Developing Hope: The Impact of International Child Sponsorship on Self-Esteem and Aspirations

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May 14, 2014

Abstract: Recent research (Wydick, Glewwe, and Rutledge, 2013) finds positive and statistically significant impacts on adult life outcomes from child sponsorship, including large impacts on schooling outcomes, the probability and quality of employment, occupational choice, and community leadership. This paper uses data from two countries to explore whether these impacts may be due not only to a relaxation of external constraints, but also to higher aspirations among sponsored children. We use survey data from Kenya and Indonesia, and psychological data from Indonesian children's self-portraits, to test whether sponsorship significantly affects psychological variables in children that are likely to foster better economic outcomes in the future. We exploit an eligibility rule setting a maximum age for newly sponsored children. We use a child's age at program rollout in his or her village as an instrument for sponsorship to establish a causal link between sponsorship and higher levels of self-esteem, as well as educational and occupational aspirations. We find a causal link between child sponsorship and large increases in educational and vocational aspirations among children in Kenya, and higher levels of happiness, self-efficacy, and hopefulness based on children's self-portrait data from Indonesia.

1. Introduction

Child sponsorship programs transfer resources from sponsors in wealthy countries to children in developing countries, helping provide them access to healthcare, nutritious meals, tuition, and school uniforms. Wydick, Glewwe, and Rutledge (2013) find large and statistically significant impacts from Compassion International's child sponsorship program on adult life outcomes. These findings include an increase in schooling completion of 1.03-1.46 years, a 12-18 percentage point increase in secondary school completion over a baseline rate of 44.5 percent, and an increase in the probability of white collar employment of 6.6 percentage points over a baseline rate of 18.7 percent.

The emphasis of many child sponsorship programs such as that operated by Compassion, however, is not merely on the relief of external constraints such as access to healthcare and schooling, but on the relief of *internal* constraints. These internal constraints of the poor, which may be strongly manifested in children, can involve feelings of hopelessness, lack of empowerment, low aspirations, a diminished sense of self-efficacy, and low self-esteem. Above nearly all else, these programs claim to bring "hope" to children, and Compassion places a particular emphasis on the development of children's aspirations.

In this paper we investigate the impacts of the Compassion International child sponsorship program on the self-esteem, life-expectations and other psychological characteristics of 1,112 children in Indonesia and Kenya. The question we address is whether the large impacts on adult life outcomes found in our study of formerly sponsored children could have been caused through psychological changes fostered by the program during the period when the children were sponsored. It is possible that the relief of external constraints from child sponsorship is solely responsible for these improved adult outcomes, and that changes in children's psychological traits due to the program are ancillary to the process. Indeed if we were to find no impact on children's psychology from child sponsorship, we could rule out impacts of the program on child psychological traits as a causal channel for the positive impacts from child sponsorship on adult life outcomes found in Wydick, Glewwe and Rutledge (2013). Thus we view a finding of significant psychological impacts on children as a critically important and necessary (but not sufficient) condition for a causal impact of heightened aspirations on adult outcomes.

A growing literature in behavioral economics explores the relationship between self-esteem and economic outcomes. Bénabou and Tirole (2003), for example, show that empowering and encouraging an individual can raise self-esteem, which may in turn raise achievement. Darolia and Wydick (2011) find that actions such as parental praise designed to foster an increase in self-esteem

result in academic achievement in university undergraduates above what natural ability would dictate.

Another important strand of the literature has sought to understand the role of internal constraints among the poor, especially in the areas of self-esteem and aspirations, and its effect on economic development. Much recent theoretical work in development economics has shown how low aspirations can lead to development traps (Dalton, Ghosal, and Mani, 2013; Bernard, Dercon, and Taffesse, 2011). Ray (2006), for example, discusses how failed aspirations and poverty are reciprocally linked in a self-sustaining trap. Genicot and Ray (2014) demonstrate how aspirations failures can lead to a divergence in investment and thus growing income inequality.

Recent experimental fieldwork has also explored the importance of psychological variables to development. Using a randomized field experiment in South Africa, Bertrand et. al (2010) test the role of psychological factors in credit and saving decisions, while Duflo, Kremer, and Robinson (2011) explore nudges and fertilizer take-up among Kenyan farmers using models of procrastination from the economics and psychology literature. The paper most closely related to ours is the study by Chiapa, Garrido, and Prina (2012), which uses a difference-in-differences approach to evaluate the impacts of Mexico's PROGRESA program on parents' educational aspirations for their children. They find that the aspirations of parents for their children's education increased by almost half of a school year among high-exposure households, and that there is a positive correlation between parental aspirations and their children's educational attainment. However, they do not investigate the aspirations of the children themselves.

