 15 years. The longitudinal survey follows two cohorts of children in each country over 4 waves (a 'Young Cohort' of two thousand children an 'Older Cohort' of one thousand

individuals. The children in the young Cohort are aged between 6 months and 1 and a half years in Wave 1 and the older children are aged between 7 and 8 years old. The unit of analysis is therefore the 'young lives child' for each household. Table 1 summarizes the ages of the children for each cohort and the sample size per country.

The dataset is suitable for my research question given the panel structure which allows me to exploit with-in household variance over time accounting for the fixed heterogeneity across households. The data is also unique given the richness of the information containing detailed modules on the economic shocks experienced by the household as well as specific questions about the caregiver's perceptions and aspirations about the child's future. The attrition rate is low (1.4 percent) for the sample of 4 countries between the first two waves. This attrition rate is particularly modest in comparison to other longitudinal studies in developing countries and despite some degree of non-random attrition there is little evidence of attrition bias on observables (Outes and Dercon, 2008)[31].

Since the survey's focus is on childhood poverty, the samples in each country were chosen to reflect the diversity of children in the country with an over-representation of poor areas. Two-stage sampling was used by selecting first 20 clusters (with a distinct pro-poor bias) and then randomly selecting a sample of children of the particular age group in each cluster. The samples (with the exception of Peru[32]) were thus not selected to be statistically representative of the country (or state) as a whole. However, detailed subsequent analyses have shown the diversity of children is successfully reflected in each country across a wide range of variables. These analyses confirm the suitability of the Young Lives Survey for the purpose of this paper, since they establish that, while the data is not befitting for national level monitoring of child outcomes, it is fully appropriate for analyzing causal relationships and modeling child welfare[33].

2.2. Conceptual Definitions and measurement of variables

Rather than develop a formal framework to model the dynamics of non-cognitive skills, as it exceeds the scope of this empirical study, in this section I simply intend to establish the key concepts in the (economics and psychology) literatures relating to aspirations and non-cognitive skills. The idea is for these conceptual underpinnings to be useful in hypothesizing about how the non-cognitive skills in question could be expected to respond to changes in circumstances, in particular to negative shocks as explored empirically in the final section of this paper.

A key starting point in this context is the notion of *internal constraints*. To date there is extensive empirical evidence in the development economics literature suggesting that market failures can lead to underinvestment by the poor despite high potential returns. These can broadly be understood as external constraints, related for example to credit and risk (Karlan et al, 2013), health externalities (Miguel and Kremer, 2004), or misinformation about the returns to education (Jensen, 2010). However, some people (not just the poor) seem to underinvest even once some of

[31] For further details on Survey Attrition and Attrition bias see the Young Lives Technical Note no. 5, www.younglives.org.uk.
[32] In Peru, the cohorts were selected using a multi-stage, cluster stratified, random sampling approach. The sample therefore represents 95% of the population excluding only children in the richest 5%.
[33] See the Young Lives Technical Notes no. 1, 2, 3 and 4, www.younglives.org.uk.

these market failures are removed or reduced. For example, in an in-depth characterization of the economic lives of the poor, Banerjee and Duflo (2007) describe how some of the destitute display no interest to accumulate wealth.

More recently, the behavioral economics field has taken an interest in the possible internal constraints which may continue to impair optimal decision-making even once external constraints are lifted. Some of these explanations build on long-standing concepts developed in other disciplines such as psychology or anthropology. For example, the associated notion of 'Learned Helplessness', dating back to the mid-nineteen sixties, states that previous negative experiences condition individuals to behave helplessly because they believe they don't control their lives (Seligman, 1975). Related to some extent is also the concept of the 'Capacity to Aspire', developed by anthropologist Arjun Appadurai highlighting people's aspirations for the future as fundamental determinants of behavior (Appadurai, 2001).

The economics theoretical literature has formalized mathematically some of these ideas. For instance, Ray (2003) elaborates a model of 'Aspirations Failure' in which an individual's surroundings and circumstances (his 'cognitive window') determine his capacity to aspire. Thus, poverty (i.e. the 'cognitive window' faced by a poor person) stifles the process of building high aspirations for the future yet these aspirations would be needed to shape behavior in order to exit poverty. As a result, poverty and the failure of aspirations may be reciprocally linked in a self-sustaining trap.

Related to internal constraints and dating even further back, Rotter (1954) was instrumental in pioneering the notion of an individual's "locus of control," the belief of individuals regarding the factors that shape their lives. More specifically, locus of control is defined as a forward-looking assessment of the determinants of future outcomes. However, it reflects past experiences and lessons learned from these experiences. As such, it encompasses the broader view of the forces that shape outcomes for everyone. (Rotter, 1954).

Subsequently, Badura (1977) defined self-efficacy as the perception about one's own ability. In contrast to locus of control which applies collectively (i.e. refers to a global view), self-efficacy refers to own's perceived capability, and is often domain specific (e.g. self-perception about one's math ability as studied by Wuepper and Lybbert, 2017). Both these concepts (locus of control and self-efficacy) are key in the present study since the psychosocial items collected in the YLS, in particular the items conforming the Agency construct, build largely upon them.

The concept of hope (or lack thereof) has also played a role in the realm of study of internal constraints, again emphasizing the role of Agency. Snyder (1992) established three psychological components that make up hope: *goals*, *agency*, and *pathways*. Individual must have a goal, see a pathway to reach that goal and believe he can achieve it. Lybbert and Wyddick (2017) build on the work by Snyder to model formally how indicates how these separate components of hope work to yield better development outcomes, and how shocks (e.g. a positive income shock such as a microfinance intervention) may yield complementary effects.

Somewhat similarly, Vakis et al. (2016), building on Carter and Barret (2006), conceptualize aspirations and psychological wellbeing (i.e. the individual's state of mind) as key *inputs* for emerging from poverty, along with the

enabling context (e.g. markets, risk, institutions, etc.) and necessary endowments (e.g. skills, physical assets, etc.). Analogous to the pathway defined in the framework by Snyder, Vakis and coauthors stress the importance of the *process* via which the inputs may be transformed into outcomes lifting the individual out of poverty. As Vakis, et al. specify, these sequential steps are critical in forming a pathway out of poverty. The process entails 'considering opportunities' (e.g. considering investing in a nonfarm business), 'transforming choice into action' (e.g. actually investing in that business), and 'converting action into welfare outcomes' (e.g. realizing the investment gains). Importantly, individuals endowed with the same assets and facing the same enabling contexts, may not be equally successful because of differences in the internal or behavioral constraints they face, i.e. the so-called "state-of-mind", which entails the individual's (i) decision-making process, (ii) their aspirations; and their (iii) mind-set type (fixed versus growth).

In general, these conceptual underpinnings about aspirations are framed in terms of how positive shocks (which enable the individual to overcome an internal constraint) may ultimately set her on a pathway out of poverty. However, these general frameworks also lend themselves to be applied in the case of negative shocks and the way in which aspirations may be destroyed or adjusted downward, thereby setting the individual on a descending pathway towards lower welfare levels.

Drawing from several of the theoretical concepts established above, it is important to note that self-efficacy and locus of control form one's attributional style, that is how we assign causality to the events that happen around us. In this sense, severe shocks may shape the respondent's attributional style, thereby lowering her self-efficacy. For example, if an item relating to a specific aspect of the child's human capital (such as the respondent's ability to help her do well in school) responds to a seemingly unrelated event (such as a weather shock), this could be explained by a shift in the respondent's locus of control (i.e. the negative shock causing the respondent to have a more external locus of control.) Thus, in the present context, I would expect the Agency measure (if measured properly) to respond negatively to a shock suffered by the household.

As stated by Vakis, et al., all three interrelated dimensions of the state-of-mind may be adversely affected by a negative shock. For example, the decision -making process may be hindered by "present biases" which are exacerbated by adverse events making people focus more on today's problems than tomorrow's even though this focus may be detrimental in the long-run (Banerjee and Mullainathan, 2010). This increased present-bias may also directly affect aspirations, in particular longer-term goals and the willingness to attain them, such as investing in the future of one's children. Linking this notion to Sen's capability approach, even a temporary shock may weaken an individual's capacity to aspire. Adverse events could also trigger 'learned helplessness', to the extent that previous negative experiences condition individuals to behave helplessly because they believe they don't control their lives (Seligman and Maier, 1976). In economic terms, a negative shock which lowers aspirations may also lower the perceived returns to an investment, if the individual believes she will fail despite whatever efforts she makes. Finally, an adverse event may shift an individual towards a more fixed-mind set, whereby they may view the external shock as a negative affirmation of their basic (in)abilities (Dweck, 2006).

Finally, on the expected malleability of the aspirations and psychosocial measures, recent work in the psychology field indicates that, although personality (measure using the Big Five scale) has a stable component over the life-span, it is malleable and likely happens in response to life experiences that pertain to a person's stage of life (Damian, et al, 2018; Roberts and Mroczek, 2008). These studies also indicate people experience smaller, incremental changes over shorter periods of time. However, these recent longitudinal studies cover longer time periods over which the changes are observed, ranging from a twenty up to a fifty-year time span. As such, it is possible that the shorter time period analyzed in the present study is insufficient to capture more significant changes in the respondents' psychosocial state of wellbeing.

Bearing in mind these broad concepts, I now specify the precise definitions used in this study to measure Aspirations, Psychosocial wellbeing and the remaining related variables used in the subsequent analysis. In the following section I also discuss the extent to which the measures available in the YLS are suitable and comparable to the standard practice in the literature.

2.2.1. Aspirations outcomes

The concept of aspirations has been developed in other fields besides economics resulting in a number of different notions. In a broad definition, an aspiration is understood as a desire or ambition to achieve a determined goal. More specifically, in this paper I follow the definition developed by Bernard and Taffesse (2012) stating that "aspirations combine or summarize the preferences maintained, the beliefs held, and the constraints acknowledged by an individual about given aspects of the future" (p.3). Therefore, elicited aspirations, as understood in this paper, differ from an unrealistic whim or unlikely dream held by an individual. Rather, elicited aspirations in the present context are meant to convey the intention to achieve an aim acknowledging both the effort (material or otherwise) required and the uncertainty associated to it.

I study households' aspirations relating to three different aspects of their lives along the future horizon:

(i) Socioeconomic Mobility prospects (short term)
(ii) Educational aspirations (mid-term)
(iii) Occupational aspirations (long-term)

Socioeconomic mobility is measured using an adaptation of Cantril's Self-Anchoring Ladder of Life Satisfaction Scale (Cantril, 1965). In the second and third rounds of the survey the child's caregiver is asked to rate their life along a nine-step scale in which the first step represents the worse possible life and the last represents the best possible life. The child's main caregiver (which corresponds to the mother in 98% of cases) is asked to state their current position on the ladder and the step they aspire to be in 4 years from now, providing a notion of the household's prospects of socioeconomic mobility in the medium term.

It is important to mention a caveat concerning the use of Cantril's self-anchoring ladder. Bond and Lang (2014, 2018) caution researchers against making comparisons between populations using ordinal scales of this sort (e.g.

using Likert-type scoring), given the strong auxiliary assumptions which have to be made about the distribution of the underlying measure, e.g. life satisfaction or happiness. As Bond and Lang (2014) explain, when placing themselves on a happiness scale- that consists of a small number of points - respondents place their happiness or utility on a range (e.g. they place themselves on the 9th rung of the ladder if they are above some critical value). Thus, any comparison of the happiness level between two groups presumes that the cut-offs for the groups are identical. Otherwise the means of the two groups may not be ranked. Consequently, it is "impossible to use such data to make scientifically valid statements of the form people in country A are, on average, happier than people in country B, or that married men are happier than single men" (Bond and Lang (2014), p. 1). Bearing these statistical considerations in mind, throughout the analysis below, I avoid making any comparisons between the countries regarding the mean values of the life satisfaction scales.

Educational aspirations are measured as the total number of years of formal education the caregiver would like the child to complete. In the survey, after stating the number of years of formal education they would like their child to complete caregivers are asked as a follow-up question whether they actually expect their child to achieve this level. In both rounds, over 96% percent of the surveyed population responds affirmatively. This provides some indication that the elicited educational aspirations, are supposed to correspond to a realistic expectation rather than an unattainable goal or a whimsical illusion.

Moreover, the caregiver is asked which job they expect the child to be doing when they are 20 years old[34]. Following one of the standards in sociology for classifying occupations according to socioeconomic status, I use Hollingshead's scale to rank the jobs stated by the parents (Hollingshead, 1975). Occupational aspirations in this paper are thus classified along a 9-point scale (a score of 9 corresponds to 'Major professionals, Higher Executives and Proprietors of Large businesses' while a score of 1 corresponds to Farm Laborers and Menial Service Workers'). The 45 different occupations, their frequencies and the classification according to the 9-point Hollingshead scale by country are presented in Table A.1. in the Appendix.

Finally, I restrict the analysis to the caregivers of the younger cohort since I am interested in the longer-term aspirations relating to future education and occupation and many of the children have only recently entered the education system by the second wave when the relevant question is first asked (while the older cohort is likely to have exited the system by the last wave at age 15).

2.2.2. Psychosocial competencies

As mentioned above, I am interested in exploring the internal constraints affecting an individual's behavior. To examine this psychological channel, I use measures of the caregiver's psychosocial competencies along 4 broad categories: Inclusion, Trust, Agency (self-efficacy), and Self-esteem. In rounds 2 and 3 of the Young Lives survey

[34] There is also a question about the job the caregiver would most like the child to do in the future, but I opt for the parent's expectation since it is more in line with the conceptual definition of aspirations in this paper (i.e. a realistic possibility.)

the caregiver is asked to state the extent to which she agrees with a number of statements[35]. Each index is made up of 5 statements as listed below:

1. Inclusion

1.1. Nearest primary school provides a good quality education for children

1.2. Nearest health facility provides a good quality health service for children

1.3. Local police do their job well

1.4. People in my community can affect local government decisions

1.5. Most people in my community are basically honest

2. Trust

2.1. I believe the government does what is right for people like me

2.2. I am confident of the ability of government officials to do their job

2.3. I feel I can trust my neighbors to look after my house if I am away

2.4. I feel I can trust people in this community to look after my child if I am away

2.5. I think it is safe for my child to go out on the street on her own

3. Agency

3.1. If I try hard, I can improve my situation in life

3.2. I like to make plans for my future

3.3. I have a choice about which school to send my child to

3.4. If my child gets really sick, I can help her get better

3.5. I can help my child do well in school if I try hard [36]

4. Self-esteem

4.1. I feel proud to show my friends or other visitors where I live

4.2. I am proud of my clothes

4.3. I feel proud of the job done by the household head

4.4. The job I do makes me feel proud

4.5. I feel proud of my children

The selection of psychosocial measures used in the YLS resembles to a large extent the approach to measuring non-cognitive skills elsewhere in the literature. A number of recent large-scale regional studies, examining skill formation in developing countries, have used similar versions of the abovementioned scales. For example, two recent investigations on skills in the workplace in Latin America, carried out by the World Bank, used as their base a list of social-emotional skills that employers value and classified these into eight subgroups to develop a taxonomy of

[35] Ideally, the level of agreement of these statements is gauged using a 5-point Likert scale. However, this was not consistently done in the second wave of the Young Lives survey. For this reason, I have to convert the answers to binary format ("Agree", "Disagree") in order to have a consistent measure across waves at the cost of losing a lot of the variance in the answers.

[36] The Agency index originally included the five questions stated above. However, question Q.3.5. had to be dropped from index in the present analysis due to the high non-response rate for this question (e.g. over 95% in the Ethiopian case.)

skills termed PRACTICE[37]. (Cunningham, 2016; and Guerra et. al., 2014) The authors then used the psychology literature—drawing from the concepts of psycho-social and neuro-biological readiness and age-appropriate contexts—to map the age and context in which each skill subset is developed.

Overall, the PRACTICE taxonomy and the choice of socioemotional categories included in the YLS, share the common source of the Big Five Personality Traits. For example, the Agency scale in the YLS relates to the Conscientiousness in the original Big Five classification; vis-a-vis the Problem Solving, Achievement and Control categories in the PRACTICE taxonomy are also related to the Conscientiousness trait. Similarly, both the Confidence category in the PRACTICE classification and the Self-Esteem and Trust scales in the YLS relate (negatively) to the Neuroticism trait of the Big Five.

The Agency subscale in the YLS relates to the self-efficacy measure commonly used in studies on internal constraints in the economics field. For example, in an aforementioned study, Wuepper and Lybbert (2017) explore self-efficacy in terms of self-perceptions about math ability. An example of this concept is captured in the YLS in one of the items of the agency construct (Q. 3.1. *If I try hard, I can improve my situation in life*). Moreover, self-efficacy is adapted in the YLS to the perceptions about the respondent's ability to develop their child's human capital (e.g. education [educational aspiration and Q.*3.5. I can help my child do well in school if I try hard*] and health [Q.*3.4. If my child gets really sick, I can help her get better*].

Perhaps the one subscale in the YLS which stands out as the least related to the standard Big Five personality traits is the Inclusion subscale. As such, the items in this scale (inquiring about access to basic services) bear less resemblance to the commonly studied skills categories and seem quite specific to the rural area context for which the Young Lives Survey was designed. Moreover, it is questionable whether the first two subscales (Inclusion and Trust) are capturing any internal constraints faced by the respondent as oppose to purely external conditions (relating to security and access to services.) In this respect, I view these two categories of the YLS as presenting the lowest degrees of *face validity* (i.e. the extent to which a scale or test is subjectively viewed as covering the concept it purports to measure). Referring back to framework laid out by Vakis et al. (2016), the items conforming the Inclusion and Trust scales seem off-hand more closely related to external circumstances affecting the 'enabling context', than internal conditions governing the individual's mental state.

However, at the broader level, the remaining subscales used in this study do bear relevance in the study of non-cognitive skills. To note, the most recent correlational studies looking at these constructs and employment outcomes have demonstrated a relation between personality traits such as Conscientiousness and Grit with outcomes such as earnings (Cunha & Heckman, 2008).

Moreover, other studies have leveraged existing datasets that include related skills also labeled as 'non-cognitive' to investigate their association to economic success (as reviewed in Guerra et al., 2014). The skills examined in these

[37] The acronym PRACTICE stands for: **P**roblem solving, **R**esilience, **A**chievement, **C**ontrol, **T**eamwork, **I**nitiative, **C**onfidence, and **E**thics.

studies, related to the subcategories in the YLS, include self-regulation (Rauber, 2007), and self-evaluations linked to self-esteem, locus of control, self-efficacy, and emotional stability (Holmand & Silva, 2009; Judge & Hurst, 2007)

On the practical front, a recent study conducted by J-PAL reviews the psychological indicators used in practice to measure individuals' (in particular women's) perceptions of their own capabilities, as well as subjects' wellbeing, sense of self-worth, and levels of stress. The list of psychological indicators in the practical guideline includes similar self-efficacy and self-esteem scales to those used in the YLS and an adaptation of the CESD instrument that largely resembles the version used in the YLS. Moreover, the World Bank's "Measuring Women's Agency" resource discusses related psychological indices such as the Locus of Control scale and the Self-Efficacy index.

Similarly, a number of these survey questions (in particular those relating to Agency, Self-efficacy and Self-Esteem) are included in the online resource provided by the University of California San Diego's EMERGE[38] website; an exhaustive compilation of survey questions that have been used to measure gender equality and empowerment along with guidelines for selecting metrics.

Overall, the ensemble of these reviews provides an indication of the scale of recent use in practice of measures of this sort in developing country contexts. These various references highlight further the need for these measures to be investigated and validated in order to be utilized in high poverty, rural settings.

2.2.3. Depression Scale

The Young Lives Survey includes a version of the CESD (Center for Epidemiologic Studies Depression Scale), originally a brief self-report questionnaire developed in 1977 by L. Radloff to measure depressive symptoms severity in the general population. This instrument is increasingly used in studies relating to poverty and health in developing countries and is included in a couple of nationally representative household panel surveys[39].
This scale, consisting of the following 20 items, was collected at baseline in the YLS for all countries (except Peru):

1. *Did you often have headaches*
2. *Was your appetite poor*
3. *Did you sleep badly*
4. *Were you easily frightened*
5. *Did your hands shake*
6. *Did you feel nervous, tense or worried*
7. *Was your digestion poor*
8. *Did you have trouble thinking clearly*
9. *Did you feel unhappy*
10. *Did you cry more than usual*
11. *Did you find it difficult to enjoy your daily activities*

[38] EMERGE stands for Evidence-Based Measures of Empowerment for Research on Gender Equality
[39] For example, the CESD is included in the Family Life Surveys in Indonesia and Mexico.

12. *Did you find it difficult to make decisions*
13. *Did your daily work suffer*
14. *Were you unable to play a useful part in life*
15. *Did you lose interest in things*
16. *Did you feel you were a worthless person*
17. *Were things so bad that you felt that you just couldn't go*
18. *Did you feel tired all of the time*
19. *Did you have uncomfortable feelings in your stomach*
20. *Were you easily tired*

This depression scale was collected in the YLS at baseline for the caregiver and has been known to relate (negatively) to a number of the domains captured in the psychosocial scales (self-esteem, locus of control, etc.) As such is it useful to include these 20 items in the subsequent factor analysis for the psychosocial wellbeing outcomes. However, a caveat to note concerning the depression scale in the Young Lives Survey is the fact that all depression scale items are reverse coded (i.e. all affirmative responses signal depression symptoms). This differs from standard practice in the use of the CESD scale (Radloff, 1977) designed to minimize acquiescence bias; usually five of the twenty-one items are positively coded (e.g. indicating a hopeful attitude towards the future and towards life). In the analysis below, I discuss the possible implications of using this modified version in my estimations.

2.2.4. Shock variables

All three rounds of the survey include a detailed module asking about the events which have affected the household economically in a negative way. The reference period for reporting shocks in waves 2 and 3 is the time elapsed since the last survey, while the reference period is shorter for the baseline survey (since the mother's pregnancy of the 'young lives child', i.e. up to one and half years back). Thus, I use the information in rounds 2 and 3 to construct the shock variable since the reference period for the baseline is not fully comparable. The shocks module in the survey includes over 50 different events. In the construction of the shocks variable I restrict the events to those which may arguably be exogenous[40] shocks to the household (14 separate events in all). In particular I construct 3 main types of shocks (1. Natural disasters [consisting of 10 separate events]; 2. Economic shocks, i.e. [consisting of 4 events relating to prices changes and employment], and 3. Aggregate shocks comprising all of the above.

The different events making up the 3 main types of shocks and their frequencies for each of the countries are included in Figure A.1. in the Appendix. Some of the individual events are very rare (reported in a given year by less than 1 percent of the sample), especially weather related and geological disasters. However, overall, Natural disasters are the most frequent in every country (as compared to Economic shocks). The bar charts in Figure A.1. reveal a lot of heterogeneity between the countries. The share of households reporting at least one Natural disaster in 2006 (Wave 2) ranges from 24 percent in Peru up to 58 percent in Ethiopia, while the share of households that

[40] A further examination of the exogeneity of these shocks is presented in the Appendix Section A.1.

reported an Economic shock in that wave is as low as 13 percent in India in contrast to 40 percent in Ethiopia. The figures also suggest there is between-wave variation in these occurrences in each of the countries. In other words, several events exhibit a high frequency in one wave and a low frequency the next wave, or vice versa (e.g. drought in India or flooding in Peru, etc.). This year-to- year variation is an important feature for the analysis on the responsiveness of non-cognitive skills to the shocks, since I will exploit the with-in household variation in exposure to these adverse events over time. In the empirical specifications presented below the regressor variable is 'Number of shocks' which aggregates the sum of shocks reported by the household for each of the three main categories[41].

3. Measurement concerns about Non-Cognitive skills

When using subjective indexes composed of multiple items it is widespread practice to use the simple averages of these items. In the present survey, for example, the simple averages of the 5 items for each pre-determined category in the survey would constitute the 'naïve' scores for Inclusion, Trust, Agency and Self-esteem. However, it is possible that the grouping of the non-cognitive outcomes as they appear in the survey is inadequate, i.e. that these constructs are *naïve* in the sense that they do not capture correctly the latent variables. To be sure, the answers to specific skill questions are likely to be imperfect proxies of the true underlying traits (Cunha, Heckman and Schennach, 2010 and Attanasio, et al. 2015). Furthermore, given the nascent interest in the use of these measures within a developing country context, few studies have yet investigated the validity of this sort of questions and the extent to which the items conforming each scale indeed measure the intended traits (Laajaj and Macours [2019] is one of the first studies to investigate this in a poor rural setting.)

To date there is a large body of experimental and empirical work that has investigated the meaningfulness of answers to subjective questions, in particular for developed country contexts. These studies have documented how cognitive factors affect the way people answer survey questions of this sort, e.g. through the ordering[42] or wording of questions and possible responses and; through scaling effects (See Bertrand and Mullainathan, 2001; and references therein).

Beyond purely cognitive issues, the social interaction involved in the survey procedure apparently also plays an important role in shaping people's responses to subjective questions. In plain terms, the evidence suggests some respondents want to avoid looking bad in front of the interviewers. For example, around 25 percent of non-voters report voting immediately after an election. Also, respondents are unwilling to report racial prejudice and to a significantly greater extent when the survey is administered by someone of the race in question. The evidence also suggests people are reluctant to admit lack of an attitude, i.e. they believe they should have an opinion about something just because the surveyor is asking about it, even fictitious issues (Sudman et al. 1996). Another specific

[41] The analysis is also run using the dummy variable 'Any shock' taking the value of 1 if a household reports in a given year any of the 14 separate events. The results are qualitatively similar between the two, however the variance in shock exposure is better exploited using the discrete number of shocks.

[42] The ordering of questions may affect individuals' answers for different reasons. For example, respondents may attempt to provide answers which are consistent with previous ones they provided, or prior questions may directly elicit certain memories or attitudes which influence subsequent answers. Moreover, people may simply not exert the mental effort required to consider or read thoroughly all the possible answers in the survey thus their ordering will affect responses (Tanur, 1992).

response pattern identified experimentally is 'Acquiescence bias' or the respondent's tendency to agree, in particular due to lack of understating of the question. This bias is also known as 'yea-saying' and is reflected in the respondent's propensity to agree (more than disagree), even when asked about statements which are (often purposely) contradictory.

Indeed, there are several sources of potential biases which may affect the measurement of non-cognitive skills. In the following section I attempt to address some of the issues described above for which the YLS data lends itself. First, I examine whether it is possible to capture better the underlying non-cognitive traits by building 'improved' measures. This is done by performing Exploratory Factor Analysis in order to allow the data to indicate the potential factor structure of the multiple items. Second, I address the concern about respondents' disproportionate tendency to agree, when answering Likert-type questions, by applying a standard acquiescence bias correction procedure. Third, I conduct a test of the measures' internal consistency (Cronbach's alpha). In the following sections I provide more details about each of the three procedures before presenting the empirical results they yield for the psychosocial measures, depression scale and aspirations measure.

3.1. Methodological procedures

3.1.1. Exploratory Factor Analysis (EFA)

There are two standard data reduction techniques commonly used in statistics: Principal Components Analysis (PCA) and Factor Analysis (FA). Both procedures allow the researcher to capture the variance in variables in a smaller set. However, the fundamental difference between the two is that PCA is a linear combination of variables while FA is a measurement model of a latent variable. As such the former method does not serve the purpose of determining whether there is indeed an underlying factor (e.g. in the present case, a non-cognitive skill such as Agency) captured by the observed variables. Rather the data reduction process in PCA consists of optimally extracting weighted averages to create one or more index variables from a larger set of variables. Therefore, given the nature of the data in question (i.e. multiple-item scales meant to measure specific psychosocial subcategories), the factor analysis procedure is more suitable analysis is based on a formal model predicting observed variables from theoretical latent factors (Comrey, 1988; Grimm and Yarnold, 1995).

Moreover, there are two types of Factor Analysis: Exploratory and Confirmatory. The latter, Confirmatory Factor Analysis, is used when the researcher wants to test a specific hypothesis about the structure or the number of dimensions underlying a set of variables. However, in the present study there is no justified pre-defined idea about the factor structure and the quantity of independent dimensions surrounding these psychosocial measures. Rather, what I wish to explore in the current section is precisely whether the structure of the data resembles the psychosocial subcategories intended in the survey instrument. Given this agnostic stance about the data structure, I therefore opt for the Exploratory Factor Analysis (EFA) procedure.

More specifically, I perform EFA on the naïve constructs of the psychosocial and aspirations outcomes (for Waves 2 and 3), as well as the depression scale items. The purpose of the EFA is to allow the data to indicate the potential

factor structure of the multiple items and ultimately construct improved measures of the related latent non-cognitive traits.

3.1.2. Acquiescence Bias Correction

Using the YLS data, it is possible to correct the psychosocial measures for acquiescence bias following a standard practice in the psychometrics literature (Rammstedt et al. 2018). The correction consists of calculating first the acquiescence score for each respondent. This is done by subtracting the mean of reverse-coded items to the mean of positively-coded and dividing by two. Subsequently, to correct for the acquiescence bias, the acquiescence score is subtracted from the Likert score for positively coded items and subtracted from the Likert score for reverse-coded items. Thus, if there is a bias causing reversed items to have on average a different value than positively-coded items, the correction brings positive and reverse questions to the same average (see Laajaj and Macours, 2019 for further details on accounting for acquiescence bias.) Note that it is only possible to apply this correction to the psychosocial measures since there are no reverse coded items conforming the aspirations measures or the depression scale as it appears in the YLS.

3.1.3. Internal consistency test: Cronbach's Alpha

Another measure, commonly used in the psychology literature to assess the internal consistency of a construct, is Cronbach's alpha. Conceptually, this indicator is affected both by the noise and the extent to which items are measuring the same underlying construct. Formally, the reliability is defined as the square of the correlation between the measured scale and the underlying factor (Cronbach, 1951). For a given number of items, it increases when the correlation between items increases. Hence it is higher when the noise of each item is low (high reliability) and when they actually measure the same underlying factor (an indicator of high validity). For the purpose of statistical analysis, a minimum threshold of 0.7 is often applied (see Laajaj & Macours [2019] for more details on the construction and use of Cronbach's alpha).

3.2. Empirical Results

3.2.1. Psychosocial competencies

To conduct the EFA for the psychosocial competencies I used each of the 20 questions asked separately and investigated their factor loadings. I determined the number of latent factors that could be extracted from all the measures using Kaiser's (1960) rule, keeping factors with eigenvalues greater than 1. Table 2.1 presents the resulting factor loadings for the psychosocial competencies questions. The table indicates which of the 4 naïve constructs each question originally belongs to (the complete questions are presented in the key below Table 2.1). To predict the resulting factors, I used oblique rotation[43]. I chose oblique rotation (as opposed to orthogonal rotation) in order to allow the factors to be correlated (Brown, 2009[a] and 2009[b]). This rotation type is befitting given the nature of

[43] The goal of the rotation procedure in EFA (whether orthogonal or oblique) is to make the pattern of loadings clearer, or more pronounced. In other words, the process is designed to reveal the simplest structure of the factors.

the subscales which may be assumed to be closely related to one another (e.g. someone with high self-esteem is also likely to have a high locus of control).

There is considerable heterogeneity in the factor loadings between the countries. The countries differ in the number of retained factors (5 factors in Ethiopia and Peru, 4 in Vietnam and only 3 in India.) This choice of retained factors satisfies the non-trivial factors criterion[44] in the case of India and Vietnam, where each factor contains at least 2 items with a loading above 0.3 (i.e. a non-trivial loading value). However, in both Ethiopia and Peru, this criterion is not fulfilled since the fifth and final factor contains only one item.

An alternative to the Kaiser criterion for choosing the number of retained factors is an inspection of the Cattell (1966) scree plot (indicating the number of factors corresponding to each eigenvalue.). Figure 1 below presents this plot for each country. In every case the plot suggests the optimal number of factors, according to the Kaiser rule (marked by the horizontal red line where the eigenvalue equals 1), largely coincides with the point at which the curve in the Cattell scree plot plateaus. Moreover, in each case the chosen number of retained factors (five factors for Ethiopia and Vietnam, four for Peru and two for India) accounts for around half the variance in the data (see Table A.2.1 in the appendix). If an additional factor was dropped in each case, the cumulative variance explained would fall to around 40 percent on average. Therefore, reducing further the number of factors, even by just one factor, would leave a considerable proportion of the variance unexplained. Thus, the ensemble of alternative criteria (following Kline, 2002 and Brown, 2009[a]), namely the Kaiser rule, the inspection of the Cattel plots, the non-trivial factors and the proportion of cumulative variance explained, provide reliability to the chosen number of factors retained.

The loadings displayed in Table 2.1 indicate that the resulting factors do not fully pool together the original subcategories of questions. This suggests the grouping of questions in the survey instrument is not adequate in capturing the 4 intended latent traits; though some degree of pooling of the subcategories is observed. Some similarities in the grouping of questions arises between Ethiopia and Peru, on the one hand, and between India and Vietnam, on the other. In Ethiopia and Peru Factor 1 captures mainly Inclusion questions, Factor 2 captures Trust items, Factor 3 captures Self-esteem questions, while Factor 4 and 5 are loaded with the residual (mainly Agency) items.

Given the variable reduction procedure, the first factor identified accounts for most of the variance in the data. This suggests that, for the present dataset, most of the variance in the psychosocial measures in the dataset stems from the Inclusion and Trust questions in Ethiopia and Peru, while the questions presenting the most variance in India and Vietnam are the Self-esteem ones. Conversely, the Agency items are scattered along several different factors accounting for the lowest proportion of the variance in the data. As mentioned above (in Section 2.2.2) one of the original Agency questions (Q.3.5[45]) had to be dropped from the index due to the high non-response rate in the second wave (e.g. in the Ethiopian case the proportion of households with missing, N/K or N/A responses

[44] See Brown, 2009a for further details on the 'non-trivial factors criterion'.
[45] Question 3.5. reads as follows: "*I can do little to help my child do well in school no matter how hard I try*".

exceeded 95 percent). Thus, it is possible that this missing component within the index explains to some extent the lower consistency of the Agency construct.

The third column in the panel for each country indicates whether the Likert-scale questions are positively coded or reverse-coded. Including reverse coded questions in this type of survey instruments, designed to capture the respondents' perceptions, is in principle a good practice in order to address agreeability bias issues. However, there could potentially be a trade-off in terms of how straightforward and understandable the questions are to the respondent, i.e. reverse coding may require phrasing questions using double negatives which can render them complex and abstract. Furthermore, in the event that similarly phrased questions were all grouped together (e.g. if all reversely coded items are loaded onto one factor), this could be an indication that the factor analysis is simply capturing response patterns which would constitute a systematic form of measurement error, such as 'acquiescence bias' (this point is addressed further below).

In order to gauge the stability of the factor structure for these psychosocial indices I also perform the EFA analysis for each wave separately. The results for this exercise are reported in Table A.2.1.1 of the appendix. However, unfortunately the results for the psychosocial measures in Wave 4 are not entirely comparable to the other 2 waves due to differences in the questionnaire in the final round. The module asking about psychosocial competencies in Wave 4 did not include the complete set of 20 items included in the previous waves (i.e. 5 items for each of the 4 subcategories- Inclusion, Trust, Agency, Self-Esteem). In contrast, the abridged version of the module in Wave 4 only included in all 7 items (i.e. 3 items for Agency and 4 items for the Self-Esteem category). The results for this final wave are nonetheless reported for the sake of completeness.

Overall, the EFA by wave indicates the factor structures are not entirely stable over the rounds. In all four countries the ordering in which the items are loaded onto the factors differs between waves 2 and 3 (for which full comparison is possible) suggesting the latent structure, captured by the indices, changes over time. However, in the majority of cases, the number of factors retained remains constant over this two-year period (except in Vietnam where it decreases from 6 to 5 factors between 2006 and 2009).

I now turn to the bias correction procedure. Note that the bias correction for the psychosocial competencies is only performed for Wave 2 since the survey questionnaires in the other two waves do not include sufficient reverse-coded items (i.e. only 1 out of the 20 psychosocial items is reverse coded in Waves 3 and 4). Even in Wave 2, the proportion of positive and reverse coded items in the YLS instrument is far from balanced (only 3 out of 19 questions are reversed). The low number of reverse phrasing in the questionnaire may be due to the trade-off mentioned above; that is, between avoiding agreeability bias and keeping questions straightforward and direct. However, the importance of including a balanced number of questions with reverse meaning in the instruments to account and correct for systematic answer patterns, has been documented for similar contexts to that of the Young Lives Survey (i.e. enumerator- administered household surveys in poor rural areas, Laajaj and Macours, 2019).

In any case, in order examine- to the extent possible - whether there is systematic response bias in the present study, I perform the acquiescence correction for Wave 2. I then rerun the factor analysis on the corrected measures in

order to investigate whether the factor structure is affected by the response bias in the naïve constructs. The EFA results for the corrected measures, presented in Table A.2.1.1. (in the Appendix), indicate there is an overall improvement in the factor structure yielded. In Ethiopia, India and Vietnam the resulting factor structure is more compact (i.e. under the same criteria for retaining factors, the number retained was reduced from 5 to 4 factors). Moreover, the loading values in the first factors (capturing the largest proportion of the variance in the data) are, in general, higher in the EFA for the corrected items. However, the EFA with the corrected items still does not exactly group the items into the intended subcategories. In any case, this overall reduction in the number of retained factors and greater loading values in the first factors does suggest the correction procedure enhanced the extent to which the set of items captures the underlying measures.

I now examine the internal consistency of each of the psychosocial measures calculating Cronbach's Alphas. The results are displayed in Table 2.4. Again, the test results are only fully comparable between waves 2 and 3 since the questionnaire did not include all the items in the final wave. Importantly, the YLS data allows me to compare the Cronbach's Alphas for the naïve psychosocial constructs versus the corrected constructs, after accounting for acquiescence bias.

In Table 2.4., for each country the alphas are calculated for the ensemble of psychosocial items and for each subcategory separately. The comparison of the first two columns indicates the considerable gain in consistency from correcting for acquiescence bias, both for the aggregate and the separate Cronbach alpha values. This improvement from the bias correction is consistent across the 4 countries, raising the consistency value of the aggregate corrected measures to $\alpha = 0.9$ in every case (from values of between 0.7 and 0.8 for the naïve constructs). The measures for the separate subcategories present equivalent improvements in internal consistency, with the exception of Agency in India (where the corrected alpha value falls slightly). Indeed, Agency stands out as the measure with the lowest consistency levels overall.

More generally, observing the other waves as well, the results for the naïve constructs in Table 2.4. indicate there is a lot of heterogeneity between the countries and between the measures. The highest overall degree of internal consistency is observed in Ethiopia where the items conforming the subcategories for Inclusion and Trust yield alpha values of at least 0.7, for both waves 2 and 3. The Self-esteem measure for Ethiopia is also highly consistent throughout the three survey rounds.

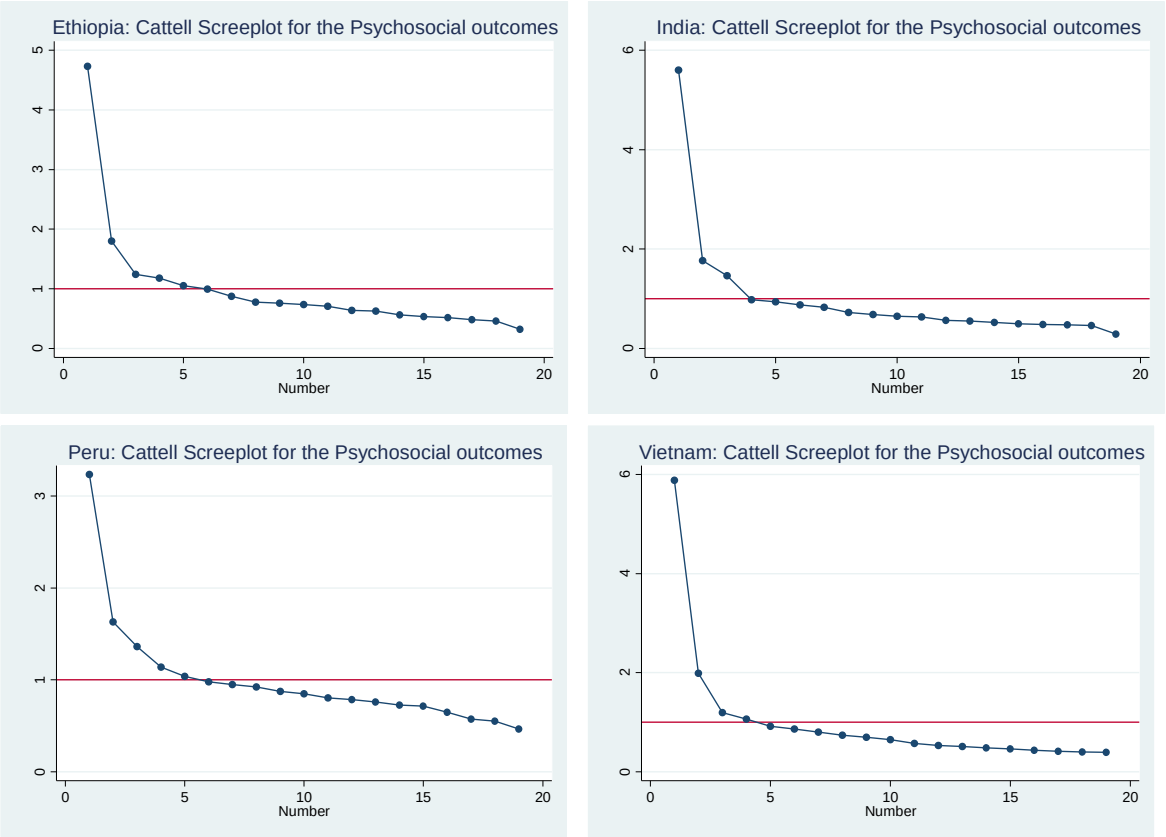
The mean alpha of each measure for the two comparable waves (2 and 3) indicates that Trust is the measure with the highest consistency ($\alpha = 0.7$) while Agency presents the lowest mean consistency ($\alpha = 0.4$) over the 4 countries (bottom panel in Table 2.4). This poor consistency of the Agency measure is driven in particular by the low values observed in Wave 2 (as low as $\alpha = 0.15$ in Peru).

As a general caveat, even the results presenting the highest alpha values (e.g. Trust or Self-esteem in wave 3) should be interpreted with caution and do not necessarily imply that the items measure the same latent construct. For example, tests with the same test length and variance, but different underlying factorial structures can result in the same values of Cronbach's alpha. Indeed, it has been shown that alpha can take on quite high values even when the

set of items measures several unrelated latent constructs. (Green, et al. 1977). This is consistent with the overall results obtained in the EFA, which do not suggest that the items conforming Trust or Self-Esteem capture a single unidimensional construct.

I now examine these issues for the remaining non-cognitive measures; that is, the psychosocial measures, including the CESD items, and the naïve aspirations constructs.

Figure 1. Cattell Scree plots for the Psychosocial measures



3.2.2. Psychosocial outcomes including the depression scale items

As mentioned above (in Section 2.2.3) an important caveat concerning the baseline depression scale in the Young Lives Survey is the fact that all CESD items are reverse coded (i.e. all affirmative responses signal depression symptoms). This diverts from standard practice in the use of the CESD scale in which five of the twenty-one items are positively coded (e.g. indicating a hopeful attitude towards the future and towards life; Radloff, 1977). Indeed, it is unfortunate that the standard scale was not applied in the Young Lives Survey both because the answers are likely to suffer from considerable acquiescence bias and because the comparability with the mobility and aspirations is reduced by omitting the positively coded items.

To perform the factor analysis using the CESD, I reversed the item responses so that the scale direction is consistent with the psychosocial items. As such, a higher factor score, indicates both a lower number of depression symptoms and a higher level of psychosocial wellbeing.

The Cattell scree plots for the factor analysis, including the CESD scale, are displayed in Figure 2 below. Once again, the optimum number of factors to be retained suggested by inspection of the plots coincides with using the Kaiser rule criterion (i.e. the plots plateau approximately at the point when the eigenvalues equal 1.) For both Ethiopia and India, the number of retained factors is 10 and only slightly lower in Vietnam -for which 8 factors are retained. With this number of factors, the 'non-trivial factors' criterion is satisfied in all three cases, and the proportion of the variance in the data accounted for is over fifty percent in all cases (Table A.2.2 in the appendix).

The values for the resulting factor loadings are displayed in Table 2.2. In general, the loading patterns are more homogenous between countries once the depression scale items are included in the factor analysis. In the 3 cases for which the depression scale is available (Ethiopia, India and Vietnam), the factor loadings successfully pool the depression scale items together. This successful pooling is expected given the previous validation of the scale and is consistent to a large extent with the factor analysis originally performed for the CESD 20-item instrument (Radloff, 1977).

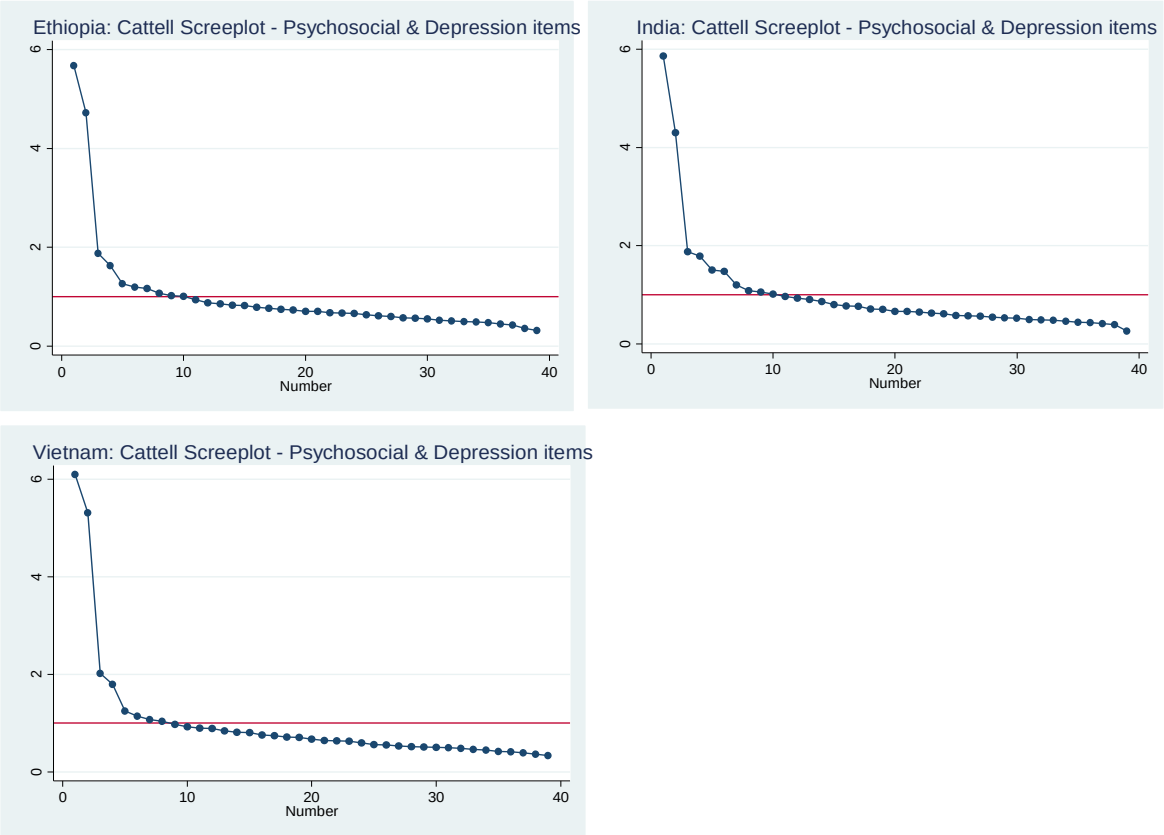
In the present dataset, even though the depression items are not all loaded on to one single factor, they are for the most part loaded onto subsequent factors. Consistent with the results obtained by Radloff (1977) the vast majority of CESD items in the Young Lives Survey have a loading above 0.4 (except for a couple of rare cases with loadings around 0.2 and 0.3; e.g. one case in India and two in Vietnam). Moreover, in Ethiopia and Vietnam, the depression items are loaded onto the first factors (within factors 1 thru 3), indicating that in these cases the CESD scale accounts for most of the variance in the data (note however, that this is not the case in India).

Also, in accordance with previous findings by Radloff the CESD items in Ethiopia and Vietnam load onto 4 distinct factors. In India, however, this number is higher, amounting to 7 depression factors in all. In the original study, the four factors are interpreted as: (i) *Depressed affect* (e.g. blues, depressed, lonely, cry sad); (ii) *Positive affect* (e.g. hopeful, happy, enjoy); (iii) *Somatic and retarded activity* (bothered, appetite, effort, sleep, get going); and (iv) *Interpersonal* (unfriendly, dislike). These original categories differ somewhat from the ones I obtain using the Young Lives instrument, in particular because all of the items in the latter instrument are negatively coded and thus the positive affect category is omitted altogether. However, the two subcategories from the original study that do seem to emerge in the present analysis are *Depressed affect* and *Somatic and retarded activity*. In particular, in my results the loadings group together into neighboring factors items indicating emotions (e.g. feeling frightened, tense, low self-worth, useless, unhappy, etc.) and separately items referring to bodily sensations (e.g. stomach and head ache, poor appetite, bad digestion, etc.).

Note that the CESD scale cannot be corrected for acquiescence bias since all the items were reverse coded in the present instrument. Indeed, this point may explain why the depression questions aren't grouped more compactly. For example, in the more recent analysis by Laajaj and Macours (2019) nineteen out of the twenty-one items load

onto a single factor[46]. Overall the Self-esteem and the Trust items are loaded more compactly than the other two psychosocial subcategories. Finally, the Agency questions, in particular, are scattered across several separate factors, suggesting the ensemble of these items is a not an adequate approximation of a single underlying trait.

Figure 2. Cattell Scree plots for the Psychosocial measures including the Depression items



3.2.3. Aspirations outcomes

I repeated the same EFA procedure described above to determine the factor loadings and the predicted values for the four aspirations outcomes. In this case I used the future ladder position (i.e. the predicted position four years from now) and the difference between the current and future position, the aspired educational attainment question and the aspired occupation question. The elicited ladder positions are measured along a 9-rung scale, the education aspiration is measured in number of years of schooling and aspired occupation is measured using the 9-point Hollingshead scale. Contrary to the psychosocial indices, none of the aspirations variables are reversely coded. Just as before, I used the same ensemble of criteria to determine the number of factors to retain (Kaiser's rule, scree plots (Figure 3 below), non-trivial factors and the proportion of cumulative variance). In this case the resulting optimal number of factors, two, is the same in all countries, accounting for over eighty percent of the variance in the data (Table A2.3). Again, the predicted values were obtained using oblique rotation given the expected high

[46] In a factor analysis performed on a set of 69 measures of non-cognitive ability.

correlation between the three categories of aspirations. Table 2.3. presents the resulting factor loadings for the aspirations outcomes and the variable key is displayed below the table. In contrast to the analysis using the psychosocial competencies, the resulting factor loadings for the aspirations outcomes suggests a high degree of homogeneity between the countries and across the waves (Table A.2.3.1 presents the EFA analysis for each separate wave). In all cases aspirations questions are grouped separately from the ladder mobility items, suggesting these two subscales capture distinct dimensions of a household's life prospects (i.e. *Mobility* aspirations and *Human capital* aspirations). Notice that in every case the distance in ladder position (V.1.2.) loads negatively onto one of the factors (e.g. this item has a negative loading for factor 1 in India, Peru and Vietnam and a negative loading for factor 2 in Ethiopia). This is possibly reflecting that households with a low predicted ladder position for the near future, have a higher (most likely less realistic) aspiration about their children's future. However, these negative loadings are low in absolute value (minus 0,15 at most in the Vietnamese case).