We seek to contribute to this emerging literature on the importance of aspirations to economic development. When positive impacts of child sponsorship became apparent during the course of our study on adult life outcomes (Wydick, Glewwe and Rutledge, 2013), we began exploring the role of aspirations development in sponsored children. Small-scale data collection efforts in Bolivia, India and Kenya revealed positive correlations between child sponsorship status and higher educational and vocational aspirations. This led us to implement studies in Kenya and Indonesia that were larger and, more importantly, permitted us to choose village sponsorship projects that had been rolled out sufficiently recently to allow for estimation of causal impacts via the age-eligibility-rule instrument used in Wydick, Glewwe and Rutledge (2013).

The survey instruments in both Kenya and Indonesia included direct questions related to measurement of self-esteem and aspirations. In addition, our study in Indonesia adds a new element taken from the psychology literature that we feel is especially relevant for children: the psychoanalysis of children's drawings (Koppitz, 1968; Klepsch and Logie, 1982; Furth, 2002). In

this exercise, we asked 540 children living in the slums of Jakarta to "Draw a picture of yourself in the rain." Based on research in the child psychology literature, we coded attributes of these drawings that consistently display empirical correlations with diagnosed psychological phenomena in children. Using our vector of age-eligibility instruments to identify causal effects, we find that sponsored children's drawings reveal significantly greater levels of self-esteem and emotional health across a large number of drawing attributes. Combined with our direct survey data, which also find significant differences in educational and vocational aspirations, we find that child sponsorship strongly and positively impacts a wide array of psychological measures in children.

Our analysis consists of four parts: (1) survey results from Kenya utilizing the age-eligibility instrument to compare sponsored children to their siblings; (2) survey results from Indonesia that utilize the same instrument to compare sponsored children to their siblings, and to compare differences between sponsored children and their siblings to differences between children that were on the sponsorship wait list and their siblings; (3) survey results based on pooled data from both countries; and (4) psychological analysis of drawings from Indonesia.

2. Description of survey and fieldwork

2.1 Description of the Compassion Program

Compassion is a faith-based Christian organization that currently supports over 1.3 million children in 26 countries, making it the third largest child sponsorship organization worldwide. Wydick, Glewwe, and Rutledge (2013) estimate that 9.14 million children are sponsored through various organizations worldwide, and that this represents a transfer of approximately $3.4 billion dollars annually. These programs have been in existence for decades and typically involve a monthly payment of around $25-$40 that funds the provision of healthcare, education, clothing, food, and other support for the sponsored child and/or the community in which he or she lives. Additionally, they foster a relationship between the child and the sponsor through the exchange of letters, photos, and gifts. (For a more detailed description of the Compassion program, see Wydick, Glewwe, and Rutledge, 2013).

One minor difference between the Compassion projects in this study and in our previous study, which involved adults who were sponsored in the 1990s or earlier, is that in most countries, the age-eligibility rule has been gradually lowered from 12 to 9 years of age. In this study we focus on the aspects of the program that seek to develop children's self-esteem and aspirations. These aspects, which make child sponsorship different from programs that provide only educational inputs, include the exchange of letters with sponsors, which exposes the children to a world outside of their

village. It also includes the support network fostered by the Compassion program and its alumni who, directly or indirectly, influence the currently sponsored children through their own accomplishments. More generally, Compassion programs place a significant emphasis on self-esteem building, character development, and enhancement of self-expectations.

2.2 Survey Fieldwork

Our studies of children in Kenyan and Indonesian communities, which compare psychological variables such as the self-esteem and life aspirations of sponsored and unsponsored children in the same community, were designed to exploit the above-mentioned age-eligibility rule to identify a causal relationship between sponsorship and psychological measures in children. Table 1 provides information on how the study was implemented in seven communities across the two study countries. In each of the study sites, a survey questionnaire was used to obtain basic information about the respondent such as age, gender, level of formal schooling, religion, sponsorship information and family characteristics such as language spoken at home and the highest level of education and occupation of each parent. In addition to this basic information, the survey questionnaires also included a series of questions designed to elicit the child's expectations for occupation and level of education and a battery of questions intended to measure self-esteem. Summary statistics for the data collected are shown in Table 2.

2.2.1 Kenya

The study in Kenya was carried out in three villages from May through July of 2011. These villages were randomly sampled from a list of all villages within a three-hour journey by car from Nairobi with a Compassion program that was first implemented between 2002 and 2004. The program started in one of these sites in May 2003, and in the other two sites in December 2003. This time frame was chosen to exploit the age eligibility criteria of the program that newly sponsored children must be between the ages of three and nine years old. This allows us to use age at the time of program roll-out as an instrument for sponsorship. The survey questionnaire was written in English, but the questions were translated into Swahili or the local mother tongue at the discretion of the enumerators as to what they believed would be the most effective way to communicate with each child.

The survey sample consisted of three groups: currently sponsored children, the next oldest non-sponsored sibling and the next youngest non-sponsored sibling. No children were surveyed from families that did not have sponsored children. Within each of the three villages, 110 children were randomly sampled from the population of currently sponsored children between the ages of 12

and 16, for a total of 330 currently sponsored children. Of these, we successfully surveyed 326 (98.8%). Once we located the sponsored child, we would then interview the next oldest and the next youngest child. There were 243 of these non-sponsored siblings between the ages of 10 and 18, of which we interviewed 237 (97.5%). Of the six who were not interviewed, two were mentally disabled, two were older siblings who had left the village because they had married, and two had left the village to find work. For these last four either we did not get permission from a parent to contact them or we could not locate them without a great amount of difficulty.

For 11 of the 326 (3.4%) currently sponsored children, the next youngest or next oldest sibling was also sponsored (even though the rule in Kenya was to allow only one sponsored child per family) but was not one of the 330 randomly sampled currently sponsored children. Four of these 11 sponsored siblings were sponsored due to the twin rule, which stipulates that if one twin is sponsored, the other must also be sponsored, and five were due to cases of extreme poverty in the family, in which case more than one child is allowed to be sponsored. The remaining two cases may have been due to some level of favoritism in one of the villages, as the local pastor had all of his age-eligible children sponsored, although only two of them fell into our target age range. In these cases, we would interview this extra sponsored sibling provided they were between 10 and 18. If this extra sponsored sibling was older, we would then interview the next oldest after this extra sponsored sibling if they were 18 or younger. If the extra sponsored sibling was younger, then we would interview the next youngest after the extra sponsored sibling if they were 10 or older. In these 11 instances, the sponsored siblings were always contiguous in birth order, and there was never a third sponsored sibling contiguous in birth order that was between the ages of 10 and 18. Thus, in these instances, we have up to four children interviewed in a family, two sponsored and two non-sponsored.

In total, the survey was administered to 570 children: 333 that were sponsored, 154 next older non-sponsored siblings and 83 next younger non-sponsored siblings, all with the same mother and father within a household. The survey was administered to the children individually by enumerators who were university students or recent graduates; these enumerators were not affiliated with the Compassion program.[1] It was made clear to the child that the studies were confidential, independent of Compassion, and no one from Compassion or anyone else would know

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[1] Since Compassion's implementing church partner often had a large role in the communities of these villages, and we hired enumerators that knew the members of the village well, a couple of the hired enumerators may have had some informal volunteer role in the church, but no affiliation with the Compassion program. Sponsored children would commonly participate in church activities outside of Compassion's program hours, and it is possible that one or two of the enumerators were involved in these activities and thus would have had some kind of relationship with some of the sponsored and non-sponsored children through the church and the community but outside of Compassion.

any of their responses. Most interviews took place in the children's schools and homes, away from any potential influences such as teachers, parents, and Compassion staff. For example, if interviewed at a school the enumerators would interview the children either in an empty room or somewhere outside that was far from being within earshot of any teachers or other school officials. If interviewed in their homes, parents and other siblings would be asked to wait either inside or outside (wherever the interview was not taking place) or the child was taken to the opposite side of the house. Surveys were never administered in the local church or Compassion center.

While most of the children were interviewed in the village they grew up in, some of those in secondary school were attending boarding school in another part of Kenya, which required up to one day of travel for an enumerator to reach. Additionally, a few older siblings that had left home to find work were located and interviewed in Nairobi or Nakuru.[2]

2.2.2 Indonesia

Researchers carried out the Indonesia fieldwork in four Compassion project sites in the capital of Jakarta from May to July of 2012. The sites were selected for fieldwork based on the year of program implementation in order to gain maximum advantage of our age-eligibility-rule instrument. Two of these projects started in February 2003 and two in February 2007.

In Indonesia we were able to use children on the waitlist for sponsorship and their own siblings as quasi-controls in the sample. Each of the sites provided a list of sponsored children and waitlisted children from which subjects were randomly chosen for the study. Each randomly chosen child from these lists was instructed to bring one sibling with them to the research site.[3] In Indonesia, which had an upper limit of two sponsored children per family, data were gathered from 287 sponsored children, 112 unsponsored siblings of sponsored children, 80 waitlisted children (of whom one was, and 79 were not, a sibling of a sponsored child), and 61 children who were siblings of waitlisted children. Most of the children were between 7 and 19 years old, but the full range is from 4 to 27. For the analysis of the survey data, we limit the sample to 470 children 7-19 years old, which balances the advantage of a larger sample with the advantage of having an age range similar to that in Kenya. The drawing analysis uses the full sample of 542 children.

The selected children and their siblings were asked to come at a specific day and time to the particular site. Each pair of children was then greeted by a graduate student researcher and the

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[2] Nakuru is Kenya's fourth largest city and the closest major city to Njoro, one of the selected villages.