It is worth noting that the life satisfaction questions are applied in a number of large-scale, cross-country surveys (cf. Gallup, LSMS[47], SEDLAC[48], and LAPOP[49], to name a few). Therefore, it is to some degree striking that, despite being the most widely used of the three naïve aspirations measures, the ladder of life questions are loaded last in the majority of cases (in India, Peru and Vietnam). This ordering indicates that the Ladder of Life subcategory provides the least variance among the aspirations measures in the dataset, and hence potentially the least signal to exploit. One reason why this particular question may not be appropriate for the Young Lives Survey sample could be the population's skill level. As mentioned above, poor areas were over-represented in the sample given the survey's focus on childhood poverty. Moreover, the results from Laajaj and Macour's investigation indeed show that instruments designed to capture non-cognitive outcomes in other settings might not be valid or reliable measures in poor rural settings. That said, it is possible that the ladder question as phrased in the Young Lives survey requires some adaptation for the sample under study.

In the present factor analysis, the variable reduction procedure suggests that most of the variance in the aspirations measures comes from the occupational aspiration variables (V. 3.1 in the Aspirations Outcomes key). Notice for example that this variable is loaded first in India and Peru and is loaded second in Vietnam (with factor loadings as high as 0.91). The fact that this variable contains a significant proportion of the variance may indicate that this is an informative and hence useful question to include in household surveys aiming to capture parental aspirations. Indeed, the ordering of these factors is an interesting result within the applied context of the measurement of aspirations. For example, there is qualitative evidence indicating that in certain settings educational aspirations are not as informative as more precise measures of girls' prospects (Glennerster, 2014). In particular, there are accounts from the piloting of survey instruments which highlight the trade-off between coverage and quality of information.

Within the specific context of measuring aspirations in the field, a trade-off is faced between simple questions which take little time to ask in a survey and can therefore be applied to a large population (e.g. aspired level of

[47] Living Standards Measurement survey, http://iresearch.worldbank.org/lsms/lsmssurveyFinder.htm
[48] Socio-Economic Database for Latin America and the Caribbean, http://sedlac.econo.unlp.edu.ar/eng/
[49] Latin American Public Opinion Project, http://www.vanderbilt.edu/lapop/survey-data.php

education) and richer, more complex and detailed information collected for a smaller subsample (for example questions to capture aspirations and empowerment through specific gender attitudes, or concrete questions about girls' independence; e.g. the distance they are allowed to walk unaccompanied). The former type of questions, which are not as context specific and for which broad coverage is more feasible, may constitute concepts which are more abstract (e.g. life satisfaction or desired educational attainment). Moreover, respondents may be more likely to answer according to social desirability (e.g. positioning themselves in the middle rung on the ladder or claiming to aspire a university degree irrespective of actual circumstances.)

On the other hand, the latter type of questions, which require proper and often costly and time-consuming field testing, may pinpoint attitudes and expectations in a more realistic manner. Answers may be more informative if respondents factor-in actual opportunities particular to their own setting (e.g. an existing job in the community or a post held by someone known, access to nearby training facilities, etc.). In fact, experimental evidence from India suggests that certain interventions that alter opportunities at the local level do indeed lead to changes in occupational aspirations and even labor force participation (cf. Jensen, 2012 and Beaman, et al., 2012).

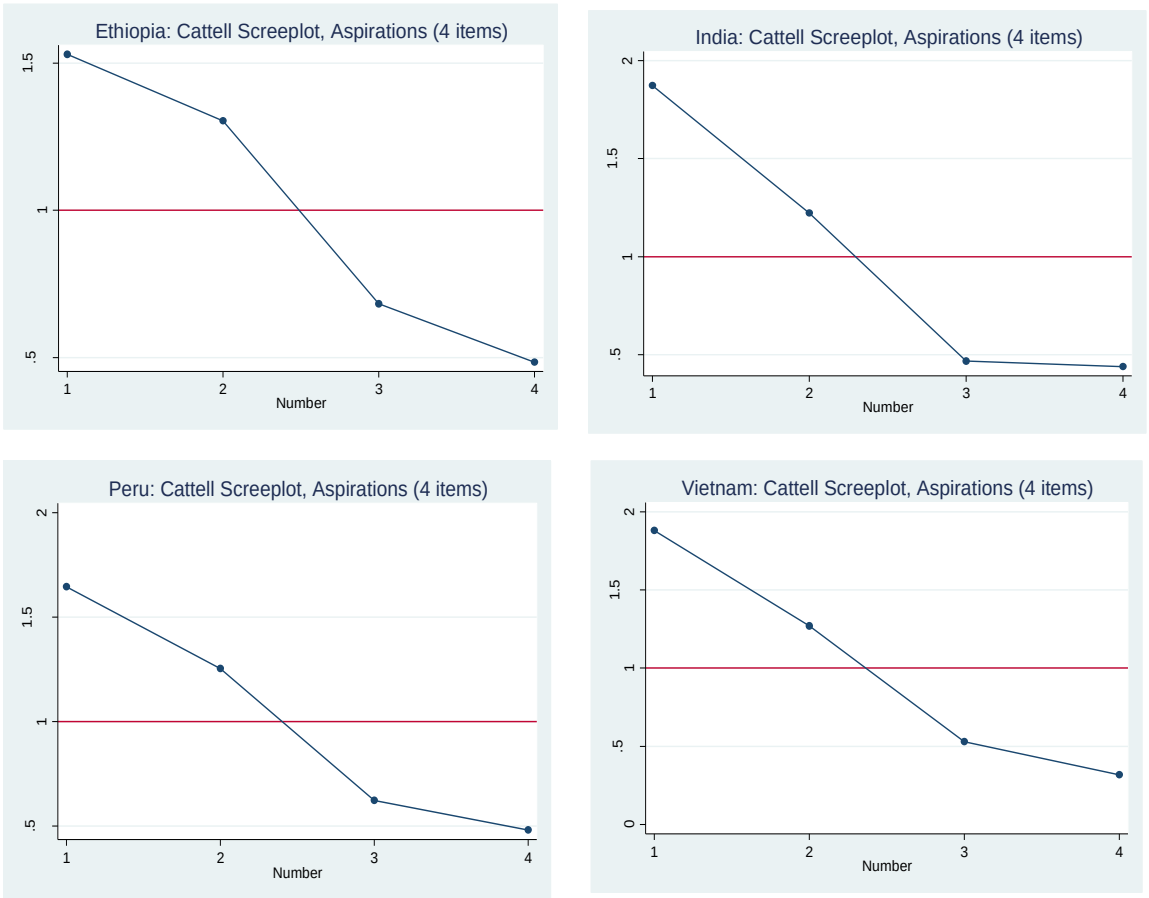
In the present context of the Young Lives survey, the ordering resulting from the EFA coincides with the more abstract concepts (e.g. the predicted future position on a symbolic ladder) being loaded last (in 3 out of the 4 countries); providing the least variance in the data. Thus, it may be the case that in the sample under study, spanning four different developing countries, concrete measures of parental aspirations are more informative. On the downside, context specificity may come at the cost of comparability to other settings and a reduction in the capacity to upscale and generalize results.

As for the internal consistency of the items that conform the aspirations measure, the Cronbach alpha test suggests a low degree of consistency (Table 2.4). The overall mean alpha value for the measure of aspirations ($\alpha = 0.5$) falls below the minimum threshold established in the psychometrics literature ($\alpha = 0.75$) and even further below the mean value calculated for the psychosocial measures in the YLS ($\alpha = 0.75$). There is a high degree of variation across countries and even more so across waves. For example, the consistency values range from 0.46 in Vietnam to 0.7 in India for a given year, and for a given country (e.g. India) alpha values fluctuate from 0.67 down to 0.5.

To synthesize the findings in this section, I performed exploratory factor analysis for both the psychosocial competencies, the baseline mental health items and the aspirations measures in order to investigate whether the naïve constructs for these non-cognitive variables were capturing correctly the intended latent traits. In general, the factor loadings for the psychosocial items do not pool together the original subcategories, rather the items are scattered across several distant factors. By contrast, the CESD scale items are more compactly loaded onto neighboring factors. In the case of the aspiration measures, the resulting factors indicate two dimensions of future prospects (namely mobility and human capital). The ordering of the loadings indicates that the CESD scale accounts for most of the variance in the data.

The EFA yields somewhat improved measures of the non-cognitive constructs with respect to the naïve constructs in terms of their factor structure. Indeed, the exploratory factor analysis indicates I should use the resulting non-cognitive factors for the subsequent regression analysis, in lieu of the original indices, to account partially for the measurement error. Thus, for the use of this type of measures, which are yet to be validated, it is sound practice to perform EFA allowing the data to indicate the factor structure and related latent traits instead of imposing them ex-ante. At a broader level, the EFA provides further evidence of the need for non-cognitive skill measurement instruments that are adapted for a poor study population with low levels of educational attainment. Finally, the internal consistency tests indicate that the psychosocial indices fare well in terms of the extent to which items are measuring the same underlying construct while the aspirations measures do not. Overall, the present analysis highlights the importance of validating these measures before mainstreaming their use.

Figure 3. Cattell Scree plots for the Aspirations measures



4. Predictive validity: Non-cognitive skills and parental investment in human capital

The EFA above has yielded improved measures of the non-cognitive outcomes of interest, in terms of their underlying factor structure. To investigate the validity of these measures I now test to what extent these constructs predict real life outcomes and behavior. In particular, I want to determine whether these measures, which are meant to capture non-cognitive skills and parental aspirations, indeed correlate to measures of their investment in their child's human capital. Ultimately, a high degree of predictive power in this context will provide an indication that these skills indeed elicit meaningful information to the development researcher.

I now examine the predictive validity of the non-cognitive skills for the four countries in the Young Lives Survey. In particular, I will analyze empirically whether the aspirations and psychosocial measures under study predict behavior and real-life outcomes. Given the focus on parental aspirations and psychosocial wellbeing I will examine whether these constructs correlate to variables relating to investments in the children's human capital and actual human capital attainment. Although the estimates are mere conditional correlations and can by no means be interpreted as causal effects of non-cognitive skills, the exercise is useful in determining whether improving their measurement (e.g. by using improved constructs as opposed to naïve measures) may contribute to the study of parental investments in human capital. That said, even if these non-cognitive skills are merely potential confounders, a high predictive power should caution the econometrician about the implications of omitting these skills when conducting research on human capital formation.

4.1. Psychosocial measures

The results for the regressions of child outcomes that signal parental investment in human capital against the non-cognitive skills are presented in Table 3.1 for the psychosocial measures, including the depression scale items. As final outcomes (dependent variables) I use observed measures of the child's human capital formation by age 8 such as: highest grade achieved (column 1), their z-score on the Peabody Picture Vocabulary Test (columns 2 and 3), the child's literacy status (column 4), the time spent in school (columns 5 and 6) and the rate of absenteeism (column 7). I also use reported measures of the household's proportional spending on the child's human capital such as spending on schooling (column 8) and on health (column 9). Notice that for some of the outcomes (columns 3, 6, 7 and 8) I use the changes in the variables to capture the dynamic dimension in parental investment overt time (between 2006 and 2009). For each of the countries I compare the estimates using the naïve constructs (left hand panel) against the improved constructs obtained in the factor analysis (right hand panel). The main regressions presented exclude any controls so as to observe the predictive power of the non-cognitive measures alone (captured by the adjusted R-squared value at the bottom). This value is then compared to the adjusted R-squared values obtained from the two alternative specifications, i.e. a regression including the non-cognitive constructs plus the full set of controls and a regression with the controls alone.

As stated before, the ultimate objective is to determine whether the non-cognitive measures under study convey meaningful information about future behavior and in particular the valuation of human capital investments. In this

sense the longitudinal structure of the survey is fitting since it allows me to examine the association between elicited aspirations and attitudes at a given moment early in the child's life (e.g. at age 4) and realized outcomes pertaining to the child's human capital formation at a subsequent stage (e.g. at age 8). Thus, even abstracting from any causal interpretation, tracing a systematic relationship between these measures- that is still detectable over time (up to 8 years later in the case of the depression items)- signals these cognitive measures carry meaningful information for the researcher. Moreover, the richness of the dataset allows me to look at actual objective measures, such as grade attainment or realized spending, as oppose to speculative indicators of behavior. For example, other studies have resorted to hypothetical measures of forward-looking behavior such as elicited credit demand -arguably a more subjective outcome- in lieu of observed behavior (Bernard and Taffese, 2014).

The results in Table 3.1. indicate there is a detectable, though moderate, positive association between some of the caregiver's psychosocial wellbeing (including the mental health items) and the child's educational attainment (4 years later). The estimates on the left panel, using the naïve constructs, show this positive relationship is most consistently observed in the case of Self-Esteem (e.g. in Ethiopia, India, and Peru). The statistical significance of the coefficients holds even with the inclusion of household and caregiver controls (save for Vietnam), signaling the potential of these non-cognitive skill measures in capturing otherwise unobserved characteristics. However, the comparison of the R-squared values at the bottom of the left panel indicate there is only a modest gain in explicative power of the final outcomes from including the naïve psychosocial measure. For example, in Ethiopia the adjusted R-squared value for Highest grade achieved (column 1) only rises 0,03 percentage points in explicative power (from 0,07 with the controls alone up to 0,10 with the controls plus the non-cognitive measures); and the gain in power is even smaller for the other outcomes. Moreover, there are some statistically significant coefficients with counter-intuitive signs in the naïve estimates; notably in Ethiopia for Trust. This significant negatively relationship may reflect that the caregivers with the least trust in others are especially cautious or risk-averse concerning the care of the children. For example, a low Trust score indicates caregivers who do not trust others to look after their children, who do not think it is safe for the child to go out on the street alone, and do not confide in neighbors to look after their house. In this context, this lack of trust may possibly be associated with more parental oversight in the child's human capital formation process. However, overall there does not seem to be a systematic pattern of results in this opposite direction for the other psychosocial naïve measures.

The comparison of the estimates using the naïve constructs (left panel) versus the improved constructs (right panel) indicates there is only a mild gain in predictive power that results from aggregating the items in a way that better accounts for measurement error. This improvement in the predictive power is at most visible in the case of Ethiopia, e.g. the R-squared for the educational attainment estimates is 0.03 percentage points higher with the factors (0.05) versus the naïve constructs (0.02). However, there is heterogeneity between the countries in this respect. The gain in predictive power in India and Vietnam is modest, while in the Peruvian case the factor estimates yield practically no improvement in the R-squared value. Note that the CESD data is missing in the survey for Peru, thus limiting in this case the predicative power gain yielded by the factor analysis. This is an important point since it is indicative of the extent of the predictive value contributed by the depression items. Indeed, this additional explanatory power is noteworthy given the long-period of time between the caregiver's depression symptoms (collected in Wave 1)

and certain child outcomes observed up to 8 years later. Examples of this persistent association between baseline depression and subsequent child outcomes include reduced absenteeism (in India) and, notably, increases in cognitive ability (as measured by the change in the PPVT score) and additional time and money spent on schooling and health (in Vietnam).

4.2. Aspirations measures

The results for the analogous regressions, correlating child outcomes to parental aspirations, are presented in Table 3.2. Overall, there is a less systematic positive association between these non-cognitive skills and the parental and child final outcomes. High elicited aspirations about children's futures predict to some degree the formation of their human capital, four years down the road. However, there are a few counterintuitive results (as with the psychosocial estimates).

Moreover, there is a lot of heterogeneity between the countries. For example, in Peru and Vietnam educational aspiration indeed correlates positively and significantly with the realized grade achieved (column 1), but not so in the other countries. Conversely, aspirations about the children's future human capital correlates in the expected direction (positively) with the score on the vocabulary test (column 2) in Ethiopia and India (for education and occupation respectively), but correlates in the opposite direction in other two countries. Overall, the outcome for which the aspired education has the most predictive validity is the literacy dummy variable (the point estimates have the expected sign in all cases and are statistically significant in three of the four countries (i.e. all except Ethiopia).

Indeed, while the educational aspiration measure seems to fare well in terms of reliability in some of the existing empirical literature (with test-retest rates as high as 80 and 90 percent, cf. Bernard and Taffesse (2014) and Angrist and Krueger, 1999), its predictive validity has yielded mixed results. For example, in the study by Bernard and Taffesse, which was also conducted in Ethiopia, but performed on another small sample of rural households, the authors find no relation between educational aspirations and elicited credit demand. However, Kossec et al. (2012), applying the same instrument and composite measure of aspirations as Bernard and Taffesse in Pakistan, do find higher household expenditures, as well as higher yields and higher savings on agricultural inputs for those reporting higher aspirations.

As for mobility aspirations, recent empirical literature finds test-retest correlations as low as 60% for the widely used Satisfaction with Life Indicators (Krueger and Schkade, 2008). One possible explanation for this comparatively better performance of the educational aspiration question in terms of reliability may be due to the fact that it is bounded by definition (capped at 16 years of education) while no upper-bound exist for income and assets. Moreover, in contrast to the questions on subjective wellbeing, some of the evidence shows the reliability of educational aspirations questions is unaffected by respondent anchoring and mood effects. Also, the ordinal characterization of aspirations is more standard in the aspired education question than in the Ladder of Life questions and certainly more straight-forward than in the occupational aspirations question.

In terms of the predictive validity of the mobility aspirations in the Young Lives Survey, again, the results in Table 3.2 present great heterogeneity between the countries. On the one hand, in India and Peru future ladder position is associated in the expected direction to a number of future child outcomes (literacy, time spent in school and the change in spending on health). By contrast, this measure of expected future economic position does not correlate to any outcome in Ethiopia and correlates negatively to other outcomes in Vietnam (i.e. to the changes in the test score and schooling hours, columns 3 and 6). Broadly speaking, there are no stark commonalities across the four countries in terms of the predictive validity of either of the ladder questions (future position or distance between current and future position).

In general, the comparison between the naïve (left panel) and the improved (right panel) constructs suggests the EFA contributes no improvement in predictive power to the estimates (the adjusted R-squared is unchanged or even slightly lower for a number of the factor estimates). As such, this aggregation method has less potential for improving measurement and the precision of estimates in the case of aspirations as compared to the indices for psychosocial wellbeing. This is consistent with the fact that the psychosocial naïve subcategories were noisier than the aspirations subscales as suggested by the factor reduction procedure in the previous section.

To summarize the predictive validity exercise conducted in this section, the results for both the psychosocial and aspirations outcomes indicate there is still a detectable association between parental non-cognitive skills and children's human capital outcomes a number of years later. In particular, it is remarkable that the depression scale items exhibit the significant expected correlations to a number of the human capital investment outcomes, given the eight-year time span between the dependent and explicative variables. Beyond the heterogeneity between countries, these persistent, significant correlations indicate the potential usefulness of non-cognitive skill measures, since they manage to capture otherwise unobserved variables. Naturally, I am not able to determine whether the correlations are driven by the fact that the non-cognitive skills in question affect decisions relating to the investment in and resulting human capital of the child or whether some other variables are correlated with both these non-cognitive skills and the human capital outcomes.

Overall the ensemble of results in this section suggest that accounting partially for measurement error, via factor analysis, does provide some gains, in predictive power, albeit modest. As a take-away message from this exercise, it seems sound practice to perform factor analysis and use improved (as opposed to naïve) constructs when analyzing data of this nature, in particular for instruments that have not yet been validated. Despite the modest improvement in the R-squared values, as evidenced in the present study, any gains in measurement reaped from a simple factor analysis procedure should be seized by the researched. Simply put, these are low-hanging fruit to be picked by the econometrician, since they come at a considerably lower cost than refining measurement through improved data collection and surveying techniques (e.g. test-retest, intensive surveyor training, etc.)

Having examined the predictive power of these non-cognitive skills, the second type of analysis that can be performed with subjective measures of this sort is trying to explain the non-cognitive measures themselves. Again, the measurement-error approach is useful in thinking about the challenges and potential biases this type of analysis

may encounter. Thus, I now turn to the exploration of whether the non-cognitive measures under question are malleable or responsive to sudden changes in circumstances.

5. Malleability: Responsiveness of Non-cognitive skills to Household shocks

Subjective variables can be useful as controls but one must be careful about their interpretation. Thus, to understand further these subjective measures it is important to examine what explains or molds these non-cognitive skills and whether they are indeed malleable and responsive to changes in circumstances (e.g. Does suffering a theft affect perceptions about risk and insecurity, i.e. Trust? Or, does suffering a drought affect households' sense of the control over their productive activity, i.e. Agency?). To this end, the dataset, which includes detailed information on shocks suffered by households and measures of these non-cognitive skills over time, is particularly useful.

Taking into account these considerations, I can still attempt to examine the extent to which these measures respond to a number of adverse events suffered by the household. In particular, the panel structure of the survey is helpful in accounting for the time invariant characteristics of the households which are unobserved to the researcher and may be correlated both to the shocks and the non-cognitive measures.

5.1. Responsiveness of Objective Economic Outcomes to Household shocks

As stated previously my main interest is to examine whether non-cognitive measures (psychosocial indices and aspirations outcomes) are malleable, in particular whether they react to shocks and whether they are variant over time. However, given potential concerns associated to the use of self-reported adverse events, I first wish to examine how the shocks under study affect standard, objective indicators of economic wellbeing. Therefore, adhering to standard practice, I first explore the relationship between the economic shocks and the households' expenditure level. Also, in order to complement the analysis of the impact of shocks on economic measures I examine the impact of shocks on anthropometric measures as indicators of acute deprivation. While weight-for-height (wfh) is the most suitable measure to capture child malnutrition, it is only valid for statures up to 120cm. Given the cohort I am using (aged between 7.5 and 8.5 years and measuring on average 121 cm by round 3 of the survey) most of the children will have surpassed this height. I therefore, use the weight-for-age z-score and body-mass index for age as alternative indicators of temporary scarcity[50].

These measures serve as a reference or benchmark due to the accuracy in their measurement (compared to the non-cognitive measures) and since the expected sign of movement is known (i.e. the intuitive negative association between adverse events and economic wellbeing). Therefore, as a first reference I examine how these objective measures of economic wellbeing are affected by a shock reported in that period using the econometric specification below:

$$econ_{it} = \alpha_i + \beta \cdot S_{it} + X_i + \varepsilon_{it} \qquad (1)$$

[50] Height-for-age is also available for the younger cohort; however, this anthropometric measure captures longer-term or chronic deprivation rather than temporary scarcity and thus is less relevant within the context of shocks.

Where ($econ_{it}$) represents the objective economic measures of wellbeing (either child anthropometric scores or household per capita expenditure) for each household i at period t (2006 for Wave 2 and 2009 for Wave 3). S_{it} is a discrete variable indicating the number of shocks reported by a household at time t. Note that the reference period for reporting shocks is the time elapsed since the last survey (i.e. shocks reported in 2006 [wave 2] occurred between 2002 and 2006 and shocks reported in 2009 [wave 3] occurred between 2006 and 2009). The estimate for β is therefore the coefficient of interest reported in the regression tables capturing the magnitude of the response of these reference economic outcomes to the number of shocks suffered.

The first term on the right, α_i, is a random variable, possibly correlated with the number of shocks (S_{it}). This household specific term, α_i, is assumed to be time-invariant. I use this within household fixed-effects specification to account for individual heterogeneity, i.e. to control for unobservable characteristics that vary across households but not across time. The last term, ε_{it}, captures the household specific time-variant error term.

The results for the fixed-effects specification for each type of shock (economic shocks, natural disasters and an aggregate measure of both) are presented in Table 4.1. Given this specification, the coefficient accompanying the number of shocks variable captures the correlation of the between-year change in number of shocks suffered by the household on the between-year change in the economic outcomes. The expected negative impact of shocks on economic wellbeing is only detected in the Ethiopian and to a lesser extent in the Vietnamese case. The negative impacts which are detectable under this specification concentrate on the anthropometric measures. In Ethiopia economic shocks and natural disasters alike are reflected on the child's early physical development. In Vietnam economic shocks also affect child development negatively as expected. In India and Peru, the estimated coefficient is also negative in the estimates for the Body Mass Index (column 2), although they are imprecisely estimated. The lack of negative significant effects for these z-scores in Peru and India may possibly reflect the generalized early child development levels in these two countries, each at an extreme (Peru on the higher end, among the 4 countries, in terms of child development outcomes). In point of fact, Peru presents the lowest level of wasting (with a z-score mean of minus 0.34 s.d.). while, on the other end of the development spectrum, India presents the highest wasting level (with a *negative* mean z-score of minus 1.9).

Another possible reason why the response of the economic variables to the shocks may not be detected is the fact that the survey over-represents poor areas and as such is not representative of the entire welfare distribution in any of the countries. The survey design, which is meant to focus on child poverty, therefore implies there is less variance in this sample, in terms of exposure and severity of the shocks, than, for example, at the national level. To some extent, this may explain why some of the countries don't present the expected significant negative sign, since households among these poor areas are more homogenous and therefore there is less signal coming from the shocks variable. Moreover, the fixed effect specification, while accounting for unobserved time-invariant heterogeneity, gets rid of part of the variation in the data, namely the between-household variation. In all, given these limitations, the country for which the expected effect of the adverse events is most clearly reflected on child development is Ethiopia.

Turning to the estimates for household expenditure (columns 3 to 5), in Ethiopia natural disasters correlate significantly to a decrease in total household expenditures, in particular, spending on food. However, this expected negative association is not detected in India, and in the case of Peru and Vietnam there some counterintuitive positive correlations to shocks which are statistically significant.

To synthesize, in general terms the majority of the significant correlations between shocks and measures of economic wellbeing present the intuitive negative sign. In particular, the results for Ethiopia confirm, that the adverse effect of the shocks under study are reflected on these households' material standard of living and more specifically on the children's wellbeing as detected in their anthropometric measures. As mentioned previously the estimates using these measures are useful to the extent that they serve as a reference or benchmark due to the accuracy in their measurement, relative to less standard indices (such as non-cognitive outcomes). Furthermore, these objective measures, provide an indication about the severity of the shocks under study. The findings indicate that in certain contexts (e.g. in the Ethiopian and the Vietnamese cases) these shocks may be affecting children's nutrition at a key stage in their development (from around ages 4 to 8). With this premise I now examine the response of the non-cognitive measures to these shocks.

5.2. Responsiveness of Aspirations to Household Shocks

I run the same household fixed-effects specification as above with the number of shocks as explicative variables, this time using the aspirations measures as dependent variables.

$$non\_cognitive_{it} = \alpha_i + \beta \cdot S_{it} + X_i + \varepsilon_{it} \qquad (2)$$

The results for the naïve and the improved constructs are presented in Table 4.2. Notice that the results are presented for the four countries, however, focus should mainly be placed on Ethiopia and Vietnam since these are the countries for which the objective measures of economic wellbeing reacted to the shocks as expected. Overall, aspirations appear to respond less to shocks than the child development outcomes. Indeed, in Ethiopia there is no evidence of a negative association between the change in the number of shocks and the change in households' prospects about upward mobility or the human capital development of their offspring. For Vietnam, there is some movement of the aspirations measures detected. In particular, Future Ladder position responds negatively to natural disasters and economic shocks (though the coefficient is only statistically significant in the former case). Economic shocks are also negatively and significantly associated to the prospect of upward mobility as measured by the distance between the current and future aspired ladder position (column 2). This negative significant relationship is also observed for the improved construct capturing Mobility. In this case the improved measure (Factor 2) consistently detects the negative association for all the types of shocks. Notice however that Factor 1, presents the counterintuitive positive significant coefficient, driven by the educational aspiration measure.

With respect to the two remaining countries, there are no significant correlations detected in Peru while India presents the expected negative association of shocks to human capital aspirations vis-à-vis a contradicting positive association to upward mobility aspirations. In any event, the interpretation of these latter results is less clear since

the objective reference outcomes examined in the previous section did not present the standard negative correlation to the shocks.

More broadly, these findings do not suggest a distinct negative reaction of aspirations to shocks. Accounting for the characteristics that remain stable over time, the results do not indicate there is a high degree of malleability of the household members' elicited outlook for the future. However, it is worth noting that the low level of responsiveness should not readily be interpreted as lack of malleability altogether. As mentioned before the fixed-effects specification and the survey design, focusing on poor areas, limit to some extent the variance utilized for the estimates.

5.3. Responsiveness of Psychosocial measures to Household Shocks

The results for the same specification, now using the Psychosocial measures as the outcome variables, are presented in Table 4.3. Compared to the Aspirations constructs, the Psychosocial constructs respond more distinctly to the adverse events, in particular in the countries of most relevance, i.e. Ethiopia and Vietnam. In the former case, economic shocks are consistently associated with a fall in households' perception about Inclusion and Trust. The results hold for the naïve as well as the improved constructs; indeed, the magnitude of the coefficients is enhanced once some of the error in measurement is accounted for through the factor analysis. Self-Esteem also presents the expected negative sign, although there is less precision in the estimate.

In Vietnam, Inclusion, Trust and Self-Esteem consistently correlate negatively to economic shocks. Again, this significant relationship holds both for the naïve and factors estimates. As in the case of Ethiopia, the coefficients are magnified using the improved constructs; for Inclusion and Self-esteem the magnitudes are nearly doubled via the factor analysis. On the other hand, Agency yields overall counterintuitive results presenting positive coefficients across the board and statistical significance in a couple of cases. It is possible that this is due to the reduced quality in the measurement of Agency as compared to the other psychosocial categories. As explained in the section on Exploratory Factor Analysis, the Agency categories only included four of the five items intended in the survey due to massive attrition in one of the questions[51].

However, in the broader context aside from Agency, the psychosocial measures do seem to react accordingly to the adverse economic events reported by the households. The strongest result is observed for the Trust construct which presents significant point estimates for all the countries, and slightly higher values for the improved factors. The malleability I detect in these non-cognitive skills, in particular in the case of the psychosocial measures resembles some of the empirical evidence on the significant and persistent impacts of economic shocks on household member's psychological wellbeing as measured using depression scales (Friedman and Thomas, 2008; and Stillman, et al., 2006).

[51] This inferior degree of measurement quality for the Agency construct is also evidenced by the resulting factors from the EFA. Notice for example, there was essentially no resulting factor capturing Agency in India and in the other 3 countries the agency items are scattered across several factors and generally loaded last onto the factor explaining the lowest marginal variance in the data.

To summarize, the aim in this section was to examine the malleability of non-cognitive skills, in particular their response to shocks suffered by the households. Given potential concerns about the data on shocks, since they are self-reported events, I first examined how the shocks under study affect standard, objective indicators of economic wellbeing (i.e. household expenditure and child anthropometrics as indicators of temporary scarcity.) The expected adverse effect of the shocks is most clearly reflected on the households' material wellbeing in the Ethiopian case and to some extent in the Vietnamese case. Therefore, I focus on these two countries when examining the malleability of non-cognitive measures to the shocks. Ultimately, the results do not suggest a distinct negative response of aspirations to shocks. The psychosocial measures however (driven mainly by Trust and Inclusion), do seem to react negatively to the economic shocks. As such, these findings may suggest that certain non-cognitive skills are not fixed traits that characterize individuals permanently, but rather malleable aspects that respond to circumstance, in this case negatively in the face of adversity. These findings are potentially important in particular if compounded with the results in the previous section suggesting some of these skills may be associated to the parental decision-making process about investments in their children.

6. Conclusions

Subjective measures of non-cognitive skills are now widely used and evidence is emerging about their importance in skill formation. However, these measures have mostly only been validated in developed countries. This paper aimed to investigate how informative and malleable these measures are within a poor rural setting, where respondent educational attainment is considerably lower and measurement may be rife with error. To this end, I exploited a rich panel dataset that spanned a decade in time across four developing countries to examine how well a number of non-cognitive skills predicted final outcomes. I focused on parental aspirations and psychosocial wellbeing (as determinants) and parental investments and observed child human capital quality (as dependent variables). Moreover, I followed a measurement-error approach and performed Exploratory Factor Analysis (EFA) to determine whether improving the measurement of the related non-cognitive traits improved their predictive power.

Finally, I investigated whether these non-cognitive measures reacted to shocks suffered by the households in order to determine their degree of malleability. The results suggested there is a still a systematic positive association between the non-cognitive skills and the subsequent child outcomes, detectable even up to 8 years after (this correlation is detected for the psychosocial measures but not for the aspirations measures). However, accounting for measurement error by using the improved factors did not increase significantly the predictive power of the non-cognitive measures. Lastly, certain psychosocial measures (mainly Trust and Inclusion) show some degree of malleability over time and reacted negatively in some cases to the adverse economic events reported by the households.

The evidence about the predictive power contained in these measures is important, in its own right, whether informing further about the decision-making process linked to skill formation at the household level or simply alerting about the potential confounding effect of omitting skills measures. Although the strength of the results is moderate, the evidence on malleability provides some indication that non-cognitive measures indeed are not fixed traits but rather skills which react in some instances to experience.

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Tables

Table 1. Young Lives Survey sample information

		Young Cohort	*Older Cohort*
Sample size per country (Number of 'young lives children')		2,000	1,000
	Year	**Age of child (in years)**	
Wave 1	2002	0.5-1.5	7-8
Wave 2	2006	4.5-5.5	11-12
Wave 3	2009	7.5-8.5	14-15

Table 2.1. Factor loadings: Psychosocial competencies

Ethiopia

Subscale/ Naive category	Question number	Positive or Reverse coded	Factor 1 *Inclusion*	Factor 2 *Trust*	Factor 3 *Self-esteem*	Factor 4 *Agency*	Factor 5 *Residual*
Trust	Q.2.2	P	0,74	0,00	-0,01	0,01	-0,01
Trust	Q.2.1	P	0,72	-0,11	0,11	0,04	-0,10
Inclusion	Q.1.4	P	0,66	-0,10	0,11	0,22	-0,14
Inclusion	Q.1.3	P	0,64	0,09	-0,05	-0,06	0,15
Inclusion	Q.1.2	P	0,50	0,11	-0,05	-0,26	0,29
Inclusion	Q.1.1	P	0,50	0,12	0,00	-0,30	0,16
Trust	Q.2.4	P	-0,05	0,89	0,00	-0,02	-0,06
Trust	Q.2.3	P	-0,04	0,89	-0,04	-0,02	-0,03
Inclusion	Q.1.5	P	0,32	0,53	-0,05	0,06	0,01
Trust	Q.2.5	P	0,18	0,40	0,10	0,21	-0,37
Self-esteem	Q.4.4	P	0,16	-0,15	0,75	0,01	-0,02
Self-esteem	Q.4.3	P	0,04	0,01	0,71	0,15	-0,07
Self-esteem	Q.4.1	P	0,06	0,01	0,62	-0,07	0,03
Self-esteem	Q.4.5	P	-0,17	0,17	0,53	-0,14	0,07
Agency	Q.3.1	P	0,00	-0,03	0,51	-0,43	-0,06
Agency	Q.3.2	P	0,07	-0,05	0,51	-0,49	-0,10
Self-esteem	Q.4.2	**R**	-0,18	0,16	0,50	0,23	0,34
Agency	Q.3.3	**R**	0,08	-0,02	0,09	0,76	0,44
Agency	Q.3.4	**R**	0,04	-0,07	-0,02	0,35	0,83

India

Subscale/ Naive category	Question number	Positive or Reverse coded	Factor 1 *Self-esteem*	Factor 2 *Trust*	Factor 3 *Inclusion*
Self-esteem	Q.4.4	P	0,72	0,08	-0,06
Self-esteem	Q.4.3	P	0,71	-0,02	-0,03
Self-esteem	Q.4.5	P	0,70	0,01	-0,07
Self-esteem	Q.4.1	P	0,69	0,01	0,03
Self-esteem	Q.4.2	**R**	0,66	0,05	-0,04
Agency	Q.3.1	P	0,64	-0,08	0,11
Agency	Q.3.2	P	0,56	-0,15	0,20
Agency	Q.3.4	**R**	0,55	0,00	-0,11
Trust	Q.2.4	P	-0,03	0,89	0,01
Trust	Q.2.3	P	-0,06	0,85	0,05
Trust	Q.2.5	P	0,09	0,75	-0,10
Inclusion	Q.1.5	P	0,01	0,47	0,33
Agency	Q.3.3	**R**	0,30	0,35	-0,03
Trust	Q.2.1	P	-0,12	0,00	0,71
Trust	Q.2.2	P	-0,05	0,04	0,71
Inclusion	Q.1.3	P	-0,04	-0,08	0,68
Inclusion	Q.1.4	P	0,02	0,05	0,61
Inclusion	Q.1.2	P	0,17	-0,01	0,55
Inclusion	Q.1.1	P	0,23	0,06	0,43

Peru

Subscale/ Naive category	Question number	Positive or Reverse coded	Factor 1 *Inclusion*	Factor 2 *Trust*	Factor 3 *Self-esteem*	Factor 4 *Agency*	Factor 5 *Residual*
Inclusion	Q.1.3	P	0,71	-0,07	-0,07	0,20	0,09
Inclusion	Q.1.2	P	0,66	-0,07	0,06	-0,14	0,02
Trust	Q.2.1	P	0,64	0,10	-0,05	0,06	-0,06
Trust	Q.2.2	P	0,56	0,25	0,00	-0,02	-0,02
Inclusion	Q.1.1	P	0,55	-0,11	0,07	-0,21	-0,03
Inclusion	Q.1.4	P	0,55	-0,03	0,00	0,03	-0,02
Trust	Q.2.4	P	0,05	0,80	-0,01	0,01	-0,01
Trust	Q.2.3	P	0,03	0,74	0,04	0,11	0,02
Trust	Q.2.5	P	-0,15	0,68	0,01	-0,12	-0,03
Inclusion	Q.1.5	P	0,35	0,41	0,06	-0,05	0,02
Self-esteem	Q.4.4	P	-0,06	-0,04	0,60	-0,13	0,36
Self-esteem	Q.4.3	P	-0,01	0,07	0,60	0,08	0,14
Self-esteem	Q.4.1	P	0,05	0,10	0,57	-0,07	0,02
Self-esteem	Q.4.2	**R**	0,00	-0,06	0,47	0,35	-0,04
Agency	Q.3.2	P	0,05	-0,11	0,42	-0,06	-0,21
Agency	Q.3.1	P	-0,06	-0,01	0,38	0,05	-0,43
Agency	Q.3.4	**R**	-0,02	0,10	-0,01	0,71	-0,04
Agency	Q.3.3	**R**	0,04	-0,07	0,01	0,69	0,10
Self-esteem	Q.4.5	P	0,01	0,00	0,16	0,05	0,81

Vietnam

Subscale/ Naive category	Question number	Positive or Reverse coded	Factor 1 *Self-esteem*	Factor 2 *Inclusion*	Factor 3 *Trust*	Factor 4 *Agency*
Self-esteem	Q.4.3	P	0,80	-0,04	0,03	0,08
Self-esteem	Q.4.4	P	0,78	0,00	0,03	0,04
Self-esteem	Q.4.5	P	0,72	-0,12	0,08	0,06
Self-esteem	Q.4.1	P	0,72	0,00	0,10	0,06
Agency	Q.3.2	P	0,69	0,04	0,02	0,01
Agency	Q.3.1	P	0,68	0,01	0,04	-0,04
Self-esteem	Q.4.2	**R**	0,59	0,12	-0,11	0,11
Inclusion	Q.1.3	P	-0,07	0,87	-0,02	0,16
Trust	Q.2.2	P	-0,01	0,76	0,04	-0,04
Inclusion	Q.1.4	P	0,01	0,70	0,04	0,20
Trust	Q.2.1	P	0,06	0,64	0,00	-0,06
Inclusion	Q.1.2	P	0,00	0,60	0,03	-0,11
Inclusion	Q.1.1	P	0,11	0,46	0,03	-0,26
Trust	Q.2.4	P	0,15	-0,02	0,73	-0,11
Trust	Q.2.3	P	0,17	0,02	0,67	-0,18
Trust	Q.2.5	P	-0,17	-0,07	0,65	0,24
Inclusion	Q.1.5	P	-0,07	0,31	0,55	-0,03
Agency	Q.3.3	**R**	0,20	0,13	-0,13	0,87
Agency	Q.3.4	**R**	-0,41	-0,14	0,09	0,52

Psychosocial competencies key:			
Subscale/ Naive category	Question number	Positive or **R**everse coded	Complete questions
1. Inclusion	Q.1.1	P	Nearest primary school provides a good quality education for children
	Q.1.2	P	Nearest health facility provides a good quality health service for children
	Q.1.3	P	Local police do their job well
	Q.1.4	P	People in community can affect local government decisions
	Q.1.5	P	Most people in my community are basically honest
2.Trust	Q.2.1	P	I believe the government does what is right for people like me
	Q.2.2	P	I am confident of the ability of government officials to do their job
	Q.2.3	P	I feel I can trust my neighbours to look after my house
	Q.2.4	P	I feel I can trust people to look after my child
	Q.2.5	P	I think it is safe for my child to go out on the street on his/her own
3.Agency	Q.3.1	P	If I try hard I can improve my situation in life
	Q.3.2	P	I like to make plans for my future
	Q.3.3	**R**	I have no choice about which school to send my child to
	Q.3.4	**R**	If my child gets sick I can do little to help him/her get better
	Q.3.5*	**R**	I can do little to help my child do well in school no matter how hard I try
4.Self-Esteem	Q.4.1	P	I feel proud to show my friends or other visitors where I live
	Q.4.2	**R**	I feel ashamed of my clothes
	Q.4.3	P	I feel proud of the job done by the household head
	Q.4.4	P	The job I do makes me feel proud
	Q.4.5	P	I feel proud of my children

* The Agency index originally included 5 questions. However, question Q.3.5. was dropped from index due to the high non-response rate for this question (e.g. over 95% in the Ethiopian case.)

Table 2.2. Factor loadings: Psychosocial and Depression scale items

Ethiopia

Subscale/ Naive category	Question number		Positive or Reverse coded	Factor 1 *Depression 1*	Factor 2 *Depression 2*	Factor 3 *Trust 1*	Factor 4 *Self-esteem*	Factor 5 *Trust 2*	Factor 6 *Depression 3*	Factor 7 *Depression 4*	Factor 8 *Inclusion*	Factor 9 *Agency 1*	Factor 10 *Agency 2*
Depression	Q5.12	decision	**R**	0,77	-0,04	-0,05	0,07	0,03	0,03	-0,18	0,03	-0,07	0,02
Depression	Q5.14	useful	**R**	0,75	-0,04	0,01	-0,04	-0,02	0,01	-0,10	0,06	0,02	0,12
Depression	Q5.16	worth	**R**	0,68	0,05	0,04	-0,01	-0,11	-0,09	0,01	0,00	-0,02	-0,02
Depression	Q5.17	ending	**R**	0,67	0,01	0,03	0,01	-0,07	0,05	-0,05	0,05	-0,07	0,00
Depression	Q5.15	lost	**R**	0,66	0,06	0,03	-0,05	-0,03	-0,03	-0,05	0,04	0,02	0,10
Depression	Q5.10	cry	**R**	0,62	-0,12	-0,02	0,07	0,07	0,00	0,09	-0,07	-0,01	-0,12
Depression	Q5.11	enjoy	**R**	0,60	0,04	-0,01	-0,02	0,12	-0,03	0,08	-0,09	0,03	0,05
Depression	Q5.8	think	**R**	0,46	0,01	-0,01	0,03	0,10	0,20	-0,04	-0,09	0,01	-0,15
Depression	Q5.9	unhappy	**R**	0,46	0,07	-0,01	-0,02	0,07	0,04	0,18	-0,12	0,07	-0,08
Depression	Q5.20	tired	**R**	-0,05	0,87	-0,01	-0,02	-0,05	0,06	0,01	0,08	0,00	-0,02
Depression	Q5.18	alltired	**R**	0,05	0,84	-0,06	-0,01	-0,01	-0,02	-0,03	0,06	0,02	0,01
Depression	Q5.19	stomach	**R**	0,03	0,56	0,02	0,03	0,00	0,29	-0,11	0,00	-0,04	-0,05
Depression	Q5.13	work	**R**	0,24	0,26	0,03	-0,14	0,07	-0,27	0,12	-0,25	0,29	0,04
Trust	Q.2.3		P	0,01	-0,04	0,90	-0,05	-0,02	0,01	0,02	-0,02	0,06	0,05
Trust	Q.2.4		P	0,02	-0,05	0,90	0,00	-0,02	0,01	0,01	-0,05	0,06	0,01
Inclusion	Q.1.5		P	-0,07	0,10	0,52	-0,03	0,19	-0,01	-0,01	0,19	-0,06	0,03
Trust	Q.2.5		P	-0,04	0,03	0,36	0,16	0,25	-0,05	0,03	-0,13	-0,20	-0,28
Self-esteem	Q.4.3		P	-0,01	0,01	0,00	0,73	0,08	0,02	-0,07	-0,11	0,05	-0,07
Self-esteem	Q.4.4		P	-0,04	-0,04	-0,14	0,70	0,18	0,03	0,01	-0,01	0,21	-0,02
Self-esteem	Q.4.1		P	0,00	-0,03	-0,01	0,61	0,01	0,02	0,01	0,08	0,18	-0,02
Self-esteem	Q.4.2		**R**	0,09	0,04	0,08	0,61	-0,21	-0,05	-0,08	0,05	-0,08	0,19
Self-esteem	Q.4.5		P	0,06	0,01	0,11	0,54	-0,24	-0,02	-0,04	0,12	0,18	-0,05
Trust	Q.2.1		P	-0,06	-0,02	0,02	-0,02	0,74	0,09	0,00	0,02	0,16	0,10
Trust	Q.2.2		P	0,07	-0,08	0,07	-0,07	0,71	0,08	-0,07	0,16	0,06	0,10
Inclusion	Q.1.4		P	0,00	0,05	-0,10	0,14	0,63	-0,06	-0,05	0,08	-0,15	-0,12
Depression	Q5.7	digestion	**R**	0,01	0,06	0,03	0,01	0,05	0,76	-0,13	-0,13	0,01	0,07
Depression	Q5.2	poorapp	**R**	0,02	0,00	-0,02	0,01	0,06	0,71	0,10	-0,06	0,04	0,09
Depression	Q5.1	headache	**R**	-0,07	0,09	-0,01	-0,03	0,02	0,57	0,20	-0,02	0,02	0,03
Depression	Q5.5	handshake	**R**	-0,16	-0,03	0,02	-0,10	-0,02	-0,03	0,82	-0,03	0,10	-0,02
Depression	Q5.3	sleep	**R**	0,07	-0,03	-0,01	0,03	-0,04	0,34	0,47	0,10	-0,08	-0,01
Depression	Q5.4	fright	**R**	0,18	0,01	0,05	0,02	-0,16	0,11	0,46	0,15	-0,10	-0,01
Depression	Q5.6	tense	**R**	0,37	-0,02	-0,05	0,01	-0,03	-0,02	0,44	0,10	0,02	-0,04
Inclusion	Q.1.2		P	0,04	0,06	-0,03	0,00	0,09	-0,09	0,00	0,81	0,01	0,01
Inclusion	Q.1.1		P	-0,05	0,09	-0,02	0,00	0,11	-0,06	0,06	0,75	0,07	-0,08
Inclusion	Q.1.3		P	0,08	-0,04	0,06	-0,04	0,42	-0,07	0,01	0,44	-0,02	0,06
Agency	Q.3.2		P	-0,02	-0,01	0,03	0,24	0,11	0,02	0,06	0,03	0,69	0,01
Agency	Q.3.1		P	-0,08	0,04	0,06	0,25	0,02	-0,03	0,08	0,00	0,66	0,08
Agency	Q.3.4		**R**	0,04	-0,04	0,05	-0,02	0,07	0,13	-0,04	-0,03	0,01	0,89
Agency	Q.3.3		**R**	-0,06	0,10	-0,05	0,24	0,15	-0,16	0,24	-0,17	-0,46	0,36

India

Subscale/ Naive category	Question number		Positive or Reverse coded	Factor 1 *Self-esteem*	Factor 2 *Trust*	Factor 3 *Inclusion*	Factor 4 *Depression 1*	Factor 5 *Depression 2*	Factor 6 *Depression 3*	Factor 7 *Depression 4*	Factor 8 *Depression 5*	Factor 9 *Depression 6*	Factor 10 *Depression 7*
Self-esteem	Q.4.1		P	0,74	0,02	0,00	-0,03	-0,02	0,01	0,04	0,03	0,00	-0,07
Self-esteem	Q.4.3		P	0,73	0,02	-0,07	-0,03	-0,04	0,03	0,02	-0,01	0,00	-0,01
Agency	Q.3.1		P	0,72	-0,05	0,09	-0,03	0,12	0,02	-0,02	0,11	-0,04	-0,18
Self-esteem	Q.4.4		P	0,72	0,09	-0,06	0,02	-0,04	-0,01	0,00	0,00	0,01	0,06
Self-esteem	Q.4.5		P	0,70	0,03	-0,08	0,05	-0,06	0,02	-0,03	-0,01	0,06	0,07
Agency	Q.3.2		P	0,62	-0,09	0,20	0,01	0,01	0,04	0,03	0,17	-0,11	-0,22
Self-esteem	Q.4.2		**R**	0,57	0,02	-0,01	0,04	-0,07	-0,03	-0,07	-0,13	0,07	0,28
Agency	Q.3.4		**R**	0,52	-0,06	-0,04	-0,07	0,21	-0,07	-0,11	-0,04	0,00	0,16
Trust	Q.2.4		P	-0,01	0,89	0,02	0,00	0,04	0,00	0,00	0,03	-0,02	-0,01
Trust	Q.2.3		P	-0,04	0,87	0,04	0,00	-0,03	0,01	0,00	0,04	0,00	-0,01
Trust	Q.2.5		P	0,10	0,78	-0,11	-0,02	0,05	0,00	0,03	0,06	-0,07	0,02
Inclusion	Q.1.5		P	0,02	0,51	0,31	0,04	-0,07	0,01	0,01	0,00	0,05	-0,06
Agency	Q.3.3		**R**	0,18	0,31	-0,01	-0,04	0,05	-0,03	0,04	-0,13	-0,01	0,39
Trust	Q.2.2		P	-0,03	0,02	0,72	-0,07	0,07	0,05	-0,04	0,02	-0,06	0,02
Trust	Q.2.1		P	-0,11	0,03	0,71	-0,09	0,22	-0,03	-0,08	0,02	-0,04	-0,05
Inclusion	Q.1.3		P	-0,05	-0,07	0,67	0,08	-0,17	0,03	0,12	-0,05	0,03	0,03
Inclusion	Q.1.4		P	0,04	0,10	0,59	0,14	-0,05	-0,04	-0,11	0,11	0,01	-0,09
Inclusion	Q.1.2		P	0,16	-0,05	0,56	-0,02	-0,09	0,00	0,12	-0,10	0,02	0,13
Inclusion	Q.1.1		P	0,12	0,00	0,47	-0,01	0,00	-0,04	0,00	-0,16	0,08	0,29
Depression	Q5.4	fright	**R**	-0,02	0,00	-0,01	0,76	-0,07	0,05	-0,07	-0,02	0,19	0,09
Depression	Q5.6	tense	**R**	0,05	-0,02	0,00	0,75	0,07	-0,13	-0,07	0,13	0,07	0,04
Depression	Q5.5	handshake	**R**	-0,06	0,03	0,00	0,67	0,10	0,00	-0,10	0,05	0,03	0,10
Depression	Q5.20	tired	**R**	0,04	-0,01	0,02	0,36	0,33	-0,11	0,33	-0,16	-0,16	-0,09
Depression	Q5.18	alltired	**R**	0,00	0,02	0,01	0,07	0,72	-0,06	0,06	-0,10	0,17	-0,02
Depression	Q5.19	stomach	**R**	-0,01	-0,01	0,01	0,18	0,62	0,08	-0,02	-0,11	-0,10	0,10
Depression	Q5.17	ending	**R**	-0,04	0,03	0,01	-0,16	0,52	-0,02	0,04	0,20	0,34	0,13
Depression	Q5.2	poorapp	**R**	0,00	0,00	0,00	-0,10	0,00	0,85	-0,07	0,00	0,01	0,06
Depression	Q5.3	sleep	**R**	0,03	-0,01	0,02	0,00	-0,11	0,78	0,10	0,00	0,09	0,00
Depression	Q5.7	digestion	**R**	-0,03	-0,01	0,07	-0,07	0,28	0,56	-0,09	0,02	0,00	0,14
Depression	Q5.1	headache	**R**	0,07	0,09	-0,09	0,25	0,04	0,48	0,09	-0,12	-0,06	-0,19
Depression	Q5.13	work	**R**	-0,03	0,01	0,01	-0,07	0,03	-0,01	0,82	0,01	0,09	0,01
Depression	Q5.11	enjoy	**R**	-0,01	0,01	-0,02	-0,11	0,03	0,02	0,80	0,13	0,01	0,13
Depression	Q5.8	think	**R**	0,02	0,05	0,00	0,15	-0,10	0,02	-0,04	0,78	-0,06	0,21
Depression	Q5.12	decision	**R**	0,06	0,05	-0,02	-0,04	-0,06	-0,07	0,17	0,70	0,17	0,10
Depression	Q5.16	worth	**R**	-0,01	-0,04	-0,03	0,17	0,08	0,05	0,10	-0,18	0,75	-0,05
Depression	Q5.14	useful	**R**	0,07	-0,03	-0,01	0,08	-0,03	0,04	0,02	0,19	0,69	-0,10
Depression	Q5.15	lost	**R**	-0,03	0,01	0,01	0,18	0,01	-0,06	0,14	0,62	-0,12	
Depression	Q5.10	cry	**R**	-0,05	-0,08	0,01	0,08	0,11	0,11	0,08	0,36	-0,14	0,65
Depression	Q5.9	unhappy	**R**	-0,03	-0,06	0,00	0,38	0,01	0,02	0,08	0,31	-0,10	0,56