[3] The sibling could be either sponsored or unsponsored, but had to be within the relevant age range; 83.4% of children brought a proximate sibling in birth order. Because of eligibility rules, in 57.7% of cases the sibling was either not a sponsored child or on the waitlist, while for the remaining cases of sponsored children, both siblings were sponsored.

enumerator, who randomly selected one of the pair and asked that child to "Draw a picture of yourself in the rain." They were provided with a desk, a sheet of white paper, and a full set of 24 colored pencils, and were told that they have fifteen minutes to complete the drawing. Meanwhile the other child was administered a survey that included a group of questions about the subject's characteristics and living conditions, as well as questions about self-esteem, hopefulness about the future, social trust, spiritual depth, and reference points with regard to expected education and occupation, followed by a time preference game. After they were finished, the two children switched activities.

3. Empirical strategy

3.1 Establishing Causality

In order to estimate the impact of sponsorship on the variables of interest, we begin by using ordinary least-squares (OLS) with village fixed effects and robust standard errors clustered at the household level. This specification is used to avoid bias due to unobservable differences across villages, each of which consisted of different ethnic groups and different Christian denominations as implementing church partners. Therefore our initial specification identifies program impacts by comparing only differences within villages. More specifically, we estimate one of the following two equations:

$$y_{ij} = \alpha_j + \gamma T_{ij} + \boldsymbol{\beta}' \boldsymbol{X_{ij}} + e_{ij} \tag{1}$$

$$y_{ij} = \alpha_j + \gamma T_{ij} + \boldsymbol{\beta}' \boldsymbol{X_{ij}} + \pi C_{ij} + e_{ij} \tag{1'}$$

where T_{ij} is a dummy variable for current sponsorship of individual i in village j, α_j is a village fixed effect, $\boldsymbol{X_{ij}}$ is a vector of control variables that includes age, gender, birth order, parents' education and family size, and C_{ij} is a dummy variable indicating a household with a sponsored child, which applies only to Indonesia, where both sponsored and non-sponsored (i.e. waitlisted) households were surveyed. Equation (1) can be estimated using data from both countries, while equation (1') can be estimated using data for only Indonesia, since Kenya does not include children from non-sponsored households (which implies that C_{ij} equals one for all observations).

While (1) and (1') control for unobserved differences across villages, there remain two potential sources of bias when estimating the causal impact of the Compassion program: endogeneity in the selection of households into the program, and endogeneity in the selection of children within a particular household. We account for the former by including in our sample only families that were selected into the program in Kenya and Indonesia or were waitlisted in Indonesia

in our analysis. That is, we estimate the average treatment effect of the sponsorship program on the treated (ATT), as opposed to the average treatment effect (ATE) on the general population.

We account for the latter source of bias by using instrumental variables that predict which siblings within program households are selected by their parents to participate in the program. More specifically, and consistent with Wydick, Glewwe, and Rutledge (2013), we find that a child's age at the time of program roll-out is strongly correlated with sponsorship, making it a natural instrument for sponsorship. Indeed the oldest eligible child is typically most likely to be sponsored upon introduction of the program into a village, with younger siblings of this child less likely, and older siblings having virtually no probability of sponsorship (since, by definition, they were not age-eligible when the program began in their communities). As in Wydick, Glewwe, and Rutledge (2013), the instrumental variables are a vector of dummy variables for age at program rollout.

For these instrumental variable estimations, the first stage equations are:

$$T_{ij} = \alpha_j + \boldsymbol{\varphi}'\boldsymbol{X_{ij}} + \lambda\boldsymbol{Z_{ij}} + u_{ij} \tag{2}$$

$$T_{ij} = \alpha_j + \boldsymbol{\varphi}'\boldsymbol{X_{ij}} + \lambda\boldsymbol{Z_{ij}} + \delta C_{ij} + u_{ij} \tag{2'}$$

where α_j, T_{ij}, X_{ij} and C_{ij} are the same as in equations (1) and (1'), and $\boldsymbol{Z_{ij}}$ is a vector of dummy variables that indicate age (in years) when the program rolled out in village j. More specifically, there are separate dummy variables for each year of age for children 9 and younger when the program rolled out, plus one dummy variable for children -3 years and younger (i.e., were born 3 years or more after the program was rolled out) and another for children ten years and older.[4] Equation (2) can be estimated using data from both countries if the non-sponsored households from the Indonesia sample are excluded. Equation (2') can also be estimated using data from both countries; since the Kenya data do not include children from non-sponsored households, C_{ij} equals one for all observations from Kenya, and so C_{ij} is incorporated into the village fixed effects for that country.

Figure 1 shows, for both Kenya and Indonesia, the probability that a child was sponsored as a function of his or her age at the time the program was introduced in his or her community. It is clear that children from about age 3 to age 9 when the program was introduced in the area were far

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[4] Due to differing age ranges of respondents at time of survey in our three main areas of analysis, the youngest respondents in the Kenyan survey analysis in section 4.1 were 2 at the time of program rollout, in the Indonesian survey analysis in section 4.2 were 2 years from being born (-2) at time of program rollout, and in the drawings analysis in section 4.4 were 5 years from being born (-5) at time of program rollout. -4 and -5 are grouped with -3 since there were so few respondents that fell into the former two categories (7 and 1 respectively).

more likely to be sponsored than other siblings. Regression estimates of equations (2) and (2') yield the probability of being selected for sponsorship within each household.

The second-stage equations are:

$$y_{ij} = \alpha_j + \gamma \hat{T}_{ij} + \boldsymbol{\beta}' \boldsymbol{X_{ij}} + e_{ij} \qquad (3)$$

$$y_{ij} = \alpha_j + \gamma \hat{T}_{ij} + \boldsymbol{\beta}' \boldsymbol{X_{ij}} + \pi C_{ij} + e_{ij} \qquad (3')$$

where y_{ij} is an outcome variable of interest, $\hat{T}_{ij}$ is the instrumented probability of being a sponsored child, and α_j, $\boldsymbol{X_{ij}}$ and C_{ij} are the same as in equations (1) and (1') (and (2) and (2')). Assuming age at program rollout is orthogonal to y_{ij}, after conditioning on age, sibling order, gender, and other characteristics, IV estimations remove bias due to intra-household selection among age-eligible children. We use standard errors clustered at the household level for all estimates.

3.2 Summary Indexes

Our survey questionnaire provides multiple measures of the sampled children's psychological well-being. One potential problem with using each of these measures in separate regressions is that, even if the impact of sponsorship on all of these outcomes of interest were equal to zero, one is still likely to find a "significant" impact if one runs regressions for a large number of outcome variables. We address this problem of multiple inference by utilizing the summary indices proposed by Anderson (2008). Summary index tests are robust to over-testing and provide a statistical test for whether a program has a "general effect." They also have higher statistical power than tests of individual variables. Outcomes within an *a priori* grouping are demeaned and normalized,[5] and then each element is weighted using the elements of the variable's corresponding row from the inverse of the covariance matrix that includes all variables within the relevant family.[6] Weighting each variable by the sum of its corresponding row (or column) entries of the inverse covariance matrix allows variables that contain more unique information to enjoy a higher weight in the summary index.

We construct three summary indices from the sampled children's responses to psychosocial questions: self-esteem, optimism, and aspirations. The first uses the standard questions from the Rosenberg (1965) Self-Esteem scale, the second uses questions from the General Social survey, and the aspirations index is generated based on responses to questions on hopes for adult occupation, expectations for adult occupation, and expected educational attainment.

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[5] In our analysis, this grouping is done at the village level.
[6] Note that this is an efficient generalized least squares estimator (Anderson 2008).

3.3 Factor Analysis

To analyze the drawings done by the children in Indonesia, we use factor analysis as a data reduction tool in order to derive latent psychological factors from observable features of those drawings (those features are summarized in Table 11). Factor analysis is commonly used as a psychometric tool to create latent factors that summarize the common variation in observed sets of variables and is increasingly used by economists to avoid problems associated with over-testing and to uncover a general effect of a program based on a set of correlated variables (see Borghans et al. 2008). We apply factor analysis to the children's drawings using varimax rotation, which yields three orthogonal factors related to children's psychological well-being: happiness, self-efficacy, and hopelessness.

4. Empirical Results

Table 2 presents summary statistics for Kenya and Indonesia, first separately and then combined. Since the summary indices are demeaned and normalized within villages, these values are not exactly equal to zero, but are very close. Some noticeable differences include the fact that respondents in Kenya were more likely to hope for and expect a white collar job (0.900 and 0.818, respectively, vs. 0.552 and 0.557 in Indonesia), and were about 3 years older and had 1.2 more siblings, on average.

4.1 Kenya

Table 3 provides additional summary statistics for the Kenya sample. Simple t-tests (with robust standard errors clustered at the household level) indicate that sponsored children were 0.137 standard deviations higher on the self-esteem index ($p < 0.01$), 0.099 standard deviations higher on the optimism index ($p < 0.10$), were 4.6 ($p < 0.10$) and 7.8 ($p < 0.05$) percentage points more likely to state that they hoped for or expected to have a white collar job, respectively, expected to achieve 0.3 more years of education ($p < 0.01$) and were 0.185 standard deviations higher on the personal aspirations index ($p < 0.01$).

Table 4 presents the results from estimating equation (1), controlling for village fixed effects, age at time of survey, gender, birth order, family size, parents' education and missing parents' education (standard errors are clustered at the household level). In column 1, the self-esteem index is estimated to increase by 0.17 standard deviations ($p < 0.01$), and in column 4 there is a 7.2 percentage point increase ($p < 0.05$) in the probability of expecting to obtain a white collar job.