Vietnam

Subscale/ Naive category	Question number		Positive or Reverse coded	Factor 1 *Self-esteem*	Factor 2 *Inclusion*	Factor 3 *Depression1*	Factor 4 *Depression2*	Factor 5 *Depression3*	Factor 6 *Depression4*	Factor 7 *Trust*	Factor 8 *Agency*
Self-esteem	Q.4.3		P	0,80	-0,06	0,00	-0,02	-0,03	0,06	0,05	0,10
Self-esteem	Q.4.4		P	0,79	-0,01	-0,05	0,00	0,04	0,04	0,03	0,05
Self-esteem	Q.4.5		P	0,73	-0,12	0,00	0,04	0,00	-0,04	0,07	0,05
Self-esteem	Q.4.1		P	0,70	0,05	0,01	0,01	-0,05	0,04	0,08	0,09
Agency	Q.3.2		P	0,68	0,06	0,02	0,01	0,02	-0,03	0,01	-0,01
Agency	Q.3.1		P	0,65	0,04	-0,02	0,00	0,01	-0,01	0,05	-0,03
Self-esteem	Q.4.2		**R**	0,58	0,10	-0,01	-0,02	0,02	-0,02	-0,08	0,10
Inclusion	Q.1.3		P	-0,02	0,83	0,04	-0,08	0,02	0,00	-0,04	0,12
Trust	Q.2.2		P	-0,01	0,73	-0,04	0,04	0,03	-0,04	0,04	-0,10
Inclusion	Q.1.4		P	0,01	0,70	0,07	-0,01	0,01	-0,02	0,03	0,18
Trust	Q.2.1		P	0,06	0,60	-0,03	0,03	0,05	-0,05	0,03	-0,10
Inclusion	Q.1.2		P	0,04	0,54	-0,01	-0,05	-0,02	0,08	0,02	-0,20
Inclusion	Q.1.1		P	0,13	0,37	-0,02	-0,01	-0,03	0,05	0,04	-0,37
Depression	Q5.8	think	**R**	0,01	-0,07	0,73	-0,01	0,05	-0,09	0,05	-0,02
Depression	Q5.12	decision	**R**	0,02	-0,02	0,72	0,02	0,07	-0,14	0,01	0,03
Depression	Q5.4	fright	**R**	-0,07	0,11	0,66	0,03	-0,20	0,05	-0,05	0,03
Depression	Q5.6	tense	**R**	-0,03	0,07	0,65	0,34	-0,12	-0,11	0,01	0,06
Depression	Q5.9	unhappy	**R**	0,00	0,01	0,61	0,06	0,01	0,08	0,03	0,05
Depression	Q5.11	enjoy	**R**	0,04	-0,10	0,31	-0,09	0,31	0,16	0,00	-0,13
Depression	Q5.20	tired	**R**	0,04	-0,09	0,08	0,75	0,01	-0,01	0,05	-0,04
Depression	Q5.18	alltired	**R**	-0,01	-0,10	-0,02	0,74	0,10	0,02	0,09	-0,11
Depression	Q5.1	headache	**R**	-0,01	0,08	0,05	0,70	0,01	-0,05	-0,08	0,03
Depression	Q5.2	poorapp	**R**	0,02	0,03	0,05	0,52	0,02	0,20	-0,02	0,07
Depression	Q5.3	sleep	**R**	0,00	0,10	0,00	0,44	0,05	0,29	-0,09	0,07
Depression	Q5.5	hndshake	**R**	-0,08	0,00	0,16	0,23	0,06	0,09	0,01	-0,10
Depression	Q5.14	useful	**R**	-0,02	0,06	-0,06	0,06	0,83	-0,12	0,02	0,06
Depression	Q5.16	worth	**R**	-0,02	0,11	-0,17	0,09	0,81	-0,11	-0,07	0,10
Depression	Q5.17	ending	**R**	-0,01	-0,05	0,09	0,00	0,59	0,01	0,03	-0,05
Depression	Q5.15	lost	**R**	0,03	-0,02	0,11	-0,10	0,56	0,23	-0,02	-0,01
Depression	Q5.13	work	**R**	0,02	-0,08	0,16	0,08	0,53	-0,09	-0,01	-0,10
Depression	Q5.7	digestin	**R**	0,01	-0,01	-0,08	0,01	-0,10	0,83	-0,01	-0,02
Depression	Q5.19	stomach	**R**	0,06	-0,05	-0,13	0,18	-0,07	0,71	-0,01	-0,02
Depression	Q5.10	cry	**R**	-0,05	0,06	0,29	-0,20	0,21	0,40	0,04	0,09
Trust	Q.2.4		P	0,15	-0,03	0,06	0,04	-0,05	-0,04	0,75	-0,10
Trust	Q.2.3		P	0,19	0,01	0,04	-0,01	-0,04	0,00	0,71	-0,13
Trust	Q.2.5		P	-0,21	-0,01	-0,06	0,05	0,03	0,04	0,62	0,26
Inclusion	Q.1.5		P	-0,07	0,34	-0,05	-0,01	0,06	0,02	0,54	-0,01
Agency	Q.3.3		**R**	0,23	0,05	0,07	-0,04	0,06	-0,01	-0,12	0,79
Agency	Q.3.4		**R**	-0,42	-0,14	-0,02	-0,03	0,01	0,02	0,08	0,50

Psychosocial items and Depression scale key:			
Subscale/ Naive category	Question number	Positive or **R**everse coded	Complete questions
1. Inclusion	Q.1.1	P	Nearest primary school provides a good quality education for children
	Q.1.2	P	Nearest health facility provides a good quality health service for children
	Q.1.3	P	Local police do their job well
	Q.1.4	P	People in community can affect local government decisions
	Q.1.5	P	Most people in my community are basically honest
2.Trust	Q.2.1	P	I believe the government does what is right for people like me
	Q.2.2	P	I am confident of the ability of government officials to do their job
	Q.2.3	P	I feel I can trust my neighbours to look after my house
	Q.2.4	P	I feel I can trust people to look after my child
	Q.2.5	P	I think it is safe for my child to go out on the street on his/her own
3.Agency	Q.3.1	P	If I try hard I can improve my situation in life
	Q.3.2	P	I like to make plans for my future
	Q.3.3	**R**	I have no choice about which school to send my child to
	Q.3.4	**R**	If my child gets sick I can do little to help him/her get better
	Q.3.5*	**R**	I can do little to help my child do well in school no matter how hard I try
4.Self-Esteem	Q.4.1	P	I feel proud to show my friends or other visitors where I live
	Q.4.2	**R**	I feel ashamed of my clothes
	Q.4.3	P	I feel proud of the job done by the household head
	Q.4.4	P	The job I do makes me feel proud
	Q.4.5	P	I feel proud of my children
5. Depression	Q.5.1	**R**	did you often have headaches
	Q.5.2	**R**	was your appetite poor
	Q.5.3	**R**	did you sleep badly
	Q.5.4	**R**	were you easily frightened
	Q.5.5	**R**	did your hands shake
	Q.5.6	**R**	did you feel nervous, tense or worried
	Q.5.7	**R**	was your digestion poor
	Q.5.8	**R**	did you have trouble thinking clearly
	Q.5.9	**R**	did you feel unhappy
	Q.5.10	**R**	did you cry more than usual
	Q.5.11	**R**	did you find it difficult to enjoy your daily activities
	Q.5.12	**R**	did you find it difficult to make decisions
	Q.5.13	**R**	did your daily work suffer
	Q.5.14	**R**	were you unable to play a useful part in life
	Q.5.15	**R**	did you lose interest in things
	Q.5.16	**R**	did you feel you were a worthless person
	Q.5.17	**R**	were things so bad that you felt that you just couldn't go
	Q.5.18	**R**	did you feel tired all of the time
	Q.5.19	**R**	did you have uncomfortable feelings in your stomach
	Q.5.20	**R**	were you easily tired

* The Agency index originally included 5 questions. However, question Q.3.5. was dropped from index due to the high non-response rate for this question (e.g. over 95% in the Ethiopian case.)

Note: In the Young Lives Survey all the depression scale items are reverse coded (i.e. all affirmative responses signal the presense of depression symptoms). However, in order to perform the factor analysis the item responses have been reversed so that the scale direction is consistent with the psychosocial items (i.e. a higher factor score indicates both a lower level of depression symptoms and a higher level of psychosocial wellbeing).

Table 2.3. Factor loadings: Aspirations outcomes (All waves)

Ethiopia

Subscale/ Naive category	Varible number	Factor 1 *Mobility*	Factor 2 *Human capital*
Life satisfaction aspiration	V.1.2	0.57	-0.02
Life satisfaction aspiration	V.1.1	0.57	0.02
Educational aspiration	V.2.1	-0.04	0.62
Occupational aspiration	V.3.1	0.04	0.61

India

Subscale/ Naive category	Varible number	Factor 1 *Human capital*	Factor 2 *Mobility*
Occupational aspiration	V.3.1	0.56	-0.02
Educational aspiration	V.2.1	0.55	0.01
Life satisfaction aspiration	V.1.2	-0.08	0.60
Life satisfaction aspiration	V.1.1	0.10	0.54

Peru

Subscale/ Naive category	Varible number	Factor 1 *Human capital*	Factor 2 *Mobility*
Occupational aspiration	V.3.1	0.58	-0.03
Educational aspiration	V.2.1	0.57	0.03
Life satisfaction aspiration	V.1.2	-0.03	0.61
Life satisfaction aspiration	V.1.1	0.03	0.59

Vietnam

Subscale/ Naive category	Varible number	Factor 1 *Human capital*	Factor 2 *Mobility*
Educational aspiration	V.2.1	0.92	-0.03
Occupational aspiration	V.3.1	0.91	0.01
Life satisfaction aspiration	V.1.2	-0.15	0.89
Life satisfaction aspiration	V.1.1	0.19	0.79

Aspirations outcomes key:

Subscale/ Naive category	Question number	Positive or **R**everse coded	Variable labels
1. Life satisfaction aspiration	V.1.1	P	Future ladder position (4 years from now)
2. Life satisfaction aspiration	V.1.2	P	Difference between current and future ladder position
3. Educational aspiration	V.2.1	P	Aspired education for child
4. Occupational aspiration	V.3.1	P	Aspired occupation for child at age 25 (9 categories)

Table 2.4. Internal consistency test for each Psychosocial and Aspirations measure: Cronbach's Alpha

		Wave 2*		Wave 3	Wave 4**
	Cronbach's Alpha	*Naive constructs*	*Corrected constructs (Acquiescence bias)*	*Naive constructs*	*Naive constructs*
ETHIOPIA	**Psychosocial (all categories)**	0.79	0.91	0.79	0.68
	Inclusion	0.69	0.85	0.67	-
	Trust	0.70	0.84	0.69	-
	Agency	0.31	0.42	0.41	0.55
	Self-esteem	0.59	0.72	0.71	0.69
	Aspirations (all categories)	0.46	-	0.30	0.47
INDIA	**Psychosocial**	0.76	0.89	0.78	0.57
	Inclusion	0.62	0.79	0.60	-
	Trust	0.65	0.80	0.70	-
	Agency	0.46	0.37	0.58	0.48
	Self-esteem	0.58	0.71	0.76	0.55
	Aspirations	0.67	-	0.59	0.50
PERU	**Psychosocial**	0.65	0.87	0.68	0.58
	Inclusion	0.62	0.74	0.60	-
	Trust	0.67	0.78	0.70	-
	Agency	0.15	0.40	0.58	0.33
	Self-esteem	0.37	0.69	0.76	0.54
	Aspirations	0.49	-	0.55	0.49
VIETNAM	**Psychosocial**	0.76	0.92	0.79	0.62
	Inclusion	0.61	0.82	0.65	-
	Trust	0.59	0.82	0.65	-
	Agency	0.48	0.56	0.48	0.37
	Self-esteem	0.67	0.79	0.74	0.60
	Aspirations	0.46	-	0.61	0.49

	Cronbach's Alpha	*Naive constructs*
Mean values /1	**Psychosocial**	0.75
	Inclusion	0.63
	Trust	0.67
	Agency	0.43
	Self-esteem	0.65
	Aspirations	0.50

Notes:

* For Wave 2 it is possible to compare the Cronbach's Alphas for Naive constructs versus the Corrected Constructs, after accounting for Aqcuiescence bias (following Rammstedt et al. 2018). The bias correction is only performed for Wave 2 since the survey questionnaires in the other two waves do not include sufficient reverse-coded items (i.e. only 1 out of the 20 psychosocial items is reverse coded in Waves 3 and 4).

** Unfortunately, the results for the psychosocial measures in Wave 4 are not entirely comparable to the other 2 waves due to differences in the questionnaire in the final wave. The module asking about psychosocial competencies in Wave 4 did not include the complete set of 20 items included in the previous waves (i.e. 5 items for each of the 4 subcategories- Inclusion, Trust, Agency, Self-Esteem). In comtrast, the abridged version of module only included in all 7 items (i.e. 3 items for Agency and 4 items for the Self-Esteem category).

1/ The mean values for the psychosocial measures are calculated as a the simple average across the 4 countries for the two comparable waves (2 and 3). In the case of the Aspirations measure the mean values are the simple average across the 4 countries for the 3 waves (i.e. Waves 2, 3 and 4).

Table 3.1 Correlation between Investment in Child human capital and Parental Non-cognitive skills

*Psychosocial and Depression items**

ETHIOPIA

NAIVE CONSTRUCTS

Dependent variable: *Child outcomes (at age 7.5-8.5 yrs old) or household outcomes in wave 3*

	(1) Highest grade achieved (child)	(2) PPVT std. score (child)	(3) Change in PPVT std. score (child)	(4) Literate (child)	(5) Hours spent in school (child)	(6) Change in Hours spent in school (child)	(7) Absenteeism (> week in last month) (child)	(8) Change in Propotion of Spending on School (hh)	(9) Change in Propotion of Spending on Health (hh)
Explicative varible: *Caregiver's non-cognitive skills in wave 2 (child's age: 4.5-5.5 yrs old)*									
Inclusion	0.14**	-2.03	-0.31	-0.02	-0.32	0.05	-0.05	-0.00	0.01
	(0.06)	(2.22)	(2.68)	(0.03)	(0.19)	(0.28)	(0.03)	(0.01)	(0.01)
Agency	-0.03	0.52	0.34	0.00	0.44***	0.21	-0.02	-0.02	0.00
	(0.05)	(2.02)	(2.44)	(0.03)	(0.15)	(0.28)	(0.02)	(0.01)	(0.01)
Trust	-0.07*	-4.34**	-3.48**	-0.06*	-0.36**	0.62**	0.01	0.01	0.01
	(0.04)	(1.60)	(1.59)	(0.03)	(0.16)	(0.23)	(0.02)	(0.01)	(0.01)
Self-esteem	0.17***	1.72	-0.02	0.02	0.11	-0.21	0.04**	-0.01	-0.01
	(0.06)	(1.55)	(2.05)	(0.02)	(0.21)	(0.16)	(0.02)	(0.01)	(0.01)
Depression (at baseline)	-0.06	-0.75	-0.31	-0.00	0.10	0.24	-0.03	0.02*	-0.02*
	(0.06)	(1.48)	(1.54)	(0.02)	(0.20)	(0.20)	(0.03)	(0.01)	(0.01)
Observations	1,375	1,353	1,316	1,369	1,374	934	963	1,373	1,373
R-squared	0.02	0.02	0.00	0.01	0.02	0.02	0.01	0.01	0.00
Adjusted R-squared	0.0198	0.0157	0.00100	0.0104	0.0209	0.0143	0.00153	0.00335	0.000215
Controls	N	N	N	N	N	N	N	N	N
R-squared values for other specifications									
Psychosocial and depression items and controls									
R-squared	0.10	0.12	0.02	0.19	0.22	0.16	0.03	0.02	0.02
Adjusted R-squared	0.0897	0.115	0.0107	0.179	0.215	0.143	0.0146	0.0113	0.0130
Controls only									
R-squared	0.07	0.12	0.02	0.19	0.22	0.15	0.03	0.02	0.02
Adjusted R-squared	0.0614	0.116	0.0118	0.182	0.213	0.141	0.0148	0.00833	0.0133

FACTORS (IMPROVED CONSTRUCTS) for Psychosocial and Depression items together

Dependent variable: *Child outcomes (at age 7.5-8.5 yrs old) or household outcomes in wave 3*

	(1) Highest grade achieved (child)	(2) PPVT std. score (child)	(3) Change in PPVT std. score (child)	(4) Literate (child)	(5) Hours spent in school (child)	(6) Change in Hours spent in school (child)	(7) Absenteeism (> week in last month) (child)	(8) Change in Propotion of Spending on School (hh)	(9) Change in Propotion of Spending on Health (hh)
Explicative varible: *Caregiver's non-cognitive skills in wave 2 (child's age: 4.5-5.5 yrs old)*									
Factor 1: Depression 1	-0.02	-0.35	0.38	-0.02	-0.14	0.22	-0.04**	0.01	-0.00
	(0.03)	(1.02)	(1.13)	(0.01)	(0.11)	(0.17)	(0.02)	(0.01)	(0.00)
Factor 2: Depression 2	-0.07*	0.06	-1.04	-0.02	-0.02	0.00	0.03***	0.00	-0.01**
	(0.04)	(0.82)	(0.74)	(0.01)	(0.13)	(0.15)	(0.01)	(0.00)	(0.01)
Factor 3: Trust 1	-0.00	-2.32**	-1.36	-0.00	-0.03	0.11	-0.00	0.00	-0.01
	(0.02)	(0.99)	(1.04)	(0.01)	(0.09)	(0.11)	(0.01)	(0.01)	(0.01)
Factor 4: Self-esteem	0.08**	0.86	0.53	0.01	0.05	0.07	0.01	-0.01**	-0.01
	(0.03)	(0.90)	(1.27)	(0.01)	(0.14)	(0.10)	(0.01)	(0.01)	(0.01)
Factor 5: Trust 2	-0.06*	-1.12	-0.51	-0.05**	-0.33***	0.30***	0.01	0.01	0.01**
	(0.03)	(0.71)	(0.80)	(0.02)	(0.09)	(0.10)	(0.01)	(0.00)	(0.00)
Factor 6: Depression 3	0.06**	1.29	0.61	0.04**	0.20	-0.13	0.00	0.00	-0.00
	(0.02)	(0.94)	(0.62)	(0.02)	(0.14)	(0.14)	(0.02)	(0.01)	(0.01)
Factor 7: Depression 4	-0.02	-0.24	-0.57	0.01	0.14	0.02	-0.01	0.00	-0.00
	(0.03)	(0.94)	(1.20)	(0.01)	(0.11)	(0.11)	(0.02)	(0.00)	(0.00)
Factor 8: Inclusion	0.12***	-0.92	-1.66	0.01	0.04	-0.04	-0.02	-0.00	0.00
	(0.03)	(1.10)	(1.04)	(0.01)	(0.08)	(0.15)	(0.02)	(0.01)	(0.01)
Factor 9: Agency 1	-0.05	1.62	-1.02	0.00	-0.05	-0.35**	0.05**	0.01*	0.01*
	(0.04)	(1.07)	(1.04)	(0.01)	(0.10)	(0.16)	(0.02)	(0.01)	(0.00)
Factor 10: Agency 2	-0.02	-0.35	-0.62	-0.01	0.22***	0.06	0.00	-0.01	0.00
	(0.02)	(0.80)	(1.08)	(0.01)	(0.07)	(0.10)	(0.01)	(0.01)	(0.00)
Observations	1,375	1,353	1,316	1,369	1,374	934	963	1,373	1,373
R-squared	0.05	0.02	0.01	0.04	0.05	0.04	0.03	0.01	0.01
Adjusted R-squared	0.0457	0.0171	0.000316	0.0300	0.0392	0.0277	0.0182	0.00759	0.00556
Controls	N	N	N	N	N	N	N	N	N
R-squared values for other specifications									
Psychosocial and depression factors and controls									
R-squared	0.12	0.14	0.03	0.20	0.23	0.16	0.05	0.03	0.03
Adjusted R-squared	0.109	0.122	0.0121	0.190	0.222	0.141	0.0297	0.0171	0.0168
Controls only									
R-squared	0.07	0.12	0.02	0.19	0.22	0.15	0.03	0.02	0.02
Adjusted R-squared	0.0614	0.116	0.0118	0.182	0.213	0.141	0.0148	0.00833	0.0133

INDIA

NAIVE CONSTRUCTS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Inclusion	0.07	4.26**	0.38	0.06	0.11	-0.01	-0.02	-0.02	0.04*
	(0.09)	(1.99)	(2.78)	(0.04)	(0.08)	(0.13)	(0.03)	(0.02)	(0.02)
Agency	-0.07	-0.59	1.10	0.11**	0.22***	0.18	-0.00	-0.01	0.03
	(0.05)	(2.26)	(2.57)	(0.04)	(0.07)	(0.18)	(0.03)	(0.01)	(0.02)
Trust	0.03	-1.19	3.49	-0.07**	-0.13	-0.19	-0.02	0.01	0.00
	(0.10)	(2.32)	(3.28)	(0.03)	(0.11)	(0.18)	(0.03)	(0.02)	(0.02)
Self-esteem	0.17*	3.56*	-5.93	0.04	-0.03	0.09	-0.04	0.01	-0.02
	(0.08)	(1.74)	(4.27)	(0.04)	(0.11)	(0.19)	(0.03)	(0.02)	(0.02)
Depression (at baseline)	0.02	4.48**	0.59	0.03	0.07	0.15	-0.02	-0.01	0.02
	(0.09)	(1.81)	(2.40)	(0.04)	(0.10)	(0.15)	(0.03)	(0.02)	(0.03)
Observations	957	967	934	970	970	797	962	980	980
R-squared	0.01	0.01	0.00	0.02	0.02	0.01	0.01	0.00	0.01
Adjusted R-squared	0.00502	0.00819	-0.00164	0.0121	0.0136	0.00219	0.00110	-0.000941	0.00509
Controls	N	N	N	N	N	N	N	N	N
R-squared values for other specifications									
Psychosocial and depression items and controls									
R-squared	0.05	0.05	0.05	0.10	0.06	0.05	0.03	0.04	0.03
Adjusted R-squared	0.0351	0.0403	0.0398	0.0881	0.0492	0.0303	0.0127	0.0306	0.0119
Controls only									
R-squared	0.04	0.04	0.05	0.09	0.05	0.04	0.02	0.04	0.02
Adjusted R-squared	0.0352	0.0351	0.0421	0.0851	0.0417	0.0281	0.0136	0.0308	0.00620

FACTORS (IMPROVED CONSTRUCTS) for Psychosocial and Depression items together

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Factor 1: Self-esteem	0.06	2.12	-2.10	0.06***	0.07	0.08	-0.04**	0.00	0.01
	(0.06)	(1.57)	(2.36)	(0.02)	(0.08)	(0.10)	(0.02)	(0.01)	(0.01)
Factor 2: Trust	0.01	-0.92	0.09	-0.04*	-0.03	-0.02	0.02	0.00	-0.01
	(0.05)	(1.34)	(1.73)	(0.02)	(0.05)	(0.08)	(0.02)	(0.01)	(0.01)
Factor 3: Inclusion	0.04	1.70**	1.77*	0.02	0.02	-0.05	-0.02	-0.01	0.02***
	(0.04)	(0.64)	(0.98)	(0.02)	(0.03)	(0.08)	(0.01)	(0.01)	(0.01)
Factor 4: Depression 1	-0.06	-0.14	2.21	0.01	0.02	-0.02	-0.01	0.01	0.01
	(0.04)	(1.21)	(2.01)	(0.02)	(0.04)	(0.09)	(0.01)	(0.01)	(0.01)
Factor 5: Depression 2	-0.00	1.65**	-0.51	0.02	0.03	0.04	0.01	-0.01**	0.02*
	(0.02)	(0.62)	(1.63)	(0.02)	(0.03)	(0.07)	(0.01)	(0.01)	(0.01)
Factor 6: Depression 3	0.06*	0.63	-0.07	-0.00	-0.05	0.05	0.01	-0.01	0.01
	(0.04)	(0.69)	(1.38)	(0.02)	(0.04)	(0.05)	(0.01)	(0.01)	(0.01)
Factor 7: Depression 4	0.06**	-0.31	-1.65	0.00	-0.05	-0.08	-0.02	0.00	-0.00
	(0.02)	(1.16)	(1.61)	(0.02)	(0.04)	(0.07)	(0.01)	(0.01)	(0.01)
Factor 8: Depression 5	-0.01	-0.29	-4.42**	0.01	0.02	0.03	-0.00	0.00	-0.01
	(0.04)	(0.79)	(1.71)	(0.02)	(0.04)	(0.07)	(0.01)	(0.01)	(0.01)
Factor 9: Depression 6	-0.01	0.39	3.82*	-0.01	-0.01	0.03	0.01	-0.00	-0.01
	(0.04)	(1.20)	(2.06)	(0.02)	(0.03)	(0.06)	(0.01)	(0.01)	(0.01)
Factor 10: Depression 7	-0.04	0.03	-1.27	-0.00	-0.00	-0.12*	-0.03**	0.01	0.01
	(0.03)	(1.05)	(1.39)	(0.02)	(0.02)	(0.06)	(0.01)	(0.01)	(0.01)
Observations	957	967	934	970	970	797	962	980	980
R-squared	0.02	0.01	0.02	0.02	0.01	0.01	0.03	0.01	0.02
Adjusted R-squared	0.00705	0.00280	0.0114	0.00564	0.000532	0.00232	0.0148	-0.000466	0.00906
Controls	N	N	N	N	N	N	N	N	N
R-squared values for other specifications									
Psychosocial and depression factors and controls									
R-squared	0.05	0.05	0.07	0.10	0.06	0.05	0.05	0.05	0.03
Adjusted R-squared	0.0332	0.0338	0.0463	0.0818	0.0462	0.0313	0.0275	0.0302	0.0138
Controls only									
R-squared	0.04	0.04	0.05	0.09	0.05	0.04	0.02	0.04	0.02
Adjusted R-squared	0.0352	0.0351	0.0421	0.0851	0.0417	0.0281	0.0136	0.0308	0.00620

Table 3.1 Correlation between Investment in Child human capital and Parental Non-cognitive skills (cont.)

*Psychosocial and Depression items**

PERU

NAIVE CONSTRUCTS

	Highest grade achieved (child)	PPVT std. score (child)	Change in PPVT std. score (child)	Literate (child)	Hours spent in school (child)	Change in Hours spent in school (child)	Absenteeism (> week in last month) (child)	Change in Propotion of Spending on School (hh)	Change in Propotion of Spending on Health (hh)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Inclusion	-0.12***	-3.81*	-0.23	-0.08*	-0.06	0.42	-0.03	0.01	-0.01
	(0.03)	(1.92)	(2.50)	(0.04)	(0.08)	(0.27)	(0.27)	(0.01)	(0.01)
Agency	0.13***	-1.70	-4.40	0.15***	0.05	-0.84***	-0.08	-0.04***	0.04**
	(0.04)	(2.00)	(2.63)	(0.04)	(0.07)	(0.18)	(0.45)	(0.01)	(0.01)
Trust	-0.04	4.51*	2.16	-0.04	-0.01	0.01	0.16	0.01	0.01
	(0.03)	(2.17)	(1.83)	(0.04)	(0.07)	(0.30)	(0.25)	(0.02)	(0.01)
Self-esteem	0.20***	-4.59	2.50	0.15**	0.03	-0.15	0.41	0.00	-0.01
	(0.06)	(3.84)	(3.46)	(0.06)	(0.11)	(0.39)	(0.28)	(0.04)	(0.01)
Observations	1,381	1,321	1,283	1,385	1,392	1,392	1,378	1,384	1,384
R-squared	0.04	0.01	0.01	0.04	0.00	0.02	0.00	0.01	0.01
Adjusted R-squared	0.0354	0.00810	0.00393	0.0371	-0.000565	0.0148	-0.00221	0.00385	0.00459
Controls	N	N	N	N	N	N	N	N	N
R-squared values for other specifications									
Psychosocial and depression items and controls									
R-squared	0.08	0.07	0.05	0.15	0.03	0.06	0.02	0.05	0.02
Adjusted R-squared	0.0756	0.0591	0.0349	0.137	0.0210	0.0467	0.00660	0.0362	0.0121
Controls only									
R-squared	0.08	0.06	0.04	0.14	0.03	0.05	0.02	0.04	0.02
Adjusted R-squared	0.0701	0.0551	0.0351	0.137	0.0235	0.0466	0.00841	0.0373	0.0106

FACTORS (IMPROVED CONSTRUCTS) Psychosocial items alone

	Highest grade achieved (child)	PPVT std. score (child)	Change in PPVT std. score (child)	Literate (child)	Hours spent in school (child)	Change in Hours spent in school (child)	Absenteeism (> week in last month) (child)	Change in Propotion of Spending on School (hh)	Change in Propotion of Spending on Health (hh)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Factor 1: Inclusion	-0.06***	-1.09	0.26	-0.03	-0.01	0.20**	0.09	0.01*	0.00
	(0.01)	(0.83)	(1.03)	(0.02)	(0.04)	(0.09)	(0.19)	(0.01)	(0.01)
Factor 2: Trust	-0.02	1.93*	0.80	-0.03	-0.03	-0.05	-0.00	-0.00	-0.00
	(0.02)	(1.10)	(0.99)	(0.02)	(0.05)	(0.18)	(0.18)	(0.01)	(0.01)
Factor 3: Self-esteem	0.05***	-0.61	0.60	0.03*	0.02	-0.01	0.07	0.00	-0.00
	(0.01)	(1.06)	(0.86)	(0.02)	(0.03)	(0.12)	(0.07)	(0.01)	(0.00)
Factor 4: Agency	0.06***	-1.41*	-2.02**	0.07***	0.01	-0.40***	0.02	-0.01*	0.01***
	(0.01)	(0.72)	(0.75)	(0.02)	(0.03)	(0.11)	(0.14)	(0.01)	(0.00)
Factor 5: Residual	0.00	-0.51	0.03	0.01	-0.02	0.07	-0.00	-0.00	-0.01
	(0.02)	(0.68)	(0.79)	(0.01)	(0.02)	(0.11)	(0.02)	(0.01)	(0.01)
Observations	1,381	1,321	1,283	1,385	1,392	1,392	1,378	1,384	1,384
R-squared	0.04	0.01	0.01	0.05	0.00	0.03	0.00	0.01	0.01
Adjusted R-squared	0.0385	0.00605	0.00575	0.0449	-0.00102	0.0226	-0.00313	0.00363	0.00263
Controls	N	N	N	N	N	N	N	N	N
R-squared values for other specifications									
Psychosocial factors and controls									
R-squared	0.09	0.07	0.05	0.15	0.03	0.06	0.02	0.05	0.02
Adjusted R-squared	0.0755	0.0544	0.0339	0.138	0.0210	0.0518	0.00550	0.0372	0.0105
Controls only									
R-squared	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Adjusted R-squared	0.0279	0.0279	0.0279	0.0279	0.0279	0.0279	0.0279	0.0279	0.0279

VIETNAM

NAIVE CONSTRUCTS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Inclusion	0.02	-1.05	2.75	-0.03	-0.27*	-0.39	0.03	-0.03	-0.02
	(0.04)	(3.04)	(5.56)	(0.03)	(0.13)	(0.38)	(0.02)	(0.02)	(0.02)
Agency	-0.03	6.85**	-9.50	-0.04	0.13	-0.30	0.03	0.12***	-0.03
	(0.09)	(2.87)	(7.40)	(0.05)	(0.31)	(0.61)	(0.02)	(0.04)	(0.02)
Trust	-0.04	3.47	11.70*	-0.08	-0.35**	-0.09	0.00	-0.02	0.01
	(0.05)	(2.48)	(6.62)	(0.05)	(0.14)	(0.39)	(0.02)	(0.03)	(0.03)
Self-esteem	0.12	4.11	-7.71	0.11*	0.39**	-0.53	-0.05**	0.01	0.02
	(0.08)	(2.41)	(5.47)	(0.06)	(0.17)	(0.33)	(0.02)	(0.01)	(0.02)
Depression (at baseline)	-0.05	2.15	-7.22	0.02	-0.12	0.16	-0.01	0.01	0.03
	(0.06)	(2.10)	(5.18)	(0.04)	(0.12)	(0.35)	(0.02)	(0.02)	(0.02)
Observations	884	838	760	884	881	812	879	886	886
R-squared	0.01	0.03	0.02	0.03	0.04	0.02	0.01	0.05	0.01
Adjusted R-squared	0.00397	0.0211	0.0159	0.0239	0.0347	0.0127	0.00419	0.0495	0.00187
Controls	N	N	N	N	N	N	N	N	N
R-squared values for other specifications									
Psychosocial and depression items and controls									
R-squared	0.06	0.10	0.14	0.17	0.27	0.30	0.01	0.07	0.03
Adjusted R-squared	0.0438	0.0839	0.118	0.155	0.255	0.286	-0.00333	0.0558	0.00873
Controls only									
R-squared	0.05	0.08	0.13	0.17	0.26	0.29	0.00	0.02	0.02
Adjusted R-squared	0.0438	0.0673	0.116	0.156	0.255	0.281	-0.00861	0.0130	0.00472

FACTORS (IMPROVED CONSTRUCTS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Factor 1: Self-esteem	0.06	3.01**	-4.74	0.05	0.19	-0.43*	-0.01	0.02**	0.01
	(0.05)	(1.41)	(3.58)	(0.04)	(0.11)	(0.23)	(0.01)	(0.01)	(0.02)
Factor 2: Inclusion	-0.01	-0.11	0.38	-0.03*	-0.02	-0.13	0.01*	-0.01	-0.00
	(0.02)	(0.92)	(2.36)	(0.02)	(0.07)	(0.13)	(0.01)	(0.01)	(0.01)
Factor 3: Depression1	-0.05**	-1.06	-0.25	-0.02	-0.11*	0.36**	-0.02**	-0.00	-0.00
	(0.02)	(0.98)	(2.27)	(0.02)	(0.06)	(0.14)	(0.01)	(0.01)	(0.01)
Factor 4: Depression2	0.04*	1.18	-2.65	0.01	0.04	-0.34***	-0.00	0.01	0.01
	(0.02)	(0.83)	(2.49)	(0.02)	(0.07)	(0.10)	(0.01)	(0.01)	(0.01)
Factor 5: Depression 3	-0.01	0.64	3.16	0.01	0.12**	0.31**	0.01	-0.01	-0.00
	(0.02)	(0.70)	(2.59)	(0.01)	(0.05)	(0.11)	(0.01)	(0.01)	(0.01)
Factor 6: Depression 4	0.02	-0.51	-2.36	0.02*	-0.03	-0.26***	0.01	0.00	0.01
	(0.02)	(0.70)	(2.88)	(0.01)	(0.06)	(0.09)	(0.01)	(0.01)	(0.01)
Factor 7: Trust	0.01	1.25	5.31*	-0.01	-0.25***	-0.12	-0.00	-0.01	-0.00
	(0.02)	(1.22)	(2.82)	(0.02)	(0.06)	(0.21)	(0.01)	(0.01)	(0.01)
Factor 8: Agency	0.05*	2.34	-10.19***	0.03**	0.19*	-0.27	-0.01	0.03**	-0.01
	(0.02)	(1.46)	(2.29)	(0.02)	(0.09)	(0.16)	(0.01)	(0.01)	(0.01)
Observations	884	838	760	884	881	812	879	886	886
R-squared	0.02	0.02	0.05	0.03	0.07	0.07	0.01	0.03	0.01
Adjusted R-squared	0.0105	0.0155	0.0387	0.0240	0.0663	0.0593	0.00533	0.0216	-0.00178
Controls	N	N	N	N	N	N	N	N	N
R-squared values for other specifications									
Psychosocial and depression factors and controls									
R-squared	0.07	0.09	0.15	0.17	0.27	0.32	0.02	0.04	0.03
Adjusted R-squared	0.0456	0.0750	0.128	0.156	0.257	0.302	-0.00275	0.0245	0.00635
Controls only									
R-squared	0.05	0.08	0.13	0.17	0.26	0.29	0.00	0.02	0.02
Adjusted R-squared	0.0438	0.0673	0.116	0.156	0.255	0.281	-0.00861	0.0130	0.00472

Notes: Control variables include: region, urban dummy, householdsize, household head gender, education, age, marital and literacy status.
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
* Note: The depression items for Peru are not available in the Young Lives Survey; thus only the psychosocial measures are presented.

Table 3.2 Correlation between Investment in Child human capital and Parental Non-cognitive skills

Aspirations measures

ETHIOPIA

NAIVE CONSTRUCTS

Dependent variable: *Child outcomes (at age 7.5-8.5 yrs old) or household outcomes in wave 3*

	(1) Highest grade achieved (child)	(2) PPVT std. score (child)	(3) Change in PPVT std. score (child)	(4) Literate (child)	(5) Hours spent in school (child)	(6) Change in Hours spent in school (child)	(7) Absenteeism (> week in last month) (child)	(8) Change in Propotion of Spending on School (hh)	(9) Change in Propotion of Spending on Health (hh)
Explicative varible: *Caregiver's non-cognitive skills in wave 2 (child's age: 4.5-5.5 yrs old)*									
Future Ladder position	0.02	0.01	-0.35	-0.01	0.01	0.05	-0.01	-0.00	0.00
	(0.02)	(0.34)	(0.45)	(0.01)	(0.07)	(0.07)	(0.01)	(0.00)	(0.00)
Distance between Current and Future Ladder	-0.01	-0.06	0.76	0.01	0.02	-0.06	0.01	0.00	-0.00
	(0.02)	(0.63)	(1.16)	(0.01)	(0.10)	(0.09)	(0.01)	(0.01)	(0.00)
Educational aspiration	0.03	1.34*	0.79	0.01	0.18***	-0.09	-0.02***	0.00*	-0.00
	(0.02)	(0.74)	(0.60)	(0.01)	(0.06)	(0.09)	(0.01)	(0.00)	(0.00)
Occupational aspiration	-0.01	-0.02	-0.66**	0.01	0.06**	0.04*	0.00	-0.00	-0.00
	(0.01)	(0.30)	(0.30)	(0.00)	(0.03)	(0.02)	(0.01)	(0.00)	(0.00)
Observations	1,600	1,576	1,538	1,595	1,599	1,120	1,137	1,598	1,598
R-squared	0.01	0.01	0.00	0.01	0.03	0.00	0.01	0.00	0.00
Adjusted R-squared	0.00310	0.00542	0.00159	0.00334	0.0266	0.000368	0.00411	-0.000675	-0.000226
Controls	N	N	N	N	N	N	N	N	N
R-squared values for other specifications									
Aspirations and controls /1									
R-squared	0.07	0.13	0.03	0.19	0.23	0.16	0.04	0.02	0.02
Adjusted R-squared	0.0651	0.127	0.0200	0.181	0.218	0.148	0.0238	0.00779	0.00882
Controls only									
R-squared	0.07	0.13	0.03	0.19	0.21	0.15	0.03	0.02	0.02
Adjusted R-squared	0.0593	0.128	0.0189	0.181	0.207	0.145	0.0220	0.00897	0.0102

FACTORS (IMPROVED CONSTRUCTS)

Dependent variable: *Child outcomes (at age 7.5-8.5 yrs old) or household outcomes in wave 3*

	(1) Highest grade achieved (child)	(2) PPVT std. score (child)	(3) Change in PPVT std. score (child)	(4) Literate (child)	(5) Hours spent in school (child)	(6) Change in Hours spent in school (child)	(7) Absenteeism (> week in last month) (child)	(8) Change in Propotion of Spending on School (hh)	(9) Change in Propotion of Spending on Health (hh)
Explicative varible: *Caregiver's non-cognitive skills in wave 2 (child's age: 4.5-5.5 yrs old)*									
Factor 1: Mobility	0.02	-0.14	0.14	0.00	0.04	0.04	-0.00	-0.00	0.00
	(0.03)	(0.63)	(1.05)	(0.01)	(0.07)	(0.09)	(0.01)	(0.00)	(0.00)
Factor 2: Human Capital	0.01	1.40	-0.70	0.02	0.34***	0.01	-0.01	0.00	-0.01**
	(0.02)	(1.13)	(0.99)	(0.01)	(0.11)	(0.08)	(0.01)	(0.00)	(0.00)
Observations	1,600	1,576	1,538	1,595	1,599	1,120	1,137	1,598	1,598
R-squared	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00
Adjusted R-squared	0.000202	0.00340	-0.000698	0.00333	0.0266	-0.00164	-0.000124	-0.000985	0.000725
Controls	N	N	N	N	N	N	N	N	N
R-squared values for other specifications									
Aspirations and controls									
R-squared	0.07	0.13	0.03	0.19	0.22	0.16	0.03	0.02	0.02
Adjusted R-squared	0.0605	0.127	0.0194	0.181	0.218	0.147	0.0215	0.00819	0.00982
Controls only									
R-squared	0.07	0.13	0.03	0.19	0.21	0.15	0.03	0.02	0.02
Adjusted R-squared	0.0593	0.128	0.0189	0.181	0.207	0.145	0.0220	0.00897	0.0102

INDIA

NAIVE CONSTRUCTS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Future Ladder position	0.02	0.96	-1.00	0.06***	0.07***	-0.02	-0.01	-0.01**	0.03***
	(0.02)	(0.57)	(1.41)	(0.01)	(0.02)	(0.04)	(0.01)	(0.00)	(0.01)
Distance between Current and Future Ladder position	-0.03	-1.15	-0.46	-0.04**	-0.07**	0.00	0.00	0.01*	-0.03***
	(0.04)	(1.00)	(2.05)	(0.02)	(0.03)	(0.06)	(0.01)	(0.01)	(0.01)
Educational aspiration	0.03	0.41	-0.35	0.02*	-0.03**	-0.11**	-0.02**	-0.00	0.00
	(0.03)	(0.56)	(0.76)	(0.01)	(0.01)	(0.04)	(0.01)	(0.00)	(0.01)
Occupational aspiration	-0.02	0.59*	0.94*	0.01	0.04***	0.03	0.01*	0.00	0.00
	(0.02)	(0.34)	(0.49)	(0.01)	(0.01)	(0.02)	(0.01)	(0.00)	(0.00)
Observations	1,425	1,458	1,399	1,468	1,461	1,202	1,422	1,475	1,475
R-squared	0.00	0.01	0.00	0.07	0.03	0.02	0.01	0.01	0.03
Adjusted R-squared	0.000575	0.00882	0.00131	0.0642	0.0249	0.0137	0.00295	0.00399	0.0249
Controls	N	N	N	N	N	N	N	N	N
R-squared values for other specifications									
Aspirations and controls									
R-squared	0.05	0.03	0.05	0.13	0.05	0.04	0.04	0.05	0.05
Adjusted R-squared	0.0376	0.0167	0.0445	0.125	0.0397	0.0320	0.0325	0.0418	0.0371
Controls only									
R-squared	0.04	0.02	0.05	0.11	0.03	0.03	0.04	0.05	0.03
Adjusted R-squared	0.0384	0.0123	0.0408	0.109	0.0279	0.0244	0.0323	0.0408	0.0207

FACTORS (IMPROVED CONSTRUCTS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Factor 1: Human Capital	0.01	2.92***	1.67	0.11***	0.08**	-0.14**	-0.00	-0.00	0.02**
	(0.03)	(0.94)	(1.59)	(0.02)	(0.03)	(0.06)	(0.01)	(0.01)	(0.01)
Factor 2: Mobility	-0.00	0.29	-1.93	0.04**	0.03	-0.03	-0.01	-0.00	0.02
	(0.03)	(0.99)	(1.93)	(0.02)	(0.03)	(0.05)	(0.01)	(0.01)	(0.01)
Observations	1,425	1,458	1,399	1,468	1,461	1,202	1,422	1,475	1,475
R-squared	0.00	0.01	0.00	0.05	0.01	0.01	0.00	0.00	0.01
Adjusted R-squared	-0.00130	0.00880	0.00146	0.0532	0.0105	0.00767	-0.000485	-0.000717	0.00741
Controls	N	N	N	N	N	N	N	N	N
R-squared values for other specifications									
Aspirations and controls									
R-squared	0.04	0.02	0.05	0.13	0.04	0.04	0.04	0.05	0.03
Adjusted R-squared	0.0371	0.0172	0.0457	0.122	0.0299	0.0265	0.0316	0.0400	0.0222
Controls only									
R-squared	0.04	0.02	0.05	0.11	0.03	0.03	0.04	0.05	0.03
Adjusted R-squared	0.0384	0.0123	0.0408	0.109	0.0279	0.0244	0.0323	0.0408	0.0207

1/ Notes: Control variables include: region, urban dummy, householdsize, household head gender, education, age, marital and literacy status.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3.2 Correlation between Investment in Child human capital and Parental Non-cognitive skills (cont.)