Column 5 indicates that sponsored children expect to achieve 0.18 years more of education ($p <$ 0.10) and scored 0.13 standard deviations higher on the aspirations index ($p < 0.05$).

While these OLS results are both statistically significant and large in magnitude, they are not necessarily estimates of causal effects. In order to address this, we estimate equation (3) using the vector of age at program rollout dummy variables as instruments for sponsorship. The first stage results from equation (2) show that the instruments are strong, with an *F*-statistic of 72.12. The strong first-stage results stem from the fact that children over 9 years old at the time of project implementation had virtually no chance of being sponsored and that children who were roughly in the 4-9 age range when the program started in their village or neighborhood had a very high probability of being sponsored.

The IV estimations in Table 5 yield local average treatment effects that are similar to, or in some cases larger than, those of the OLS estimates of the average treatment effects on the treated in Table 4.[7] Sponsorship leads to an increase in the self-esteem index of 0.158 standard deviations ($p < 0.05$), which is almost identical to the OLS estimate of 0.166. The impact of sponsorship on optimism is positive but relatively small and statistically insignificant, as was the OLS estimate. Sponsored children are 10.0 percentage points ($p < 0.05$) more likely to hope for a white collar job, which is about 2.5 times the magnitude of the (statistically insignificant) coefficient from the OLS estimations. They are also 9.3 percentage points ($p < 0.10$) more likely to expect a white collar job, which is similar to the OLS estimate of 7.2 percentage points. Sponsored children expect to achieve 0.275 additional years of education ($p < 0.10$), which is somewhat higher than the OLS estimate of 0.180. The final column of Table 7 shows that sponsorship increased children's aggregate educational and vocational aspirations by 0.326 standard deviations ($p<0.01$), which is more than double the OLS estimate of 0.132. Overall, the IV estimations from the main Kenya study are either similar to, or somewhat larger than, the corresponding OLS estimates in Table 4.

4.2 Indonesia Survey Results

To explore the external validity of the Kenya results, we collected similar data in Indonesia. Although additional respondents were surveyed, we restrict the analysis here to the 470 respondents between the ages of 7 and 19 for comparability with the Kenya study. An important difference between the Indonesia data and the Kenya data is that the non-sponsored children in the

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[7] Note that the standard errors are clustered at the household level only. Although in principle it would be desirable to cluster at the village level; clustering at the village level is not possible because the number of instruments exceeds the number of clusters. Recall, however, that all regressions include community/village fixed effects, which is one way to allow for unobserved common factors within villages.

Indonesia study also include children from non-treated households that were waitlisted for entry into the program but never actually had any child in their household sponsored. Table 6 provides summary statistics. Although not statistically significant, sponsored children had higher levels of self-esteem (0.008 standard deviations) and optimism (0.083). Surprisingly, they were 10.6 percentage points less likely to report that they expected to obtain a white collar job ($p < 0.05$). On the other hand, they expected to achieve 0.53 more years of education than non-sponsored children ($p < 0.05$). The unexpected result for expecting to obtain a white collar job may be partially due to Compassion choosing the neediest children for sponsorship.

Table 7 presents OLS estimations of equation (1') controlling for treated household, age, gender, birth order, size of family, and community fixed effects as well as clustering standard errors at the household level.[8] The impacts of sponsorship are generally statistically insignificant, although the positive point estimate is relatively large for years of expected education (0.37 years), which is larger in magnitude than the corresponding OLS estimates in Table 4 for Kenya (0.18 years). Somewhat surprisingly, the coefficients on the self-esteem index and on expecting to obtain a white collar job are actually negative, although statistically insignificant.

Table 8 presents IV estimations of equation (3'), instrumenting for sponsorship with dummy variables for age at program rollout, and controlling for treated household, age, gender, birth order, family size, and community fixed effects.[9] The results are largely similar to those in Table 7, both in sign and magnitude, and in (lack of) statistical significance. Overall, the survey results from Indonesia are all statistically insignificant, while several of the results from the Kenya data are statistically significant.

Since the selection of the non-sponsored child within a family was not random, as a robustness check we look at families that had only one or two children and thus could have been no bias in the selection of the non-sponsored child in the family that participated.[10] Tables A1 and A2 duplicate table 7 and 8 on this sub-sample. While the standard errors are much larger due to a much smaller sample size, the point estimates are actually larger in magnitude as well, but still statistically insignificant.

4.3 Combined Survey Results

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[8] Data on parental education were not collected in Indonesia.

[9] As with the Kenya IV estimates, these results cluster the standard errors at the household level, due to the small number of villages (only four).

[10] In these regressions, the control group is, in effect, children who were age 10 or older when the program started in their communities and so were not eligible to be sponsored.