Aspirations measures

PERU

NAIVE CONSTRUCTS									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Future Ladder position	0.02**	-0.13	-1.33**	0.02**	0.07***	-0.01	0.03	-0.00	0.00*
	(0.01)	(0.59)	(0.57)	(0.01)	(0.01)	(0.05)	(0.07)	(0.00)	(0.00)
position	-0.00	-0.91	-0.20	0.00	-0.00	-0.05	-0.23	-0.01	-0.00
	(0.02)	(0.54)	(0.54)	(0.01)	(0.03)	(0.04)	(0.22)	(0.01)	(0.01)
Educational aspiration	0.03***	-1.57**	-0.78	0.03*	-0.01	-0.10**	-0.05	-0.01	0.00
	(0.01)	(0.72)	(0.68)	(0.01)	(0.02)	(0.05)	(0.08)	(0.01)	(0.00)
Occupational aspiration	0.03***	-0.63*	0.05	0.03***	0.02	-0.11***	-0.06	0.00	0.00
	(0.01)	(0.32)	(0.49)	(0.01)	(0.02)	(0.03)	(0.11)	(0.00)	(0.00)
Observations	1,422	1,362	1,325	1,428	1,436	1,436	1,419	1,426	1,426
R-squared	0.04	0.02	0.01	0.04	0.02	0.01	0.00	0.00	0.00
Adjusted R-squared	0.0354	0.0171	0.00984	0.0391	0.0146	0.00903	0.000794	0.000288	0.00139
Controls	N	N	N	N	N	N	N	N	N
R-squared values for other specifications									
Aspirations and controls /1									
R-squared	0.09	0.07	0.04	0.16	0.04	0.06	0.02	0.05	0.02
Adjusted R-squared	0.0838	0.0575	0.0325	0.149	0.0338	0.0474	0.0114	0.0386	0.0129
Controls only									
R-squared	0.08	0.06	0.04	0.15	0.03	0.05	0.02	0.05	0.02
Adjusted R-squared	0.0769	0.0518	0.0315	0.148	0.0262	0.0465	0.00871	0.0405	0.0136

FACTORS (IMPROVED CONSTRUCTS)									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Factor 1: Human Capita	0.10***	-3.38**	-1.20	0.09***	0.03	-0.34***	-0.15	-0.00	0.01**
	(0.02)	(1.35)	(0.90)	(0.02)	(0.03)	(0.09)	(0.22)	(0.01)	(0.00)
Factor 2: Mobility	0.04**	-1.17	-2.32**	0.04***	0.10**	-0.06	-0.18	-0.01	0.01
	(0.02)	(1.03)	(0.93)	(0.01)	(0.04)	(0.10)	(0.13)	(0.01)	(0.01)
Observations	1,422	1,362	1,325	1,428	1,436	1,436	1,419	1,426	1,426
R-squared	0.04	0.02	0.01	0.04	0.01	0.01	0.00	0.00	0.00
Adjusted R-squared	0.0351	0.0173	0.00868	0.0391	0.0105	0.0102	0.000850	0.000688	0.00210
Controls	N	N	N	N	N	N	N	N	N
R-squared values for other specifications									
Aspirations and controls									
R-squared	0.09	0.07	0.04	0.16	0.04	0.06	0.02	0.05	0.02
Adjusted R-squared	0.0845	0.0576	0.0328	0.150	0.0322	0.0482	0.0119	0.0396	0.0134
Controls only									
R-squared	0.08	0.06	0.04	0.15	0.03	0.05	0.02	0.05	0.02
Adjusted R-squared	0.0769	0.0518	0.0315	0.148	0.0262	0.0465	0.00871	0.0405	0.0136

VIETNAM

NAIVE CONSTRUCTS									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Future Ladder position	0.03***	1.55***	-3.23**	0.01	-0.01	-0.27***	0.01	0.02***	0.01
	(0.01)	(0.54)	(1.50)	(0.01)	(0.06)	(0.09)	(0.03)	(0.01)	(0.00)
position	-0.02	-2.02*	9.66***	-0.02	0.02	0.44***	0.03	-0.03***	-0.00
	(0.02)	(0.99)	(1.89)	(0.01)	(0.08)	(0.11)	(0.11)	(0.01)	(0.01)
Educational aspiration	0.06***	-0.71**	-2.10*	0.04***	0.06	-0.22**	0.00	0.01	-0.01*
	(0.02)	(0.33)	(1.06)	(0.01)	(0.04)	(0.08)	(0.01)	(0.00)	(0.00)
Occupational aspiration	0.02	0.89	-3.11***	0.02	0.08*	-0.07	0.04	0.00	0.00
	(0.02)	(0.59)	(1.08)	(0.01)	(0.04)	(0.07)	(0.02)	(0.00)	(0.00)
Observations	1,228	1,152	1,048	1,228	1,223	1,116	1,215	1,230	1,230
R-squared	0.07	0.02	0.05	0.09	0.03	0.06	0.00	0.02	0.00
Adjusted R-squared	0.0657	0.0135	0.0495	0.0890	0.0302	0.0540	-0.00279	0.0213	0.000684
Controls	N	N	N	N	N	N	N	N	N
R-squared values for other specifications									
Aspirations and controls									
R-squared	0.11	0.11	0.15	0.23	0.26	0.30	0.01	0.06	0.02
Adjusted R-squared	0.101	0.102	0.143	0.225	0.250	0.292	-0.00609	0.0485	0.0101
Controls only									
R-squared	0.09	0.11	0.14	0.22	0.25	0.29	0.01	0.04	0.02
Adjusted R-squared	0.0806	0.102	0.133	0.215	0.249	0.283	-0.00312	0.0361	0.00971

FACTORS (IMPROVED CONSTRUCTS)									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Factor 1: Human Capita	0.13**	1.22	-10.27***	0.11***	0.22**	-0.53***	0.07	0.02***	-0.00
	(0.05)	(1.22)	(1.91)	(0.03)	(0.08)	(0.13)	(0.05)	(0.01)	(0.01)
Factor 2: Mobility	0.02	0.53	3.22	-0.01	0.01	0.00	0.04	-0.01	0.01
	(0.01)	(0.51)	(1.89)	(0.01)	(0.04)	(0.10)	(0.05)	(0.01)	(0.01)
Observations	1,228	1,152	1,048	1,228	1,223	1,116	1,215	1,230	1,230
R-squared	0.07	0.00	0.04	0.09	0.03	0.04	0.00	0.01	0.00
Adjusted R-squared	0.0648	0.00315	0.0401	0.0903	0.0306	0.0399	-0.00121	0.0104	-0.000381
Controls	N	N	N	N	N	N	N	N	N
R-squared values for other specifications									
Aspirations and controls									
R-squared	0.11	0.11	0.15	0.23	0.26	0.30	0.01	0.05	0.02
Adjusted R-squared	0.102	0.100	0.140	0.226	0.250	0.289	-0.00464	0.0382	0.00958
Controls only									
R-squared	0.09	0.11	0.14	0.22	0.25	0.29	0.01	0.04	0.02
Adjusted R-squared	0.0806	0.102	0.133	0.215	0.249	0.283	-0.00312	0.0361	0.00971

1/ Notes: Control variables include: region, urban dummy, householdsize, household head gender, education, age, marital and literacy status.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.1. Response of Economic outcomes to Number of Shocks

	Anthropometrics		*Hh Expenditures (log)*		
	Weight for age	Body mass for age	Total expenditure	Food expenditure	Non Food expenditure
ETHIOPIA	(1)	(2)	(3)	(4)	(5)
Economic shocks	-0.09**	-0.14**	0.00	-0.00	0.01
	(0.035)	(0.063)	(0.021)	(0.025)	(0.024)
Natural disasters	-0.06***	-0.11***	-0.02*	-0.03***	0.01
	(0.017)	(0.023)	(0.009)	(0.008)	(0.016)
Aggregate shocks	-0.06***	-0.10***	-0.01	-0.02*	0.01
(econ and nat. disaster)	(0.016)	(0.021)	(0.008)	(0.009)	(0.012)
Observations	2,633	2,633	2,633	2,633	2,633
INDIA	(1)	(2)	(3)	(4)	(5)
Economic shock	0.03	-0.11	0.04	0.01	0.08
	(0.048)	(0.078)	(0.053)	(0.050)	(0.063)
Natural disasters	0.00	0.07	-0.02	-0.01	-0.03
	(0.029)	(0.048)	(0.019)	(0.029)	(0.026)
Observations	1,755	1,755	1,755	1,755	1,755
Aggregate shocks	0.01	0.01	-0.00	-0.00	0.00
(econ and nat. disaster)	(0.018)	(0.030)	(0.017)	(0.020)	(0.022)
Observations	1,755	1,755	1,755	1,755	1,755
PERU	(1)	(2)	(3)	(4)	(5)
Economic shock	-0.01	-0.06	0.00	0.01	-0.01
	(0.032)	(0.061)	(0.019)	(0.019)	(0.031)
Natural disasters	0.00	-0.05	0.04	0.05**	0.03
	(0.019)	(0.029)	(0.025)	(0.021)	(0.039)
Aggregate shocks	-0.00	-0.04	0.02	0.03**	0.02
(econ and nat. disaster	(0.013)	(0.028)	(0.017)	(0.014)	(0.029)
Observations	2,586	2,586	2,586	2,585	2,586
VIETNAM	(1)	(2)	(3)	(4)	(5)
Economic shock	-0.04*	-0.23***	0.08**	0.04	0.15**
	(0.021)	(0.049)	(0.035)	(0.028)	(0.057)
Natural disasters	0.00	-0.01	0.00	0.00	0.01
	(0.005)	(0.013)	(0.006)	(0.005)	(0.008)
Aggregate shocks	-0.00	-0.02	0.01	0.00	0.01
(econ and nat. disaster)	(0.005)	(0.016)	(0.007)	(0.006)	(0.011)
Observations	2,163	2,163	2,163	2,161	2,162

All regressions include household fixed effects. Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4.2. Response of Aspirations measures to Number of shocks

	Naive constructs				*Improved constructs*	
	Future Ladder Position	Distance in Ladder Position	Educational Aspiration	Educational Aspiration	Factor 1 *Mobility*	Factor 2 *Human capital*
ETHIOPIA	(1)	(2)	(3)	(4)	(5)	(6)
Economic shocks	0.20	0.07	-0.03	-0.02	0.10	-0.02
	(0.156)	(0.060)	(0.048)	(0.099)	(0.066)	(0.035)
Natural disasters	0.04	0.05	-0.00	0.06	0.04	0.02
	(0.070)	(0.037)	(0.030)	(0.045)	(0.033)	(0.016)
Aggregate shocks	0.06	0.05*	-0.01	0.04	0.04	0.01
(econ and nat. disaster)	(0.067)	(0.027)	(0.025)	(0.044)	(0.029)	(0.015)
Observations	2,633	2,633	2,633	2,633	2,633	2,633
INDIA	Future Ladder Position	Distance in Ladder Position	Educational Aspiration	Educational Aspiration	Factor 1 *Human capital*	Factor 2 *Mobility*
Economic shock	0.15	-0.01	-0.29*	-0.42	-0.13*	0.04
	(0.166)	(0.121)	(0.160)	(0.258)	(0.069)	(0.108)
Natural disasters	0.09	0.13*	-0.17	0.28	0.02	0.11
	(0.100)	(0.064)	(0.153)	(0.191)	(0.065)	(0.063)
Observations	1,755	1,755	1,755	1,755	1,755	1,755
Aggregate shocks	0.09	0.07	-0.17	0.04	-0.03	0.07
(econ and nat. disaster)	(0.080)	(0.052)	(0.106)	(0.140)	(0.047)	(0.054)
Observations	1,755	1,755	1,755	1,755	1,755	1,755
PERU	Future Ladder Position	Distance in Ladder Position	Educational Aspiration	Educational Aspiration	Factor 1 *Human capital*	Factor 2 *Mobility*
Economic shock	-0.07	0.03	-0.01	0.09	0.02	-0.01
	(0.077)	(0.087)	(0.084)	(0.081)	(0.038)	(0.055)
Natural disasters	0.08	-0.02	0.00	0.10	0.03	0.02
	(0.089)	(0.040)	(0.067)	(0.073)	(0.036)	(0.034)
Aggregate shocks	0.03	-0.00	-0.00	0.08	0.02	0.01
(econ and nat. disaster)	(0.055)	(0.032)	(0.045)	(0.048)	(0.023)	(0.024)
Observations	2,586	2,586	2,586	2,586	2,586	2,586
VIETNAM	Future Ladder Position	Distance in Ladder Position	Educational Aspiration	Educational Aspiration	Factor 1 *Human capital*	Factor 2 *Mobility*
Economic shock	-0.04	-0.11***	0.09*	0.12	0.07**	-0.09*
	(0.084)	(0.036)	(0.041)	(0.072)	(0.027)	(0.049)
Natural disasters	-0.03***	-0.00	0.01	-0.02	-0.00	-0.01**
	(0.011)	(0.008)	(0.017)	(0.044)	(0.018)	(0.005)
Aggregate shocks	-0.03**	-0.00	0.01	-0.01	-0.00	-0.02**
(econ and nat. disaster)	(0.012)	(0.007)	(0.016)	(0.041)	(0.017)	(0.006)
Observations	2,163	2,163	2,163	2,163	2,163	2,163

All regressions include household fixed effects. Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.3. Response of Psychosocial measures to Number of shocks

	Naive constructs				*Improved constructs*				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ETHIOPIA	Inclusion	Agency	Trust	Self-Esteem	Factor 1 *Inclusion*	Factor 2 *Trust*	Factor 3 *Self-Esteem*	Factor 4 *Agency*	Factor 5 *Residual*
Economic shocks	-0.09**	0.01	-0.06*	-0.02	-0.16**	-0.08**	-0.04	0.09	-0.00
	(0.035)	(0.022)	(0.033)	(0.031)	(0.066)	(0.038)	(0.059)	(0.059)	(0.051)
Natural disasters	-0.01	0.02	-0.01	0.00	-0.03	-0.01	0.03	0.01	-0.01
	(0.016)	(0.011)	(0.016)	(0.013)	(0.024)	(0.024)	(0.032)	(0.034)	(0.034)
Aggregate shocks	-0.02	0.01	-0.02	-0.00	-0.05**	-0.02	0.01	0.02	-0.01
(econ and nat. disaster)	(0.015)	(0.011)	(0.014)	(0.012)	(0.023)	(0.020)	(0.029)	(0.030)	(0.029)
Observations	2,633	2,633	2,633	2,633	2,633	2,633	2,633	2,633	-0.00

INDIA	Inclusion	Agency	Trust	Self-Esteem	Factor 1 *Self-Esteem*	Factor 2 *Trust*	Factor 3 *Inclusion*
Economic shock	-0.06	-0.15	-0.14**	-0.11	-0.25	-0.22	-0.14
	(0.077)	(0.102)	(0.060)	(0.111)	(0.204)	(0.153)	(0.113)
Natural disasters	0.05	0.12	0.07	0.11*	0.25*	0.13	0.08
	(0.059)	(0.086)	(0.065)	(0.060)	(0.140)	(0.122)	(0.105)
Observations	1,755	1,755	1,755	1,755	1,755	1,755	1,755
Aggregate shocks	0.01	0.02	0.00	0.03	0.07	0.01	0.01
(econ and nat. disaster)	(0.036)	(0.047)	(0.037)	(0.035)	(0.074)	(0.074)	(0.070)
Observations	1,755	1,755	1,755	1,755	1,755	1,755	1,755

PERU	Inclusion	Agency	Trust	Self-Esteem	Factor 1 *Inclusion*	Factor 2 *Trust*	Factor 3 *Self-Esteem*	Factor 4 *Agency*	Factor 5 *Residual*
Economic shock	-0.04	0.04**	-0.09***	-0.01	-0.11**	-0.13***	0.04	0.05	-0.05
	(0.025)	(0.017)	(0.021)	(0.016)	(0.051)	(0.032)	(0.055)	(0.062)	(0.076)
Natural disasters	-0.01	0.04*	0.00	0.02	-0.02	0.02	0.05	0.10	-0.00
	(0.013)	(0.020)	(0.029)	(0.013)	(0.027)	(0.050)	(0.052)	(0.060)	(0.046)
Aggregate shocks	-0.02	0.03**	-0.02	0.01	-0.04	-0.02	0.04	0.07*	-0.02
(econ and nat. disaster)	(0.012)	(0.014)	(0.020)	(0.009)	(0.028)	(0.031)	(0.031)	(0.041)	(0.038)
Observations	2,586	2,586	2,586	2,586	2,586	2,586	2,586	2,586	2,586

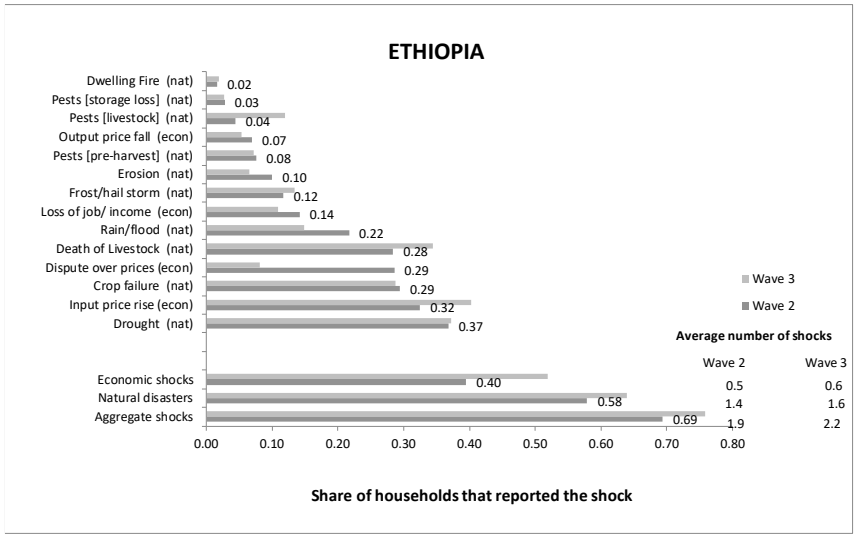
VIETNAM	Inclusion	Agency	Trust	Self-Esteem	Factor 1 *Self-Esteem*	Factor 2 *Inclusion*	Factor 3 *Trust*	Factor 4 *Agency*
Economic shock	-0.21***	0.15***	-0.16***	-0.24***	-0.45***	-0.44***	-0.19**	0.30***
	(0.046)	(0.049)	(0.041)	(0.044)	(0.093)	(0.094)	(0.076)	(0.092)
Natural disasters	-0.00	-0.01	-0.01	-0.00	-0.00	-0.01	-0.01	-0.02
	(0.012)	(0.012)	(0.008)	(0.013)	(0.025)	(0.028)	(0.008)	(0.022)
Aggregate shocks	-0.01	-0.00	-0.01	-0.01	-0.02	-0.03	-0.02	-0.00
(econ and nat. disaster)	(0.016)	(0.015)	(0.011)	(0.017)	(0.033)	(0.035)	(0.012)	(0.027)
Observations	2,163	2,163	2,163	2,163	2,163	2,163	2,163	2,163

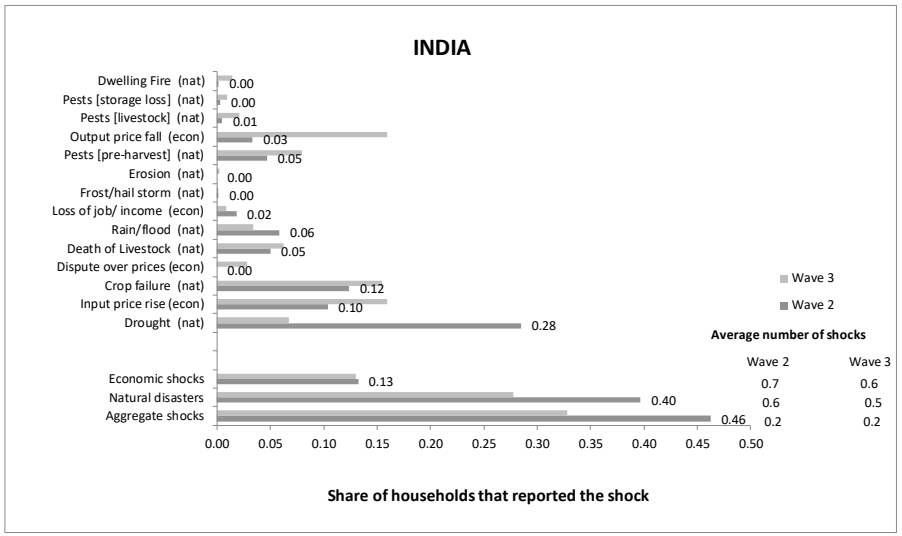
All regressions include household fixed effects. Robust standard errors in parentheses

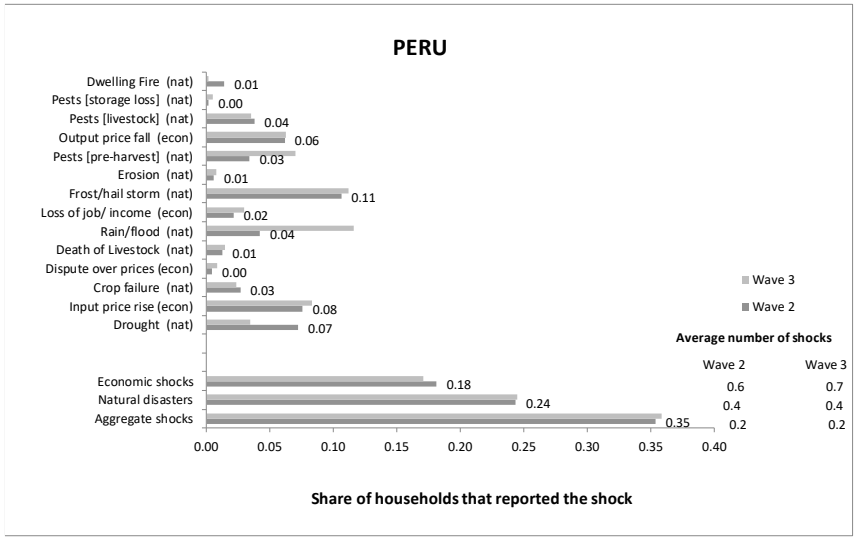
*** p<0.01, ** p<0.05, * p<0.1

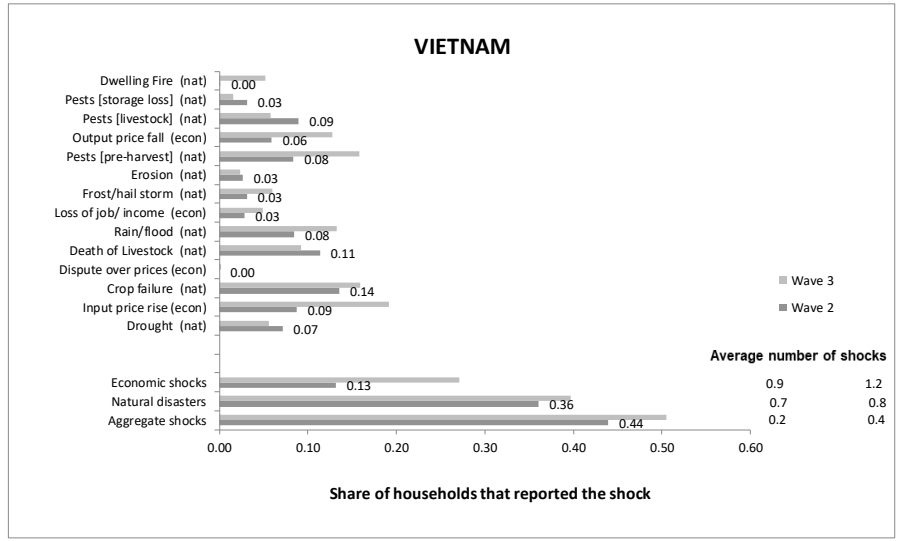
Appendix Figures

Figure A.1. Frequency of Shocks by type of adverse event









Appendix Tables

Table A.1. Caregivers' Occupational aspirations for their child

Answers in Round 3 (2009) to the question:

When NAME is about 20 years old what job do you think s/he will be doing?

	Occupation	Hollingshead score (1-9)*	Ethiopia Frequency	Ethiopia %		India Frequency	India %		Peru Frequency	Peru %		Vietnam Frequency	Vietnam %	
1	**A**ccountant	8	8	0.43		13	0.74		14	0.74		6	0.33	
2	Actor/actress	8	1	0.05		0	0.00		2	0.11		0	0.00	
3	Administrative assistant/secretary	7	6	0.32		3	0.17		22	1.16		0	0.00	
4	Artist	5	2	0.11		2	0.11		9	0.47		1	0.05	
5	**C**ivil servant	5	236	12.74	(4)	47	2.66		0	0.00		29	1.58	
6	Computer operator	6	1	0.05		12	0.68		1	0.05		1	0.05	
7	Conductor	3	1	0.05		5	0.28		0	0.00		0	0.00	
8	Construction worker	2	0	0.00		1	0.06		4	0.21		7	0.38	
9	Cook	6	0	0.00		0	0.00		5	0.26		1	0.05	
10	**D**entist	9	0	0.00		0	0.00		0	0.00		1	0.05	
11	District collector	8	0	0.00		10	0.57		0	0.00		0	0.00	
12	Doctor	9	742	40.04	(1)	123	6.97	(5)	123	6.49	(2)	60	3.27	(4)
13	Domestic worker	1	3	0.16		3	0.17		16	0.84		2	0.11	
14	Driver	3	8	0.43		3	0.17		14	0.74		7	0.38	
15	**E**ngineer	9	75	4.05	(5)	115	6.52		84	4.43	(5)	15	0.82	
16	**F**armer	1	9	0.49		59	3.34		57	3.01		69	3.76	(3)
17	Fireman/woman	4	1	0.05		1	0.06		1	0.05		0	0.00	
18	Fisherman	3	1	0.05		0	0.00		1	0.05		16	0.87	
19	Full-time parent/housewife	1	3	0.16		203	11.50	(3)	11	0.58		4	0.22	
20	**L**abourer	2	0	0.00		22	1.25		18	0.95		52	2.84	(5)
21	Lawyer	9	13	0.70		3	0.17		31	1.64		5	0.27	
22	Lecturer	9	2	0.11		1	0.06		4	0.21		2	0.11	
23	**M**anager	7	0	0.00		0	0.00		8	0.42		0	0.00	
24	Market trader/shop assistant	4	2	0.11		4	0.23		9	0.47		2	0.11	
25	Mason	5	0	0.00		4	0.23		0	0.00		1	0.05	
26	Mechanic	4	5	0.27		8	0.45		27	1.42		7	0.38	
27	Military man/woman	6	0	0.00		5	0.28		7	0.37		17	0.93	
28	**N**urse	8	69	3.72		24	1.36		106	5.59	(3)	4	0.22	
29	**O**ther	-	9	0.49		173	9.80	(4)	31	1.64		29	1.58	
30	**P**ainter/decorator	4	2	0.11		0	0.00		0	0.00		1	0.05	
31	Pilot	8	22	1.19		4	0.23		2	0.11		0	0.00	
32	Policeman/woman	6	3	0.16		45	2.55		53	2.80		20	1.09	
33	Politician	9	3	0.16		1	0.06		1	0.05		0	0.00	
34	President of country	9	11	0.59		0	0.00		0	0.00		0	0.00	
35	**R**eligious leader/priest/sheikh	8	7	0.38		0	0.00		2	0.11		0	0.00	
36	**S**cientist	9	6	0.32		0	0.00		1	0.05		0	0.00	
37	Singer	7	1	0.05		2	0.11		4	0.21		2	0.11	
38	Sportsman/woman	7	1	0.05		0	0.00		6	0.32		0	0.00	
39	Student/University student	8	303	16.35	(2)	463	26.23	(1)	1102	58.12	(1)	1277	69.67	(1)
40	**T**ailor	4	1	0.05		21	1.19		6	0.32		22	1.20	
41	Taxi driver	4	1	0.05		6	0.34		1	0.05		1	0.05	
42	Teachers	7	283	15.27	(3)	359	20.34	(2)	85	4.48	(4)	167	9.11	(2)
43	Trader/Businesssman/woman	7	7	0.38		9	0.51		19	1.00		2	0.11	
44	Traditional occupation	1	0	0.00		9	0.51		0	0.00		3	0.16	
45	**V**eterinary	9	5	0.27		2	0.11		9	0.47		0	0.00	
	Total		1853	100		1765	100		1896	100		1833	100	

Notes: Author's classification according to Hollingshead's (1975) 9-point scale.
The numbers in parethesis next to the percentages indicate the ranking of the (5) most frequent occupations in each country. The shaded cells indicate the most frequent occupation, ranked number (1) in each country.

* **Occupation categories: Score 9-** Higher excecutives, Proprietors of large Businesses, and Major Professionals; **Score 8-** Administrators, Lesser Professionals, Proprietors of Medium-sized Businesses; **Score 7-** Smaller Business Owners, Farm Owners, Managers, Minor Professionals; **Score 6-** Technicians, Semiprofessionals, Small Business Owners; **Score 5-** Clerical and Sales Workers, Small Farm and Business Owners; **Score 4-** Small Business Owners, Skilled Manual Workers, Craftsmen, and Tenant Farmers; **Score 3-** Machine Operators and Semiskilled Workers; **Score 2-** Unskilled Workers; **Score 1-** Farm Laborers/Menial Service Workers.

Table A.2.1. Factor analysis results

Psychosocial items

ETHIOPIA

(1) Factor	(2) Eigenvalue	(3) Difference	(4) Proportion of variance	(5) Cumulative Variance
Factor1	4.7	2.9	0.2	0.2
Factor2	1.8	0.6	0.1	0.3
Factor3	1.2	0.1	0.1	0.4
Factor4	1.2	0.1	0.1	0.5
Factor5	1.1	0.1	0.1	0.5
Factor6	1.0	0.1	0.1	0.6
Factor7	0.9	0.1	0.0	0.6
Factor8	0.8	0.0	0.0	0.7
Factor9	0.8	0.0	0.0	0.7
Factor10	0.7	0.0	0.0	0.7
Factor11	0.7	0.1	0.0	0.8
Factor12	0.6	0.0	0.0	0.8
Factor13	0.6	0.1	0.0	0.8
Factor14	0.6	0.0	0.0	0.9
Factor15	0.5	0.0	0.0	0.9
Factor16	0.5	0.0	0.0	0.9
Factor17	0.5	0.0	0.0	1.0
Factor18	0.5	0.1	0.0	1.0
Factor19	0.3	.	0.0	1.0

INDIA

(1) Factor	(2) Eigenvalue	(3) Difference	(4) Proportion of variance	(5) Cumulative Variance
Factor1	5.6	3.8	0.3	0.3
Factor2	1.8	0.3	0.1	0.4
Factor3	1.5	0.5	0.1	0.5
Factor4	1.0	0.0	0.1	0.5
Factor5	0.9	0.1	0.0	0.6
Factor6	0.9	0.0	0.0	0.6
Factor7	0.8	0.1	0.0	0.7
Factor8	0.7	0.0	0.0	0.7
Factor9	0.7	0.0	0.0	0.7
Factor10	0.6	0.0	0.0	0.8
Factor11	0.6	0.1	0.0	0.8
Factor12	0.6	0.0	0.0	0.8
Factor13	0.6	0.0	0.0	0.9
Factor14	0.5	0.0	0.0	0.9
Factor15	0.5	0.0	0.0	0.9
Factor16	0.5	0.0	0.0	0.9
Factor17	0.5	0.0	0.0	1.0
Factor18	0.5	0.2	0.0	1.0
Factor19	0.3	.	0.0	1.0

PERU

(1) Factor	(2) Eigenvalue	(3) Difference	(4) Proportion of variance	(5) Cumulative Variance
Factor1	3.2	1.6	0.2	0.2
Factor2	1.6	0.3	0.1	0.3
Factor3	1.4	0.2	0.1	0.3
Factor4	1.1	0.1	0.1	0.4
Factor5	1.0	0.1	0.1	0.4
Factor6	1.0	0.0	0.1	0.5
Factor7	0.9	0.0	0.0	0.5
Factor8	0.9	0.0	0.0	0.6
Factor9	0.9	0.0	0.0	0.6
Factor10	0.8	0.0	0.0	0.7
Factor11	0.8	0.0	0.0	0.7
Factor12	0.8	0.0	0.0	0.8
Factor13	0.8	0.0	0.0	0.8
Factor14	0.7	0.0	0.0	0.8
Factor15	0.7	0.1	0.0	0.9
Factor16	0.6	0.1	0.0	0.9
Factor17	0.6	0.0	0.0	0.9
Factor18	0.6	0.1	0.0	1.0
Factor19	0.5	.	0.0	1.0

VIETNAM

(1) Factor	(2) Eigenvalue	(3) Difference	(4) Proportion of variance	(5) Cumulative Variance
Factor1	5.9	3.9	0.3	0.3
Factor2	2.0	0.8	0.1	0.4
Factor3	1.2	0.1	0.1	0.5
Factor4	1.1	0.1	0.1	0.5
Factor5	0.9	0.1	0.0	0.6
Factor6	0.9	0.1	0.0	0.6
Factor7	0.8	0.1	0.0	0.7
Factor8	0.7	0.0	0.0	0.7
Factor9	0.7	0.0	0.0	0.7
Factor10	0.6	0.1	0.0	0.8
Factor11	0.6	0.0	0.0	0.8
Factor12	0.5	0.0	0.0	0.8
Factor13	0.5	0.0	0.0	0.9
Factor14	0.5	0.0	0.0	0.9
Factor15	0.5	0.0	0.0	0.9
Factor16	0.4	0.0	0.0	0.9
Factor17	0.4	0.0	0.0	1.0
Factor18	0.4	0.0	0.0	1.0
Factor19	0.4	.	0.0	1.0

Notes: The shaded rows indicate the retained factors according to the Kaiser rule (ie. eigenvalue above 1.) Thus, the squared cells in column 5 of each table indicate the proportion of the total variance in the data explained by the retained factors (e.g. In the case of Ethiopia, the five retained factors explain half of the total variance [0.5] in the data on Psychocial measures).

Table A.2.2. Factor analysis results

Psychosocial and depression scale items

ETHIOPIA

(1) Factor	(2) Eigenvalue	(3) Difference	(4) Proportion of variance	(5) Cumulative Variance
Factor1	5.68	0.95	0.15	0.15
Factor2	4.72	2.85	0.12	0.27
Factor3	1.88	0.25	0.05	0.31
Factor4	1.63	0.36	0.04	0.36
Factor5	1.27	0.07	0.03	0.39
Factor6	1.20	0.03	0.03	0.42
Factor7	1.17	0.10	0.03	0.45
Factor8	1.07	0.05	0.03	0.48
Factor9	1.02	0.02	0.03	0.50
Factor10	1.01	0.07	0.03	0.53
Factor11	0.94	0.07	0.02	0.55
Factor12	0.87	0.02	0.02	0.58
Factor13	0.86	0.03	0.02	0.60
Factor14	0.82	0.00	0.02	0.62
Factor15	0.82	0.03	0.02	0.64
Factor16	0.79	0.02	0.02	0.66
Factor17	0.77	0.02	0.02	0.68
Factor18	0.74	0.01	0.02	0.70
Factor19	0.73	0.03	0.02	0.72
Factor20	0.70	0.00	0.02	0.74
Factor21	0.70	0.02	0.02	0.75
Factor22	0.68	0.01	0.02	0.77
Factor23	0.67	0.01	0.02	0.79
Factor24	0.66	0.02	0.02	0.81
Factor25	0.63	0.02	0.02	0.82
Factor26	0.61	0.01	0.02	0.84
Factor27	0.60	0.03	0.02	0.85
Factor28	0.57	0.00	0.01	0.87
Factor29	0.57	0.01	0.01	0.88
Factor30	0.56	0.03	0.01	0.90
Factor31	0.52	0.01	0.01	0.91
Factor32	0.51	0.01	0.01	0.92
Factor33	0.50	0.01	0.01	0.94
Factor34	0.49	0.02	0.01	0.95
Factor35	0.47	0.02	0.01	0.96
Factor36	0.45	0.02	0.01	0.97
Factor37	0.43	0.07	0.01	0.98
Factor38	0.36	0.04	0.01	0.99
Factor39	0.31	.	0.01	1.00

INDIA

(1) Factor	(2) Eigenvalue	(3) Difference	(4) Proportion of variance	(5) Cumulative Variance
Factor1	5.86	1.56	0.15	0.15
Factor2	4.30	2.42	0.11	0.26
Factor3	1.88	0.09	0.05	0.31
Factor4	1.79	0.28	0.05	0.35
Factor5	1.50	0.02	0.04	0.39
Factor6	1.48	0.28	0.04	0.43
Factor7	1.20	0.12	0.03	0.46
Factor8	1.09	0.03	0.03	0.49
Factor9	1.05	0.04	0.03	0.52
Factor10	1.01	0.05	0.03	0.54
Factor11	0.96	0.03	0.02	0.57
Factor12	0.94	0.03	0.02	0.59
Factor13	0.90	0.04	0.02	0.61
Factor14	0.86	0.06	0.02	0.64
Factor15	0.80	0.03	0.02	0.66
Factor16	0.78	0.01	0.02	0.68
Factor17	0.76	0.05	0.02	0.70
Factor18	0.71	0.01	0.02	0.72
Factor19	0.71	0.04	0.02	0.73
Factor20	0.67	0.01	0.02	0.75
Factor21	0.66	0.01	0.02	0.77
Factor22	0.65	0.02	0.02	0.78
Factor23	0.63	0.02	0.02	0.80
Factor24	0.61	0.03	0.02	0.82
Factor25	0.58	0.01	0.01	0.83
Factor26	0.57	0.01	0.01	0.85
Factor27	0.56	0.02	0.01	0.86
Factor28	0.55	0.02	0.01	0.87
Factor29	0.53	0.01	0.01	0.89
Factor30	0.52	0.03	0.01	0.90
Factor31	0.49	0.00	0.01	0.91
Factor32	0.49	0.00	0.01	0.93
Factor33	0.49	0.03	0.01	0.94
Factor34	0.46	0.02	0.01	0.95
Factor35	0.44	0.01	0.01	0.96
Factor36	0.43	0.02	0.01	0.97
Factor37	0.41	0.02	0.01	0.98
Factor38	0.40	0.13	0.01	0.99
Factor39	0.26	.	0.01	1.00

VIETNAM

(1) Factor	(2) Eigenvalue	(3) Difference	(4) Proportion of variance	(5) Cumulative Variance
Factor1	6.10	0.79	0.16	0.16
Factor2	5.31	3.29	0.14	0.29
Factor3	2.02	0.22	0.05	0.34
Factor4	1.80	0.55	0.05	0.39
Factor5	1.25	0.10	0.03	0.42
Factor6	1.14	0.07	0.03	0.45
Factor7	1.07	0.03	0.03	0.48
Factor8	1.04	0.06	0.03	0.51
Factor9	0.98	0.05	0.03	0.53
Factor10	0.93	0.03	0.02	0.55
Factor11	0.90	0.01	0.02	0.58
Factor12	0.89	0.05	0.02	0.60
Factor13	0.84	0.03	0.02	0.62
Factor14	0.81	0.01	0.02	0.64
Factor15	0.80	0.04	0.02	0.66
Factor16	0.76	0.02	0.02	0.68
Factor17	0.75	0.03	0.02	0.70
Factor18	0.71	0.01	0.02	0.72
Factor19	0.71	0.03	0.02	0.74
Factor20	0.68	0.03	0.02	0.76
Factor21	0.65	0.01	0.02	0.77
Factor22	0.64	0.01	0.02	0.79
Factor23	0.63	0.03	0.02	0.81
Factor24	0.60	0.03	0.02	0.82
Factor25	0.56	0.01	0.01	0.83
Factor26	0.55	0.02	0.01	0.85
Factor27	0.53	0.01	0.01	0.86
Factor28	0.52	0.01	0.01	0.88
Factor29	0.52	0.01	0.01	0.89
Factor30	0.50	0.01	0.01	0.90
Factor31	0.49	0.01	0.01	0.91
Factor32	0.48	0.02	0.01	0.93
Factor33	0.47	0.02	0.01	0.94
Factor34	0.45	0.03	0.01	0.95
Factor35	0.42	0.01	0.01	0.96
Factor36	0.41	0.02	0.01	0.97
Factor37	0.39	0.03	0.01	0.98
Factor38	0.37	0.03	0.01	0.99
Factor39	0.34	.	0.01	1.00

Notes: The shaded rows indicate the retained factors according to the Kaiser rule (ie. eigenvalue above 1.) Thus, the squared cells in column 5 of each table indicate the proportion of the total variance in the data explained by the retained factors (e.g. In the case of Ethiopia, the ten retained factors explain half of the total variance [0.53] in the data on psychosocial measures and depression).

Table A.2.3. Factor analysis results

Aspirations (4 items)

ETHIOPIA

(1) Factor	(2) Eigenvalue	(3) Difference	(4) Proportion of variance	(5) Cumulative Variance
Factor1	1.53	0.23	0.38	0.38
Factor2	1.30	0.62	0.33	0.71
Factor3	0.68	0.20	0.17	0.88
Factor4	0.48	.	0.12	1.00

INDIA

(1) Factor	(2) Eigenvalue	(3) Difference	(4) Proportion of variance	(5) Cumulative Variance
Factor1	1.87	0.65	0.47	0.47
Factor2	1.22	0.75	0.31	0.77
Factor3	0.47	0.03	0.12	0.89
Factor4	0.44	.	0.11	1.00

PERU

(1) Factor	(2) Eigenvalue	(3) Difference	(4) Proportion of variance	(5) Cumulative Variance
Factor1	1.64	0.39	0.41	0.41
Factor2	1.25	0.63	0.31	0.72
Factor3	0.62	0.14	0.16	0.88
Factor4	0.48	.	0.12	1.00

VIETNAM

(1) Factor	(2) Eigenvalue	(3) Difference	(4) Proportion of variance	(5) Cumulative Variance
Factor1	1.88	0.61	0.47	0.47
Factor2	1.27	0.74	0.32	0.79
Factor3	0.53	0.21	0.13	0.92
Factor4	0.32	.	0.08	1.00

Notes: The shaded rows indicate the retained factors according to the Kaiser rule (ie. eigenvalue above 1.) Thus, the squared cells in column 5 of each table indicate the proportion of the total variance in the data explained by the retained factors (e.g. In the case of Ethiopia, the two retained factors explain eighty percent of the total variance [0.8] in the data on Aspirations).

Table A.2.4. Factor analysis results: Depression scale items

ETHIOPIA

(1) Factor	(2) Eigenvalue	(3) Difference	(4) Proportion of variance	(5) Cumulative Variance
Factor1	5.74	4.11	0.29	0.29
Factor2	1.63	0.49	0.08	0.37
Factor3	1.14	0.14	0.06	0.43
Factor4	1.00	0.03	0.05	0.48
Factor5	0.97	0.11	0.05	0.52
Factor6	0.86	0.04	0.04	0.57
Factor7	0.83	0.05	0.04	0.61
Factor8	0.78	0.02	0.04	0.65
Factor9	0.75	0.04	0.04	0.68
Factor10	0.72	0.03	0.04	0.72
Factor11	0.69	0.03	0.03	0.75
Factor12	0.66	0.02	0.03	0.79
Factor13	0.64	0.03	0.03	0.82
Factor14	0.61	0.02	0.03	0.85
Factor15	0.60	0.02	0.03	0.88
Factor16	0.57	0.05	0.03	0.91
Factor17	0.52	0.01	0.03	0.93
Factor18	0.51	0.07	0.03	0.96
Factor19	0.44	0.08	0.02	0.98
Factor20	0.36	.	0.02	1.00

INDIA

(1) Factor	(2) Eigenvalue	(3) Difference	(4) Proportion of variance	(5) Cumulative Variance
Factor1	4.31	2.48	0.22	0.22
Factor2	1.83	0.39	0.09	0.31
Factor3	1.45	0.28	0.07	0.38
Factor4	1.17	0.08	0.06	0.44
Factor5	1.09	0.07	0.05	0.49
Factor6	1.01	0.08	0.05	0.54
Factor7	0.94	0.08	0.05	0.59
Factor8	0.86	0.04	0.04	0.63
Factor9	0.82	0.07	0.04	0.67
Factor10	0.76	0.05	0.04	0.71
Factor11	0.71	0.05	0.04	0.75
Factor12	0.66	0.03	0.03	0.78
Factor13	0.64	0.03	0.03	0.81
Factor14	0.61	0.02	0.03	0.84
Factor15	0.59	0.02	0.03	0.87
Factor16	0.57	0.03	0.03	0.90
Factor17	0.54	0.04	0.03	0.93
Factor18	0.50	0.03	0.03	0.95
Factor19	0.47	0.01	0.02	0.98
Factor20	0.46	.	0.02	1.00

VIETNAM

(1) Factor	(2) Eigenvalue	(3) Difference	(4) Proportion of variance	(5) Cumulative Variance
Factor1	5.59	3.82	0.28	0.28
Factor2	1.77	0.64	0.09	0.37
Factor3	1.13	0.10	0.06	0.43
Factor4	1.04	0.08	0.05	0.48
Factor5	0.95	0.06	0.05	0.52
Factor6	0.90	0.06	0.04	0.57
Factor7	0.84	0.03	0.04	0.61
Factor8	0.81	0.07	0.04	0.65
Factor9	0.73	0.03	0.04	0.69
Factor10	0.70	0.03	0.04	0.72
Factor11	0.67	0.02	0.03	0.76
Factor12	0.65	0.02	0.03	0.79
Factor13	0.62	0.03	0.03	0.82
Factor14	0.60	0.03	0.03	0.85
Factor15	0.56	0.02	0.03	0.88
Factor16	0.54	0.00	0.03	0.91
Factor17	0.54	0.04	0.03	0.93
Factor18	0.50	0.00	0.03	0.96
Factor19	0.50	0.15	0.02	0.98
Factor20	0.35	.	0.02	1.00

Notes: The shaded rows indicate the retained factors according to the Kaiser rule (ie. eigenvalue above 1.) Thus, the squared cells in column 5 of each table indicate the proportion of the total variance in the data explained by the retained factors (e.g. In the case of Ethiopia, the three retained factors explain forty percent of the total variance [0.43] in the data on depression).

Table A.2.1.1. Factor loadings: Psychosocial competencies (by each separate wave)

Ethiopia (Wave 2)

Subscale/ Naive category	Question number	Positive or Reverse coded	Factor 1 *Trust/ Inclusion*	Factor 2 *Trust*	Factor 3 *Self-esteem*	Factor 4 *Inclusion*	Factor 5 *Agency*
Trust	Q.2.1	P	0.75	0.03	0.12	-0.08	0.00
Trust	Q.2.2	P	0.72	0.04	0.01	0.05	0.02
Inclusion	Q.1.4	P	0.63	-0.07	0.01	0.16	0.00
Inclusion	Q.1.3	P	0.46	-0.01	-0.03	0.45	0.03
Trust	Q.2.3	P	-0.03	0.91	-0.06	-0.03	0.03
Trust	Q.2.4	P	0.00	0.87	0.01	-0.05	-0.01
Inclusion	Q.1.5	P	0.28	0.53	-0.10	0.13	0.05
Trust	Q.2.5	P	0.28	0.31	0.16	-0.03	-0.18
Self-esteem	Q.4.4	P	0.27	-0.11	0.68	-0.10	0.08
Agency	Q.3.2	P	-0.03	0.00	0.64	0.03	-0.16
Self-esteem	Q.4.3	P	0.21	0.01	0.63	-0.18	0.08
Agency	Q.3.1	P	-0.16	0.01	0.62	0.10	-0.09
Self-esteem	Q.4.1	P	0.13	-0.02	0.55	0.01	0.07
Self-esteem	Q.4.5	P	-0.23	0.04	0.51	0.26	0.01
Inclusion	Q.1.2	P	0.03	-0.02	-0.05	0.83	0.05
Inclusion	Q.1.1	P	0.07	-0.03	0.04	0.78	-0.06
Agency	Q.3.4	**R**	-0.02	0.06	-0.02	-0.01	0.76
Agency	Q.3.3	**R**	0.15	-0.12	-0.06	-0.02	0.68
Self-esteem	Q.4.2	**R**	-0.25	0.18	0.22	0.07	0.49

Ethiopia (Wave 3)

Subscale/ Naive category	Question number	Positive or Reverse coded	Factor 1 *Inclusion*	Factor 2 *Trust*	Factor 3 *Self-esteem*	Factor 4 *Agency 1*	Factor 5 *Agency 2*
Inclusion	Q.1.2	P	0.72	0.04	0.06	-0.15	-0.26
Inclusion	Q.1.1	P	0.71	0.04	0.00	-0.06	-0.18
Trust	Q.2.2	P	0.65	0.08	-0.03	0.07	0.05
Trust	Q.2.1	P	0.59	-0.07	-0.05	0.32	0.18
Inclusion	Q.1.3	P	0.54	0.23	0.02	-0.09	-0.07
Inclusion	Q.1.4	P	0.44	-0.12	0.12	0.01	0.40
Trust	Q.2.4	P	0.01	0.88	-0.02	0.05	-0.03
Trust	Q.2.3	P	0.04	0.84	-0.10	0.14	0.04
Inclusion	Q.1.5	P	0.30	0.48	-0.01	0.01	0.09
Trust	Q.2.5	P	0.08	0.38	0.09	-0.18	0.34
Self-esteem	Q.4.2	P	-0.05	-0.01	0.78	-0.16	0.09
Self-esteem	Q.4.3	P	0.03	-0.03	0.69	0.06	0.12
Self-esteem	Q.4.4	P	0.15	-0.21	0.69	0.16	-0.02
Self-esteem	Q.4.1	P	0.07	0.00	0.66	0.07	-0.09
Self-esteem	Q.4.5	P	-0.25	0.29	0.51	0.06	-0.18
Agency	Q.3.1	P	-0.06	0.11	0.04	0.81	-0.02
Agency	Q.3.2	P	0.02	0.07	0.02	0.79	-0.05
Agency	Q.3.4	**R**	0.14	0.04	0.08	-0.04	-0.67
Agency	Q.3.3	**R**	-0.16	0.11	0.11	-0.10	0.61

Ethiopia (Wave 4*)

Subscale/ Naive category	Question number	Positive or Reverse coded	Factor 1 *Self-Esteem*	Factor 2 *Agency*
Self-esteem	Q.4.3	P	0.79	0.01
Self-esteem	Q.4.4	P	0.77	0.07
Self-esteem	Q.4.2	P	0.73	-0.13
Self-esteem	Q.4.5	P	0.58	0.10
Agency	Q.3.1	P	-0.01	0.83
Agency	Q.3.2	P	0.01	0.80

India (Wave 2)

Subscale/ Naive category	Question number	Positive or Reverse coded	Factor 1 *Self-esteem*	Factor 2 *Trust*	Factor 3 *Trust/ Inclusion*	Factor 4 *Inclusion*	Factor 5 *Agency*
Self-esteem	Q.4.4	P	0.73	0.10	-0.08	-0.04	-0.07
Self-esteem	Q.4.5	P	0.68	-0.01	-0.10	-0.04	0.00
Agency	Q.3.1	P	0.61	-0.08	0.06	0.16	0.00
Self-esteem	Q.4.1	P	0.61	0.08	0.01	0.03	-0.02
Self-esteem	Q.4.3	P	0.55	0.04	0.02	0.02	0.14
Agency	Q.3.2	P	0.46	-0.23	0.42	-0.10	-0.06
Trust	Q.2.3	P	-0.03	0.84	0.03	0.00	0.02
Trust	Q.2.4	P	0.04	0.82	-0.04	0.08	0.04
Inclusion	Q.1.5	P	-0.04	0.61	0.31	-0.09	-0.09
Trust	Q.2.5	P	0.25	0.54	-0.11	0.00	-0.04
Trust	Q.2.2	P	-0.07	0.03	0.75	0.00	0.09
Trust	Q.2.1	P	0.03	-0.01	0.70	-0.01	0.07
Inclusion	Q.1.3	P	-0.13	0.01	0.63	0.15	-0.16
Inclusion	Q.1.4	P	0.05	0.08	0.61	0.02	-0.01
Inclusion	Q.1.1	P	-0.02	0.10	-0.03	0.83	0.02
Inclusion	Q.1.2	P	0.06	-0.05	0.12	0.77	0.04
Agency	Q.3.3	**R**	-0.09	0.01	0.01	0.08	0.77
Agency	Q.3.4	**R**	0.04	-0.02	-0.03	0.06	0.75
Self-esteem	Q.4.2	**R**	0.02	0.07	0.12	-0.18	0.57

India (Wave 3)

Subscale/ Naive category	Question number	Positive or Reverse coded	Factor 1 *Self-esteem*	Factor 2 *Inclusion*	Factor 3 *Trust*	Factor 4 *Agency 1*	Factor 5 *Agency 2*
Self-esteem	Q.4.2	**R**	0.72	0.03	-0.10	-0.01	0.01
Self-esteem	Q.4.4	P	0.69	-0.03	0.02	0.13	0.07
Self-esteem	Q.4.3	P	0.69	-0.09	0.05	0.24	0.05
Self-esteem	Q.4.5	P	0.65	-0.03	0.04	0.03	-0.04
Self-esteem	Q.4.1	P	0.52	0.00	0.04	0.40	-0.03
Trust	Q.2.1	P	-0.19	0.69	-0.02	0.05	0.00
Trust	Q.2.2	P	0.05	0.63	0.08	-0.06	-0.03
Inclusion	Q.1.4	P	-0.10	0.60	-0.04	0.27	0.03
Inclusion	Q.1.5	P	-0.19	0.54	0.17	0.24	0.08
Inclusion	Q.1.2	P	0.29	0.51	0.04	-0.06	0.02
Inclusion	Q.1.3	P	0.18	0.50	-0.09	-0.12	0.04
Inclusion	Q.1.1	P	0.33	0.49	-0.04	-0.25	-0.12
Trust	Q.2.4	P	-0.08	0.04	0.87	0.03	-0.03
Trust	Q.2.5	P	0.17	-0.10	0.82	-0.18	0.02
Trust	Q.2.3	P	-0.03	0.10	0.81	0.06	-0.01
Agency	Q.3.1	P	0.13	0.05	-0.05	0.72	-0.12
Agency	Q.3.2	P	0.21	0.01	-0.02	0.70	0.02
Agency	Q.3.3	**R**	0.04	-0.04	-0.01	-0.01	0.88
Agency	Q.3.4	**R**	-0.02	-0.05	0.01	0.09	-0.84

India (Wave 4*)

Subscale/ Naive category	Question number	Positive or Reverse coded	Factor 1 *Self-Esteem*	Factor 2 *Agency*
Self-esteem	Q.4.3	P	0.77	-0.06
Self-esteem	Q.4.4	P	0.72	0.02
Self-esteem	Q.4.2	P	0.65	-0.06
Self-esteem	Q.4.5	P	0.43	0.18
Agency	Q.3.1	P	-0.07	0.84
Agency	Q.3.2	P	0.02	0.78

* **Note:** Unfortunately, the results for the psychosocial measures in Wave 4 are not entirely comparable to the other 2 waves due to differences in the questionnaire in the final wave. The module asking about psychosocial competencies in Wave 4 did not include the complete set of 20 items included in the previous waves (i.e. 5 items for each of the 4 subcategories- Inclusion, Trust, Agency, Self-Esteem). In contrast, the abridged version of module only included in all 7 items (i.e. 3 items for *Agency* and 4 items for the *Self-Esteem* category).