Next, to maximize our sample size, we aggregate our survey data across both countries to see whether there are, on average, positive estimates across the study countries. Table 9 presents aggregated OLS estimations of equation (1), controlling for age, gender, and village/community fixed effects. The results indicate a strong positive impact of the Compassion program on self-esteem by 0.094 standard deviations ($p < 0.01$), years of expected education by 0.28 years ($p < 0.05$), and the general aspirations index by 0.113 std. dev. ($p < 0.05$). Sponsored children also scored higher on the optimism index by 0.09 standard deviations ($p < 0.10$).

Of course, these OLS estimates could be biased, so Table 10 combines the data on sponsored households from the Indonesia study and the main Kenya study. Since waitlisted households were not surveyed in Kenya, these estimates exclude the waitlisted households in the Indonesia data. Again, equation (3) is estimated using dummy variables for age at time of program rollout to instrument for sponsorship, with one exception: we group all of those who were two or younger into one category.[11] As seen in Table 10, the coefficients on all the outcome variables are positive. The estimated impact of the Compassion program on children's expectations of obtaining a white-collar job in adulthood is a 7.3 percentage point increase, but it is statistically insignificant. In contrast, we do find statistically significant positive impacts on hoping for a while collar job (12.9 percentage points, with $p<0.05$), years of expected education (0.65 years, with $p < 0.01$), and in their personal aspirations index (0.375 std. dev., with $p < 0.01$).

Overall, the power gained by combining results across our countries of study allows us to look at the overall impact of the program across the countries of the study. In particular, the 0.375 standard deviation increase caused by sponsorship on the aspirations index in column 6 of Table 10 appears to reflect significant overall impacts on aspirations from child sponsorship.

4.4 Indonesia Drawings

Each child who participated in the study in Indonesia was invited to sit at a small desk or table and was given a white sheet of paper with a new box of 24 colored pencils. The subjects were then asked to "Draw a picture of yourself in the rain." Table 11 provides summary statistics on the 20 drawing characteristics measured from these drawings. Children's self-portraits have been analyzed in a lengthy psychology literature, and often yield insightful information into the psychological makeup of children that is more difficult to obtain accurately from direct survey

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[11] This was done to unify the dummy variables across Indonesia and Kenya since in Kenya we never surveyed children that were younger than two at the time of sponsorship (see figure 1). As a check, Table A3 replicates Table 8 of the Indonesia IV estimation results except that for the instrument all of those younger than two are grouped into one dummy variable. The results of the two tables are very similar.

questions. The correlation between these drawings and their respective psychological attributes is taken from classic studies in the human figure drawing literature, including Koppitz, (1968), Klepsch and Logie (1982), Thomas and Silk (1990), and Furth (2002). A carrot symbol ("^") indicates that the measures for which a positive value represents a negative psychological outcome. These 20 characteristics were taken from the psychology literature and were chosen before any analysis of the drawings, and none were added or dropped after empirical analysis began.

As can be seen from simple *t*-tests (with robust standard errors clustered at the household level), 13 of the 20 measures display statistically significant differences between sponsored and non-sponsored children, and 11 of these indicate an unequivocally more positive psychological outcome for sponsored children. Moreover, one of the two variables indicating poorer psychological health, "long arms," which describes a self-portrait with abnormally long arms is ambiguous; it has been associated with both emotional neediness as well as affection for others. The other, "huge figure," has the smallest impact difference in terms of both magnitude and statistical significance among our statistically significant differences.

Figures 2-4 provide examples of children's drawings that show variation in happiness, self-efficacy, and hopelessness, three factors we generated by conducting factor analysis on the drawing data. Figures 2A and 2B illustrate differences in happiness between two children of roughly the same age, where facial expression and body language display remarkable contrast between the two drawings, such that the drawing in 2A ranks in the only the 17th percentile in the Happiness factor, while the drawing on the right in 2B ranks in the 92nd percentile.

Figures 3A and 3B show two children's drawings ranking in the 8th percentile and 94th percentile, respectively, in Self-Efficacy/Optimism. Salient characteristics of the drawing in 3A with negative correlations to the latent factor include the use of a single color, the presence of lightning, and poor integration of body parts. These contrast to the multiple light colors used in 3B, the presence of a sun above the clouds, and the child using an umbrella to protect herself from the rain.

Figures 4A and 4B illustrate differences in our Hopelessness factor, where the drawing on the left in 4A was done by a teenage girl and the drawing on the right by a boy in elementary school. Note the missing facial features and hidden limbs in the girl's self-portrait on the left, all factors correlated with hopelessness and depression. In contrast, the bright colors used by the boy on the right in 4B, facial expression, full illustration of facial features and limbs, use of the umbrella are factors that have been empirically correlated with hopefulness in children (Klepsch and Logie, 1982, Furth, 2002).