Table A.2.1.1 (continued). Factor loadings: Psychosocial competencies (by each separate wave)

Peru (Wave 2)

Subscale/ Naive category	Question number	Positive or Reverse coded	Factor 1 *Inclusion*	Factor 2 *Trust*	Factor 3 *Agency*	Factor 4 *Self-esteem*	Factor 5 *Residual*
Inclusion	Q.1.3	P	0.73	-0.09	0.19	-0.10	0.08
Inclusion	Q.1.2	P	0.66	-0.06	-0.09	-0.02	0.06
Trust	Q.2.1	P	0.65	0.11	0.05	0.04	-0.11
Trust	Q.2.2	P	0.58	0.23	-0.05	0.04	-0.05
Inclusion	Q.1.4	P	0.58	-0.07	-0.03	0.13	-0.12
Inclusion	Q.1.1	P	0.53	-0.09	-0.17	-0.02	0.05
Trust	Q.2.4	P	0.06	0.77	-0.05	-0.02	-0.02
Trust	Q.2.3	P	0.02	0.76	0.14	0.03	-0.03
Trust	Q.2.5	P	-0.16	0.66	-0.16	-0.02	0.07
Inclusion	Q.1.5	P	0.37	0.39	0.00	0.02	0.01
Agency	Q.3.3	**R**	0.03	-0.04	0.68	-0.14	0.12
Agency	Q.3.4	**R**	0.01	0.06	0.66	0.02	-0.13
Self-esteem	Q.4.2	**R**	-0.04	-0.06	0.52	0.27	-0.03
Self-esteem	Q.4.3	P	0.01	0.06	0.16	0.55	0.24
Self-esteem	Q.4.1	P	0.08	0.12	-0.02	0.54	0.17
Agency	Q.3.2	P	-0.03	-0.07	-0.11	0.52	-0.21
Self-esteem	Q.4.4	P	-0.01	-0.11	-0.10	0.50	0.50
Agency	Q.3.1	P	-0.06	-0.03	-0.01	0.49	-0.28
Self-esteem	Q.4.5	P	-0.03	0.02	0.01	0.03	0.77

Peru (Wave 3)

Subscale/ Naive category	Question number	Positive or Reverse coded	Factor 1 *Trust*	Factor 2 *Trust/ Inclusion*	Factor 3 *Inclusion*	Factor 4 *Self-esteem*	Factor 5 *Residual*
Trust	Q.2.4	P	0.79	0.07	-0.05	0.04	0.01
Trust	Q.2.3	P	0.70	0.16	-0.13	0.08	0.05
Trust	Q.2.5	P	0.69	-0.15	0.01	0.00	-0.02
Inclusion	Q.1.5	P	0.49	0.23	0.16	0.08	-0.06
Inclusion	Q.1.4	P	0.04	0.66	-0.14	-0.08	0.13
Trust	Q.2.1	P	0.08	0.57	0.15	-0.05	-0.13
Trust	Q.2.2	P	0.28	0.56	0.06	0.01	-0.04
Inclusion	Q.1.3	P	-0.08	0.50	0.32	-0.03	0.07
Agency	Q.3.3	**R**	-0.32	0.38	-0.24	0.38	-0.11
Inclusion	Q.1.1	P	-0.06	-0.03	0.81	0.03	-0.06
Inclusion	Q.1.2	P	-0.03	0.08	0.79	0.01	0.05
Self-esteem	Q.4.2	**R**	-0.03	0.04	0.07	0.64	0.05
Self-esteem	Q.4.1	P	0.13	-0.01	0.02	0.59	-0.11
Self-esteem	Q.4.4	P	0.11	-0.12	-0.06	0.57	0.03
Self-esteem	Q.4.3	P	0.11	-0.08	0.02	0.57	0.12
Agency	Q.3.1	P	-0.05	-0.12	0.06	0.42	-0.12
Agency	Q.3.2	P	-0.14	0.04	0.13	0.33	0.17
Agency	Q.3.4	**R**	0.00	-0.05	0.06	0.02	0.72
Self-esteem	Q.4.5	P	0.02	0.08	-0.08	0.02	0.67

Peru (Wave 4*)

Subscale/ Naive category	Question number	Positive or Reverse coded	Factor 1 *Self-Esteem*	Factor 2 *Agency*
Self-esteem	Q.4.2	P	0.83	-0.34
Self-esteem	Q.4.3	P	0.68	0.15
Self-esteem	Q.4.4	P	0.56	0.29
Agency	Q.3.2	P	0.37	0.31
Self-esteem	Q.4.5	P	-0.10	0.79
Agency	Q.3.1	P	-0.06	0.67

Vietnam (Wave 2)

Subscale/ Naive category	Question number	Positive or Reverse coded	Factor 1 *Self-esteem*	Factor 2 *Trust/ Inclusion*	Factor 3 *Trust*	Factor 4 *Inclusion*	Factor 5 *Residual*	Factor 6 *Residual*
Self-esteem	Q.4.4	P	0.78	-0.07	-0.01	0.02	0.01	0.04
Self-esteem	Q.4.3	P	0.76	-0.19	0.06	0.05	0.05	0.12
Self-esteem	Q.4.1	P	0.74	0.05	-0.06	0.03	0.22	-0.03
Agency	Q.3.1	P	0.59	0.11	-0.07	0.04	-0.13	-0.10
Agency	Q.3.2	P	0.57	0.12	-0.02	-0.01	-0.14	-0.07
Self-esteem	Q.4.5	P	0.54	-0.07	0.16	0.03	-0.29	0.01
Trust	Q.2.2	P	-0.07	0.83	0.00	-0.02	0.04	-0.05
Trust	Q.2.1	P	-0.02	0.82	-0.03	-0.12	-0.02	0.04
Inclusion	Q.1.3	P	-0.06	0.60	-0.02	0.26	-0.08	0.07
Inclusion	Q.1.4	P	0.06	0.51	0.06	0.12	-0.14	-0.01
Trust	Q.2.3	P	0.01	-0.05	0.86	0.05	-0.01	0.13
Trust	Q.2.4	P	0.02	-0.01	0.79	-0.02	0.04	0.05
Inclusion	Q.1.5	P	-0.04	0.27	0.51	-0.01	0.27	-0.04
Inclusion	Q.1.2	P	0.01	0.03	0.04	0.79	0.05	-0.01
Inclusion	Q.1.1	P	0.10	-0.06	0.00	0.78	0.01	-0.08
Trust	Q.2.5	P	0.11	-0.01	0.16	-0.07	0.80	-0.34
Agency	Q.3.4	**R**	-0.24	-0.07	-0.11	0.21	0.60	0.21
Agency	Q.3.3	**R**	-0.06	-0.05	0.18	-0.02	-0.22	0.87
Self-esteem	Q.4.2	**R**	0.33	0.20	-0.14	-0.12	0.19	0.54

Vietnam (Wave 3)

Subscale/ Naive category	Question number	Positive or Reverse coded	Factor 1 *Self-esteem*	Factor 2 *Trust/ Inclusion*	Factor 3 *Trust*	Factor 4 *Inclusion*	Factor 5 *Residual*
Self-esteem	Q.4.2	**R**	0.74	0.04	-0.02	-0.04	-0.15
Self-esteem	Q.4.3	P	0.73	0.01	-0.06	0.08	0.02
Self-esteem	Q.4.4	P	0.73	-0.03	-0.02	0.10	-0.08
Self-esteem	Q.4.1	P	0.68	0.00	0.06	-0.08	0.01
Agency	Q.3.3	**R**	0.52	-0.14	-0.17	0.31	-0.02
Agency	Q.3.2	P	0.51	0.17	0.00	-0.20	0.35
Self-esteem	Q.4.5	P	0.45	-0.08	0.08	-0.04	0.38
Trust	Q.2.2	P	0.01	0.81	-0.06	0.01	-0.11
Inclusion	Q.1.4	P	0.05	0.69	-0.08	0.03	-0.02
Trust	Q.2.1	P	-0.03	0.64	0.04	-0.10	0.11
Inclusion	Q.1.3	P	-0.01	0.64	-0.05	0.27	0.05
Trust	Q.2.3	P	-0.05	-0.11	0.91	0.04	0.04
Trust	Q.2.4		0.02	-0.06	0.88	0.02	0.00
Inclusion	Q.1.5	P	-0.06	0.23	0.56	0.05	-0.02
Inclusion	Q.1.1	P	-0.01	-0.01	0.10	0.76	0.09
Inclusion	Q.1.2	P	0.03	0.16	0.00	0.70	0.09
Agency	Q.3.4	**R**	-0.13	-0.02	0.03	0.25	0.68
Trust	Q.2.5	P	0.20	0.12	0.35	0.04	-0.47
Agency	Q.3.1	P	0.40	0.01	0.12	-0.04	0.46

Vietnam (Wave 4*)

Subscale/ Naive category	Question number	Positive or Reverse coded	Factor 1 *Self-Esteem*	Factor 2 *Agency*
Self-esteem	Q.4.4	P	0.82	-0.09
Self-esteem	Q.4.3	P	0.81	-0.14
Self-esteem	Q.4.2	P	0.51	0.17
Self-esteem	Q.4.5	P	0.48	0.12
Agency	Q.3.1	P	-0.21	0.91
Agency	Q.3.2	P	0.21	0.62

* **Note:** Unfortunately, the results for the psychosocial measures in Wave 4 are not entirely comparable to the other 2 waves due to differences in the questionnaire in the final wave. The module asking about psychosocial competencies in Wave 4 did not include the complete set of 20 items included in the previous waves (i.e. 5 items for each of the 4 subcategories- Inclusion, Trust, Agency, Self-Esteem). In contrast, the abridged version of module only included in all 7 items (i.e. 3 items for *Agency* and 4 items for the *Self-Esteem* category).

Table A.2.1.2. Factor loadings: Psychosocial competencies
(Items Corrected for Acquiescence Bias)

Ethiopia (Wave 2)

Subscale/ Naive category	Question number	Positive or **R**everse coded	**Factor 1** *Trust/ Inclusion*	**Factor 2** *Self-esteem*	**Factor 3** *Residual 1*	**Factor 4** *Residual 2*
Trust	Q.2.2	P	0.81	-0.02	0.00	0.11
Inclusion	Q.1.5	P	0.79	-0.01	0.09	0.02
Inclusion	Q.1.3	P	0.77	0.02	-0.04	0.08
Inclusion	Q.1.4	P	0.72	0.01	-0.11	-0.01
Trust	Q.2.1	P	0.71	0.09	-0.06	0.06
Trust	Q.2.3	P	0.66	0.12	0.17	0.03
Trust	Q.2.4	P	0.62	0.19	0.12	0.07
Inclusion	Q.1.2	P	0.60	0.16	0.00	-0.01
Inclusion	Q.1.1	P	0.55	0.28	-0.05	-0.07
Trust	Q.2.5	P	0.48	0.26	-0.05	-0.09
Agency	Q.3.1	P	0.04	0.79	-0.04	-0.06
Agency	Q.3.2	P	0.06	0.75	0.02	-0.03
Self-esteem	Q.4.5	P	0.06	0.71	0.04	-0.03
Self-esteem	Q.4.4	P	0.12	0.68	-0.05	-0.02
Self-esteem	Q.4.3	P	0.09	0.67	-0.03	-0.05
Self-esteem	Q.4.1	P	0.13	0.62	-0.01	0.02
Self-esteem	Q.4.2	**R**	0.21	-0.20	0.85	-0.29
Agency	Q.3.3	**R**	0.23	-0.25	-0.68	-0.33
Agency	Q.3.4	**R**	0.18	-0.14	-0.08	0.93

India (Wave 2)

Subscale/ Naive category	Question number	Positive or **R**everse coded	**Factor 1** *Inclusion*	**Factor 2** *Self-esteem*	**Factor 3** *Trust*	**Factor 4** *Agency*
Trust	Q.2.2	P	0.80	-0.04	0.02	-0.02
Inclusion	Q.1.3	P	0.79	-0.03	-0.05	-0.12
Trust	Q.2.1	P	0.75	0.01	0.00	-0.02
Inclusion	Q.1.4	P	0.64	0.10	0.06	0.03
Inclusion	Q.1.2	P	0.61	0.14	0.03	0.10
Inclusion	Q.1.1	P	0.50	0.11	0.19	0.04
Self-esteem	Q.4.5	P	-0.03	0.73	0.11	-0.07
Self-esteem	Q.4.4	P	-0.07	0.73	0.21	-0.05
Agency	Q.3.1	P	0.18	0.63	0.05	0.01
Self-esteem	Q.4.1	P	0.03	0.59	0.22	-0.08
Self-esteem	Q.4.3	P	0.02	0.56	0.20	0.05
Agency	Q.3.2	P	0.38	0.56	-0.23	0.04
Trust	Q.2.3	P	0.01	0.02	0.86	-0.02
Trust	Q.2.4	P	-0.02	0.12	0.84	0.05
Trust	Q.2.5	P	-0.11	0.36	0.57	0.02
Inclusion	Q.1.5	P	0.26	0.05	0.55	-0.07
Agency	Q.3.3	**R**	0.11	-0.47	0.29	0.64
Agency	Q.3.4	**R**	0.03	0.26	-0.05	0.54
Self-esteem	Q.4.2	**R**	0.18	-0.09	0.21	-0.68

Peru (Wave 2)

Subscale/ Naive category	Question number	Positive or **R**everse coded	**Factor 1** *Inclusion*	**Factor 2** *Self-esteem/ Agency*	**Factor 3** *Trust*	**Factor 4** *Residual 1*	**Factor 5** *Residual 2*
Inclusion	Q.1.4	P	0.73	0.08	-0.12	-0.03	-0.02
Trust	Q.2.1	P	0.71	0.04	0.04	0.10	0.05
Inclusion	Q.1.3	P	0.70	0.18	-0.15	0.08	0.16
Inclusion	Q.1.2	P	0.69	0.09	-0.03	0.06	0.10
Trust	Q.2.2	P	0.68	-0.04	0.18	0.11	0.00
Inclusion	Q.1.1	P	0.56	0.13	0.00	-0.01	0.11
Inclusion	Q.1.5	P	0.40	0.07	0.36	0.09	-0.02
Self-esteem	Q.4.5	P	0.07	0.74	0.08	-0.07	0.02
Self-esteem	Q.4.4	P	0.11	0.72	-0.01	-0.10	-0.10
Self-esteem	Q.4.3	P	0.07	0.70	0.07	-0.06	-0.12
Agency	Q.3.1	P	0.07	0.65	0.06	-0.12	-0.03
Agency	Q.3.3	**R**	0.36	-0.62	0.15	-0.37	-0.46
Agency	Q.3.2	P	0.10	0.64	0.05	-0.09	-0.08
Self-esteem	Q.4.1	P	0.16	0.52	0.13	-0.02	-0.16
Trust	Q.2.4	P	0.06	-0.02	0.82	0.04	0.10
Trust	Q.2.5	P	-0.16	0.10	0.79	0.02	0.11
Trust	Q.2.3	P	-0.01	0.13	0.74	0.05	0.00
Agency	Q.3.4	**R**	0.20	-0.21	0.10	0.98	-0.21
Self-esteem	Q.4.2	**R**	0.23	-0.22	0.17	-0.25	0.94

Vietnam (Wave 2)

Subscale/ Naive category	Question number	Positive or **R**everse coded	**Factor 1** *Self-esteem*	**Factor 2** *Trust*	**Factor 3** *Trust/ Inclusion*	**Factor 4** *Inclusion*
Inclusion	Q.1.3	P	0.90	-0.08	-0.11	0.09
Trust	Q.2.2	P	0.87	-0.04	-0.02	0.14
Trust	Q.2.1	P	0.79	0.06	-0.06	0.16
Inclusion	Q.1.4	P	0.72	0.11	-0.11	0.07
Inclusion	Q.1.2	P	0.65	0.01	0.14	-0.02
Inclusion	Q.1.5	P	0.61	0.05	0.16	-0.07
Inclusion	Q.1.1	P	0.49	0.20	0.19	-0.02
Trust	Q.2.3	P	0.45	0.30	0.04	-0.21
Trust	Q.2.4	P	0.42	0.29	0.07	-0.17
Self-esteem	Q.4.3	P	-0.13	0.90	0.01	-0.05
Self-esteem	Q.4.4	P	-0.05	0.88	-0.04	0.01
Self-esteem	Q.4.5	P	0.11	0.76	-0.05	-0.01
Self-esteem	Q.4.1	P	0.06	0.72	0.06	0.09
Agency	Q.3.2	P	0.13	0.71	-0.09	0.03
Agency	Q.3.1	P	0.16	0.70	-0.01	0.06
Agency	Q.3.3	**R**	0.18	-0.05	-0.92	-0.45
Agency	Q.3.4	**R**	0.11	-0.22	0.76	-0.22
Trust	Q.2.5	P	0.08	0.13	0.59	-0.16
Self-esteem	Q.4.2	**R**	0.20	0.02	0.09	0.91

Note: The factor structures for each country are obtained by performing EFA using the items after correcting for acquiescence bias (following Rammstedt et al. 2018). The bias correction is only performed for Wave 2 since the survey questionnaires in the other two waves do not include sufficient reverse-coded items (i.e. only 1 out of the 20 psychosocial items is reverse coded in Waves 3 and 4).

Table A.2.3.1. Factor loadings: Aspirations outcomes (By each separate wave)

ETHIOPIA

Wave 2			
Subscale/ Naive category	Varible number	Factor 1 *Mobility*	Factor 2 *Human capital*
Life satisfaction aspiration	V.1.2	0.87	-0.02
Life satisfaction aspiration	V.1.1	0.87	0.02
Educational aspiration	V.2.1	-0.01	0.83
Occupational aspiration	V.3.1	0.01	0.83

Wave 3			
Subscale/ Naive category	Varible number	Factor 1 *Human capital*	Factor 2 *Mobility*
Life satisfaction aspiration	V.1.1	0.86	0.02
Life satisfaction aspiration	V.1.2	0.85	-0.02
Educational aspiration	V.2.1	-0.15	0.77
Occupational aspiration	V.3.1	0.15	0.76

Wave 4			
Subscale/ Naive category	Varible number	Factor 1 *Human capital*	Factor 2 *Mobility*
Life satisfaction aspiration	V.1.2	0.90	-0.03
Life satisfaction aspiration	V.1.1	0.90	0.03
Occupational aspiration	V.3.1	0.00	0.81
Educational aspiration	V.2.1	0.00	0.81

INIDIA

Wave 2			
Subscale/ Naive category	Varible number	Factor 1 *Human capital*	Factor 2 *Mobility*
Occupational aspiration	V.3.1	0.92	-0.02
Educational aspiration	V.2.1	0.91	0.01
Life satisfaction aspiration	V.1.2	-0.13	0.93
Life satisfaction aspiration	V.1.1	0.16	0.83

Wave 3			
Subscale/ Naive category	Varible number	Factor 1 *Human capital*	Factor 2 *Mobility*
Occupational aspiration	V.3.1	0.86	-0.03
Educational aspiration	V.2.1	0.85	0.02
Life satisfaction aspiration	V.1.2	-0.12	0.90
Life satisfaction aspiration	V.1.1	0.14	0.82

Wave 4			
Subscale/ Naive category	Varible number	Factor 1 *Human capital*	Factor 2 *Mobility*
Life satisfaction aspiration	V.1.2	0.88	-0.12
Life satisfaction aspiration	V.1.1	0.87	0.12
Educational aspiration	V.2.1	0.04	0.86
Occupational aspiration	V.3.1	-0.04	0.86

PERU

Wave 2			
Subscale/ Naive category	Varible number	Factor 1 *Human capital*	Factor 2 *Mobility*
Occupational aspiration	V.3.1	0.87	-0.03
Educational aspiration	V.2.1	0.86	0.03
Life satisfaction aspiration	V.1.2	-0.05	0.84
Life satisfaction aspiration	V.1.1	0.05	0.82

Wave 3			
Subscale/ Naive category	Varible number	Factor 1 *Human capital*	Factor 2 *Mobility*
Occupational aspiration	V.3.1	0.88	-0.05
Educational aspiration	V.2.1	0.86	0.05
Life satisfaction aspiration	V.1.2	-0.03	0.84
Life satisfaction aspiration	V.1.1	0.03	0.82

Wave 4			
Subscale/ Naive category	Varible number	Factor 1 *Human capital*	Factor 2 *Mobility*
Occupational aspiration	V.3.1	0.83	-0.05
Educational aspiration	V.2.1	0.81	0.05
Life satisfaction aspiration	V.1.2	-0.07	0.83
Life satisfaction aspiration	V.1.1	0.07	0.80

VIETNAM

Wave 2			
Subscale/ Naive category	Varible number	Factor 1 *Human capital*	Factor 2 *Mobility*
Occupational aspiration	V.3.1	0.83	-0.05
Educational aspiration	V.2.1	0.81	0.05
Life satisfaction aspiration	V.1.2	-0.07	0.83
Life satisfaction aspiration	V.1.1	0.07	0.80

Wave 3			
Subscale/ Naive category	Varible number	Factor 1 *Human capital*	Factor 2 *Mobility*
Educational aspiration	V.2.1	0.92	-0.01
Occupational aspiration	V.3.1	0.91	-0.02
Life satisfaction aspiration	V.1.2	-0.17	0.88
Life satisfaction aspiration	V.1.1	0.21	0.78

Wave 4			
Subscale/ Naive category	Varible number	Factor 1 *Human capital*	Factor 2 *Mobility*
Life satisfaction aspiration	V.1.2	0.88	-0.14
Life satisfaction aspiration	V.1.1	0.85	0.15
Occupational aspiration	V.3.1	-0.06	0.84
Educational aspiration	V.2.1	0.05	0.83

Appendix Section A.1. Examination of the Endogeneity of Household Shocks

The econometric specifications used Section 3.3 to examine the malleability of non-cognitive skills include household fixed-effects. The household-specific term takes care of unobserved heterogeneity that remains constant over time, however any unobserved factors that are subject to change are unaccounted for. For this reason, and given the fact that the information on shocks is self-reported, it is useful to examine to what extent the shocks under study are endogenous to the household's initial conditions. To investigate this, I use information from the household's wealth at baseline (in 2002) to determine whether it predicts the number of shocks reported subsequently by the household. More specifically, I run pooled OLS regressions (for the number of shocks in Wave 2 and Wave 3) against a wealth index (comprised of 3 components: housing quality, consumer durables and a services index).

The results, presented in Table A.3., suggest broadly that in India, Peru and Vietnam initial wealth index is not endogenously associated to the reporting of economic shocks at subsequent periods. In Ethiopia however, lower access to housing services does predict significantly the number of shocks suffered by the household in the following periods. Moreover, in the case of natural disasters the composite baseline wealth level index does correlate significantly with the reporting of shocks, in particular for Ethiopia and Vietnam (the two countries of focus), as well as for Peru. This result indicates a greater vulnerability to shocks for poorer households and signals the endogenous nature of their self-report. The reverse causality explanation, i.e. that the adverse event causes a decrease in wealth, can be ruled out since the observed level of wealth (baseline values) precedes the shock.

Broadly speaking these results confirms the need to use a household fixed effects specification when investigating the responsiveness of aspirations and psychosocial wellbeing to self-reported shocks. Even though in the previous section there were evidently no claims about causality from the shocks to the movement observed in the psychosocial measures, the results from a simple cross-section analysis would not be easily interpreted. At the very least, the fixed effects models ensured that the correlation coefficient of interest (between shocks and non-cognitive skills) is not capturing the systematic higher vulnerability to shocks of poorer households. In other words, this exercise provides reassurance about the specification I chose in the previous section (despite discarding part of the variation in the data), since the individual fixed effects ensure that any observed and unobserved constant characteristics that may confound the effect on skills, are accounted for. Moreover, remaining wary against any claims about causality, the lack of a systematic association between baseline wealth and reported economic shocks adds some additional insight to the results on malleability, namely that some degree of the signal from the economic shocks to the non-cognitive measures could be a direct response.

Table A.3. Correlation between Number of Shocks and Baseline Wealth

	ETHIOPIA				INDIA				PERU				VIETNAM			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
RHS variable /1:	*Housing quality*	*Consumer durables*	*Housing Services*	*Wealth index*	*Housing quality*	*Consumer durables*	*Housing Services*	*Wealth index*	*Housing quality*	*Consumer durables*	*Housing Services*	*Wealth index*	*Housing quality*	*Consumer durables*	*Housing Services*	*Wealth index*
Dependent variables /2:																
Economic shock	-0.18	-0.21	-0.54***	-0.77**	0.00	-0.04	0.07	0.04	0.09	0.12	0.04	0.13	0.07	0.06	-0.08	0.05
	(0.280)	(0.198)	(0.168)	(0.362)	(0.053)	(0.075)	(0.067)	(0.084)	(0.059)	(0.096)	(0.071)	(0.109)	(0.055)	(0.086)	(0.075)	(0.094)
Observations	2,828	2,817	2,817	2,802	1,414	1,413	1,413	1,412	2,586	2,581	2,582	2,577	2,163	2,163	2,163	2,163
R-squared	0.056	0.056	0.073	0.066	0.015	0.016	0.016	0.016	0.006	0.006	0.005	0.006	0.004	0.003	0.004	0.003
Natural disaster	-0.73	-1.05***	-1.10**	-2.03**	0.01	-0.23	0.39*	0.21	-0.15	-0.30**	-0.25**	-0.40**	-0.83**	-0.52**	-0.80**	-1.52***
	(0.448)	(0.359)	(0.491)	(0.746)	(0.136)	(0.150)	(0.222)	(0.256)	(0.091)	(0.132)	(0.111)	(0.156)	(0.337)	(0.222)	(0.371)	(0.552)
Observations	2,828	2,817	2,817	2,802	1,414	1,413	1,413	1,412	2,586	2,581	2,582	2,577	2,163	2,163	2,163	2,163
R-squared	0.254	0.256	0.263	0.266	0.129	0.131	0.138	0.131	0.168	0.169	0.172	0.172	0.023	0.019	0.020	0.023
Aggregate shocks	-0.91	-1.26**	-1.64***	-2.80***	0.01	-0.27	0.46*	0.25	-0.05	-0.18	-0.21	-0.27	-0.76**	-0.46*	-0.88**	-1.47***
(econ and nat. disaste	(0.665)	(0.489)	(0.557)	(0.976)	(0.179)	(0.195)	(0.253)	(0.316)	(0.108)	(0.183)	(0.163)	(0.227)	(0.342)	(0.244)	(0.381)	(0.560)
Observations	2,828	2,817	2,817	2,802	1,414	1,413	1,413	1,412	2,586	2,581	2,582	2,577	2,163	2,163	2,163	2,163
R-squared	0.247	0.248	0.263	0.263	0.102	0.104	0.110	0.104	0.129	0.130	0.132	0.131	0.022	0.019	0.021	0.022

Notes: All regressions are pooled cross-section estimates for Wave 2 (2006) and Wave 3 (2008), including the following household characteristics as controls: region, urban dummy, householdsize, household head gender, education, age, marital and literacy status. Robust standard errors in parentheses.

Robust standard errors, clustered at the sentinel site level, in parentheses.

1/ *RHS variables:* The variable in column 4 is a composite index for household Wealth at baseline (ie. Wave 1 in 2002). The composite score is calculated as the simple average of the variables in columns 1 to 3, ranging from 0 (the lowest score) to 1 (the highest).

2/ *Dependent variables:* Each dependent variable is a discrete variable capturing the number shocks of each type reported by the household .

Chapter 3

Maternal Mental Health and Child human capital: Long-term risk factors in development trajectories

Abstract

This paper aims to investigate the risk factors (near birth) associated to children's developmental trajectories into youth, with a focus on maternal mental health. To this end I exploit a panel data set (the Young Lives Survey) that spans three developing countries over the course of twelve years. To delve into the study of maternal mental health, I propose an alternative, disaggregated measure of mental health by performing Exploratory Factor Analysis (EFA) on the items that conform the CES-D scale. The evidence does not suggest there is more explicative power in the factors, however they do provide some insight about the aspects of mental health that are associated to the child's development. I also perform gradients analysis to examine the gaps between the children of mothers with poor versus stable mental health. The results from the gradients analyses indicate that the development gaps widen with time, suggesting the importance of maternal mental health as a risk factor in the early stages of a child's development.

1. Introduction

According to conservative estimates, worldwide more than 200 million children under five years old fail to reach their developmental potential. Poverty, malnutrition, and poor health are by now well-established risk factors identified empirically in the health literature (Grantham-McGregor et al. (2007). These risk factors pose a particular threat in the early years of a child's life when vital brain development processes are under way (Thompson, 2001). Indeed, growth faltering in the first thousand days (FTD) after conception is associated negatively with educational, labor market, marriage market, adult health, and intergenerational outcomes (Behrman, et al. 2016). Moreover, there is evidence of the association between stunting and wasting early in life and limited neural development which have proven impacts on cognitive and socioemotional development (see Black, Walker, Fernald, et al., 2016, and Black, Devereux, and Salvanes, and references therein).

However, multi-country studies, examining the role of poverty on child development, have mainly focused on the scarcity of material resources, such as food, nutrients, assets, etc. There is less direct empirical evidence on the importance of the intangible aspects in the child's upbringing. Examples of these non-material resources include the quality of the environment, the level of stimulation and the caregiver's psychosocial wellbeing, among others. Indeed, the psychological domain seems to be particularly relevant given its association to longer term wellbeing, as suggested by recent studies both conceptually (Vakis, et al., 2015) and empirically in developed country contexts (Clark, et. al). Furthermore, early stimulation through parenting has taken center-stage in the dialogue on ECD interventions, aside from educational support and health nutrition (The Lancet Series, 2016). Hence the relevance of setting the focus on the parents in their caregiving capacity.

Nonetheless, the evidence on the importance of the mother's or the caregiver's mental health remains scant, in particular for developing countries. The dearth of data, in addition to the challenges of persuasively identifying causality and the long time required for the adequate treatment of mental illnesses are likely reasons this remains an under-researched area.

The psychology literature has documented associations between mental health and negative child and mother outcomes but these relationships have not been causal (Lund et al., 2010; Murray, 1996, 1999). It is only more recently that some evidence of a causal relationship between maternal mental wellbeing and child outcomes is starting to emerge. This causal inference has been provided by studies analyzing maternal stress using sibling comparisons (Aizer, et al., 2016), bereavement during pregnancy (Black, et al, 2016)[52] and randomized trials, for example highlighting the long-term impacts of treating maternal depression on parental investments (Baranov, et. al, 2017).

[52] While Aizer et al. (2016) find that maternal mental stress (measured using cortisol levels) affects negatively the cognitive function of children, Black, et al. (2016) find that maternal stress (caused by the death of a close relative) has no impact on later life educational attainment or wages.

This paper aims to investigate the risk factors (near birth) associated to children's developmental trajectories into youth, with a focus on maternal mental health. To this end I exploit a panel data set (the Young Lives Survey) that spans three developing countries[53] over the course of twelve years. This longitudinal survey offers a richness of information on young children in poverty and the care they receive early in their lives, importantly, the mental state of their caregiver. Thus, this data allows me to expand the investigation of the early-life risk factors beyond the 'usual suspects', i.e. the economic dimensions commonly analyzed in existing studies. The psychological dimension addressed in this paper may be particularly important given the vulnerability of the mother's mental state near the time of birth of the child, given the recently documented anatomical changes in the pregnant human brain that last for at least 2 years (Hoekzema, et al 2016).

In this paper I utilize the longitudinal dimension of the survey to examine to what extent parental mental health helps predict the life paths these children will follow. As a first approach I study the association between the mother's mental state and the child's subsequent development at different stages independently. The panel dataset I use provides information on key child development outcomes such as anthropometric and cognitive measures when the child is six months old, four, eight and twelve years old. Thus, this information allows me to calculate development gradients in order to analyze the cognitive and anthropometric gaps between the children of mothers in a good mental state versus those that suffer from poor mental health. These gradients have commonly been developed to compare individuals from low versus high socioeconomic backgrounds (Schady, et al., 2014). Therefore, a contribution of this study is to extend the analysis of lags in early childhood beyond the wealth gradients studied to date, to measure the early disadvantages that the children of mentally frail mothers face.

Indeed, the mother-child relationship, mediated to a large extent by the socioemotional state of the mother (or main caretaker), is particularly relevant at the very early stages of the child's lifecycle. Over the first 5 years, when the brain is highly malleable, is the stage at which important foundational socioemotional skills[54] are developed by the child. The active wiring, taking place in the brain at this point, lays the foundation for later skill development. Indeed, the majority of the positive brain wiring, prior to the age of three, occurs through interaction with a supportive, trusted caregiver (Kautz et al, 2014). In this study I approximate the likely quality of this interaction by using the information on the caregivers' mental stability at this crucial, early stage. Moreover, because young children's behaviors are controlled by external guidance, as opposed to internal motivation, the context they are reared in during this initial period becomes fundamental. It is known that children at this early time need contexts that allow them to model, observe and be rewarded for the age-appropriate skills that are the foundation for future skill-building (Guerra, Modecki, and Cunningham 2014). In other words, the quality of the rapport with the caregiver during this important time-window may determine the developmental trajectory on which that child is set. This is the research question I aim to investigate empirically by exploiting the longitudinal dimension of the information available to observe the development pathway followed by the child.

[53] The Young Lives Survey actually collects data on four countries (Ethiopia, India, Peru and Vietnam). However, for the purpose of this study, I will only use the data for three of the countries since the information from the module on mental health is not publicly accessible for Peru.

[54] Socioemotional skills such as problem solving through play with their peers, impulse control, confidence and the ability to work with others are developed at this early stage (Kautz, et al, 2014)

To delve further in the study of maternal[55] mental health, I propose an alternative, disaggregated measure of mental health by performing Exploratory Factor Analysis (EFA) on the 20-items that conform the CES-D scale. Using the predicted factors yielded by the EFA, instead of the dichotomous depression scale commonly used, in principle provides three advantages: (i) it exploits more of the variance in the mental health data; (ii) it may reduce some of the observed measurement error (as indicated in Laajaj and Macours, 2017); and importantly, (iii) it allows me to investigate in more detail and interpret more easily the aspects of mental health which are associated to the child's human capital development. Thus, another potential contribution with respect to existing studies on the subject would be to use an alternative measure of mental health which provides enhanced measurement and additional insight about the different aspects relating to the caregiver's state of mind.

As a second approach, to integrate the longitudinal information in a single development indicator, I construct trajectories of the key human capital outcomes (i.e. cognitive development and anthropometrics) to examine how the early risk factors (in particular maternal mental health) help determine the pathways children follow. Thus, the proposed approach may contribute to the literature by capturing through the trajectories a summary measure of the child's progress over multiple periods, as such, an intertemporal and more comprehensive, picture of the child's life-path.

There are two main empirical questions I want to answer by using the abovementioned approaches. First, I want to examine whether I gain more insight about the relationship between maternal mental health and child development by using the factors derived from the EFA than by using the commonly used original scale. Second, I want to investigate whether I learn more about this association between the mother's mental state and the quality of the child's human capital by constructing development trajectories than by using separately the information on the child's development at each stage.

As an answer to the first question, the evidence does not suggest there is more explicative power in the factors (as the adjusted R-square values are left unchanged). However, to the extent that the factors may be more easily interpreted they do provide more insight about the aspects of mental health that affect development.

The results from the gradients analyses suggest that the development gaps widen with time (in particular for weight in India and Vietnam). This finding is supported by the regression analysis at each development stage separately. Indeed, the most important finding to highlight is the fact that the significant associations between psychological wellbeing and the offspring's physical development is both long-lasting and, most notably, intensified over the child's development cycle. Thus overall, the gradients analysis provides the strongest evidence of the association between maternal mental wellbeing and the formation of the child's human capital; more so than the trajectories analysis.

[55] The module on mental health in the Young Live's actually asks about the caregiver's mental health. However, in over 95% of the cases the caregiver is the child's mother, thus from hereon I will use indistinctly the terms mother and caregiver when referring to mental health outcomes.

The rest of this paper is organized as follows. In the following segment (Section 2) I describe the panel dataset used (the Young Lives Survey) and present some descriptive statistics for the three countries under study. Section 3 describes the exploratory factor analysis (EFA) procedure used to obtain the alternative mental health measures. In Section 4 I describe the methodology and present the results for the correlation estimates between mental health and child outcomes at each stage in their development. In Section 5 I expand the analysis by constructing child development trajectories and estimating the association between the mother's mental state and the likelihood that a child will follow a determined development pathway. Finally, the conclusions are presented in Section 6.

2. Dataset and descriptive statistics

2.1. The Young Lives Survey Dataset

The source of data used in this paper is the Young Lives Survey (YLS), a rich panel dataset collected as part of a long-term research program investigating the nature of childhood poverty in three developing countries- Ethiopia, India (the state of Andhra Pradesh) and Vietnam[56] —over 15 years. As detailed in Clavijo (2017), the longitudinal survey follows two distinct cohorts of children in each country over 4 waves (a 'Young Cohort' of two thousand children and an 'Older Cohort' of one thousand individuals.) The children in the young Cohort are aged between 6 months and 1 and a half years in Wave 1 and the older children are aged between 7 and 8 years old. The unit of analysis is therefore the 'young lives child' for each household. Table 1 summarizes the ages and stages of development of the children for each cohort at each wave, as well as the sample size per country.

I find this dataset fitting for my research question given the panel structure which allows me to follow the child's development (including cognitive and anthropometric measures) since birth and over a critical period for foundational skill formation. Moreover, the data is unique given the detailed and timely information on the caregiver's mental state closely after giving birth. For this reason, I will focus on the younger cohort in my analysis which is followed from early childhood (from the age of six months), through middle childhood (between the ages of four and eight years), into the advent of adolescence (up to the age of twelve); (see Table 1). As mentioned above, the evidence suggests the mother-child relationship, mediated to a large extent by the socioemotional state of the mother (or main caretaker), is particularly relevant at the early stages of the child's lifecycle (Cunningham, et al, 2018); hence the focus on the younger cohort.

The survey's overall attrition rate is low (1.4 percent) for the sample of 4 countries between the first two waves. This rate of attrition is particularly moderate in comparison to other longitudinal studies in developing countries and despite some degree of non-random attrition there is little evidence of attrition bias on observables (Outes and Dercon, 2008)[57].

[56] The Young Live Survey actually collects data for four countries in all; including Peru. However, in this paper I only used the data for Ethiopia, India and Vietnam since the module on the caregiver's mental health is not available for Peru.
[57] For further details on Survey Attrition and Attrition bias see the Young Lives Technical Note no. 5, www.younglives.org.uk.

The samples in each country were chosen to reflect the diversity of children in the country with an over-representation of poor areas, given the survey's focus on childhood poverty. Two-stage sampling was used by selecting first 20 clusters (with a distinct pro-poor bias) and then randomly selecting a sample of children of the particular age group in each cluster. The samples were therefore not selected to be statistically representative of the country (or state) as a whole. However, detailed subsequent analyses have shown the diversity of children is successfully reflected in each country across a wide range of variables. These analyses establish that, although the data is not befitting for national level monitoring of child outcomes, it is fully appropriate for modeling child welfare[58]. In this sense it confirms the Young Lives Survey is suitable for the purpose of this paper since the full range of the child development distribution is effectively captured.

2.2. Descriptive Statistics

The descriptive statistics for the sample of data used are presented in Table 2.1. For each country I present the main variables used in the subsequent analyses including the principal characteristics for the caregiver, the child and the household. The first variable indicates the incidence of depression reported by the child's main caregiver[59]. This caregiver depression variable is a dichotomous variable based on the CES- D scale (Center for Epidemiological Studies- Depression scale). The standard definition of a case of clinical depression is the presence of 8 or more symptoms out of the 20 symptoms asked in the scale (the full list of the items included in the CES-D scale are presented in Box 1). Under this definition the incidence of maternal or caregiver depression is less than 35 percent in all three countries (and as low as 21 percent in Vietnam). The statistics overall reflect the pro-poor focus of the survey, for example in terms of the low education and literacy levels for the caregiver and household head; these levels are similarly low in Ethiopia and India (around 3 years of education on average). The data reveal however some heterogeneity between the countries, e.g. literacy and education are significantly higher in Vietnam compared to the other two countries, while wealth (measured in terms of housing, services and consumer durables) is comparatively lower in Ethiopia.

The last column in the panel for each country presents the difference (in means) for each variable between the households of caregivers that were classified as depressed versus those that were not. Again, the overall differences in means suggest some degree of heterogeneity between the countries. In India the contrast between depressed and non-depressed caregivers and the households they inhabit is the most salient. In the Indian context the mean difference is statistically significant in over half of the cases, while in Ethiopia and Vietnam the proportion of statistically significant differences is lower, though still above random (i.e. around a third of the variables present significant differences). Analyzing the descriptive statistics separately by category, the differences in means indicate that in all three countries the children from depressed mothers differ systematically from their counterparts in terms of the caregiver's and the household's characteristics, as well as reported shocks. However, this difference is less stark in terms of the conditions surrounding the mothers' pregnancy and postpartum period, in particular in

[58] See the Young Lives Technical Notes no. 1, 2, 3 and 4, www.younglives.org.uk.

[59] To note is the fact that in the vast majority of cases (over 98 percent in each country) the main caregiver is the child's mother. Thus, henceforth the terms 'caregiver depression' and 'maternal depression' will be used indistinctly.

Vietnam and Ethiopia where only one out of the eleven variables differs significantly between depressed and undepressed mothers. In terms of the child's characteristics around birth, interestingly, in Ethiopia the mother's mental health correlates, as expected, to her perception about the child's health (e.g. having a long-term illness, or the youngster's overall health compared to others of the same age). However, the child's actual anthropometric measures at birth (i.e. average weight and height) overall do not differ between depressed and sane mothers.

Moreover, in Vietnam and Ethiopia several variables signaling the mother's behavior and conditions during and after pregnancy (e.g. antenatal visits, preventive care during gestation or having a premature birth) are on average the same irrespective of the mother's mental condition around the time of birth. In contrast, in India depressed mothers appear to differ from mentally stable mothers along a number of behavioral dimensions surrounding the time of birth of their children.

Overall, these statistics indicate that the households of depressed caregivers present a disadvantage with respect to their non-depressed counterparts along a number of dimensions around the time when the depression episode was presented. In the subsequent analysis (Section 4 in particular) I will investigate whether this disadvantage is translated onto the newborn child's development and whether it persists over time.

3. Exploratory Factor Analysis: Disaggregated measures of Maternal Mental Health

To study maternal[60] mental health, I use the version of the CES-D (Center for Epidemiological Studies- Depression) scale collected in the Young Lives Survey. Following from the investigation in my previous study on the measurement of non-cognitive skills (Clavijo, 2017), I propose to use an alternative measure of mental health by performing Exploratory Factor Analysis (EFA) on the 20-items that conform the CES-D scale[61]. Using the predicted factors yielded by the EFA, instead of the dichotomous depression scale commonly used, in principle provides three advantages: (i) it exploits more of the variance in the mental health data; (ii) it may reduce some of the observed measurement error (as indicated in Laajaj and Macours, 2017); and importantly, (iii) it allows me to investigate in more detail and interpret more easily the aspects of mental health which are associated to the child's human capital development.

The results for the EFA, following the criteria for retaining factors[62] described in Clavijo, 2017, are displayed in Table 3. Note that in the EFA I reversed the item responses of the depression symptoms so that the scale direction indicates mental health positively. This scale reversion is done in order to facilitate the interpretation of the results

[60] The module on mental health in the Young Live's actually asks about the caregiver's mental health. As mentioned in a previous footnote, in over 95% of the cases the caregiver is the child's mother. For this reason, I use indistinctly the terms mother and caregiver when referring to mental health outcomes.

[61] It is worth noting that the CES-D as applied in the Young Lives survey differs in some respects from the original version (Radloff, 1977). Clavijo (2017) discusses these differences and the potential implications of using this modified version of the scale. A caveat to note concerning the depression scale in the Young Lives Survey is the fact that all depression scale items are reverse coded (i.e. all affirmative responses signal depression symptoms). This differs from standard practice in the use of the CES-D scale designed to minimize acquiescence bias; usually five of the twenty items are positively coded.

[62] To determine the number of latent factors that could be extracted from all the measures I used Kaiser's (1960) rule, keeping factors with eigenvalues greater than 1. An alternative to the Kaiser criterion for choosing the number of retained factors is an inspection of the Cattell (1966) scree plot. This method plots the number of factors corresponding to each eigenvalue and dictates that the point at which the curve in the Cattell scree plot plateaus indicates the number of factors that should be retained.

when comparing them to the associations between wealth and child development. As such, a higher factor score indicates better mental health (or less symptoms of depression). Box 1, below the table, indicates the three subscale categories of the items conforming the CES-D scale (Group 1: Depressed Affect; Group 2: Somatic and Retarded Activity; and Group 3: Interpersonal items). This grouping, adapted from the original CES-D scale study (Radloff, 1977), provides insight about what each of the resulting factors mean. It is in this respect that the EFA procedure may enhance the interpretation of the mental health results and its association to the child's subsequent development. The shaded cells in Table 1 indicate the items that load most heavily onto each of the factors, thus adding meaning to the numerical factor scores, beyond the dichotomous mental health measure commonly used (i.e. a dummy variable equal to 1 when there are 8 or more depression symptoms).

The EFA results indicate there is considerable heterogeneity between the 3 countries. The 3 naïve subcategories are more closely captured in the Ethiopian case where the factor analysis yielded only 3 factors. The first factor contains a mixture of the *depressed affect* and *interpersonal* items, while the two remaining factors capture the *somatic and retarded activity* symptoms. As noted before, this input about what each factor captures will prove useful when looking at the correlations between maternal mental health and the subsequent child outcomes. In particular, it will be interesting to try to unpack the diverse aspects of mental health linked to the child's development. Using the disaggregated factors may thus shed light on, for example, whether the interpersonal dimension of depression (e.g. feeling unworthy of other's affection) is more closely related to the child's (hampered) development, than say, the somatic symptoms of depression (e.g. headaches, poor appetite, etc.). Based on the existing evidence on the importance of early stimulation (mainly from the caregiver), a prior could be that the interpersonal aspect of depression is a particular threat to the child's development. The factor analysis approach may cast some empirical light on this matter.

Ethiopia is also the country for which the proportion of statistically significant differences (between the households of depressed versus non-depressed caregivers) was the lowest (0.27), followed by Vietnam (0.37), and the highest was in India (0.72). This pattern maps the number of factors yielded by the factor analysis, the lowest in Ethiopia (3 factors), followed by Vietnam (4) and finally, the highest number of factors yielded in the Indian case (6 factors). Despite the differences between the countries, in terms of the number of retained factors, in all three cases the 'non-trivial factors criterion' is satisfied. This criterion demands that each factor contains at least two items with a loading value above 0.3 (i.e. a 'non-trivial' loading value)[63]. This requirement, in terms of loading values, ensures that the items in each factor have a sufficiently strong correlation.

In particular, in Vietnam the first factor captures mainly (though not exclusively) *Depressed affect items*. With respect to the second factor, just as in Ethiopia, Factor 2 is comprised of items from the *Somatic and Retarded Activity group* alone (in both countries the two questions relating to 'feeling tired') were loaded first onto this factor. The third factor contains, in its majority, items from the *Interpersonal* subcategory, while the last factor contains the residual items. In India, the country for which the EFA yielded the highest number of factors, the items from the different

[63] See Brown, 2009a for further details on the 'non-trivial factors criterion' and other criteria used to determine the number of factors to retain when applying EFA.

subcategories are scattered across the six factors. For example, the first factor contains items from all three subcategories while the second factor contains, in equal number, items from the *Depressed affect* and the *Interpersonal* naïve subgroups (two items from each). It is only Factors 3, 5 and 6 that capture items from a single subcategory, namely the questions relating to somatic feelings (group 2 in the case of Factor 3 and 5) and interpersonal relations (group 3 for Factor 6).

To summarize, the exploratory factor analysis reveals heterogeneity in the underlying structure of the information on mental health for each country. The factor analysis procedure does not classify the items exactly into the three original subcategories in any of the countries. However, there are a number of cases in which the retained factor is composed entirely (or in its majority) by items from the same original subcategory (e.g. Factor 2 and 3 in Ethiopia, Factor 2 in Vietnam, or Factor 3 in India, among others). In the subsequent analyses, these will be the factors which may provide further insight about the aspects of mental health related to child development, beyond the standard single depression scale value.

4. Mental health and Child development at each stage

4.1. Methodology

As a first approximation I examine the association between the mother's mental health and the child's development at different stages in her early lifetime (when they are around five, eight and twelve years old). To do so I first examine the raw correlations by running simple OLS estimates between the dichotomous mental health variable and the child's weight, height and cognitive test scores (as measured by the Peabody Picture Vocabulary Test - PPVT). The mental health dummy is positively coded so that a value of one (1) indicates the caregiver is *not* depressed (i.e. that she does *not* present 8 or more depression symptoms). I also run these same OLS estimates using the alternative (continuous) mental health measures obtained by performing Exploratory Factor Analysis on the 20 items of the (positively coded) items of the CES-D (Center for Epidemiological Studies- Depression) scale. The resulting factors are the disaggregated constructs of the mental health scale (3 factors in Ethiopia, 6 factors in India, and 4 factors in Vietnam). The comparison between the 'naïve' and alternative estimates will indicate whether there are gains in measurement and/or insight from using the disaggregated measures of maternal mental health.

I then extend the analysis by running controlled OLS regressions to account for the other, more commonly studied, risk factors associated to the child's early physical and cognitive development. The covariates included progressively in the controlled OLS estimates are grouped into the following categories (household sociodemographic characteristics, economic circumstances, anthropometrics, antenatal care use and shocks to the household.) While these estimates will only indicate associations (and clearly not causality) between the maternal mental state and the child's development, the progressive addition of covariates will indicate the cases in which those associations to mental health remain statistically significant, above and beyond the correlation of the psychological dimension to the 'usual suspects' related to early and mid-childhood development. Note that these estimates are run for each separate round of the survey (when the child is 5, 8 and 12 years old) in order to analyze the evolution of this association to the caregiver's mental wellbeing over the child development course. In particular, any significant

correlations to the mother's psychologic state, up to a decade later, *and* after controlling for a considerable number of key background conditions, will indicate a strong, lasting relationship.

4.2. Correlations Estimates: Results

Tables 4.1, 4.2. and 4.3 display respectively the results for the estimates of the correlations between the caregiver's mental health and the child's weight, height and cognitive test score. The weight and height estimates use the child's absolute values (in kilograms and centimeters respectively) while the cognitive score estimates use the standardized PPVT values[64]. All estimates control for the child's age in months to account for any age-specific heterogeneity with-in each wave. For every country, the estimates in column 1 at each wave indicate the raw correlation, while the estimates in columns 2 and 3 add progressively the commonly used covariates described above. In the panel for each country, the estimates using the dichotomous mental health measure are presented at the top of the panel and the estimates using the disaggregated factors at the bottom[65] [66].

Once again, the results indicate a considerable degree of heterogeneity between the countries. In the Ethiopian case, the correlation between the caregiver's state of mind, as measured using the mental health dummy, is not significantly associated with any of the dimensions of child development at any stage. In contrast, the results for India provide a first indication of the lasting association there may be between the caregiver's state of mind and the formation of the child's human capital. For example, in the case of physical development (namely, weight; Table 4.1, Panel B) the estimates suggest there is still a significant correlation to maternal mental health up to 12 years later (by Wave 4). This long-term significant correlation holds for the naïve estimates even once the partial set of covariates are controlled for, including the usual sociodemographic characteristics such as the mother's and the household head's education, gender and household size (Panel B; column 2 for Wave 3 and 4). However, the correlation no longer holds when full controls are added. In the case of Vietnam this statistically significant raw correlation is also detected between the naïve measure of maternal mental health and the child's weight at ages 8 and 12 (Table 4.1., Panel C). However, this result is not as robust as in India, since its significance does not hold once the first set of controls is introduced. Nevertheless, it is noteworthy that in the Indian and Vietnamese cases the magnitudes of the associations to weight somewhat over time. For example, in India the point estimate value for weight increases by nearly 1.5 times during middle childhood (between Wave 2 and Wave 3) and more than doubles when the child enters early adolescence (between Wave 3 and Wave 4). Likewise, in Vietnam, the statistically significant point estimate nearly doubles over the mid-childhood period for the weight outcome. This result could indicate that the link between the caregiver's mental health (notably early-on in the child's upbringing) and the child's development (as measured through weight), is not only persistent over the years but could potentially be

[64] Cognitive test scores are standardized by demeaning the raw score for each child and dividing it by the standard deviation for each wave. In other words, the standardization is specific to each age-group contained in a wave (i.e. 4.5-5.5 years for Wave 2, 7.5-8.5 years for Wave 3, and 12 years for Wave 4). Therefore, the standardization procedure accounts for differences in the distribution of the raw PPVT scores at the different stages of development.

[65] The measures for the caregiver's mental health (both naïve and disaggregated) are positively coded. In the case of the naïve dichotomous measure, a value of one indicates the caregiver in not depressed (i.e. does not present 8 or more depression symptoms). In the case of the disaggregated measures a higher score indicates the presence of less depression symptoms and therefore better mental. The measures are obtained by performing the Exploratory Factor Analysis on the 20 items of the (positively coded) items of the CES-D (Center for Epidemiological Studies- Depression) scale, as described in the previous section.

[66] For brevity, the coefficients for each of the control variables are not displayed in the case of the Naïve estimates.

intensified in the later stages. However, since these weight estimates use the absolute (kg) values it cannot be confirmed yet whether there is an absolute increase in the magnitude of the relationship. This point will be addressed in the next section when I use the standardized values of all the outcomes.

In a similar sense, the correlation estimates for height (Table 4.2.) suggest there is no significant positive relation between caretaker mental health and child stature in Ethiopia at any development stage, while the estimates in India yield significant coefficients for height at the latter stage of development controlling for certain sociodemographic characteristics (i.e. in Wave 4 when the child is 12 years old; Panel B). In Vietnam the raw correlation between height and mental health is positive though not significant when using the naïve measure. However, the correlation is positive and significant once I use the disaggregated measure of mental wellbeing (Factor 3 at age 8; and Factor 4 at age 12). These significant correlations hold even once the partial controls are added in the estimates.

Note that the long-term result for India is the most robust to the inclusion of covariates in the estimates. In particular, the coefficient's statistical significance is maintained once the initial set of controls (column 2) is introduced and it remains marginally significant when the full controls are included (column 3). [67]

The stepwise introduction of controls[68] indicates that the association between the mother's mental state and the child's height remains positive and significant when I control for the household's sociodemographic and economic characteristics, and, notably, even when pregnancy conditions are accounted for (e.g. access to antenatal care). However, the significance of the mental health coefficient is fully absorbed once I control for the child's anthropometric measures at birth (i.e. weight for age and height for age z-scores). This suggests the significant long-term association captured in the partially controlled estimate (Table 4.2., Panel B, column 2) may be picking up some otherwise unobserved condition which is contemporaneously related to the child's length at birth and the mother's mental state, which is measured near the time the child is born (from 6 to 18 months after).

Moreover, notice that in Ethiopia there are some counter-intuitive negative and significant correlations to the height outcome at the latter stage of development (Wave 4). The estimates at the bottom of the panel (Table 4.2., Panel A) present the results for the alternative measures which may provide some insight regarding this unexpected sign. Interestingly, the factor estimates for Wave 4 reveal that some aspects of mental health are indeed positively associated with child development, as expected (i.e. Factor 3), while another dimension of the psychological scale correlates negatively to the child's height (i.e. Factor 1). More specifically, these estimates indicate that the negative result obtained in the naïve regression is driven by the items captured in Factor 1, which comprise mainly depression symptoms from the subgroups 1 and 3 (*Depressed affect* and *Interpersonal* items); while Factor 3 captures mostly the

[67] As a follow-up exercise to these levels estimates, looking at correlations between mental health and child outcomes, I also ran the analogous estimates using the changes in child outcomes between waves (instead of the levels at each wave). The overall results indicate the progress between development stages (i.e. the change in each child outcome between waves 1 and 2; between waves 2 and 3; and between waves 3 and 4) is not strongly associated to the mother's initial mental state. Overall, the significant correlations between mental health and the change in child outcomes is not robust to the inclusion of control variables. The only case in which the positive correlation between mental state and the change in the outcome remains statistically significant, even once covariates are added, is precisely the Indian case. In the long-term estimates using the change in height outcome (between waves 3 and 4), the significance of the mental health measure is robust to the inclusion of all control. This is consistent with the levels estimates, for which the strongest results is also for height in India. The results for the estimates using the changes in levels are not displayed for the sake of brevity, but are available upon request.

[68] For brevity, the full set of results (including all regressions for which each control is added progressively) are not displayed. These results are available upon request.

somatic dimension of the CES-D scale. Notice that although the coefficients for Factor 3 are positive and significant, even when accounting for all covariates, and slightly larger in magnitude than those for Factor 1, the resulting correlation for the naïve estimate is negative.

This counter intuitive result for Factor 1, in relation to weight and height, is quite robust in the long run (by the time the child turns twelve years old). This unpredicted result could be indicative of challenges inherent to the interpretation of the questions and the underlying phenomenon they are capturing, since all the items conforming the scale would in principle be expected to correlate in the same direction. In this case, the stepwise introduction of controls indicates that the statistical significance of the 3rd factor disappears when additional covariates are introduced to account for the household's economic condition and access to basic services. In particular, the consumer durables index fully absorbs the significant association between the third factor and the child's weight at age 8, while the first factor still remains negative and significant. That is, factor 1 remains significant even when the mother's antenatal care and the child's anthropometric measures at birth are accounted for. Thus, it is only with the very last set of controls, i.e. including exposure to shocks, that the counterintuitive association vanishes.

To delve further empirically into what may be driving this outcome I analyze how the factors correlate to the mother's characteristics at baseline. In particular, Table 2.2. extends the descriptive statistics initially displayed (in Table 2.1) to illustrate whether the mothers that score low for each of the mental health factors differ from those that score high. The descriptive statistics in Table 2.2 confirm that Factor 1 correlates differently to the rest of observables, in comparison to Factor 2 and 3. To note, the standard household economic characteristics (e.g. household head education, size, wealth, expenditure, and livestock) correlate as expected to the second and third factors while they are either uncorrelated or have the opposite sign in the case of factor 1. Indeed, these descriptive statistics suggest that the first factor -the one containing the most variance from the mental scale- is capturing some underlying unobservable aspect of the mother, above and beyond the usual variables that characterize the household's standard of living.

More broadly, the key finding to highlight in the Ethiopian case is the fact that the positive, significant associations between psychological wellbeing and the offspring's height are both long-lasting and, possibly, intensified over the child's development cycle.

Turning now to the results for the cognitive development outcome, the estimates in Table 4.3 indicate a similar pattern between the countries. While the association between the caregiver's mental state and the child's score on the PPVT is not positive and significant at any period in Ethiopia, it is statistically significant with the expected positive sign in the other two countries, in particular in the later periods (from ages 8 onwards). More specifically, in India the association between maternal psychological wellbeing and the child's cognitive development during middle childhood (at age 8) is notably significant, even when the full set of background characteristics are accounted for (Table 4.3., Panel B, column 3 for Wave 3). In Vietnam this significant association is still detected in the latter stage of development (at age 12) when the sociodemographic controls are included and remains marginally significant with the additional controls (Table 4.3., Panel C, columns 2 and 3 for Wave 4). In Ethiopia, the counter-intuitive negative result observed for height is also present in the case of cognitive development (for Wave 4). Once,

again, the alternative estimates reveal that the unexpected result is driven by the items captured in Factor 1, while Factor 2 and Factor 3 do show the predicted positive correlations (for the uncontrolled estimates).

In the Indian case, for the naïve estimates, there is still a significant raw correlation by the last wave, though the magnitude of the coefficient does not increase with time. However, the long-term cognitive results for Vietnam do suggest that the association between maternal state of mind and her child's development, i.e. the PPVT score, is persistent and magnified over time (the point estimate including partial controls nearly doubles between waves 3 and 4.) In this case, for the cognitive outcome, this increase in the magnitude of the coefficient is indicative of some degree of intensification in the correlation between mental health and the child's cognitive ability since the PPVT scores used are standardized.

Regarding the covariates in the estimates, overall these present the expected signs. For example, the child gender covariates by developmental stage are consistent with standard evidence on growth curves by age and gender (Ames 1952, 1956). In particular, the established evidence indicates a typical girl is slightly shorter than the typical boy at all ages until adolescence. The present estimates are consistent with this result since the male dummy for the child during the early stages of development (Waves 2 and 3) is positive and significant in the majority of the cases for the height estimates. Moreover, the pediatric literature documents girls become comparatively taller shortly after age 11 because their adolescent spurt takes place two years earlier than boys'. This result is also captured in the height estimates since the child gender variable switches sign in the final wave (by age 12)[69]. In a similar way, according to the literature on child development, the typical girl weighs a little less than the boy at birth and only equals him around age eight. This result is also reflected in the height estimates by the positive male child coefficients for the two early stages of development (between the ages of 5 and 8). Lastly, according to the pediatric literature, the girl becomes heavier at age nine or ten, and remains so until about age fourteen and a half; a result which is likewise detected in the height estimates since the male coefficient becomes negative in the final round, when the child enters early adolescence.

When comparing the factor estimates to the naïve estimates, overall the disaggregated measures do not seem to add considerable explicative power to the estimation. In other words, using the mental health factors does not enhance notably the adjusted R-squared values of the estimates for any of the three child outcomes (weight, height or cognitive score).

However, the disaggregated estimates do add some degree of insight in terms of the interpretation about the relationship between caregiver mental sanity and child development. As mentioned above, in the Ethiopian case, the alternative estimates revealed that different aspects of mental health relate in different (even opposing) directions to the child's development. In particular, the mental health items relating to bodily or somatic symptoms correlated positively to the youngster's progress, as expected. By contrast, the questions related to the other two subcategories, that is those related to interpersonal interactions and (lack of) depressed emotions presented the opposite

[69] Subsequently, the evidence from adolescent growth curves indicate that at age 14 girls are surpassed again in height by the typical boy, whose adolescent spurt has now started, while hers is nearly finished. However, this result cannot be confirmed in the Young Live data since the final round of data, currently available, only follows the younger cohort up to age 12.

relationship to the minor's development process. One hypothesis to explain this curious result is that the somatic items -which ask about concrete, easily identifiable bodily sensations (e.g. sleeplessness, headaches, etc.)- may be more straightforward and as such capture to a better extent the respondent's mental state as intended by the scale.

Focusing on the Indian case (Panel B in Tables 4.1 thru 4.3), for which the association of mental health to child development was most salient in the naïve (controlled) estimates, the alternative estimates overall reveal that the mental health factor most significantly correlated to the child's outcomes are Factors 1 and 2, i.e. the factors collecting the most variance in the EFA procedure. Indeed, both the estimates for weight and PPVT scores indicate that during the initial stages of development the connection to the caregiver's psychosocial wellbeing is entirely driven by the first mental health factor. Moreover, the significant association to this factor holds once the partial set of controls for weight are added and even with the full set of controls for the cognitive score (Table 4.2., Panel B and C, Waves 2 and 3). On the other hand, the robust long-term result for height is driven by Factor 2

The progressive introduction of controls[70], in the estimates for the weight outcome, indicates that in the short run (Wave 2), the significant association is robust to the inclusion of the household's socioeconomic characteristics (head's education, housing quality, consumer durables, among others) and some behavioral aspects of the mother during pregnancy (e.g. antenatal visits). It is only once the anthropometric measures at baseline are included that the correlation of the mental health factor to child weight (at age 4) is no longer significant. However, at the subsequent stages of development, the significance of coefficient for Factor 1 is absorbed sooner, i.e. once the economic variables are added to the regression (in particular, by the consumer durables index.)

An inspection of the items that conform the factors might provide insight about the psychological category driving the significant associations to the child outcomes. However, a review of the EFA results in Table 3 reveals that in the Indian case Factor 1 does not capture a single distinct aspect of mental health but rather a mixture of depression symptoms (or lack thereof) from the three subcategories. Factor 2 also contains items from more than one category of the CES-D scale (groups 1 and 3; i.e. depressed affect and interpersonal items). As such, it is unclear which dimension of the psychological scale prevails in this case.

To synthesize, the above correlation estimates provide some evidence of the lasting association between the caregiver's psychologic wellbeing and her child's development, even if some of the relationship have present the unexpected sign. These findings provide an initial empirical indication that maternal mental health is a key factor related to the newborn's development, above and beyond, the usual wealth-related risk-factors. An important follow-up question that emerges is whether the magnitude of this intergenerational correlation intensifies over time. In particular, I am interested in examining whether the association between maternal mental health and her child's development is consistent with a skill-acquisition framework characterized by *dynamic complementarity*, or the notion that "skills beget skills" (Heckman and Kautz, 2013). In other words, I want to inquire empirically whether early development lags will accumulate and exacerbate with the passage of time. In the following section I investigate

[70] Again, the full set of results from the stepwise addition of controls is omitted but available upon request.

specifically the evolution of these gaps over the course of the child's development cycle, using standardized measures for all of the child development outcomes in order to track and compare their evolution over time.

4.3. Gradients Analysis at each stage in the child's development cycle

In order to visualize how the gaps in the child's development evolve over their early life cycle, I construct mental health gradients for each country (Figures 1.1., 1.2 and 1.2; left panels). In particular, I compare two groups of children; those under the care of mothers scoring the best mental health score (the top quartile in the continuous distribution; the blue line in the figures) versus those of mothers scoring the lowest mental health score (the bottom quartile; the red line). In particular, I plot the mean values of the child outcomes for each group between the ages of approximately 5 up to 12 years of age.

I also construct analogous wealth gradients comparing the children from the top wealth households to those at the bottom. I include these graphs (on the right panels in each figure) as a reference of the gaps relating to this more commonly studied risk factor. The differences in the means between the groups are indicated at each period and whether it is statistically significant (the asterisks indicate the level of statistical significance). Importantly, in contrast to the previous estimates, I use the standardized[71] values of each of the child outcomes (weight, height, and PPVT score) in order to gauge and visualize more accurately the evolution of the gaps between the top and bottom groups in the distribution. In particular, the standardization procedure accounts for differences in the distribution of the absolute outcomes as the child grows older- which would otherwise mechanically yield larger absolute differentials at latter stages of development.

The mental health gradients for Ethiopia, displayed in Figure 1.1. (left panel), suggest that the two groups of children from mothers with sound versus poor mental health do not differ in their development for any of the outcomes, while the wealth gradients (right panel) do reveal sizable significant differences- which widen slightly over the child's development cycle in the case of cognitive ability.

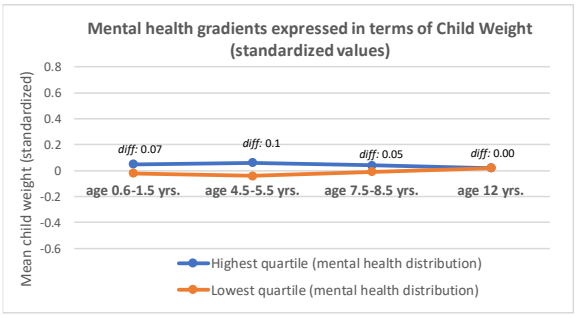
In contrast, in India and Vietnam, there are detectable significant gaps in weight and cognitive ability between the children of mothers with the best and worst mental health scores. In India (Figure 1.2.), the gaps in weight differentials are statistically significant throughout the entire growth period and increase over the years. Indeed, the weight gap doubles in magnitude between the time the child is one and twelve years old (rising from 0.15 to 0.32 percentage points). Note that the mental health gradients for height in India are also increasing in magnitude, though only significant in the final round (and marginally significant at the 80 percent level for waves 2 and 3). The results for cognitive ability in India suggest a persistent significant cognitive disadvantage for the low mental health group. However, this significant gap remains fairly stable in magnitude over the development course.

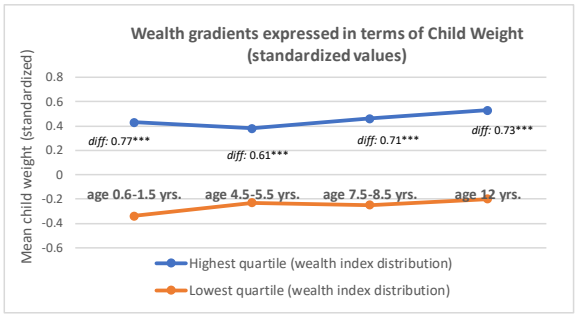
[71] As before, the outcomes for weight and height are standardized by demeaning the absolute values for each child (in kilograms and centimeters respectively) and dividing it by the standard deviation for each wave. The standardization is therefore specific to each age-group contained in a wave (i.e. 4.5-5.5 years for Wave 2, 7.5-8.5 years for Wave 3, and 12 years for Wave 4).

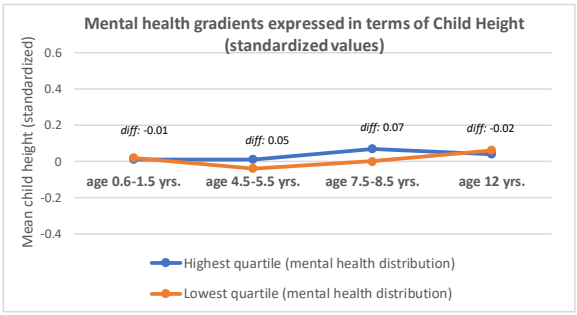
In Vietnam (Figure 1.3), as in India, the mental health gradients for weight are significant and slightly steeper toward the end of the study period, while the height gaps are at most marginally significant in the final rounds. Cognitive gaps in the Vietnamese case are statistically significant at age four and then again at the end of the development period by age twelve. The magnitude of the gap, however, remains stable over the rounds. This difference between the evolution of the gaps in physical versus cognitive development resonates to some extent with the existing evidence suggesting that the accumulation of skills (cognitive and non-cognitive) may be far more plastic than physical growth. Indeed, some of the existing evidence suggests there may be more chances of later life recovery from early lags in skill acquisition than from physical underdevelopment (Borghans et al, 2008).

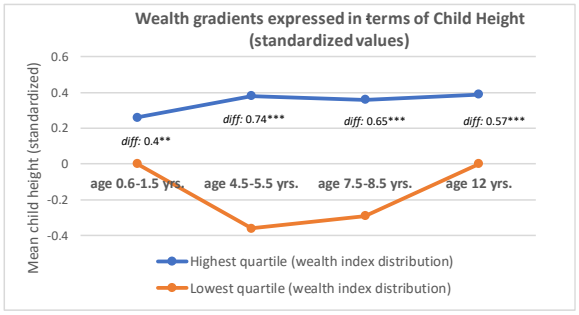
Overall, the significant mental health gradients (found in India and Vietnam), are comparative smaller in magnitude, vis-à-vis the commonly studied wealth gradients. In synthesis, the weight and cognitive mental health gradients indicate there are persistent lags in the development of children raised by mother's suffering from poor mental health. Moreover, the differentials in the standardized weight and (to a lesser extent) height values suggest the lags in physical development widen with time while the lags in cognitive ability remain fairly constant. As such the results are not directly consistent with the notion that missing out on the acquisition of foundational skills, may impair the acquisition process of future skills. Nevertheless, the present evidence of the persistent and increasing gaps in physical growth is important in its own right.

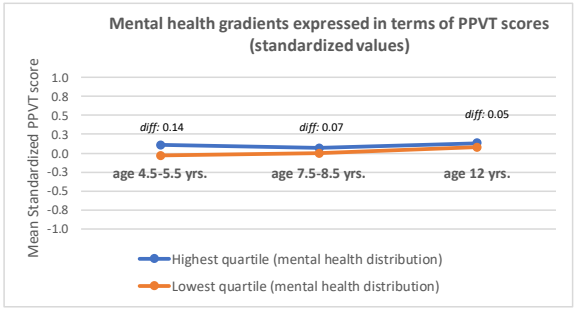
Figure 1.1. Child Development Gradients: ETHIOPIA

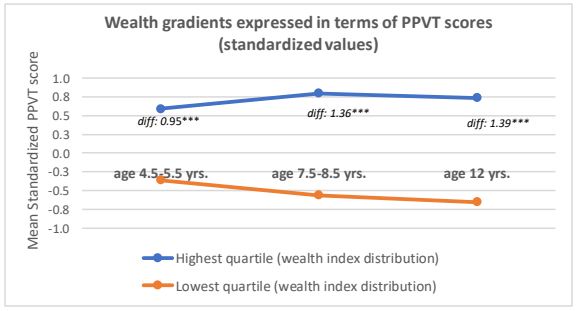






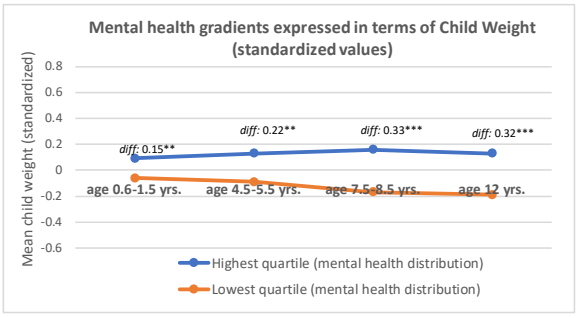


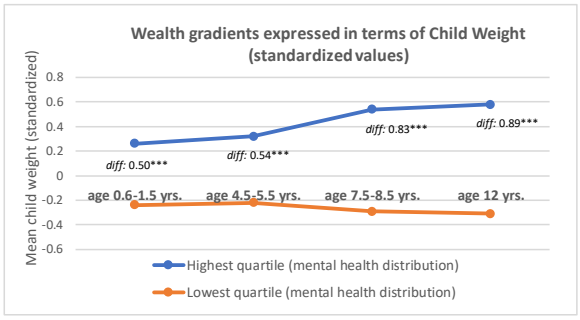


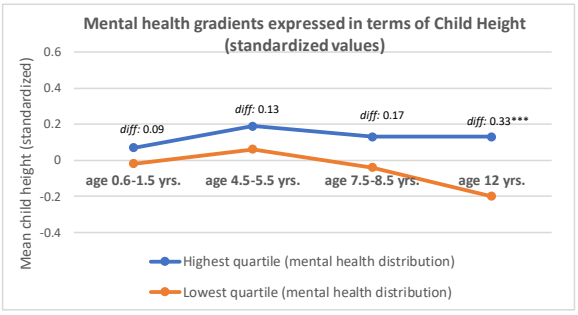


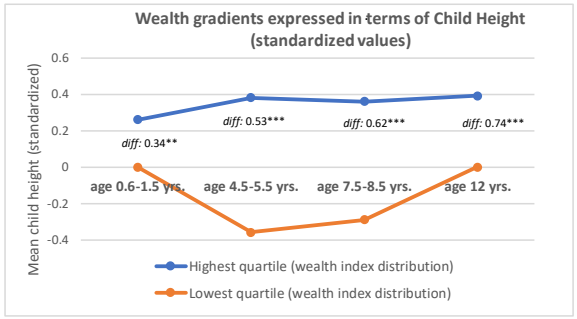
Note: The asterisks on the figures, displayed next to each point estimate, the indicate the level of statistical significance of the difference between the means for the top and bottom quartiles in the distribution as follows: *** p<0.01, ** p<0.05, * p<0.1

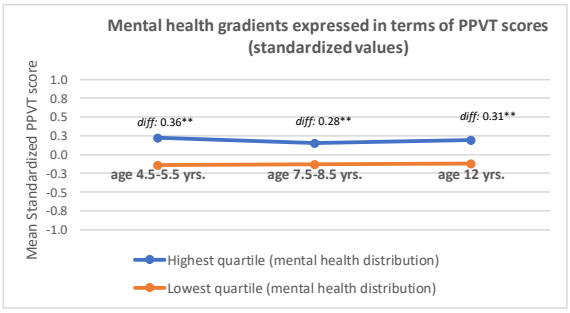
Figure 1.2. Child Development Gradients: INDIA

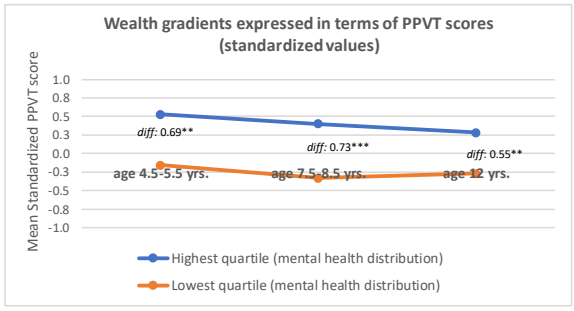






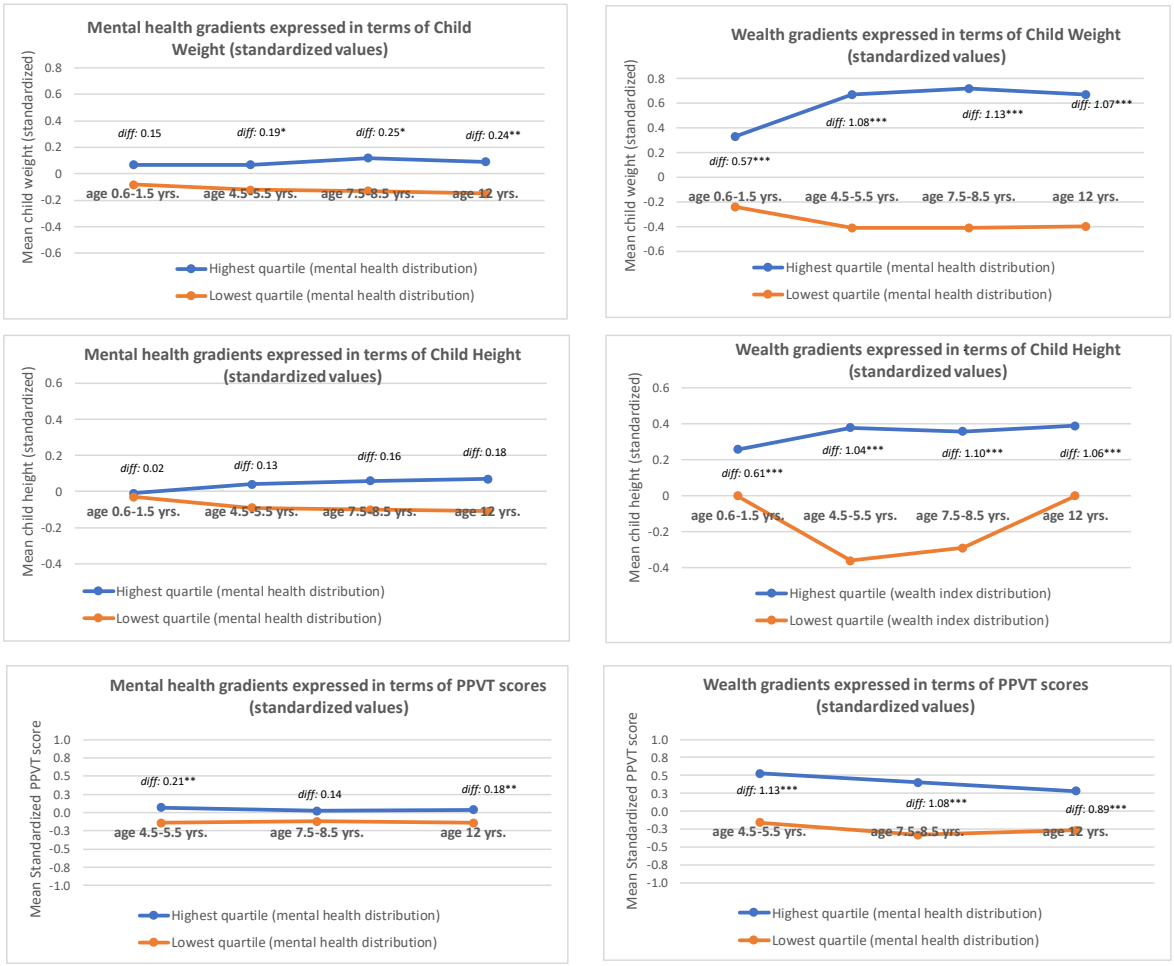






Note: The asterisks on the figures, displayed next to each point estimate, the indicate the level of statistical significance of the difference between the means for the top and bottom quartiles in the distribution as follows: *** p<0.01, ** p<0.05, * p<0.1

Figure 1.3. Child Development Gradients: VIETNAM



Note: The asterisks on the figures, displayed next to each point estimate, the indicate the level of statistical significance of the difference between the means for the top and bottom quartiles in the distribution as follows: *** p<0.01, ** p<0.05, * p<0.1

5. Mental health and Child development trajectories

5.1. Methodology and Conceptual definitions

After investigating the association between a mother's mental state and her child's human capital formation at each separate development stage, I now wish to expand the analysis by examining this association along the child's development course as a whole. Following from my investigation on welfare trajectories (Clavijo, 2016) I propose to examine the youngster's multi-stage development by building child human capital trajectories. Elaborating on the methodology developed by Premand and Vakis (2008), I construct a single measure that collapses the information on the individual's progress over the four-wave period. Analogous to the welfare trajectories approach, the human capital trajectories also measure development relative to the population distribution.

More specifically, the development trajectories describe the sequence of a child's position along the development distribution as time unfolds. In this case the development distributions correspond to the three outcomes analyzed in the previous sections (i.e. weight, height and cognitive test score). To build the trajectories I make use of the four rounds of data available (t=4) such that trajectories take the form {ijkl} where i, j, k, and l correspond to each individual child's position along the development outcome distribution in Wave 1 (i), Wave 2 (j), Wave 3 (k) and Wave 4 (l)[72]. The child's position in a given round is determined by the tercile of the development outcome distribution she falls into, where the bottom tercile of each outcome indicates *low development* (tercile 1), the middle tercile indicates average development (tercile 2) and the top tercile (tercile 3) indicates a high or a satisfactory development[73].

Since I am interested in analyzing the pathways followed by the children over the four-round period, in terms of their physical and cognitive development, I focus mainly on the following four trajectories to characterize separately patterns of persistence and mobility along the development distributions:

Persistence patterns

(1) Sustained low development: {ijkl} = {1111} ;

(2) Sustained high development: {ijkl} = {3333} ;

Movement patterns

(3) Downward movement: {ijkl} such that { i > j > k > l };

(4) Upward movement: {ijkl} such that { i < j < k < l };

Hence, the general specification for the regressions to examine the child's human capital trajectories would be:

$$traj_i = \beta_0 + \beta_1 maternal\_mental\_health_i + \beta_2 X_i + \varepsilon_i$$

Where the dependent outcome $traj_i$ would be a binary variable indicating whether the household i exhibits each of the 4 trajectories described above and X_i would be the vector of common controls (household sociodemographic characteristics, economic circumstances, etc.) Finally, the coefficient of interest, reported in the regression tables below, would be β_1. This term captures the association of maternal mental health to the likelihood that a child follows a determined development trajectory. This term will either be a single coefficient for the estimates using the naïve mental health measure, or a vector of coefficients for each of the factors in the case of the estimates using the

[72] In the case of cognitive development, the PPVT scores are collected from Wave 2, when the child is around 5 years old, onwards. As such the cognitive development trajectories consist of three-round sequences.

[73] The rationale for choosing to use terciles instead of a higher number of quantiles to build the 4-period trajectories is that the number of possible trajectory combinations increases excessively when the distribution is cut-up into smaller segments. This renders the frequency of sustained patterns near negligible. I therefore choose to rank the child's position using terciles (instead of quartiles or quintiles).

alternative maternal mental health measures[74]. The two persistence patterns, {ijkl=1111} and {ijkl=3333}, indicate trajectories of chronic underdevelopment and sustained satisfactory development respectively. In other words, these pathways signal the youngsters that are permanently lagging or flourishing in terms of their skill acquisition over the four-period course.

Moreover, the downward movement trend flags the children who have started-off on a good development path (either average or above average; i.e. terciles 2 and 3), but have later deviated from that path presenting subsequent lags in their human capital formation[75]. These kids may be characterized as thriving initially in terms of their development, but vulnerable and as such lagging behind subsequently. Finally, the upward movement trend indicates the youngsters that have improved their development pathway over the four-wave period, either because they experienced an early development lag (positioned at the bottom of the distribution) and managed to move upward from there, or because they initially presented an average development level and subsequently rose to the top. This trajectory therefore characterizes the young individuals who seem resilient in their development process since they are able to overcome a period of initial adversity (or just average development) and even progress to the top of the distribution.

5.2. Trajectories Estimates: Results

The results for the trajectories estimates for each of the three countries are presented in Tables 5.1, 5.2 and 5.3. Again, each column contains the estimates for a separate regression; the top panel displays the estimates using the continuous mental health scale as the explicative variable while the bottom panel displays the results for the regressions including each of the predicted mental health factors on the right-hand side of the regression. As mentioned above, the dependent variable in each regression is a dummy indicating whether the child followed a given trajectory. I run all the estimates using an alternative definition for each of the four main trajectories described in section 5.1. above; hence the eight trajectories in all.

For the persistence patterns I build 'conditional' and 'unconditional' trajectories. To be specific, the 'unconditional' low development dummy (column 1 for each outcome in the tables) takes the value of one (1) if the child remains in the bottom tercile over the 4 waves (i.e. if *traj* {ijkl} = 1111) and the value of zero (0) otherwise. Thus, the estimates for the 'unconditional' trajectories use the entire sample. In contrast, the estimates using the 'conditional'

[74] As before, the measures for the caregiver's mental health (both naïve and disaggregated) are positively coded. However, in order to exploit fully the variation in the caregiver's mental health, in this case the naïve measure is a continuous variable indicating the proportion of depression symptoms the caregiver does *not* present (i.e. a score of 0.9 indicates the caregiver only presents 2 out of the 20 depression symptoms; a favorable mental health score). As in the previous estimates, for the disaggregated measures a higher score indicates the presence of less depression symptoms and therefore better mental health. The measures are obtained by performing Exploratory Factor Analysis on the 20 items of the (positively coded) CES-D (Center for Epidemiological Studies- Depression) scale.

[75] Notice that conceptually a strictly downward trend { i > j > k > l } implies a downward step in the distribution in the transition between each wave. However, given that there are only three possible positions along the distribution (i.e. tercile 1, 2 and 3) it is not possible for any child to present a position descent in every period over the four periods. As such, in practice the downward trajectory implies at least one transition between waves over which the child remains in the same position. Therefore, the precise definition of the downward trajectories I construct allows for one of the transitions to hold with the equality sign. More specifically there are three possible pathways classified as downward movements: *traj* = ijkl such that { i $\geq$ j > k > l } or { i > j $\geq$ k > l } or { i > j > k $\geq$ l }. The same rationale applies in the empirical definition of the upward trend, i.e. there are also three possible pathways classified as upward movements: *traj* = ijkl such that { i $\leq$ j < k < l } or { i < j $\leq$ k < l } or { i < j < k $\leq$ l }.

low development trajectory restrict the sample to the children who start out in the bottom tercile[76]. As such, this 'conditional' dummy also takes the value of one (1) if the child remains permanently in the bottom tercile but only takes the value of zero if the child started out in the lowest tercile in Wave 1 and then deviates from the bottom of the distribution (i.e. if *traj* {ijkl}is such that i=1 and jkl ≠ 111). The estimates using this alternative definition, although they only utilize a third of the sample, may add insight in the analysis of the pathways since the conditional trajectories zoom-in on the initially lagged kids to examine the association between the caregiver's psychological wellbeing and the likelihood that these children remain in that underdeveloped position.

For the movement patterns I build 'weak' and 'strong' downward (and upward trends). Note that in the weak version of the trajectories the downward (or upward) movement may hold in just one of the transitions (between Wave 1 and 2, Wave 2 and 3, or between Wave 3 and 4). Conversely, in the strong version the descent (or ascent) in position within the distribution must occur in at least two of the transitions.

All the estimates presented in Tables 5.1 thru 5.3 include child month-of age fixed-effects and control for the basic socioeconomic covariates (the estimates including additional controls are presented in the Appendix). At the broad level, the results for the trajectories estimates yield very few significant coefficients; suggesting there is not a strong correlation between mental health and these specific trajectories. In particular, the results for Ethiopia do not indicate the mother's psychologic wellbeing relates to the child's development pathway in a significant way. In the case of India, maternal mental health is positively and significantly associated to certain persistence trajectories. Controlling for the household's sociodemographic characteristics, sound mental health correlates significantly to having a lower probability of being stuck at the bottom of the height distribution, and also correlates significantly to having a higher probability of thriving at the top of the weight distribution. This last result for sustained high development, in terms of weight, is also statistically significant in the Vietnamese case; although practically no other coefficient is statistically significant in Vietnam. Overall, given the multiple hypotheses being tested, any single significant result carries low statistical meaning at the broader level. Indeed, only 11 percent of the total number of coefficients estimated yielded a statistically significant result; barely above the proportion expected by mere chance.

When examining the estimates using the factors I observe once again (as in the estimates for the separate waves) that some of the factors correlate in opposing directions to the development trajectories. For example, in India for the estimates of the two downward trajectories Factor 1 and Factor 3 present the expected negative sign, indicating a correlation between good mental health and a reduced probability of following a downward trajectory (Table 5.2., columns 5 and 6). However, this intuitive result is offset by the positive and significant coefficients accompanying Factor 2 and Factor 4. These opposing correlation forces are reflected in the resulting naïve estimate, for which no association of the mental health scale to the downward trajectories is detected. Hence, the alternative trajectories estimates provide an additional indication that different dimensions within the mental health scale may move in different directions. To the extent that these movements may offset each other and thus be undetectable when using the naïve scale alone, the use of the disaggregated measures may have value-added. Indeed, it is possible that

[76] In the analogous 'conditional' definition of the sustained high development trajectory (column 3 for each outcome in the tables) the sample is restricted to the individuals that start off in the top tercile of the distribution.

using these factors may shed further light on the subject of mental health as a development risk factor, given the complexity inherent in a scale of this sort and the challenges to its accurate measurement.

To synthesize, the above estimates do not suggest there is a strong correlation between the mother's mental health and the child's development pathway as captured using the development trajectories described above. Overall, the evidence of the association between maternal psychological wellbeing and the child's human capital formation is by far more robust in the previous analysis, i.e., as suggested by the results from the estimates and gradients at each separate stage of development, rather than a single measure capturing the entire trajectory.

6. Conclusions

To summarize, the aim of this paper was to investigate the risk factors (near birth) affecting children's developmental trajectories into youth, with a special focus on a less studied aspect affecting the quality of the child's upbringing; namely maternal mental health. One of the main contributions, with respect to existing studies on the subject, was to use an alternative measure of mental health (yielded from a factor analysis procedure) which potentially provided enhanced measures. These factors provided additional insight about the different (opposing) dimensions relating to the caregiver's state of mind and associated to the child's development (as measured by her weight, height and cognitive score).

As a second approach, to integrate the longitudinal information in a single development indicator, I constructed trajectories of the key human capital outcomes to examine how the early risk factors (in particular maternal mental health) help determine the pathways children follow. These trajectories capture a summary measure of the child's progress over multiple periods, as such, an intertemporal and more comprehensive, picture of the child's life-path. In general, the results for the trajectories estimates yield very few significant coefficients; suggesting there is not a strong correlation between mental health and these specific trajectories.

Above all, the main take-away message that emerges from the present analysis is that there are some lasting and increasing associations between the caregiver's psychologic wellbeing and her child's progress at each separate stage of development, despite some lack of consistency across different countries and indicators. These findings provide an empirical indication that maternal mental health may be a key factor related to the newborn's development in some settings, above and beyond, the usual wealth-related risk-factors. Most notably, the gradients analysis provides evidence of the persistent and increasing lags in physical growth (weight) suffered by the children raised by mentally frail caregivers. This long-term empirical finding is important given the fact that parental mental health has been less studied (than wealth or nutrition) as a risk factor in the child's early development and it is only of late that the focus is being set more acutely on the parents in their caregiving capacity.

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Table 1. Young Lives Survey sample information

		Young Cohort		*Older Cohort*	
Sample size per country (Number of 'young lives children')		2,000		1,000	
	Year	**Age of child (in yrs)**	**Development stage**	**Age of child (in yrs)**	**Development stage**
Wave 1	2002	0.5-1.5	early childhood	7-8	middle childhood
Wave 2	2006	4.5-5.5	middle childhood	11-12	early adolescence
Wave 3	2009	7.5-8.5	middle childhood	14-15	middle adolescence
Wave 4	2012	12.5-13.5	early adolescence	17-18	early adulthood

Table 2.1. Descriptive Statistics

	ETHIOPIA						INDIA						VIETNAM					
Variables	Obs.	Mean	Std. Dev.	Min	Max	Difference in means (Depressed vs. Non-depressed)	Obs.	Mean	Std. Dev.	Min	Max	Difference in means (Depressed vs. Non-depressed)	Obs.	Mean	Std. Dev.	Min	Max	Difference in means (Depressed vs. Non-depressed)
Mother/Caregiver's characteristics																		
Caregiver depression (CESD) /1	1971	0.3	0.5	0.0	1	-	1899	0.3	0.5	0.0	1	-	1882	0.2	0.4	0.0	1	-
Caregiver literacy (literate=1)	1999	0.3	0.4	0.0	1	-0.05	2011	0.4	0.5	0.0	1	-0.11**	2000	0.8	0.4	0.0	1	-0.06
Caregiver education (yrs)	1993	2.6	4.0	0.0	16	-0.43	2004	3.2	4.5	0.0	16	-1.68***	1938	6.3	4.8	0.0	16	-0.84*
Child characteristics (baseline)																		
Gender (male=1)	1999	0.5	0.5	0.0	1	0.01	2011	0.5	0.5	0.0	1	0.06**	2000	0.5	0.5	0.0	1	0.02
Weight for age (z-score)	1855	-1.4	1.5	-7.7	3	-0.08	1994	-1.5	1.1	-6.6	3	-0.27***	1992	-1.0	1.1	-6.0	6	-0.20***
Height for age (z-score)	1946	-1.6	2.0	-8.0	8	0.10	1992	-1.3	1.6	-8.1	9	-0.33**	1992	-1.1	1.3	-7.2	9	-0.19**
Body mass index (z-score)	1853	-0.7	1.5	-7.4	4	-0.18*	1991	-1.0	1.2	-6.4	4	-0.09	1990	-0.4	1.0	-7.4	5	-0.13**
Stunted (yes=1)	1946	0.4	0.5	0.0	1	-0.02	1992	0.3	0.5	0.0	1	0.11***	1992	0.2	0.4	0.0	1	0.07**
Underweight (yes=1)	1855	0.3	0.5	0.0	1	0.02	1994	0.3	0.5	0.0	1	0.08***	1992	0.1	0.4	0.0	1	0.05***
Thin (yes=1)	1853	0.2	0.4	0.0	1	0.03**	1991	0.2	0.4	0.0	1	0.00	1992	0.0	0.2	0.0	1	0.02*
Health compared to peers (same/better=1; worse=0	1996	1.9	0.8	1.0	3	0.28***	2011	1.6	0.7	1.0	3	0.24***	2000	1.8	0.8	1.0	3	0.38***
Long-term illness/health problem (yes=1)	1997	0.1	0.3	0.0	1	0.06***	2011	0.0	0.2	0.0	1	0.04**	2000	0.0	0.2	0.0	1	0.07***
Pregnancy and postpartum characteristics																		
Antenatal care (received care?)(yes=1)	1923	0.5	0.5	0.0	1	0.02	1985	0.9	0.3	0.0	1	-0.10**	1981	0.8	0.4	0.0	1	-0.01
Antenatal care level of service (none=0; high=3)	1847	0.9	1.1	0.0	3	-0.00	1957	2.0	1.1	0.0	3	-0.41***	1954	1.4	1.0	0.0	3	-0.08
Months pregnant at first antenatal visit	948	4.5	1.6	0.0	9	0.11	1726	3.7	1.4	1.0	9	0.28**	1628	3.9	1.7	1.0	9	0.05
Number of antenatal visits	931	4.4	2.1	1.0	16	-0.00	1742	4.9	2.2	1.0	20	-0.47**	1635	3.1	1.7	1.0	12	-0.20
Tetatnus injections during in antenatal visit	959	0.9	0.3	0.0	1	0.00	1747	1.0	0.2	0.0	1	-0.02**	1626	0.8	0.4	0.0	1	-0.02
Iron supplementation during pregnancy							1746	0.9	0.2	0.0	1	-0.02						
Difficulty during pregnancy (yes=1)	1916	0.3	0.4	0.0	1	0.22***	1982	0.1	0.3	0.0	1	0.13***	1980	0.2	0.4	0.0	1	0.22***
Premature birth	1885	0.1	0.3	0.0	1	0.03	1923	0.1	0.3	0.0	1	0.02	1960	0.1	0.3	0.0	1	0.03
Breastfed (yes=1)	1930	1.0	0.1	0.0	1	-0.00	1986	1.0	0.2	0.0	1	-0.01	1981	1.0	0.1	0.0	1	-0.00
Breastfeeding period (no. of months)	1895	17.3	3.0	0.0	18	-0.12	1931	16.9	3.6	0.0	18	0.72***	1962	17.1	2.7	0.0	18	-0.29*
Household characteristics (baseline)																		
Household head age	1987	37.5	10.9	17.0	110	1.70***	2011	40.0	14.9	18.0	95	-1.57	2000	37.9	14.0	14.0	89	-2.63***
Household head gender (male=1)	1998	0.9	0.3	0.0	1	-0.07***	2011	0.9	0.3	0.0	1	0.03	2000	0.8	0.4	0.0	1	-0.02
Household head education (yrs)	1985	3.5	4.6	0.0	16	-0.80*	2000	3.5	4.9	0.0	16	-0.98**	1739	6.2	5.2	0.0	16	-0.32
Household size	1999	5.7	2.2	2.0	16	0.36***	2011	5.4	2.4	2.0	22	-0.11	2000	4.9	1.8	2.0	14	-0.27*
Wealth Index	1977	0.2	0.2	0.0	1	-0.01	2006	0.4	0.2	0.0	1	-0.09***	1999	0.4	0.2	0.0	1	-0.03
Housing Index	1998	0.2	0.2	0.0	1	-0.00	2010	0.5	0.3	0.0	1	-0.10***	2000	0.5	0.3	0.0	1	0.01
Services Index	1990	0.3	0.3	0.0	1	0.00	2008	0.6	0.3	0.0	1	-0.09**	2000	0.4	0.3	0.0	1	-0.03
Consumer durables Index	1987	0.1	0.1	0.0	1	-0.02*	2010	0.2	0.2	0.0	1	-0.07***	1999	0.4	0.2	0.0	1	-0.08***
Drinking water access	1994	0.5	0.5	0.0	1	0.01	2011	0.8	0.4	0.0	1	-0.00	2000	0.1	0.3	0.0	1	-0.03
Toilet access	1999	0.2	0.4	0.0	1	-0.02	2008	0.3	0.5	0.0	1	-0.14*	2000	0.5	0.5	0.0	1	-0.04
Electricity access	1997	0.4	0.5	0.0	1	0.02	2011	0.8	0.4	0.0	1	-0.07*	2000	0.8	0.4	0.0	1	-0.01
Cooking	1997	0.1	0.3	0.0	1	-0.01	2011	0.2	0.4	0.0	1	-0.16**	2000	0.2	0.4	0.0	1	-0.05
Food expenditure (Wave 2) /2	1912	90.0	64.3	8.4	745	-5.29	1950	402.3	298.1	0.0	4223	32.84	1970	239.7	151.7	43.7	2029	-30.97***
Non-food expenditure	1912	56.1	74.0	0.3	1080	-6.27	1950	410.1	405.9	23.0	7738	-16.76	1970	162.8	316.8	5.2	10400	-38.85**
Total expenditure (Wave 2)	1912	145.5	115.8	9.7	1218	-11.33*	1950	812.4	552.3	90.7	8571	16.08	1970	402.5	414.0	57.8	11827	-69.82***
Livestock ownership	1999	0.6	0.5	0.0	1	-0.03	2011	0.4	0.5	0.0	1	0.04	2000	0.7	0.5	0.0	1	-0.02
Shocks reported (last 6 months since baseline)																		
Natural disaster	1999	0.1	0.2	0.0	1	0.04**	2011	0.1	0.2	0.0	1	0.05*	2000	0.0	0.1	0.0	1	0.01
Economic shock	1999	0.6	0.5	0.0	1	0.19***	2011	0.1	0.3	0.0	1	0.08***	2000	0.1	0.3	0.0	1	0.04**
Crime	1999	0.4	0.5	0.0	1	0.03	2011	0.3	0.5	0.0	1	0.08*	2000	0.2	0.4	0.0	1	0.10**
Family shock (death, divorce, or illness of member)	1999	0.3	0.5	0.0	1	0.21***	2011	0.2	0.4	0.0	1	0.11***	2000	0.2	0.4	0.0	1	0.27***

Notes: The asterisks next to the differences in means indicate the statistical signifcance as follows: *** p<0.01, ** p<0.05, * p<0.1.

1/ The caregiver depression variable is a dichotomous variable based on the CES- D scale (Center for Epidemiological Studies- Depression scale). The standard definition of a case of clinical depression is the presence of 8 or more symptoms out of the 20 symptoms asked in the scale.

2/ All household characteristics correspond to information at baseline, except total expenditure which is only available from Wave 2 onwards. Expenditures values are expressed in the local currency for each country.

Table 2.2 Descriptive Statistics (by Mental health Factors)

Variables	ETHIOPIA						INDIA										VIETNAM						
			Difference in means						Difference in means										Difference in means				
	Obs.	Mean	Mental health scale (Depressed vs. Non-depressed)	Factor 1	Factor 2	Factor 3	Obs.	Mean	Mental health scale (Depressed vs. Non-depressed)	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Obs.	Mean	Mental health scale (Depressed vs. Non-depressed)	Factor 1	Factor 2	Factor 3	Factor 4
				(Bottom vs. Top quartile)						(Bottom vs. Top quartile)									(Bottom vs. Top quartile)				
Mother/Caregiver's characteristics																							
Caregiver depression (CESD) /1	1971	0.3	-	0.88***	0.72***	0.68***	1899	0.3	-	0.51***	0.36***	0.55***	0.48***	0.41***	0.25***	1882	0.2	-	0.65***	0.54***	0.42***	0.52***	
Caregiver literacy (literate=1)	1999	0.3	-0.05	-0.01	-0.10**	-0.13**	2011	0.4	-0.11**	-0.16***	0.02	-0.19**	-0.11**	-0.07*	-0.04	2000	0.8	-0.06	-0.01	-0.06	-0.05	-0.07*	
Caregiver education (yrs)	1993	2.6	-0.43	-0.21	-0.92**	-1.48**	2004	3.2	-1.68***	-1.34***	0.21	-2.21**	-1.12*	-0.68*	-0.78	1938	6.3	-0.84*	-0.47	-1.44*	0.12	-1.11**	
Child characteristics (baseline)																							
Gender (male=1)	1999	0.5	0.01	0.06*	0.05	-0.02	2011	0.5	0.06**	-0.01	0.03	0.04	0.09***	0.01	-0.02	2000	0.5	0.02	-0.03	0.06**	0.02	-0.04	
Weight for age (z-score)	1855	-1.4	-0.08	-0.07	0.03	-0.31**	1994	-1.5	-0.27***	-0.39***	-0.27***	-0.31**	-0.15*	-0.07	0.11	1992	-1.0	-0.20***	-0.16	-0.31***	-0.10*	-0.23***	
Height for age (z-score)	1946	-1.6	0.10	0.00	0.31*	-0.19*	1992	-1.3	-0.33**	-0.61***	-0.29**	-0.26	-0.10	-0.16	0.15	1992	-1.1	-0.19**	-0.17	-0.18	-0.15	-0.15	
Body mass index (z-score)	1853	-0.7	-0.18*	-0.10	-0.25	-0.23	1991	-1.0	-0.09	-0.03	-0.14	-0.19	-0.12	0.05	0.03	1990	-0.4	-0.13**	-0.08	-0.28***	-0.03	-0.20***	
Stunted (yes=1)	1946	0.4	-0.02	0.01	-0.07*	0.04	1992	0.3	0.11***	0.14***	0.04	0.09**	0.04	0.07*	-0.01	1992	0.2	0.07**	0.04	0.08*	-0.00	0.07**	
Underweight (yes=1)	1855	0.3	0.02	0.00	-0.03	0.08**	1994	0.3	0.08***	0.10***	0.08***	0.10**	0.02	0.01	-0.02	1992	0.1	0.05***	0.03	0.09***	-0.01	0.06**	
Thin (yes=1)	1853	0.2	0.03**	0.01	0.04	0.03	1991	0.2	0.00	-0.02	0.02	0.01	0.02	-0.00	-0.01	1992	0.0	0.02*	-0.01	0.01	-0.02	0.01	
Health compared to peers (same/better=1; worse=0	1996	0.8	-0.18***	-0.22***	-0.19***	-0.23***	2011	1.6	-0.11***	-0.12***	-0.04	-0.05**	-0.08**	-0.05	-0.04	2000	1.8	-0.26***	-0.23***	-0.33***	-0.09**	-0.15***	
Long-term illness/health problem (yes=1)	1997	0.1	0.06***	0.08***	0.08***	0.07***	2011	0.0	0.04**	0.01	0.01	0.05***	0.02**	0.02	0.02	2000	0.0	0.07***	0.06***	0.05***	0.03	0.06**	
Pregnancy and postpartum characteristics																							
Antenatal care (received care?)(yes=1)	1923	0.5	0.02	0.01	-0.04	0.03	1985	0.9	-0.10**	-0.07**	-0.04	-0.02	0.02	0.01	-0.03	1981	0.8	-0.01	0.03	0.04	-0.05*	0.01	
Antenatal care level of service (none=0; high=3)	1847	0.9	-0.00	0.04	-0.14	-0.03	1957	2.0	-0.41***	-0.37***	-0.14	-0.34**	0.05	-0.10	-0.04	1954	1.4	-0.08	-0.06	-0.03	-0.04	-0.03	
Months pregnant at first antenatal visit	948	4.5	0.11	-0.13	0.10	0.31	1726	3.7	0.28**	0.26**	0.09	0.31**	-0.10	0.40**	0.06	1628	3.9	0.05	0.31**	0.19	-0.22	0.06	
Number of antenatal visits	931	4.4	-0.00	0.27	-0.01	-0.28	1742	4.9	-0.47**	-0.69***	-0.20	-0.71**	-0.03	-0.17	0.16	1635	3.1	-0.20	-0.29	-0.43**	-0.04	-0.26**	
Tetatnus injections during in antenatal visit	959	0.9	0.00	0.00	-0.02	-0.03	1747	1.0	-0.02**	-0.02***	-0.02	-0.05**	-0.01	-0.01	0.02	1626	0.8	-0.02	-0.06	-0.01	0.01	-0.02	
Mother wanted to be pregnant at the time?	1894	0.6	-0.19***	-0.28***	-0.08**	-0.07**	1970	0.9	-0.03	-0.04**	0.00	-0.05**	-0.03	-0.01	0.06*	1978	0.8	-0.02	-0.03	-0.08**	-0.01	-0.03	
Iron supplementation during pregnancy							1746	0.9	-0.02	-0.05**	-0.03*	-0.05**	-0.01	-0.03	0.03								
Difficulty during pregnancy (yes=1)	1916	0.3	0.22***	0.20***	0.28***	0.28***	1982	0.1	0.13***	0.06**	0.05**	0.10***	0.13***	0.10***	0.01	1980	0.2	0.22***	0.12**	0.24***	0.09**	0.14***	
Difficulty during labor	1908	0.4	0.11***	0.15***	0.16***	0.17***	1981	0.3	0.03	0.05	-0.01	0.02	0.09*	-0.04	-0.11**	1981	0.2	0.10***	0.06	0.07*	0.03	0.10***	
Premature birth	1885	0.1	0.03	0.03*	0.03	0.05**	1923	0.1	0.02	0.02	0.03	-0.02	0.05*	-0.02	0.02	1960	0.1	0.03	0.01	*0.04*	0.03	0.01	
Breastfed (yes=1)	1930	1.0	-0.00	-0.00	0.00	0.00	1986	1.0	-0.01	-0.01	-0.02*	-0.00	-0.00	0.00	-0.03**	1981	1.0	-0.00	-0.01	0.00	-0.01	0.00	
Breastfeeding period (no. of months)	1895	17.3	-0.12	-0.20	0.39	0.22	1931	16.9	0.72***	0.22	0.36	0.70*	0.19	-0.05	0.91**	1962	17.1	-0.29*	0.03	-0.35**	-0.20	-0.01	
Household characteristics (baseline)																							
Household head age	1987	37.5	1.70***	1.59*	2.81***	2.47***	2011	40.0	-1.57	1.69	-1.29	0.01	-1.69	0.87	-2.34*	2000	37.9	-2.63***	-3.27***	-0.91	-1.56	-0.26	
Household head gender (male=1)	1998	0.9	-0.07***	-0.15***	0.00	-0.05**	2011	0.9	0.03	0.00	-0.01	0.01	0.02	-0.00	0.01	2000	0.8	-0.02	0.00	-0.03	-0.04	0.01	
Household head education (yrs)	1985	3.5	-0.80*	-0.68	-1.20**	-1.98***	2000	3.5	-0.98**	-0.96*	0.44	-2.21**	-0.86*	-0.62	0.15	1739	6.2	-0.32	0.01	-1.27	0.47	-0.41	
Household size	1999	5.7	0.36***	0.22	0.62***	0.48***	2011	5.4	-0.11	0.52*	-0.09	-0.01	-0.19	-0.04	-0.21	2000	4.9	-0.27*	-0.66***	0.04	-0.05	-0.07	
Wealth Index	1977	0.2	-0.01	0.01	-0.04*	-0.05*	2006	0.4	-0.09***	-0.13***	-0.03	-0.13**	-0.06**	-0.01	0.01	1999	0.4	-0.03	-0.03	-0.04	-0.02	-0.05**	
Housing Index	1998	0.2	-0.00	0.02	-0.04*	-0.04*	2010	0.5	-0.10***	-0.15***	-0.05*	-0.16**	-0.06**	-0.00	-0.02	2000	0.5	0.01	0.02	0.00	0.01	-0.04	
Services Index	1990	0.3	0.00	0.03	-0.03	-0.05	2008	0.6	-0.09**	-0.17***	-0.03	-0.12**	-0.06*	-0.03	0.04	2000	0.4	-0.03	-0.03	-0.06	-0.01	-0.06**	
Consumer durables Index	1987	0.1	-0.02*	-0.02	-0.03**	-0.05**	2010	0.2	-0.07***	-0.08***	-0.02	-0.10**	-0.06**	-0.01	-0.00	1999	0.4	-0.08***	-0.08***	-0.08**	-0.06***	-0.05***	
Drinking water access	1994	0.5	0.01	0.03	-0.03	-0.01	2011	0.8	-0.00	-0.06	-0.01	0.03	-0.05	0.01	0.07	2000	0.1	-0.03	-0.06	-0.03	-0.03	-0.04	
Toilet access	1999	0.2	-0.02	-0.02	-0.01	-0.03	2008	0.3	-0.14*	-0.24**	-0.02	-0.20**	-0.07	-0.04	0.06	2000	0.5	-0.04	-0.00	-0.12**	0.06	-0.10**	
Electricity access	1997	0.4	0.02	0.11*	-0.07	-0.10*	2011	0.8	-0.07*	-0.17***	-0.06	-0.11**	-0.08**	0.00	0.04	2000	0.8	-0.01	-0.00	-0.01	-0.02	-0.06	
Cooking	1997	0.1	-0.01	-0.00	-0.02	-0.07	2011	0.2	-0.16**	-0.21**	-0.02	-0.21**	-0.04	-0.07	-0.00	2000	0.2	-0.05	-0.06	-0.08	-0.07	-0.04	
Food expenditure (Wave 2) /2	1912	90.0	-5.29	-7.37	-10.58**	-12.39**	1950	402.3	32.84	-21.04	28.37	9.30	-32.77**	54.86**	40.49	1970	239.7	-30.97***	-54.69**	-26.63*	-29.19**	-25.63**	
Non-food expenditure	1912	56.1	-6.27	-0.89	-19.06***	-18.54***	1950	410.1	-16.76	-73.69**	11.73	-80.37**	-20.57	48.27	5.14	1970	162.8	-38.85**	-47.53*	-30.46	-6.20	-19.64	
Total expenditure (Wave 2)	1912	145.5	-11.33*	-7.98	-29.62***	-30.60***	1950	812.4	16.08	-94.73**	40.10	-71.07	-53.35	103.13*	45.63	1970	402.5	-69.82***	-102.22**	-57.09*	-35.39	-45.27**	
Livestock ownership	1999	0.6	-0.03	-0.12**	0.06*	0.05	2011	0.4	0.04	0.06	-0.04	0.09	-0.00	-0.02	0.01	2000	0.7	-0.02	0.00	0.01	0.01	0.01	
Shocks reported (last 6 months since baseline)																							
Natural disaster	1999	0.1	0.04**	0.05**	0.05***	0.04*	2011	0.1	0.05*	0.03	0.04***	0.04	0.01	0.04*	-0.02	2000	0.0	0.01	0.00	-0.00	-0.00	0.01	
Economic shock	1999	0.6	0.19***	0.26***	0.25***	0.28***	2011	0.1	0.08***	0.06**	0.06*	0.09***	0.07***	-0.02	0.06**	2000	0.1	0.04**	0.06*	0.08***	0.03	0.03**	
Crime	1999	0.4	0.03	-0.02	0.16***	0.18***	2011	0.3	0.08*	0.06	0.05	0.11	0.01	-0.04	0.13*	2000	0.2	0.10**	0.05	0.15***	-0.01	0.11***	
Family shock (death, divorce, or illness of member)	1999	0.3	0.21***	0.31***	0.18***	0.16***	2011	0.2	0.11***	0.11**	0.07*	0.13***	0.09*	0.01	0.07	2000	0.2	0.27***	0.26***	0.22***	0.16***	0.18***	

Notes: The asterisks next to the differences in means indicate the statistical signifcance as follows: *** p<0.01, ** p<0.05, * p<0.1.

The mental health factors are obtained by performing Exploratory Factor Analysis on the 20 items of the (positively coded) of the CES-D (Center for Epidemiological Studies- Depression) scale. The resulting factors are the disaggregated constructs of the mental health scale. A higher score indicates the presence of less depression symptoms and therefore better mental. For each descriptive statistic the means difference compares the average value for mothers that score low (bottom quartile) versus those that score high (top quartile) for each mental health factor .

1/ The caregiver depression variable is a dichotomous variable based on the CES- D scale (Center for Epidemiological Studies- Depression scale). The standard definition of a case of clinical depression is the presence of 8 or more symptoms out of the 20 symptoms asked in the scale.

Table 3. Factor loadings: Mental Health Measures

Ethiopia

Subscale/ Naive category	Question number	Item	Factor 1	Factor 2	Factor 3
group 3	D.12	decision	0.71	0.03	-0.08
group 3	D.14	useful	0.70	0.03	-0.08
group 3	D.16	worth	0.67	-0.03	0.04
group 1	D.15	lost	0.65	0.04	-0.04
group 1	D.17	ending	0.64	0.03	0.05
group 3	D.11	enjoy	0.62	0.03	0.04
group 1	D.10	cry	0.57	-0.06	0.13
group 1	D.9	unhappy	0.49	0.09	0.18
group 1	D.6	tense	0.45	-0.11	0.40
group 2	D.8	think	0.41	0.14	0.11
group 3	D.13	work	0.35	0.22	-0.26
group 2	D.20	tired	0.02	0.81	-0.02
group 2	D.18	all tired	0.12	0.77	-0.09
group 2	D.19	stomach	-0.02	0.66	0.10
group 2	D.7	digestion	-0.12	0.40	0.38
group 2	D.5	hands shake	-0.01	-0.20	0.66
group 2	D.3	sleep	0.07	0.03	0.63
group 2	D.1	headache	-0.10	0.25	0.52
group 1	D.4	frightened	0.24	-0.10	0.51
group 2	D.2	poor appetite	-0.07	0.29	0.49

India

Subscale/ Naive category	Question number	Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
group 1	D.10	cry	0.69	-0.14	0.15	0.03	0.08	0.00
group 2	D.8	think	0.68	-0.04	-0.13	0.15	0.01	0.04
group 1	D.9	unhappy	0.61	-0.10	0.07	0.33	-0.01	0.01
group 3	D.12	decision	0.48	0.20	-0.13	-0.05	-0.07	0.28
group 3	D.16	worth	-0.22	0.78	0.06	0.16	0.03	0.01
group 3	D.14	useful	-0.05	0.72	-0.06	0.09	0.00	0.04
group 1	D.15	lost	0.11	0.63	-0.04	0.02	0.03	-0.02
group 1	D.17	ending	0.27	0.41	0.36	-0.18	-0.03	-0.03
group 2	D.19	stomach	0.04	-0.08	0.73	0.04	0.01	-0.01
group 2	D.18	all tired	0.02	0.22	0.66	-0.04	-0.04	0.02
group 2	D.20	tired	-0.17	-0.13	0.52	0.26	-0.11	0.28
group 1	D.4	frightened	0.05	0.13	-0.04	0.75	0.07	-0.09
group 1	D.6	tense	0.17	0.06	-0.03	0.74	-0.09	0.00
group 2	D.5	hands shake	0.11	0.05	0.17	0.59	-0.01	-0.11
group 2	D.2	poor appetite	0.05	-0.01	0.01	-0.07	0.82	-0.04
group 2	D.3	sleep	0.00	0.05	-0.15	0.04	0.79	0.14
group 2	D.1	headache	-0.17	-0.05	0.02	0.24	0.52	0.11
group 2	D.7	digestion	0.16	0.02	0.31	-0.13	0.52	-0.14
group 3	D.11	enjoy	0.16	-0.03	0.01	-0.07	0.05	0.81
group 3	D.13	work	-0.03	0.07	0.08	-0.06	0.03	0.80

Vietnam

Subscale/ Naive	Question number	Item	Factor 1	Factor 2	Factor 3	Factor 4
group 3	D.12	decision	0.76	-0.02	0.07	-0.14
group 2	D.8	think	0.71	0.00	0.06	-0.08
group 1	D.4	frightened	0.67	0.06	-0.22	0.04
group 1	D.6	tense	0.65	0.34	-0.12	-0.12
group 1	D.9	unhappy	0.59	0.07	0.03	0.09
group 2	D.20	tired	0.06	0.75	0.05	0.00
group 2	D.18	all tired	-0.02	0.75	0.15	0.01
group 2	D.1	headache	0.08	0.69	0.00	-0.08
group 2	D.2	poor appetite	0.04	0.52	0.01	0.20
group 2	D.3	sleep	0.06	0.40	-0.02	0.30
group 2	D.5	hands shake	0.12	0.23	0.11	0.16
group 3	D.14	useful	-0.08	0.12	0.81	-0.18
group 3	D.16	worth	-0.16	0.10	0.79	-0.09
group 1	D.17	ending	0.09	0.01	0.59	0.02
group 1	D.15	lost	0.09	-0.08	0.57	0.23
group 3	D.13	work	0.16	0.03	0.53	-0.04
group 3	D.11	enjoy	0.27	-0.12	0.33	0.17
group 2	D.7	digestion	-0.08	-0.03	-0.11	0.87
group 2	D.19	stomach	-0.18	0.20	-0.06	0.69
group 1	D.10	cry	0.29	-0.21	0.21	0.41

Note: The item responses of the depression symptoms were reversed to perfom the EFA. The scale direction thus indicates mental health positively; as such, a higher factor score, indicates better mental health (or less symptoms of depression).

Box 1. Mental Health Key (CESD scale symptoms of depression)

Subscale/ Naive category (1)	Question number	Item	Item description
Group 1: Depressed Affect	D.4	frightened	were you easily frightened
	D.6	tense	did you feel nervous, tense or worried
	D.9	unhappy	did you feel unhappy
	D.10	cry	did you cry more than usual
	D.15	lost	did you lose interest in things
	D.17	ending	were things so bad that you felt that you just couldn't go on
Group 2: Somatic and Retarded Activity	D.1	headache	did you often have headaches
	D.2	poor appetite	was your appetite poor
	D.3	sleep	did you sleep badly
	D.5	hands shake	did your hands shake
	D.7	digestion	was your digestion poor
	D.8	think	did you have trouble thinking clearly
	D.18	all tired	did you feel tired all of the time
	D.19	stomach	did you have uncomfortable feelings in your stomach
	D.20	tired	were you easily tired
Group 3: Interpersonal	D.11	enjoy	did you find it difficult to enjoy your daily activities
	D.12	decision	did you find it difficult to make decisions
	D.13	work	did your daily work suffer
	D.14	useful	were you unable to play a useful part in life
	D.16	worth	did you feel you were a worthless person

Note: (1) The subscale categories are adapted from the original CES-D scale study (Radloff, 1977)

Table 4.1. Correlation between Caregiver's Mental health and Child Physical Development (Weight)

Panel A: ETHIOPIA

Explicative varibles: *Caregiver's mental health and other household characteristics (when child is between 0.5 and 1.5 yrs old).*

	Wave 2			Wave 3			Wave 4		
	Dependent variables: *Child standardized* ***weight*** *at age* ***4.5 - 5.5 yrs old***			Dependent variables: *Child standardized* ***weight*** *at age* ***7.5 - 8.5 yrs old***			Dependent variables: *Child standardized* ***weight*** *at age* ***12 yrs old***		
NAÏVE MEASURE /1	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Mental health dummy	0.09	0.03	0.03	0.01	-0.08	-0.00	-0.19	-0.32	-0.28
(1=non-depressed)	(0.14)	(0.14)	(0.12)	(0.18)	(0.17)	(0.16)	(0.31)	(0.28)	(0.22)
Observations	1,493	1,493	1,493	1,493	1,493	1,493	1,493	1,493	1,493
R-squared	0.00	0.06	0.23	0.00	0.07	0.22	0.00	0.09	0.22
R-sq-adj	-0.000207	0.0598	0.215	-0.000668	0.0694	0.207	-0.000327	0.0846	0.209
Additional Controls									
Sociodemographic chars. /2	N	Y	Y	N	Y	Y	N	Y	Y
Econonomic conditions /3	N	N	Y	N	N	Y	N	N	Y
Antenatal care /4	N	N	Y	N	N	Y	N	N	Y
Other shocks /5	N	N	Y	N	N	Y	N	N	Y

Note: For brevity, the coefficients for each of the control variables are not displayed in the case of the Naïve estimates. Selected coefficients for the control variables are displayed for the Disaggregated estimates below.

DISAGGREGATED MEASURES /1	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Mental health (Factor 1)	-0.01	0.01	0.02	-0.18**	-0.14*	-0.07	-0.35**	-0.29**	-0.23**
	(0.07)	(0.06)	(0.05)	(0.08)	(0.07)	(0.06)	(0.15)	(0.12)	(0.10)
Mental health (Factor 2)	-0.00	-0.03	-0.02	0.03	-0.02	0.00	-0.00	-0.09	-0.08
	(0.04)	(0.05)	(0.05)	(0.06)	(0.06)	(0.06)	(0.18)	(0.15)	(0.12)
Mental health (Factor 3)	0.12**	0.06	0.04	0.23**	0.14*	0.11	0.46**	0.29**	0.21*
	(0.05)	(0.04)	(0.04)	(0.09)	(0.07)	(0.07)	(0.17)	(0.13)	(0.12)
Hh head Education (years)		0.06***	0.03**		0.09***	0.03		0.16***	0.06*
		(0.02)	(0.01)		(0.03)	(0.02)		(0.05)	(0.03)
Child Sex (1 = male)		0.46***	0.58***		0.38***	0.56***		-1.18***	-0.92***
		(0.12)	(0.11)		(0.12)	(0.13)		(0.30)	(0.29)
Consumer durables Index			1.55**			3.02**			5.38***
			(0.55)			(1.30)			(1.49)
Level of antenatal care			-0.07			-0.07			-0.06
			(0.06)			(0.08)			(0.18)
Weight for age			0.58***			0.64***			0.81***
(child's z-score around 6 mos.)			(0.09)			(0.09)			(0.16)
Height for age			-0.07			-0.01			0.11
(child's z-score around 6 mos.)			(0.06)			(0.10)			(0.16)
Environmental Shock			-0.03			-0.05			-0.32
			(0.13)			(0.23)			(0.25)
Observations	1,432	1,432	1,432	1,432	1,432	1,432	1,432	1,432	1,432
R-squared	0.00	0.06	0.22	0.01	0.08	0.22	0.01	0.09	0.22
Adjusted R-squared	0.001	0.06	0.203	0.00480	0.0694	0.204	0.00669	0.0860	0.206
Additional Controls									
Sociodemographic chars. /2	N	Y	Y	N	Y	Y	N	Y	Y
Econonomic conditions /3	N	N	Y	N	N	Y	N	N	Y
Antenatal care /4	N	N	Y	N	N	Y	N	N	Y
Other shocks /5	N	N	Y	N	N	Y	N	N	Y

Notes:

1/ The measures for the caregiver's mental health (both naïve and disaggregated) are positively coded. In the case of the naïve dichotomous measure, a value of one indicates the caregivers in *not* depressed (i.e. does not present 8 or more depression symptoms). In the case of the disaggregated measures a higher score indicates the presence of less depression symptoms and therefore better mental. The measures are obtained by performing Exploratory Factor Analysis on the 20 items of the (positively coded) items of the CES-D (Center for Epidemiological Studies- Depression) scale. The resulting 3 factors are the disaggregated constructs of the mental health scale.

2/ Household Sociodemographic characteristics (additional controls): Household head's age and sex; caregiver's years of education and literacy; and household size.

3/ Economic conditions (additional controls): Access to safe drinking water, sanitation, electricity, adequate fuels for cooking; and housing quality index.

4/ Level of antenatal care coded as follows: 0 = None; 1 = Low; 2 = Medium; 3 = High.

5/ The other shocks included as controls are crime, economic and family shocks (i.e. family member death or divorce). All shocks refer to events reported when child was around 6 months old.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.1. Correlation between Caregiver's Mental health and Child Physical Development (Weight)

Panel B: INDIA

Explicative varibles: *Caregiver's mental health and other household characteristics (when child is between 0.5 and 1.5 yrs old).*

	Wave 2			Wave 3			Wave 4		
	Dependent variables: *Child standardized* ***weight*** *at age* ***4.5 - 5.5 yrs old***			Dependent variables: *Child standardized* ***weight*** *at age* ***7.5 - 8.5 yrs old***			Dependent variables: *Child standardized* ***weight*** *at age* ***12 yrs old***		
NAÏVE MEASURE /1	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Mental health dummy	0.40***	0.29**	0.04	0.74***	0.42**	0.04	1.88***	0.95**	0.24
(1=non-depressed)	(0.13)	(0.12)	(0.10)	(0.24)	(0.18)	(0.18)	(0.52)	(0.44)	(0.38)
Observations	1,271	1,271	1,271	1,271	1,271	1,271	1,271	1,271	1,271
R-squared	0.01	0.06	0.34	0.01	0.12	0.36	0.01	0.15	0.30
R-sq-adj	0.00691	0.0524	0.330	0.0102	0.116	0.346	0.0130	0.147	0.290
Additional Controls									
Sociodemographic chars. /2	N	Y	Y	N	Y	Y	N	Y	Y
Econonomic conditions /3	N	N	Y	N	N	Y	N	N	Y
Antenatal care /4	N	N	Y	N	N	Y	N	N	Y
Other shocks /5	N	N	Y	N	N	Y	N	N	Y

Note: For brevity, the coefficients for each of the control variables are not displayed in the case of the Naïve estimates. Selected coefficients for the control variables are displayed for the Disaggregated estimates below.

DISAGGREGATED MEASURES /1	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Mental health (Factor 1)	0.18***	0.14***	0.03	0.35***	0.24**	0.04	0.70***	0.44*	-0.00
	(0.04)	(0.04)	(0.04)	(0.08)	(0.09)	(0.10)	(0.22)	(0.22)	(0.21)
Mental health (Factor 2)	0.01	0.05	-0.02	0.02	0.09	0.03	0.26	0.34*	0.28*
	(0.06)	(0.06)	(0.04)	(0.09)	(0.10)	(0.08)	(0.18)	(0.19)	(0.16)
Mental health (Factor 3)	0.06	-0.01	-0.04	0.20	0.05	-0.03	0.61**	0.21	0.04
	(0.07)	(0.07)	(0.05)	(0.12)	(0.10)	(0.07)	(0.22)	(0.20)	(0.17)
Mental health (Factor 4)	-0.03	-0.01	-0.03	-0.10	-0.08	-0.10	0.01	-0.03	-0.03
	(0.06)	(0.07)	(0.05)	(0.10)	(0.10)	(0.07)	(0.20)	(0.17)	(0.15)
Mental health (Factor 5)	0.05	0.03	0.04	0.07	0.02	0.02	-0.09	-0.18	-0.18
	(0.05)	(0.04)	(0.05)	(0.12)	(0.10)	(0.07)	(0.22)	(0.20)	(0.17)
Mental health (Factor 6)	0.05	0.04	0.07**	0.04	0.00	0.08	-0.25	-0.28	-0.10
	(0.04)	(0.03)	(0.03)	(0.10)	(0.07)	(0.08)	(0.26)	(0.22)	(0.21)
Hh head Education (years)		0.05***	0.02		0.09***	0.03		0.25***	0.11***
		(0.01)	(0.01)		(0.02)	(0.02)		(0.04)	(0.03)
Child Sex (1 = male)		0.36***	0.53***		0.46**	0.67***		-2.14***	-1.88***
		(0.10)	(0.10)		(0.19)	(0.20)		(0.48)	(0.49)
Consumer durables Index			0.50			1.47**			3.92**
			(0.34)			(0.57)			(1.38)
Level of antenatal care			0.06			0.06			0.28
			(0.05)			(0.08)			(0.21)
Weight for age			1.04***			1.37***			2.18***
(child's z-score around 6 mos.)			(0.07)			(0.09)			(0.21)
Height for age			-0.09*			-0.13***			-0.20**
(child's z-score around 6 mos.)			(0.04)			(0.04)			(0.07)
Environmental Shock			-0.22			-0.30			-0.72
			(0.15)			(0.21)			(0.42)
Observations	1,271	1,271	1,271	1,271	1,271	1,271	1,271	1,271	1,271
R-squared	0.01	0.06	0.34	0.02	0.13	0.36	0.02	0.16	0.30
Adjusted R-squared	0.00938	0.0527	0.329	0.0188	0.119	0.345	0.0200	0.150	0.289
Additional Controls									
Sociodemographic chars. /2	N	Y	Y	N	Y	Y	N	Y	Y
Econonomic conditions /3	N	N	Y	N	N	Y	N	N	Y
Antenatal care /4	N	N	Y	N	N	Y	N	N	Y
Other shocks /5	N	N	Y	N	N	Y	N	N	Y

Notes:

1/ The measures for the caregiver's mental health (both naïve and disaggregated) are positively coded. In the case of the naïve dichotomous measure, a value of one indicates the caregivers in *not* depressed (i.e. does not present 8 or more depression symptoms). In the case of the disaggregated measures a higher score indicates the presence of less depression symptoms and therefore better mental. The measures are obtained by performing Exploratory Factor Analysis on the 20 items of the (positively coded) items of the CES-D (Center for Epidemiological Studies- Depression) scale. The resulting 6 factors are the disaggregated constructs of the mental health scale.

2/ Household Sociodemographic characteristics (additional controls): Household head's age and sex; caregiver's years of education and literacy; and household size.

3/ Economic conditions (additional controls): Access to safe drinking water, sanitation, electricity, adequate fuels for cooking; and housing quality index.

4/ Level of antenatal care coded as follows: 0 = None; 1 = Low; 2 = Medium; 3 = High.

5/ The other shocks included as controls are crime, economic and family shocks (i.e. family member death or divorce). All shocks refer to events reported when child was around 6 months old.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.1. Correlation between Caregiver's Mental health and Child Physical Development (Weight)

Panel C: VIETNAM

Explicative varibles: *Caregiver's mental health and other household characteristics (when child is between 0.5 and 1.5 yrs old).*

1.8375

	Wave 2			Wave 3			Wave 4		
	Dependent variables: *Child standardized* ***weight*** *at age* ***4.5 - 5.5 yrs old***			Dependent variables: *Child standardized* ***weight*** *at age* ***7.5 - 8.5 yrs old***			Dependent variables: *Child standardized* ***weight*** *at age* ***12 yrs old***		
NAÏVE MEASURE /1	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Mental health dummy	0.29	0.13	-0.19	0.80*	0.45	-0.11	1.47*	0.88	-0.03
(1=non-depressed)	(0.26)	(0.21)	(0.16)	(0.44)	(0.32)	(0.28)	(0.82)	(0.71)	(0.65)
Observations	949	949	949	949	949	949	949	949	949
R-squared	0.00	0.19	0.52	0.00	0.16	0.39	0.00	0.14	0.35
R-sq-adj	0.000591	0.182	0.515	0.00243	0.157	0.378	0.00354	0.135	0.340
Additional Controls									
Sociodemographic chars. /2	N	Y	Y	N	Y	Y	N	Y	Y
Econonomic conditions /3	N	N	Y	N	N	Y	N	N	Y
Antenatal care /4	N	N	Y	N	N	Y	N	N	Y
Other shocks /5	N	N	Y	N	N	Y	N	N	Y

Note: For brevity, the coefficients for each of the control variables are not displayed in the case of the Naïve estimates. Selected coefficients for the control variables are displayed for the Disaggregated estimates below.

DISAGGREGATED MEASURES /1	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Mental health (Factor 1)	-0.11	-0.04	-0.02	-0.08	0.02	0.05	-0.59	-0.41	-0.44
	(0.15)	(0.13)	(0.09)	(0.22)	(0.21)	(0.12)	(0.44)	(0.43)	(0.33)
Mental health (Factor 2)	0.20	0.05	-0.01	0.36	0.11	0.01	0.61	0.23	0.08
	(0.13)	(0.10)	(0.07)	(0.27)	(0.20)	(0.16)	(0.36)	(0.28)	(0.26)
Mental health (Factor 3)	0.10	0.09	-0.04	0.30	0.27	0.04	0.77*	0.70*	0.38
	(0.12)	(0.10)	(0.05)	(0.19)	(0.17)	(0.10)	(0.40)	(0.37)	(0.24)
Mental health (Factor 4)	0.16	0.11	0.06	0.22	0.12	0.03	0.53	0.34	0.24
	(0.12)	(0.11)	(0.08)	(0.17)	(0.18)	(0.15)	(0.31)	(0.36)	(0.29)
Hh head Education (years)		0.11***	0.04**		0.15***	0.03		0.24***	0.06
		(0.03)	(0.02)		(0.04)	(0.02)		(0.07)	(0.05)
Child Sex (1 = male)		1.12***	0.92***		1.42***	1.11***		0.37	-0.13
		(0.25)	(0.15)		(0.33)	(0.23)		(0.66)	(0.40)
Consumer durables Index			1.48***			4.61***			7.93***
			(0.51)			(1.08)			(1.77)
Level of antenatal care			0.13			0.02			0.61*
			(0.12)			(0.37)			(0.32)
Weight for age			1.37***			1.86***			3.16***
(child's z-score around 6 mos.)			(0.12)			(0.25)			(0.44)
Height for age			-0.07			-0.05			-0.31
(child's z-score around 6 mos.)			(0.09)			(0.17)			(0.29)
Environmental Shock			-0.14			-0.24			0.13
			(0.21)			(0.42)			(0.91)
Observations	949	949	949	949	949	949	949	949	949
R-squared	0.01	0.17	0.52	0.01	0.17	0.39	0.02	0.15	0.36
Adjusted R-squared	0.00687	0.163	0.513	0.00857	0.158	0.376	0.0136	0.139	0.340
Additional Controls									
Sociodemographic chars. /2	N	Y	Y	N	Y	Y	N	Y	Y
Econonomic conditions /3	N	N	Y	N	N	Y	N	N	Y
Antenatal care /4	N	N	Y	N	N	Y	N	N	Y
Other shocks /5	N	N	Y	N	N	Y	N	N	Y

Notes:

1/ The measures for the caregiver's mental health (both naïve and disaggregated) are positively coded. In the case of the naïve dichotomous measure, a value of one indicates the caregivers in *not* depressed (i.e. does not present 8 or more depression symptoms). In the case of the disaggregated measures a higher score indicates the presence of less depression symptoms and therefore better mental. The measures are obtained by performing Exploratory Factor Analysis on the 20 items of the (positively coded) items of the CES-D (Center for Epidemiological Studies- Depression) scale. The resulting 4 factors are the disaggregated constructs of the mental health scale.

2/ Household Sociodemographic characteristics (additional controls): Household head's age and sex; caregiver's years of education and literacy; and household size.

3/ Economic conditions (additional controls): Access to safe drinking water, sanitation, electricity, adequate fuels for cooking; and housing quality index.

4/ Level of antenatal care coded as follows: 0 = None; 1 = Low; 2 = Medium; 3 = High.

5/ The other shocks included as controls are crime, economic and family shocks (i.e. family member death or divorce). All shocks refer to events reported when child was around 6 months old.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.2. Correlation between Caregiver's Mental health and Child Physical Development (Height)

Panel A: ETHIOPIA

Explicative varibles: *Caregiver's mental health and other household characteristics (when child is between 0.5 and 1.5 yrs old).*

	Wave 2			Wave 3			Wave 4		
	Dependent variables: Child standardized **height** at age 4.5 - 5.5 yrs old			Dependent variables: Child standardized **height** at age 7.5 - 8.5 yrs old			Dependent variables: Child standardized **height** at age 12 yrs old		
NAÏVE MEASURE /1	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Mental health dummy	-0.11	-0.24	-0.23	-0.13	-0.27	-0.21	-0.63	-0.75*	-0.65*
(1=non-depressed)	(0.37)	(0.35)	(0.30)	(0.45)	(0.45)	(0.37)	(0.41)	(0.41)	(0.35)
Observations	1,493	1,493	1,493	1,493	1,493	1,493	1,493	1,493	1,493
R-squared	0.00	0.06	0.19	0.00	0.05	0.16	0.00	0.07	0.20
R-sq-adj	-0.000587	0.0577	0.182	-0.000593	0.0466	0.150	0.000995	0.0695	0.188
Additional Controls									
Sociodemographic chars. /2	N	Y	Y	N	Y	Y	N	Y	Y
Econonomic conditions /3	N	N	Y	N	N	Y	N	N	Y
Antenatal care /4	N	N	Y	N	N	Y	N	N	Y
Other shocks /5	N	N	Y	N	N	Y	N	N	Y

Note: For brevity, the coefficients for each of the control variables are not displayed in the case of the Naïve estimates. Selected coefficients for the control variables are displayed for the Disaggregated estimates below.

DISAGGREGATED MEASURES /1	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Mental health (Factor 1)	-0.08	0.04	0.08	-0.23	-0.11	0.02	-0.48*	-0.40*	-0.32
	(0.22)	(0.22)	(0.20)	(0.20)	(0.19)	(0.05)	(0.26)	(0.22)	(0.20)
Mental health (Factor 2)	-0.06	-0.19	-0.15	-0.03	-0.15	-0.02	-0.17	-0.26	-0.21
	(0.18)	(0.18)	(0.16)	(0.19)	(0.20)	(0.05)	(0.25)	(0.23)	(0.18)
Mental health (Factor 3)	0.35**	0.17	0.10	0.55**	0.35	0.04	0.66***	0.48**	0.35**
	(0.14)	(0.13)	(0.12)	(0.20)	(0.21)	(0.04)	(0.19)	(0.19)	(0.16)
Hh head Education (years)		0.03	0.05		0.19***	0.03**		0.14**	0.01
		(0.02)	(0.03)		(0.05)	(0.01)		(0.05)	(0.05)
Child Sex (1 = male)		-0.51	0.57**		-0.32	0.58***		-2.41***	-1.87***
		(0.56)	(0.25)		(0.30)	(0.11)		(0.39)	(0.39)
Consumer durables Index		0.15***	2.06			1.55**			6.88***
		(0.05)	(1.55)			(0.55)			(1.61)
Level of antenatal care		0.21	0.04			-0.07			-0.11
		(0.25)	(0.15)			(0.06)			(0.23)
Weight for age			0.92***			0.58***			0.78***
(child's z-score around 6 mos.)			(0.17)			(0.09)			(0.15)
Height for age			0.25			-0.07			0.68***
(child's z-score around 6 mos.)			(0.21)			(0.06)			(0.24)
Environmental Shock			-0.49			-0.03			-0.70
			(0.47)			(0.13)			(0.45)
Observations	1,432	1,432	1,432	1,432	1,432	1,432	1,432	1,432	1,432
R-squared	0.00	0.06	0.19	0.00	0.05	0.22	0.01	0.08	0.20
Adjusted R-squared	0.000992	0.0544	0.174	0.00283	0.0459	0.203	0.00580	0.0710	0.186
Additional Controls									
Sociodemographic chars. /2	N	Y	Y	N	Y	Y	N	Y	Y
Econonomic conditions /3	N	N	Y	N	N	Y	N	N	Y
Antenatal care /4	N	N	Y	N	N	Y	N	N	Y
Other shocks /5	N	N	Y	N	N	Y	N	N	Y

Notes:

1/ The measures for the caregiver's mental health (both naïve and disaggregated) are positively coded. In the case of the naïve dichotomous measure, a value of one indicates the caregivers in *not* depressed (i.e. does not present 8 or more depression symptoms). In the case of the disaggregated measures a higher score indicates the presence of less depression symptoms and therefore better mental. The measures are obtained by performing Exploratory Factor Analysis on the 20 items of the (positively coded) items of the CES-D (Center for Epidemiological Studies- Depression) scale. The resulting 3 factors are the disaggregated constructs of the mental health scale.

2/ Household Sociodemographic characteristics (additional controls): Household head's age and sex; caregiver's years of education and literacy; and household size.

3/ Economic conditions (additional controls): Access to safe drinking water, sanitation, electricity, adequate fuels for cooking; and housing quality index.

4/ Level of antenatal care coded as follows: 0 = None; 1 = Low; 2 = Medium; 3 = High.

5/ The other shocks included as controls are crime, economic and family shocks (i.e. family member death or divorce). All shocks refer to events reported when child was around 6 months old.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.2. Correlation between Caregiver's Mental health and Child Physical Development (Height)

Panel B: INDIA

Explicative varibles: *Caregiver's mental health and other household characteristics (when child is between 0.5 and 1.5 yrs old).*

	Wave 2			Wave 3			Wave 4		
	Dependent variables: Child standardized **height** at age 4.5 - 5.5 yrs old			Dependent variables: Child standardized **height** at age 7.5 - 8.5 yrs old			Dependent variables: Child standardized **height** at age 12 yrs old		
NAÏVE MEASURE /1	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Mental health dummy	0.73*	0.37	-0.31	0.75	0.12	-0.72	2.44***	1.64**	0.85
(1=non-depressed)	(0.38)	(0.37)	(0.34)	(0.54)	(0.48)	(0.54)	(0.63)	(0.57)	(0.63)
Observations	1,271	1,271	1,271	1,271	1,271	1,271	1,271	1,271	1,271
R-squared	0.00	0.05	0.21	0.00	0.08	0.24	0.02	0.09	0.24
R-sq-adj	0.00226	0.0404	0.201	0.00174	0.0793	0.233	0.0163	0.0893	0.223
Additional Controls									
Sociodemographic chars. /2	N	Y	Y	N	Y	Y	N	Y	Y
Econonomic conditions /3	N	N	Y	N	N	Y	N	N	Y
Antenatal care /4	N	N	Y	N	N	Y	N	N	Y
Other shocks /5	N	N	Y	N	N	Y	N	N	Y

Note: For brevity, the coefficients for each of the control variables are not displayed in the case of the Naïve estimates. Selected coefficients for the control variables are displayed for the Disaggregated estimates below.

DISAGGREGATED MEASURES /1	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Mental health (Factor 1)	0.33*	0.21	-0.16	0.43*	0.24	-0.18	0.62**	0.42	-0.10
	(0.17)	(0.14)	(0.11)	(0.21)	(0.21)	(0.15)	(0.26)	(0.25)	(0.20)
Mental health (Factor 2)	0.00	0.10	-0.03	0.18	0.30	0.19	0.26	0.31	0.24
	(0.20)	(0.17)	(0.13)	(0.27)	(0.22)	(0.17)	(0.24)	(0.21)	(0.17)
Mental health (Factor 3)	0.12	-0.06	-0.16	0.21	-0.06	-0.23	0.47	0.15	-0.02
	(0.27)	(0.24)	(0.18)	(0.29)	(0.23)	(0.18)	(0.30)	(0.26)	(0.22)
Mental health (Factor 4)	-0.13	-0.10	-0.05	-0.33	-0.30	-0.28	-0.22	-0.29	-0.23
	(0.19)	(0.18)	(0.14)	(0.27)	(0.22)	(0.17)	(0.31)	(0.25)	(0.21)
Mental health (Factor 5)	-0.00	-0.05	-0.09	0.09	0.01	-0.03	0.16	0.09	0.02
	(0.16)	(0.15)	(0.14)	(0.24)	(0.21)	(0.16)	(0.21)	(0.19)	(0.11)
Mental health (Factor 6)	0.17	0.13	0.17	0.20	0.12	0.16	0.27	0.25	0.36*
	(0.14)	(0.14)	(0.16)	(0.14)	(0.10)	(0.15)	(0.24)	(0.23)	(0.21)
Hh head Education (years)		0.14***	0.07*		0.13***	0.03		0.23***	0.10**
		(0.04)	(0.04)		(0.04)	(0.04)		(0.05)	(0.04)
Child Sex (1 = male)		0.52*	0.86***		0.56*	0.92***		-2.34***	-1.98***
		(0.30)	(0.29)		(0.28)	(0.29)		(0.33)	(0.36)
Consumer durables Index			2.37**			4.54***			5.35***
			(0.87)			(1.09)			(1.30)
Level of antenatal care			0.51**			0.25			0.16
			(0.22)			(0.19)			(0.23)
Weight for age			0.87***			1.22***			1.24***
(child's z-score around 6 mos.)			(0.17)			(0.21)			(0.19)
Height for age			0.89***			0.71***			0.95***
(child's z-score around 6 mos.)			(0.17)			(0.16)			(0.24)
Environmental Shock			-0.67			-0.49			-0.12
			(0.52)			(0.54)			(0.69)
Observations	1,271	1,271	1,271	1,271	1,271	1,271	1,271	1,271	1,271
R-squared	0.01	0.05	0.22	0.01	0.09	0.25	0.02	0.10	0.24
Adjusted R-squared	0.00113	0.0388	0.200	0.00756	0.0825	0.233	0.0139	0.0871	0.222
Additional Controls									
Sociodemographic chars. /2	N	Y	Y	N	Y	Y	N	Y	Y
Econonomic conditions /3	N	N	Y	N	N	Y	N	N	Y
Antenatal care /4	N	N	Y	N	N	Y	N	N	Y
Other shocks /5	N	N	Y	N	N	Y	N	N	Y

Notes:

1/ The measures for the caregiver's mental health (both naïve and disaggregated) are positively coded. In the case of the naïve dichotomous measure, a value of one indicates the caregivers in *not* depressed (i.e. does not present 8 or more depression symptoms). In the case of the disaggregated measures a higher score indicates the presence of less depression symptoms and therefore better mental. The measures are obtained by performing Exploratory Factor Analysis on the 20 items of the (positively coded) items of the CES-D (Center for Epidemiological Studies- Depression) scale. The resulting 6 factors are the disaggregated constructs of the mental health scale.

2/ Household Sociodemographic characteristics (additional controls): Household head's age and sex; caregiver's years of education and literacy; and household size.

3/ Economic conditions (additional controls): Access to safe drinking water, sanitation, electricity, adequate fuels for cooking; and housing quality index.

4/ Level of antenatal care coded as follows: 0 = None; 1 = Low; 2 = Medium; 3 = High.

5/ The other shocks included as controls are crime, economic and family shocks (i.e. family member death or divorce). All shocks refer to events reported when child was around 6 months old.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.2. Correlation between Caregiver's Mental health and Child Physical Development (Height)

Panel C: VIETNAM

Explicative varibles: *Caregiver's mental health and other household characteristics (when child is between 0.5 and 1.5 yrs old).*

	Wave 2			Wave 3			Wave 4		
	Dependent variables: Child standardized **height** at age 4.5 - 5.5 yrs old			Dependent variables: Child standardized **height** at age 7.5 - 8.5 yrs old			Dependent variables: Child standardized **height** at age 12 yrs old		
NAÏVE MEASURE /1	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Mental health dummy	0.45	-0.02	-0.26	0.69	0.17	-0.02	1.22	0.51	0.03
(1=non-depressed)	(0.64)	(0.53)	(0.43)	(0.56)	(0.37)	(0.33)	(0.93)	(0.73)	(0.71)
Observations	949	949	949	949	949	949	949	949	949
R-squared	0.00	0.17	0.41	0.00	0.18	0.41	0.00	0.19	0.39
R-sq-adj	-0.000196	0.162	0.397	0.000750	0.177	0.399	0.00229	0.186	0.376
Additional Controls									
Sociodemographic chars. /2	N	Y	Y	N	Y	Y	N	Y	Y
Econonomic conditions /3	N	N	Y	N	N	Y	N	N	Y
Antenatal care /4	N	N	Y	N	N	Y	N	N	Y
Other shocks /5	N	N	Y	N	N	Y	N	N	Y

Note: For brevity, the coefficients for each of the control variables are not displayed in the case of the Naïve estimates. Selected coefficients for the control variables are displayed for the Disaggregated estimates below.

DISAGGREGATED MEASURES /1	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Mental health (Factor 1)	-0.39	-0.20	-0.13	-0.41	-0.17	-0.10	-0.60	-0.33	-0.26
	(0.30)	(0.28)	(0.21)	(0.34)	(0.29)	(0.21)	(0.44)	(0.38)	(0.27)
Mental health (Factor 2)	0.18	-0.12	-0.12	0.24	-0.10	-0.09	0.16	-0.26	-0.26
	(0.24)	(0.20)	(0.14)	(0.28)	(0.26)	(0.20)	(0.38)	(0.30)	(0.21)
Mental health (Factor 3)	0.41*	0.36*	0.15	0.30	0.22	0.01	0.56	0.44	0.08
	(0.21)	(0.18)	(0.13)	(0.28)	(0.24)	(0.15)	(0.36)	(0.28)	(0.21)
Mental health (Factor 4)	0.29	0.10	0.14	0.36	0.15	0.16	0.88**	0.61*	0.64**
	(0.27)	(0.25)	(0.20)	(0.25)	(0.20)	(0.16)	(0.32)	(0.30)	(0.23)
Hh head Education (years)		0.22***	0.08		0.25***	0.09*		0.34***	0.13**
		(0.06)	(0.06)		(0.06)	(0.04)		(0.07)	(0.05)
Child Sex (1 = male)		1.69***	1.56***		1.00*	0.89**		-1.23*	-1.46***
		(0.51)	(0.35)		(0.52)	(0.35)		(0.68)	(0.43)
Consumer durables Index			0.91			1.68			6.23***
			(1.71)			(1.59)			(1.32)
Level of antenatal care			0.54**			0.36*			0.53*
			(0.22)			(0.17)			(0.29)
Weight for age			0.85**			0.73**			0.89**
(child's z-score around 6 mos.)			(0.32)			(0.30)			(0.36)
Height for age			1.51***			1.70***			1.86***
(child's z-score around 6 mos.)			(0.29)			(0.30)			(0.33)
Environmental Shock			-0.22			0.12			0.56
			(0.55)			(0.55)			(0.87)
Observations	949	949	949	949	949	949	949	949	949
R-squared	0.01	0.17	0.41	0.01	0.18	0.41	0.02	0.20	0.39
Adjusted R-squared	0.00309	0.163	0.396	0.00266	0.176	0.398	0.0111	0.190	0.378
Additional Controls									
Sociodemographic chars. /2	N	Y	Y	N	Y	Y	N	Y	Y
Econonomic conditions /3	N	N	Y	N	N	Y	N	N	Y
Antenatal care /4	N	N	Y	N	N	Y	N	N	Y
Other shocks /5	N	N	Y	N	N	Y	N	N	Y

Notes:

1/ The measures for the caregiver's mental health (both naïve and disaggregated) are positively coded. In the case of the naïve dichotomous measure, a value of one indicates the caregivers in *not* depressed (i.e. does not present 8 or more depression symptoms). In the case of the disaggregated measures a higher score indicates the presence of less depression symptoms and therefore better mental. The measures are obtained by performing Exploratory Factor Analysis on the 20 items of the (positively coded) items of the CES-D (Center for Epidemiological Studies- Depression) scale. The resulting 4 factors are the disaggregated constructs of the mental health scale.

2/ Household Sociodemographic characteristics (additional controls): Household head's age and sex; caregiver's years of education and literacy; and household size.

3/ Economic conditions (additional controls): Access to safe drinking water, sanitation, electricity, adequate fuels for cooking; and housing quality index.

4/ Level of antenatal care coded as follows: 0 = None; 1 = Low; 2 = Medium; 3 = High.

5/ The other shocks included as controls are crime, economic and family shocks (i.e. family member death or divorce). All shocks refer to events reported when child was around 6 months old.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.3. Correlation between Caregiver's Mental health and Child Cognitive Development (PPVT standardized score)

Panel A: ETHIOPIA

Explicative varibles: *Caregiver's mental health and other household characteristics (when child is between 0.5 and 1.5 yrs old).*

	Wave 2			Wave 3			Wave 4		
	Dependent variables: *Child standardized* ***PPVT score*** *at age* ***4.5 - 5.5 yrs old***			Dependent variables: *Child standardized* ***PPVT*** *score at age* ***7.5 - 8.5 yrs old***			Dependent variables: *Child standardized* ***PPVT score*** *at age* ***12 yrs old***		
NAÏVE MEASURE /1	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Mental health dummy	0.01	-0.02	-0.02	-0.02	-0.06	-0.07	-0.08	-0.15**	-0.13*
(1=non-depressed)	(0.08)	(0.06)	(0.05)	(0.07)	(0.06)	(0.05)	(0.07)	(0.07)	(0.06)
Observations	1,493	1,493	1,493	1,493	1,493	1,493	1,295	1,295	1,295
R-squared	0.00	0.16	0.23	0.00	0.20	0.35	0.00	0.22	0.36
R-sq-adj	-0.000652	0.158	0.216	-0.000554	0.199	0.340	0.000901	0.216	0.348
Additional Controls									
Sociodemographic chars. /2	N	Y	Y	N	Y	Y	N	Y	Y
Econonomic conditions /3	N	N	Y	N	N	Y	N	N	Y
Antenatal care /4	N	N	Y	N	N	Y	N	N	Y
Other shocks /5	N	N	Y	N	N	Y	N	N	Y

Note: For brevity, the coefficients for each of the control variables are not displayed in the case of the Naïve estimates. Selected coefficients for the control variables are displayed for the Disaggregated estimates below.

DISAGGREGATED MEASURES /1	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Mental health (Factor 1)	-0.05	-0.01	0.02	-0.08	-0.03	0.00	-0.17***	-0.13***	-0.10***
	(0.04)	(0.03)	(0.03)	(0.05)	(0.04)	(0.03)	(0.05)	(0.04)	(0.03)
Mental health (Factor 2)	0.04	-0.00	-0.01	0.06	0.01	-0.01	0.11**	0.06	0.05
	(0.04)	(0.03)	(0.03)	(0.04)	(0.03)	(0.02)	(0.05)	(0.05)	(0.04)
Mental health (Factor 3)	0.10**	0.05**	0.03	0.05	-0.00	-0.03	0.08**	0.02	-0.00
	(0.04)	(0.02)	(0.02)	(0.04)	(0.03)	(0.02)	(0.03)	(0.03)	(0.02)
Hh head Education (years)		0.03***	0.01		0.04***	0.02**		0.04***	0.01
		(0.01)	(0.01)		(0.01)	(0.01)		(0.01)	(0.01)
Child Sex (1 = male)		0.08*	0.07		-0.01	-0.02		0.04	0.07
		(0.04)	(0.05)		(0.05)	(0.05)		(0.05)	(0.05)
Consumer durables Index			1.20***			1.08***			0.99***
			(0.38)			(0.35)			(0.34)
Level of antenatal care			-0.03			0.01			-0.02
			(0.03)			(0.03)			(0.03)
Weight for age			0.03			0.05*			0.04
(child's z-score around 6 mos.)			(0.03)			(0.03)			(0.04)
Height for age			-0.03			-0.03			-0.01
(child's z-score around 6 mos.)			(0.03)			(0.02)			(0.03)
Environmental Shock			-0.05			-0.06			-0.02
			(0.07)			(0.08)			(0.09)
Observations	1,432	1,432	1,432	1,432	1,432	1,432	1,237	1,237	1,237
R-squared	0.01	0.17	0.23	0.01	0.19	0.34	0.03	0.23	0.36
Adjusted R-squared	0.00958	0.160	0.219	0.00635	0.189	0.331	0.0285	0.220	0.348
Additional Controls									
Sociodemographic chars. /2	N	Y	Y	N	Y	Y	N	Y	Y
Econonomic conditions /3	N	N	Y	N	N	Y	N	N	Y
Antenatal care /4	N	N	Y	N	N	Y	N	N	Y
Other shocks /5	N	N	Y	N	N	Y	N	N	Y

Notes:

1/ The measures for the caregiver's mental health (both naïve and disaggregated) are positively coded. In the case of the naïve dichotomous measure, a value of one indicates the caregivers in *not* depressed (i.e. does not present 8 or more depression symptoms). In the case of the disaggregated measures a higher score indicates the presence of less depression symptoms and therefore better mental. The measures are obtained by performing Exploratory Factor Analysis on the 20 items of the (positively coded) items of the CES-D (Center for Epidemiological Studies- Depression) scale. The resulting 3 factors are the disaggregated constructs of the mental health scale.

2/ Household Sociodemographic characteristics (additional controls): Household head's age and sex; caregiver's years of education and literacy; and household size.

3/ Economic conditions (additional controls): Access to safe drinking water, sanitation, electricity, adequate fuels for cooking; and housing quality index.

4/ Level of antenatal care coded as follows: 0 = None; 1 = Low; 2 = Medium; 3 = High.

5/ The other shocks included as controls are crime, economic and family shocks (i.e. family member death or divorce). All shocks refer to events reported when child was around 6 months old.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.3. Correlation between Caregiver's Mental health and Child Cognitive Development (PPVT standardized score)

Panel B: INDIA

Explicative varibles: *Caregiver's mental health and other household characteristics (when child is between 0.5 and 1.5 yrs old).*

	Wave 2			Wave 3			Wave 4		
	Dependent variables: *Child standardized* ***PPVT score*** *at age* ***4.5 - 5.5 yrs old***			Dependent variables: *Child standardized* ***PPVT*** *score at age* ***7.5 - 8.5 yrs old***			Dependent variables: *Child standardized* ***PPVT score*** *at age* ***12 yrs old***		
NAÏVE MEASURE /1	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Mental health dummy	0.17**	0.03	-0.01	0.30***	0.22**	0.14*	0.20*	0.11	0.06
(1=non-depressed)	(0.08)	(0.06)	(0.06)	(0.08)	(0.08)	(0.08)	(0.11)	(0.11)	(0.09)
Observations	1,271	1,271	1,271	1,271	1,271	1,271	1,271	1,271	1,271
R-squared	0.00	0.15	0.18	0.02	0.12	0.17	0.01	0.09	0.14
R-sq-adj	0.00410	0.146	0.167	0.0149	0.111	0.153	0.00653	0.0813	0.129
Additional Controls									
Sociodemographic chars. /2	N	Y	Y	N	Y	Y	N	Y	Y
Econonomic conditions /3	N	N	Y	N	N	Y	N	N	Y
Antenatal care /4	N	N	Y	N	N	Y	N	N	Y
Other shocks /5	N	N	Y	N	N	Y	N	N	Y

Note: For brevity, the coefficients for each of the control variables are not displayed in the case of the Naïve estimates. Selected coefficients for the control variables are displayed for the Disaggregated estimates below.

DISAGGREGATED MEASURES /1	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Mental health (Factor 1)	0.15***	0.10**	0.07*	0.11**	0.08*	0.03	0.11	0.08	0.06
	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.06)	(0.06)	(0.04)
Mental health (Factor 2)	-0.10	-0.08	-0.09	0.04	0.06	0.05	0.01	0.03	0.01
	(0.08)	(0.06)	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)	(0.03)	(0.03)
Mental health (Factor 3)	0.05	-0.01	-0.01	0.09*	0.04	0.04	0.06	0.02	0.03
	(0.04)	(0.03)	(0.02)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)	(0.03)
Mental health (Factor 4)	-0.07	-0.07	-0.07*	0.00	0.01	-0.01	0.01	0.01	0.00
	(0.05)	(0.04)	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.04)	(0.03)
Mental health (Factor 5)	0.08**	0.06*	0.06*	-0.00	-0.02	-0.02	-0.01	-0.02	-0.02
	(0.04)	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)
Mental health (Factor 6)	0.06	0.04	0.05	-0.04	-0.05	-0.04	-0.02	-0.03	-0.02
	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.05)	(0.05)	(0.04)
Hh head Education (years)		0.02**	0.02*		0.03***	0.02***		0.02***	0.02***
		(0.01)	(0.01)		(0.01)	(0.01)		(0.01)	(0.01)
Child Sex (1 = male)		0.01	0.01		0.27***	0.28***		0.13**	0.13**
		(0.05)	(0.05)		(0.07)	(0.07)		(0.06)	(0.06)
Consumer durables Index			0.27			0.26			0.28*
			(0.29)			(0.31)			(0.16)
Level of antenatal care			0.07**			0.03			0.06**
			(0.03)			(0.04)			(0.03)
Weight for age			0.03			0.03			0.06*
(child's z-score around 6 mos.)			(0.03)			(0.03)			(0.03)
Height for age			0.03			0.06**			0.07***
(child's z-score around 6 mos.)			(0.02)			(0.03)			(0.02)
Environmental Shock			-0.16			0.21			0.07
			(0.11)			(0.15)			(0.06)
Observations	1,271	1,271	1,271	1,271	1,271	1,271	1,271	1,271	1,271
R-squared	0.03	0.16	0.19	0.03	0.12	0.17	0.02	0.09	0.15
Adjusted R-squared	0.0289	0.156	0.176	0.0207	0.114	0.152	0.0144	0.0846	0.130
Additional Controls									
Sociodemographic chars. /2	N	Y	Y	N	Y	Y	N	Y	Y
Econonomic conditions /3	N	N	Y	N	N	Y	N	N	Y
Antenatal care /4	N	N	Y	N	N	Y	N	N	Y
Other shocks /5	N	N	Y	N	N	Y	N	N	Y

Notes:

1/ The measures for the caregiver's mental health (both naïve and disaggregated) are positively coded. In the case of the naïve dichotomous measure, a value of one indicates the caregivers in *not* depressed (i.e. does not present 8 or more depression symptoms). In the case of the disaggregated measures a higher score indicates the presence of less depression symptoms and therefore better mental. The measures are obtained by performing Exploratory Factor Analysis on the 20 items of the (positively coded) items of the CES-D (Center for Epidemiological Studies- Depression) scale. The resulting 6 factors are the disaggregated constructs of the mental health scale.

2/ Household Sociodemographic characteristics (additional controls): Household head's age and sex; caregiver's years of education and literacy; and household size.

3/ Economic conditions (additional controls): Access to safe drinking water, sanitation, electricity, adequate fuels for cooking; and housing quality index.

4/ Level of antenatal care coded as follows: 0 = None; 1 = Low; 2 = Medium; 3 = High.

5/ The other shocks included as controls are crime, economic and family shocks (i.e. family member death or divorce). All shocks refer to events reported when child was around 6 months old.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.3. Correlation between Caregiver's Mental health and Child Cognitive Development (PPVT standardized score)

Panel C: VIETNAM

Explicative varibles: *Caregiver's mental health and other household characteristics (when child is between 0.5 and 1.5 yrs old).*

	Wave 2			Wave 3			Wave 4		
	Dependent variables: *Child* ***PPVT score*** *at age* ***4.5 - 5.5 yrs old***			Dependent variables: *Child* ***PPVT score*** *at age* ***7.5 - 8.5 yrs old***			Dependent variables: *Child* ***PPVT score*** *at age* ***12 yrs old***		
NAÏVE MEASURE /1	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Mental health dummy	0.18	0.10	0.07	0.16*	0.07	0.08	0.24***	0.13*	0.08
(1=non-depressed)	(0.10)	(0.08)	(0.07)	(0.08)	(0.08)	(0.09)	(0.07)	(0.07)	(0.06)
Observations	949	949	949	949	949	949	942	942	942
R-squared	0.00	0.20	0.26	0.00	0.25	0.29	0.01	0.21	0.26
R-sq-adj	0.00341	0.190	0.241	0.00292	0.244	0.277	0.00769	0.205	0.244
Additional Controls									
Sociodemographic chars. /2	N	Y	Y	N	Y	Y	N	Y	Y
Econonomic conditions /3	N	N	Y	N	N	Y	N	N	Y
Antenatal care /4	N	N	Y	N	N	Y	N	N	Y
Other shocks /5	N	N	Y	N	N	Y	N	N	Y

Note: For brevity, the coefficients for each of the control variables are not displayed in the case of the Naïve estimates. Selected coefficients for the control variables are displayed for the Disaggregated estimates below.

DISAGGREGATED MEASURES /1	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Mental health (Factor 1)	-0.03	0.01	0.02	-0.05	-0.01	0.00	0.02	0.06*	0.06*
	(0.04)	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.05)	(0.03)	(0.04)
Mental health (Factor 2)	0.05	-0.00	0.00	0.05	-0.01	-0.00	-0.05	-0.10**	-0.09**
	(0.05)	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.04)
Mental health (Factor 3)	0.00	-0.01	-0.01	0.04	0.03	0.03	0.06	0.04	0.04
	(0.06)	(0.05)	(0.04)	(0.04)	(0.03)	(0.03)	(0.05)	(0.03)	(0.03)
Mental health (Factor 4)	0.07	0.04	0.01	0.03	-0.01	-0.03	0.11***	0.07**	0.06*
	(0.05)	(0.04)	(0.03)	(0.05)	(0.04)	(0.03)	(0.04)	(0.03)	(0.03)
Hh head Education (years)		0.03***	0.01		0.04***	0.02**		0.02***	0.01
		(0.01)	(0.01)		(0.01)	(0.01)		(0.01)	(0.01)
Child Sex (1 = male)		0.12*	0.09		0.03	0.00		0.01	-0.02
		(0.06)	(0.06)		(0.05)	(0.05)		(0.08)	(0.08)
Consumer durables Index			0.15			0.20			0.40
			(0.20)			(0.27)			(0.24)
Level of antenatal care			0.03			0.10***			0.14***
			(0.04)			(0.02)			(0.05)
Weight for age			0.01			0.04			0.08*
(child's z-score around 6 mos.)			(0.04)			(0.05)			(0.04)
Height for age			0.03			0.00			0.01
(child's z-score around 6 mos.)			(0.03)			(0.04)			(0.04)
Environmental Shock			-0.28**			-0.14			-0.16
			(0.11)			(0.09)			(0.13)
Observations	949	949	949	949	949	949	942	942	942
R-squared	0.01	0.20	0.26	0.01	0.25	0.29	0.02	0.22	0.27
Adjusted R-squared	0.00464	0.187	0.238	0.00111	0.242	0.275	0.0160	0.215	0.253
Additional Controls									
Sociodemographic chars. /2	N	Y	Y	N	Y	Y	N	Y	Y
Econonomic conditions /3	N	N	Y	N	N	Y	N	N	Y
Antenatal care /4	N	N	Y	N	N	Y	N	N	Y
Other shocks /5	N	N	Y	N	N	Y	N	N	Y

Notes:

1/ The measures for the caregiver's mental health (both naïve and disaggregated) are positively coded. In the case of the naïve dichotomous measure, a value of one indicates the caregivers in *not* depressed (i.e. does not present 8 or more depression symptoms). In the case of the disaggregated measures a higher score indicates the presence of less depression symptoms and therefore better mental. The measures are obtained by performing Exploratory Factor Analysis on the 20 items of the (positively coded) items of the CES-D (Center for Epidemiological Studies- Depression) scale. The resulting 4 factors are the disaggregated constructs of the mental health scale.

2/ Household Sociodemographic characteristics (additional controls): Household head's age and sex; caregiver's years of education and literacy; and household size.

3/ Economic conditions (additional controls): Access to safe drinking water, sanitation, electricity, adequate fuels for cooking; and housing quality index.

4/ Level of antenatal care coded as follows: 0 = None; 1 = Low; 2 = Medium; 3 = High.

5/ The other shocks included as controls are crime, economic and family shocks (i.e. family member death or divorce). All shocks refer to events reported when child was around 6 months old.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5.1. Correlation between Maternal Mental Health and Child's development Trajectories: ETHIOPIA

Controlled Estimates (partial controls)

	Child's WEIGHT trajectory								Child's HEIGHT trajectory								Child's COGNITIVE trajectory (PPVT score)							
	4 - PERIOD TRAJECTORIES								4 - PERIOD TRAJECTORIES								3 - PERIOD TRAJECTORIES							
Dependent variable	Sustained low level		Sustained high level		Downward trend		Upward trend		Sustained low level		Sustained high level		Downward trend		Upward trend		*Dep. variable*	Sustained low level		Sustained high level		Downward trend		Upward trend	
traj : ijkl =	(unconditional) { 1111 }	(conditional) { 1111 | *i* = 1 }	(unconditional) { 3333 }	(conditional) { 3333 | *i* = 3 }	(weak) { i ≥ j ≥ k ≥ l }	(strict) { i > j > k > l }	(weak) { i ≤ j ≤ k ≤ l }	(strict) { i < j < k < l }	(unconditional) { 1111 }	(conditional) { 1111 | *i* = 1 }	(unconditional) { 3333 }	(conditional) { 3333 | *i* = 3 }	(weak) { i ≥ j ≥ k ≥ l }	(strict) { i > j > k > l }	(weak) { i ≤ j ≤ k ≤ l }	(strict) { i < j < k < l }	***traj : ijk***	(unconditional) { 111 }	(conditional) { 111 | *i* = 1 }	(unconditional) { 333 }	(conditional) { 333 | *i* = 3 }	(weak) { i ≥ j ≥ k }	(strict) { i > j > k }	(weak) { i ≤ j ≤ k }	(strict) { i < j < k }
NAÏVE MEASURE	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**		**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Mental health	0.01	0.11	-0.00	-0.02	0.05	0.01	-0.07	0.01	0.06*	0.01	0.08	0.02	-0.06	-0.01	-0.05	0.01		0.01	0.03	0.04	0.08	0.03	0.02*	-0.09	-0.01
(cont. var.)	(0.03)	(0.11)	(0.04)	(0.08)	(0.04)	(0.02)	(0.05)	(0.01)	(0.04)	(0.05)	(0.09)	(0.11)	(0.04)	(0.02)	(0.03)	(0.01)		(0.04)	(0.06)	(0.09)	(0.11)	(0.04)	(0.01)	(0.06)	(0.01)
Observations	1,493	618	1,493	468	1,493	1,493	1,493	1,493	1,493	1,493	603	499	1,493	1,493	1,493	1,493		1,295	1,295	490	397	1,493	1,493	1,493	1,493
R-squared	0.08	0.03	0.10	0.07	0.04	0.03	0.03	0.02	0.09	0.10	0.08	0.08	0.06	0.02	0.07	0.03		0.08	0.20	0.10	0.22	0.02	0.02	0.03	0.02
R-sq-adj	0.0706	-0.00262	0.0851	0.0290	0.0283	0.0176	0.0125	0.00609	0.0758	0.0842	0.0545	0.0469	0.0525	0.0104	0.0532	0.0143		0.0671	0.184	0.0608	0.181	0.00763	0.00452	0.0212	0.00593
DISAGGREGATED MEASURES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**		**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Mental health:																									
Factor 1	0.01	0.05**	0.00	0.00	0.02	-0.00	-0.03**	-0.00	0.01	-0.01	0.05*	-0.03	0.01	0.00	-0.02**	-0.00		0.02*	-0.00	0.04	0.02	0.01	0.01*	-0.03**	-0.00
	(0.01)	(0.02)	(0.01)	(0.03)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)		(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.00)	(0.01)	(0.00)
Factor 2	-0.00	0.00	0.00	0.02	-0.00	0.00	0.01	0.00	0.02**	0.00	-0.01	0.03	-0.02*	-0.01	0.00	0.00		-0.02	0.00	-0.05*	-0.01	0.01	0.00	0.02	-0.00
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)		(0.02)	(0.01)	(0.02)	(0.04)	(0.01)	(0.00)	(0.01)	(0.00)
Factor 3	-0.01	-0.03	-0.00	-0.02	-0.01	0.00	0.00	0.00	-0.02	0.01	-0.03	0.02	-0.01	0.00	0.01	0.00		-0.01	0.02*	0.00	0.03*	-0.01	-0.00	-0.01	-0.00
	(0.01)	(0.03)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.03)	(0.02)	(0.02)	(0.01)	(0.01)	(0.00)		(0.01)	(0.01)	(0.03)	(0.02)	(0.01)	(0.00)	(0.02)	(0.00)
Observations	1,432	600	1,432	447	1,432	1,432	1,432	1,432	1,432	1,432	580	474	1,432	1,432	1,432	1,432		1,237	1,237	468	385	1,432	1,432	1,432	1,432
R-squared	0.08	0.04	0.10	0.07	0.05	0.03	0.03	0.02	0.09	0.10	0.10	0.09	0.07	0.03	0.07	0.03		0.09	0.20	0.12	0.22	0.02	0.02	0.04	0.02
R-sq-adj	0.0712	0.000755	0.0820	0.0220	0.0319	0.0125	0.0126	0.00644	0.0801	0.0882	0.0655	0.0453	0.0563	0.0112	0.0549	0.0134		0.0772	0.182	0.0749	0.180	0.00604	0.00476	0.0247	0.00450
Controls																									
Month of age FE /1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
Sociodem. chars. /2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
Econ. conditions /3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		N	N	N	N	N	N	N	N
Antenatal care /4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		N	N	N	N	N	N	N	N
Other shocks /5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		N	N	N	N	N	N	N	N

Notes: For brevity, the coefficients for each of the control variables are not displayed.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5.2. Correlation between Maternal Mental Health and Child's development Trajectories: INDIA

Controlled Estimates (partial controls)

	Child's WEIGHT trajectory								Child's HEIGHT trajectory								Child's COGNITIVE trajectory (PPVT score)							
	4 - PERIOD TRAJECTORIES								4 - PERIOD TRAJECTORIES								3 - PERIOD TRAJECTORIES							
Dependent variable	Sustained low level		Sustained high level		Downward trend		Upward trend		Sustained low level		Sustained high level		Downward trend		Upward trend		*Dep. variable*	Sustained low level		Sustained high level		Downward trend		Upward trend	
	(unconditional)	(conditional)	(unconditional)	(conditional)	(weak)	(strict)	(weak)	(strict)	(unconditional)	(conditional)	(unconditional)	(conditional)	(weak)	(strict)	(weak)	(strict)		(unconditional)	(conditional)	(unconditional)	(conditional)	(weak)	(strict)	(weak)	(strict)
traj : ijkl =	{ 1111 }	{ 1111 | *i* = 1 }	{ 3333 }	{ 3333 | *i* = 3 }	{ i ≥ j ≥ k ≥ l }	{ i > j > k > l }	{ i ≤ j ≤ k ≤ l }	{ i < j < k < l }	{ 1111 }	{ 1111 | *i* = 1 }	{ 3333 }	{ 3333 | *i* = 3 }	{ i ≥ j ≥ k ≥ l }	{ i > j > k > l }	{ i ≤ j ≤ k ≤ l }	{ i < j < k < l }	***traj : ijk =***	{ 111 }	{ 111 | *i* = 1 }	{ 333 }	{ 333 | *i* = 3 }	{ i ≥ j ≥ k }	{ i > j > k }	{ i ≤ j ≤ k }	{ i < j < k }
NAÏVE MEASURE	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**		**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Mental health	-0.09	-0.10	0.07*	0.14*	-0.00	0.02	0.05	0.02	-0.07*	0.02	-0.10	-0.05	0.03	0.04	0.00	0.02		-0.02	0.07*	-0.00	0.15	-0.05	-0.02	0.00	0.02
(cont. var.)	(0.05)	(0.10)	(0.03)	(0.08)	(0.05)	(0.02)	(0.04)	(0.02)	(0.04)	(0.03)	(0.10)	(0.09)	(0.06)	(0.02)	(0.05)	(0.02)		(0.04)	(0.04)	(0.09)	(0.12)	(0.07)	(0.02)	(0.07)	(0.02)
Observations	1,569	603	1,569	469	1,569	1,569	1,569	1,569	1,569	1,569	618	530	1,569	1,569	1,569	1,569		1,569	1,569	511	532	1,569	1,569	1,569	1,569
R-squared	0.07	0.16	0.08	0.13	0.10	0.03	0.08	0.04	0.13	0.12	0.15	0.10	0.16	0.05	0.13	0.05		0.06	0.12	0.07	0.12	0.01	0.02	0.02	0.02
R-sq-adj	0.0538	0.134	0.0691	0.0897	0.0918	0.0134	0.0715	0.0326	0.122	0.110	0.121	0.0632	0.148	0.0433	0.118	0.0425		0.0493	0.110	0.0387	0.0828	0.00210	0.0109	0.0130	0.00462
DISAGGREGATED MEASURES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**		**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Mental health:																									
Factor 1	-0.02	-0.03	0.01	0.02	-0.02	0.00	0.00	-0.00	-0.01	0.02**	0.01	0.03	-0.01	-0.01*	-0.00	0.00		-0.01	0.02*	0.00	0.01	-0.01	-0.00	-0.00	0.01*
	(0.01)	(0.02)	(0.01)	(0.03)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)		(0.01)	(0.01)	(0.03)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)
Factor 2	-0.02**	-0.04	0.01	0.03	0.01	-0.01	0.01	0.00	-0.02	0.01	-0.01	-0.01	0.02*	0.00	0.01	0.01		-0.01	0.01	-0.03	0.06**	-0.02	-0.00	0.03	-0.00
	(0.01)	(0.02)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)		(0.01)	(0.01)	(0.02)	(0.03)	(0.02)	(0.00)	(0.02)	(0.01)
Factor 3	-0.00	-0.00	0.01	0.02	-0.01	0.00	0.00	0.00	0.00	0.00	-0.05*	0.02	-0.02**	0.01	0.01	-0.00		0.01	-0.01	0.01	-0.02	-0.02	-0.00	-0.01	0.00
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.02)	(0.03)	(0.01)	(0.00)	(0.01)	(0.00)		(0.01)	(0.01)	(0.03)	(0.02)	(0.01)	(0.00)	(0.01)	(0.00)
Factor 4	-0.01	0.01	0.01	0.03	0.03**	-0.00	0.01	0.00	-0.01	-0.01	-0.00	-0.04*	0.02	0.02**	-0.02	0.00		-0.01	0.01	-0.02	0.02	0.01	-0.01	0.00	0.00
	(0.01)	(0.02)	(0.01)	(0.03)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)		(0.01)	(0.01)	(0.03)	(0.02)	(0.02)	(0.00)	(0.02)	(0.00)
Factor 5	0.01	0.03	-0.01	-0.02	0.01	0.00	-0.01	0.00	-0.01	0.00	-0.00	0.02	0.02	0.00	0.00	0.00		-0.00	0.00	0.02	-0.02	0.02	0.01	-0.00	-0.00
	(0.01)	(0.02)	(0.01)	(0.03)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.00)		(0.01)	(0.01)	(0.03)	(0.03)	(0.02)	(0.00)	(0.02)	(0.01)
Factor 6	0.01	0.00	-0.00	-0.02	-0.01	-0.00	-0.01	0.00	0.01	-0.01	0.00	-0.04*	-0.01	-0.00	0.00	0.00		0.02*	-0.00	0.04*	-0.00	-0.01	-0.00	-0.00	0.00
	(0.01)	(0.02)	(0.01)	(0.03)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.00)	(0.02)	(0.00)
Observations	1,271	490	1,271	368	1,271	1,271	1,271	1,271	1,271	1,271	509	421	1,271	1,271	1,271	1,271		1,271	1,271	410	451	1,271	1,271	1,271	1,271
R-squared	0.08	0.18	0.10	0.14	0.11	0.03	0.07	0.05	0.15	0.12	0.16	0.12	0.17	0.08	0.12	0.06		0.06	0.13	0.09	0.13	0.03	0.02	0.03	0.02
R-sq-adj	0.0661	0.143	0.0794	0.0836	0.0899	0.0114	0.0554	0.0334	0.137	0.106	0.114	0.0641	0.149	0.0618	0.105	0.0405		0.0449	0.113	0.0316	0.0853	0.00992	0.00600	0.0105	-0.000138
Controls																									
Month of age FE /1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
Sociodem. chars. /2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
Econ. conditions /3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		N	N	N	N	N	N	N	N
Antenatal care /4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		N	N	N	N	N	N	N	N
Other shocks /5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		N	N	N	N	N	N	N	N

Notes: For brevity, the coefficients for each of the control variables are not displayed.
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5.3. Correlation between Maternal Mental Health and Child's development Trajectories: VIETNAM

Controlled Estimates (partial controls)

	Child's WEIGHT trajectory								Child's HEIGHT trajectory								Child's COGNITIVE trajectory (PPVT score)							
	4 - PERIOD TRAJECTORIES								4 - PERIOD TRAJECTORIES								3 - PERIOD TRAJECTORIES							
Dependent variable	Sustained low level		Sustained high level		Downward trend		Upward trend		Sustained low level		Sustained high level		Downward trend		Upward trend		*Dep. variable*	Sustained low level		Sustained high level		Downward trend		Upward trend	
	(unconditional)	(conditional)	(unconditional)	(conditional)	(weak)	(strict)	(weak)	(strict)	(unconditional)	(conditional)	(unconditional)	(conditional)	(weak)	(strict)	(weak)	(strict)		(unconditional)	(conditional)	(unconditional)	(conditional)	(weak)	(strict)	(weak)	(strict)
traj : ijkl =	{1111}	{1111 | i = 1}	{3333}	{3333 | i = 3}	{i ≥ j ≥ k ≥ l}	{i > j > k > l}	{i ≤ j ≤ k ≤ l}	{i < j < k < l}	{1111}	{1111 | i = 1}	{3333}	{3333 | i = 3}	{i ≥ j ≥ k ≥ l}	{i > j > k > l}	{i ≤ j ≤ k ≤ l}	{i < j < k < l}	***traj : ijk =***	{111}	{111 | i = 1}	{333}	{333 | i = 3}	{i ≥ j ≥ k}	{i > j > k}	{i ≤ j ≤ k}	{i < j < k}
NAÏVE MEASURE	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**		**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Mental health	-0.06	-0.02	0.06*	0.05	0.00	-0.04	-0.01	-0.05	0.02	0.05	-0.02	0.09	-0.08*	0.00	-0.06	0.02		-0.03	0.02	-0.02	0.04	0.01	0.01	0.04	0.01
(cont. var.)	(0.06)	(0.11)	(0.03)	(0.14)	(0.06)	(0.03)	(0.07)	(0.04)	(0.06)	(0.05)	(0.09)	(0.16)	(0.04)	(0.02)	(0.05)	(0.03)		(0.06)	(0.03)	(0.11)	(0.09)	(0.08)	(0.02)	(0.05)	(0.02)
Observations	1,249	533	1,249	393	1,249	1,249	1,249	1,249	1,249	1,249	503	417	1,249	1,249	1,249	1,249		1,239	1,239	433	394	1,249	1,249	1,249	1,249
R-squared	0.13	0.13	0.12	0.18	0.15	0.05	0.09	0.03	0.22	0.13	0.24	0.12	0.19	0.04	0.15	0.06		0.21	0.09	0.23	0.13	0.04	0.02	0.03	0.02
R-sq-adj	0.113	0.0967	0.109	0.138	0.140	0.0391	0.0757	0.0177	0.205	0.121	0.210	0.0836	0.182	0.0229	0.141	0.0477		0.201	0.0761	0.199	0.0883	0.0220	0.00613	0.0118	0.00418
DISAGGREGATED MEASURES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**		**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Mental health:																									
Factor 1	0.03	0.05	-0.01	-0.03	0.01	-0.00	-0.04*	-0.01	0.01	-0.01	0.03	0.01	0.00	0.01	-0.00	0.00		-0.01	-0.01	-0.02	-0.03	-0.00	-0.00	0.02	0.00
	(0.02)	(0.03)	(0.02)	(0.04)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.03)	(0.04)	(0.02)	(0.01)	(0.02)	(0.01)		(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.00)	(0.02)	(0.00)
Factor 2	-0.01	0.01	0.01	0.04	-0.00	-0.00	0.00	-0.01*	0.02	0.01	0.02	-0.00	0.01	0.00	-0.03	-0.01		0.01	-0.01	0.01	-0.01	0.01	0.01**	-0.00	0.00
	(0.01)	(0.02)	(0.01)	(0.04)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.02)	(0.01)	(0.01)	(0.01)		(0.02)	(0.00)	(0.03)	(0.02)	(0.01)	(0.00)	(0.02)	(0.00)
Factor 3	-0.02	-0.02	0.02	0.04	0.00	-0.01	0.01	0.00	-0.01	0.02	0.00	0.02	-0.00	-0.00	0.00	0.01		0.01	0.03***	0.01	0.07***	-0.02	0.00	0.00	-0.00
	(0.01)	(0.03)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)		(0.02)	(0.01)	(0.04)	(0.02)	(0.03)	(0.00)	(0.02)	(0.00)
Factor 4	-0.02	-0.03	-0.00	-0.02	0.01	-0.00	0.01	0.01	-0.01	-0.01	-0.04	-0.03	-0.02	-0.00	0.01	-0.00		-0.01	0.00	0.00	0.01	0.02	-0.00	0.00	0.00
	(0.01)	(0.03)	(0.01)	(0.03)	(0.01)	(0.01)	(0.02)	(0.00)	(0.01)	(0.01)	(0.03)	(0.03)	(0.02)	(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.04)	(0.03)	(0.02)	(0.01)	(0.01)	(0.01)
Observations	949	393	949	316	949	949	949	949	949	949	379	327	949	949	949	949		942	942	319	323	949	949	949	949
R-squared	0.13	0.16	0.14	0.20	0.16	0.07	0.10	0.04	0.24	0.14	0.27	0.14	0.20	0.04	0.16	0.06		0.23	0.11	0.27	0.18	0.04	0.02	0.04	0.02
R-sq-adj	0.114	0.111	0.119	0.141	0.143	0.0476	0.0796	0.0191	0.218	0.121	0.222	0.0787	0.179	0.0193	0.137	0.0384		0.216	0.0913	0.215	0.116	0.0209	-0.000875	0.0158	-0.00529
Controls																									
Month of age FE /1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
Sociodem. chars. /2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
Econ. conditions /3	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		N	N	N	N	N	N	N	N
Antenatal care /4	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		N	N	N	N	N	N	N	N
Other shocks /5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		N	N	N	N	N	N	N	N

Notes: For brevity, the coefficients for each of the control variables are not displayed.
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix Tables

Table A.5.1.1. Correlation between Maternal Mental Health and Child's development Trajectories: ETHIOPIA

Controlled Estimates (full controls)

	Child's WEIGHT trajectory								Child's HEIGHT trajectory								Child's COGNITIVE trajectory (PPVT score)							
	4 - PERIOD TRAJECTORIES								4 - PERIOD TRAJECTORIES								3 - PERIOD TRAJECTORIES							
Dependent variable	Sustained low level		Sustained high level		Downward trend		Upward trend		Sustained low level		Sustained high level		Downward trend		Upward trend		*Dep. variable*	Sustained low level		Sustained high level		Downward trend		Upward trend	
		(conditional)		(conditional)	(weak)	(strict)	(weak)	(strict)		(conditional)		(conditional)	(weak)	(strict)	(weak)	(strict)			(conditional)		(conditional)	(weak)	(strict)	(weak)	(strict)
traj : ijkl =	{1111}	{1111 | *i* = 1}	{3333}	{3333 | *i* = 3}	{i≥j≥k≥l}	{i>j>k>l}	{i≤j≤k≤l}	{i<j<k<l}	{1111}	{1111 | *i* = 1}	{3333}	{3333 | *i* = 3}	{i≥j≥k≥l}	{i>j>k>l}	{i≤j≤k≤l}	{i<j<k<l}	***traj : ijk***	{1111}	{1111 | *i* = 1}	{3333}	{3333 | *i* = 3}	{i≥j≥k≥l}	{i>j>k>l}	{i≤j≤k≤l}	{i<j<k<l}
NAÏVE MEASURE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mental health	0.00	0.07	-0.02	-0.04	0.04	0.01	-0.03	0.00	0.08*	-0.01	0.12	0.02	-0.07	-0.01	-0.04	-0.00		0.01	0.04	0.06	0.11	0.06	0.02	-0.10**	-0.01
(cont. var.)	(0.03)	(0.11)	(0.04)	(0.08)	(0.05)	(0.02)	(0.06)	(0.02)	(0.04)	(0.05)	(0.08)	(0.12)	(0.05)	(0.02)	(0.04)	(0.02)		(0.03)	(0.04)	(0.07)	(0.10)	(0.04)	(0.01)	(0.05)	(0.01)
Observations	1,493	618	1,493	468	1,493	1,493	1,493	1,493	1,493	1,493	603	499	1,493	1,493	1,493	1,493		1,295	1,295	490	397	1,493	1,493	1,493	1,493
R-squared	0.10	0.07	0.16	0.14	0.07	0.04	0.05	0.03	0.10	0.11	0.11	0.10	0.08	0.04	0.08	0.04		0.13	0.30	0.17	0.33	0.04	0.03	0.07	0.03
R-sq-adj	0.0833	0.0219	0.138	0.0738	0.0467	0.0143	0.0237	0.00354	0.0801	0.0869	0.0575	0.0409	0.0614	0.0160	0.0605	0.0140		0.107	0.287	0.106	0.267	0.0202	0.00671	0.0461	0.00537
DISAGGREGATED MEASURES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mental health:																									
Factor 1	0.00	0.04	0.00	0.00	0.02*	-0.00	-0.02*	-0.00	0.01	-0.01	0.05**	-0.02	0.00	0.00	-0.02*	-0.00		0.02	0.01	0.04*	0.03	0.01	0.01**	-0.03**	-0.00
	(0.01)	(0.02)	(0.01)	(0.03)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.02)	(0.03)	(0.01)	(0.00)	(0.01)	(0.00)		(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.00)	(0.01)	(0.00)
Factor 2	0.00	0.00	-0.00	0.01	-0.00	0.00	0.01	0.00	0.02**	-0.00	-0.00	0.02	-0.02*	-0.01	-0.00	0.00		-0.02	-0.00	-0.05**	-0.00	0.01	0.00	0.02	-0.00
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)		(0.01)	(0.01)	(0.02)	(0.03)	(0.01)	(0.00)	(0.01)	(0.00)
Factor 3	-0.00	-0.03	-0.01	-0.03	-0.01	0.00	0.00	0.00	-0.01	0.01	-0.02	0.02	-0.01	0.00	0.00	0.00		0.00	0.01	0.01	0.02	-0.01	-0.01	-0.02	-0.00
	(0.01)	(0.03)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.03)	(0.02)	(0.02)	(0.01)	(0.01)	(0.00)		(0.01)	(0.01)	(0.03)	(0.02)	(0.01)	(0.00)	(0.02)	(0.00)
Observations	1,432	600	1,432	447	1,432	1,432	1,432	1,432	1,432	1,432	580	474	1,432	1,432	1,432	1,432		1,237	1,237	468	385	1,432	1,432	1,432	1,432
R-squared	0.11	0.08	0.16	0.14	0.07	0.03	0.05	0.03	0.11	0.11	0.13	0.10	0.09	0.04	0.08	0.04		0.14	0.30	0.18	0.33	0.04	0.03	0.07	0.03
R-sq-adj	0.0849	0.0247	0.135	0.0636	0.0473	0.0100	0.0214	0.00347	0.0837	0.0914	0.0690	0.0330	0.0646	0.0133	0.0581	0.0132		0.115	0.281	0.115	0.261	0.0202	0.00742	0.0490	0.00267
Controls																									
Month of age FE /1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
Sociodem. chars. /2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
Econ. conditions /3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
Antenatal care /4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
Other shocks /5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y

Notes: For brevity, the coefficients for each of the control variables are not displayed.
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A.5.2.1. Correlation between Maternal Mental Health and Child's development Trajectories: INDIA

Controlled Estimates (full controls)

	Child's WEIGHT trajectory								Child's HEIGHT trajectory								Child's COGNITIVE trajectory (PPVT score)							
	4 - PERIOD TRAJECTORIES								4 - PERIOD TRAJECTORIES								3 - PERIOD TRAJECTORIES							
Dependent variable	Sustained low level		Sustained high level		Downward trend		Upward trend		Sustained low level		Sustained high level		Downward trend		Upward trend		*Dep. variable*	Sustained low level		Sustained high level		Downward trend		Upward trend	
	(unconditional)	(conditional)	(unconditional)	(conditional)	(weak)	(strict)	(weak)	(strict)	(unconditional)	(conditional)	(unconditional)	(conditional)	(weak)	(strict)	(weak)	(strict)		(unconditional)	(conditional)	(unconditional)	(conditional)	(weak)	(strict)	(weak)	(strict)
traj : ijkl =	{ 1111 }	{ 1111 | *i* = 1 }	{ 3333 }	{ 3333 | *i* = 3 }	{ i ≥ j ≥ k ≥ l }	{ i > j > k > l }	{ i ≤ j ≤ k ≤ l }	{ i < j < k < l }	{ 1111 }	{ 1111 | *i* = 1 }	{ 3333 }	{ 3333 | *i* = 3 }	{ i ≥ j ≥ k ≥ l }	{ i > j > k > l }	{ i ≤ j ≤ k ≤ l }	{ i < j < k < l }	***traj : ijk =***	{ 111 }	{ 111 | *i* = 1 }	{ 333 }	{ 333 | *i* = 3 }	{ i ≥ j ≥ k }	{ i > j > k }	{ i ≤ j ≤ k }	{ i < j < k }
NAÏVE MEASURE	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**		**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Mental health	-0.07	-0.10	0.06*	0.12*	0.00	0.02	0.05	0.03	-0.06	-0.01	-0.10	-0.11	0.06	0.04*	-0.01	0.01		0.02	0.07	0.08	0.12	-0.03	-0.02	-0.01	0.02
(cont. var.)	(0.05)	(0.10)	(0.03)	(0.07)	(0.05)	(0.02)	(0.04)	(0.02)	(0.04)	(0.04)	(0.09)	(0.08)	(0.06)	(0.02)	(0.05)	(0.02)		(0.03)	(0.04)	(0.08)	(0.13)	(0.06)	(0.02)	(0.06)	(0.02)
Observations	1,569	603	1,569	469	1,569	1,569	1,569	1,569	1,569	1,569	618	530	1,569	1,569	1,569	1,569		1,569	1,569	511	532	1,569	1,569	1,569	1,569
R-squared	0.08	0.18	0.11	0.19	0.11	0.04	0.09	0.05	0.15	0.14	0.19	0.14	0.18	0.07	0.14	0.06		0.09	0.14	0.13	0.14	0.04	0.03	0.05	0.02
R-sq-adj	0.0629	0.131	0.0907	0.134	0.0965	0.0190	0.0712	0.0329	0.134	0.118	0.141	0.0897	0.161	0.0469	0.121	0.0400		0.0700	0.120	0.0749	0.0868	0.0191	0.0106	0.0303	0.000278
DISAGGREGATED MEASURES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**		**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Mental health:																									
Factor 1	-0.01	-0.02	0.00	0.00	-0.01	0.01	0.00	-0.01	-0.00	0.01	0.02	0.03	-0.01	-0.01*	-0.00	0.00		-0.00	0.01	0.01	0.00	-0.00	-0.00	0.00	0.01
	(0.01)	(0.03)	(0.01)	(0.03)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)		(0.01)	(0.01)	(0.03)	(0.02)	(0.02)	(0.00)	(0.01)	(0.01)
Factor 2	-0.02**	-0.04*	0.02*	0.03	0.01	-0.01	0.02	0.00	-0.01	0.01	-0.02	-0.01	0.02*	-0.00	0.01	0.00		-0.00	0.01	-0.02	0.06**	-0.03	-0.00	0.02	-0.00
	(0.01)	(0.02)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.00)	(0.01)	(0.00)		(0.01)	(0.01)	(0.02)	(0.03)	(0.02)	(0.00)	(0.02)	(0.01)
Factor 3	0.00	0.00	0.01	0.00	-0.01	0.00	0.00	0.00	0.01	-0.00	-0.03	0.01	-0.01	0.01*	0.00	-0.01		0.01	-0.01	0.01	-0.02	-0.02	-0.00	-0.01	0.00
	(0.01)	(0.03)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.02)	(0.03)	(0.01)	(0.00)	(0.01)	(0.00)		(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.00)	(0.01)	(0.00)
Factor 4	-0.00	0.01	0.00	0.03	0.02**	-0.00	0.01	0.00	-0.01	-0.01	0.00	-0.04	0.02	0.01**	-0.02	0.00		-0.00	0.00	-0.01	0.01	0.01	-0.01	0.00	0.00
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)	(0.02)	(0.00)		(0.01)	(0.01)	(0.03)	(0.02)	(0.02)	(0.00)	(0.02)	(0.00)
Factor 5	0.00	0.02	-0.00	-0.00	0.01	0.00	-0.01	0.00	-0.02	0.00	-0.01	0.02	0.02*	0.00	0.00	0.00		-0.00	0.00	0.02	-0.02	0.02	0.01	0.00	-0.00
	(0.01)	(0.02)	(0.01)	(0.03)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)		(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.00)	(0.02)	(0.01)
Factor 6	0.01	0.00	0.00	-0.02	-0.01	-0.00	-0.00	0.00	0.01	-0.01	-0.00	-0.04	-0.01	-0.00	0.00	0.00		0.02*	-0.00	0.04*	0.01	-0.01	-0.00	-0.00	0.00
	(0.01)	(0.02)	(0.01)	(0.03)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.00)	(0.02)	(0.00)
Observations	1,271	490	1,271	368	1,271	1,271	1,271	1,271	1,271	1,271	509	421	1,271	1,271	1,271	1,271		1,271	1,271	410	451	1,271	1,271	1,271	1,271
R-squared	0.10	0.21	0.13	0.23	0.12	0.05	0.08	0.07	0.18	0.14	0.21	0.17	0.19	0.09	0.13	0.07		0.09	0.15	0.14	0.16	0.06	0.03	0.05	0.03
R-sq-adj	0.0719	0.143	0.106	0.140	0.0913	0.0220	0.0528	0.0383	0.152	0.115	0.144	0.0875	0.161	0.0600	0.108	0.0386		0.0601	0.125	0.0510	0.0895	0.0294	0.00556	0.0261	-0.00159
Controls																									
Month of age FE /1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
Sociodem. chars. /2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
Econ. conditions /3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
Antenatal care /4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
Other shocks /5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y

Notes: For brevity, the coefficients for each of the control variables are not displayed.
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A.5.3.1. Correlation between Maternal Mental Health and Child's development Trajectories: VIETNAM

Controlled Estimates (full controls)

	Child's WEIGHT trajectory								Child's HEIGHT trajectory								Child's COGNITIVE trajectory (PPVT score)							
	4 - PERIOD TRAJECTORIES								4 - PERIOD TRAJECTORIES								3 - PERIOD TRAJECTORIES							
Dependent variable	Sustained low level		Sustained high level		Downward trend		Upward trend		Sustained low level		Sustained high level		Downward trend		Upward trend		*Dep. variable*	Sustained low level		Sustained high level		Downward trend		Upward trend	
	(unconditional)	(conditional)	(unconditional)	(conditional)	(weak)	(strict)	(weak)	(strict)	(unconditional)	(conditional)	(unconditional)	(conditional)	(weak)	(strict)	(weak)	(strict)		(unconditional)	(conditional)	(unconditional)	(conditional)	(weak)	(strict)	(weak)	(strict)
traj : ijkl =	{ 1111 }	{ 1111 | *i* = 1 }	{ 3333 }	{ 3333 | *i* = 3 }	{ i ≥ j ≥ k ≥ l }	{ i > j > k > l }	{ i ≤ j ≤ k ≤ l }	{ i < j < k < l }	{ 1111 }	{ 1111 | *i* = 1 }	{ 3333 }	{ 3333 | *i* = 3 }	{ i ≥ j ≥ k ≥ l }	{ i > j > k > l }	{ i ≤ j ≤ k ≤ l }	{ i < j < k < l }	***traj : ijk =***	{ 111 }	{ 111 | *i* = 1 }	{ 333 }	{ 333 | *i* = 3 }	{ i ≥ j ≥ k }	{ i > j > k }	{ i ≤ j ≤ k }	{ i < j < k }
NAÏVE MEASURE	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**		**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Mental health	-0.00	0.09	0.03	0.04	0.02	-0.02	-0.06	-0.05	0.00	0.02	-0.01	0.10	-0.03	0.03	-0.05	0.00		-0.02	0.01	-0.04	0.05	-0.00	0.01	0.04	0.00
(cont. var.)	(0.05)	(0.12)	(0.04)	(0.13)	(0.06)	(0.03)	(0.06)	(0.04)	(0.05)	(0.05)	(0.10)	(0.15)	(0.05)	(0.02)	(0.05)	(0.03)		(0.06)	(0.03)	(0.10)	(0.11)	(0.08)	(0.02)	(0.05)	(0.02)
Observations	1,249	533	1,249	393	1,249	1,249	1,249	1,249	1,249	1,249	503	417	1,249	1,249	1,249	1,249		1,239	1,239	433	394	1,249	1,249	1,249	1,249
R-squared	0.15	0.17	0.20	0.28	0.17	0.07	0.10	0.04	0.25	0.18	0.26	0.19	0.21	0.06	0.16	0.07		0.24	0.12	0.27	0.15	0.07	0.05	0.05	0.03
R-sq-adj	0.125	0.118	0.179	0.218	0.149	0.0501	0.0811	0.0192	0.229	0.155	0.214	0.127	0.188	0.0368	0.139	0.0450		0.221	0.0957	0.211	0.0703	0.0412	0.0225	0.0259	0.00282
DISAGGREGATED MEASURES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**		**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Mental health:																									
Factor 1	0.04**	0.08**	-0.01	-0.02	0.00	-0.00	-0.05**	-0.01	0.01	-0.01	0.03	0.02	0.01	0.01	-0.01	-0.00		-0.01	-0.00	-0.02	-0.02	-0.00	-0.00	0.02	-0.00
	(0.01)	(0.04)	(0.02)	(0.04)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.03)	(0.04)	(0.02)	(0.01)	(0.02)	(0.01)		(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.00)	(0.02)	(0.00)
Factor 2	-0.01	0.01	0.01	0.04	-0.00	-0.00	0.01	-0.01	0.01	0.01	0.01	-0.00	0.01	0.00	-0.02	-0.00		0.01	-0.01	0.00	-0.01	0.01	0.01**	-0.00	0.00
	(0.01)	(0.02)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.02)	(0.01)	(0.01)	(0.01)		(0.02)	(0.01)	(0.03)	(0.02)	(0.01)	(0.00)	(0.02)	(0.00)
Factor 3	-0.01	-0.01	0.01	0.04	0.01	-0.01	0.01	-0.00	-0.00	0.01	0.02	0.02	0.00	-0.00	0.00	0.01		0.01	0.02***	0.02	0.07**	-0.02	0.00	0.00	-0.00
	(0.01)	(0.03)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)	(0.01)	(0.01)	(0.02)	(0.01)		(0.02)	(0.01)	(0.04)	(0.03)	(0.02)	(0.00)	(0.02)	(0.00)
Factor 4	-0.02	-0.03	-0.00	-0.01	0.01	0.00	0.01	0.01	-0.02	-0.01	-0.05	-0.01	-0.02	0.00	0.02	0.00		-0.01	0.00	0.00	0.02	0.00	-0.00	0.01	0.00
	(0.01)	(0.03)	(0.01)	(0.03)	(0.01)	(0.01)	(0.02)	(0.00)	(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.04)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)
Observations	949	393	949	316	949	949	949	949	949	949	379	327	949	949	949	949		942	942	319	323	949	949	949	949
R-squared	0.16	0.21	0.22	0.31	0.19	0.09	0.12	0.06	0.26	0.18	0.30	0.21	0.21	0.07	0.17	0.07		0.27	0.15	0.32	0.21	0.08	0.04	0.06	0.03
R-sq-adj	0.128	0.134	0.192	0.222	0.154	0.0573	0.0847	0.0195	0.231	0.147	0.227	0.117	0.184	0.0300	0.138	0.0345		0.241	0.118	0.234	0.117	0.0483	0.00701	0.0289	-0.00404
Controls																									
Month of age FE /1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
Sociodem. chars. /2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
Econ. conditions /3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
Antenatal care /4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
Other shocks /5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y

Notes: For brevity, the coefficients for each of the control variables are not displayed.
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1