Table 12 provides summary statistics on the three factors we assemble using the measures in Table 11, along with responses to questions from our optimism and self-esteem indices. These factors were created using factor analysis with the varimax rotation discussed in section 3.3, where the varimax rotation ensures that each of the factors exhibit a zero correlation between themselves. Because the drawing analysis was carried out only in Indonesia, we do not combine or compare results with any results from Kenya, and so we do not restrict this sample by age. From simple t-tests, sponsored children scored 0.203 higher ($p < 0.05$) on the happiness factor, and 0.221 higher ($p < 0.01$) on the self-efficacy factor, and 0.338 lower ($p < 0.01$) lower on the hopelessness factor.

Table 13 shows rotated factor loadings from an analysis for which we allow for three factors. We give names to the three factors based on correlations between each factor and five variables in our survey (three that represent hope and two that represent self-esteem[12]) and the twenty drawing characteristic variables from the children's artwork. We labeled Factor 1 "Happiness" because it is very strongly positively correlated with a smiling self-portrait and negatively with a frowning or crying self-portrait and negatively correlated with a series of missing body and facial parts, the lack of which are correlated with emotional disturbance. We named Factor 2 "Self-Efficacy/Optimism" because it was strongly correlated with cheery colors, positive body language, and especially with the self-portrait figure holding an umbrella or taking shelter proactively from the rain. Factor 3 was a negative psychological factor that we called "Hopelessness" because, congruent with the existing empirical literature, it was strongly correlated with poor integration of body parts, missing facial features, drawn in a single color, and drawn as a monster figure, and was strongly correlated with our two (low) self-esteem questions.

Table 14 presents estimates equation (1') with and without community fixed effects, and equation (3'), which includes community fixed effects, on the happiness, self-efficacy, and hopelessness factors. Again, all estimations cluster standard errors at the household level. Each of the coefficient estimations on all of the three factors are indicative of enhanced psychological well-being among sponsored children. All are significant at the 1% or 5% level except for the IV regression on self-efficacy. These estimates range from 0.24 to 0.55 standard deviation positive impacts on Factor 1 (Happiness), from 0.13 to 0.33 standard deviation positive impacts on Factor 2 (Self-Efficacy), and from 0.35 to 0.88 standard deviation *decreases* in Factor 3 (Hopelessness) among sponsored children. For robustness, we test whether these results hold up when omitting drawing

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[12] The three Hopefulness questions in order are: "Do you believe that the future holds good things for you?", "When you are old, will you have a good job and income?", "Will your adult life be better than that of your parents?", and the two Self-Esteem questions in order are: "Do you sometimes think that you do not have much to be proud of?", "At times do you think that you are not much good at all?"

characteristics that could be affected by experience with drawing[13], since non-sponsored children may have less opportunity to draw. Tables A4-A6 duplicate Tables 12-14 and show very similar results. Overall, our analysis of children's self-portrait drawings provides additional evidence for a causal link between sponsorship and positive psychological impacts in the areas of self-esteem and aspirations.[14]

5. Conclusion

This paper seeks to explain the underlying mechanisms for the positive impacts on life outcomes of child sponsorship found in Wydick, Glewwe, and Rutledge (2013). A strong focus of Compassion's sponsorship program is on building the self-esteem and aspirations of sponsored children regarding educational and vocational outcomes. We test whether the program has an impact in these areas to investigate the possibility of a causal link between the development of aspirations among the poor and economic development.

Our analysis indicates that Compassion's child sponsorship program has large causal effects that lead to higher self-esteem and higher self-expectations for education and employment. Our analysis of children's drawings in Indonesia indicates large causal impacts on happiness, self-efficacy, and hopefulness about the future. The instrumental variable results provide estimates of the average treatment effect on the treated that avoid bias due to intra-household selection among age-eligible children.

If a causal link between aspirations and economic outcomes can be established, it would have significant implications for the way in which both researchers and practitioners think about how virtuous cycles of economic development occur among the poor in developing countries. Development economics has long concerned itself with the relief of *external* constraints.

Seen from the broader perspective of behavioral and development economics, our study suggests that when evaluating the impacts of programs it is important to consider the alleviation of *internal* constraints, the psychological factors that can lead to persistent poverty through low self-esteem and aspirations. If these two types of interventions are complements to each other, a combined intervention with children may be able to have a much greater impact than either would

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[13] These characteristics are long arms, poor integration of body parts, erasure marks/scribble outs, tiny head and short arms

[14] We also included an additional estimation in Table A7 analogous to Table A1 and A2 for the survey results. Again, since the selection of the non-sponsored child was not random, we look at families that had only one or two children and thus there could have been no bias in the selection of the non-sponsored child within the family that participated. The results largely mirror that of table 14 but with less statistical power due to the smaller sample size, with the only exception that the sign on the IV estimation of happiness is now negative, but statistically insignificant.

on its own. Greater understanding of factors such as enhanced aspirations and self-efficacy could lead to more effective international aid programs for children and a deeper understanding of why some programs have stronger impacts than others.

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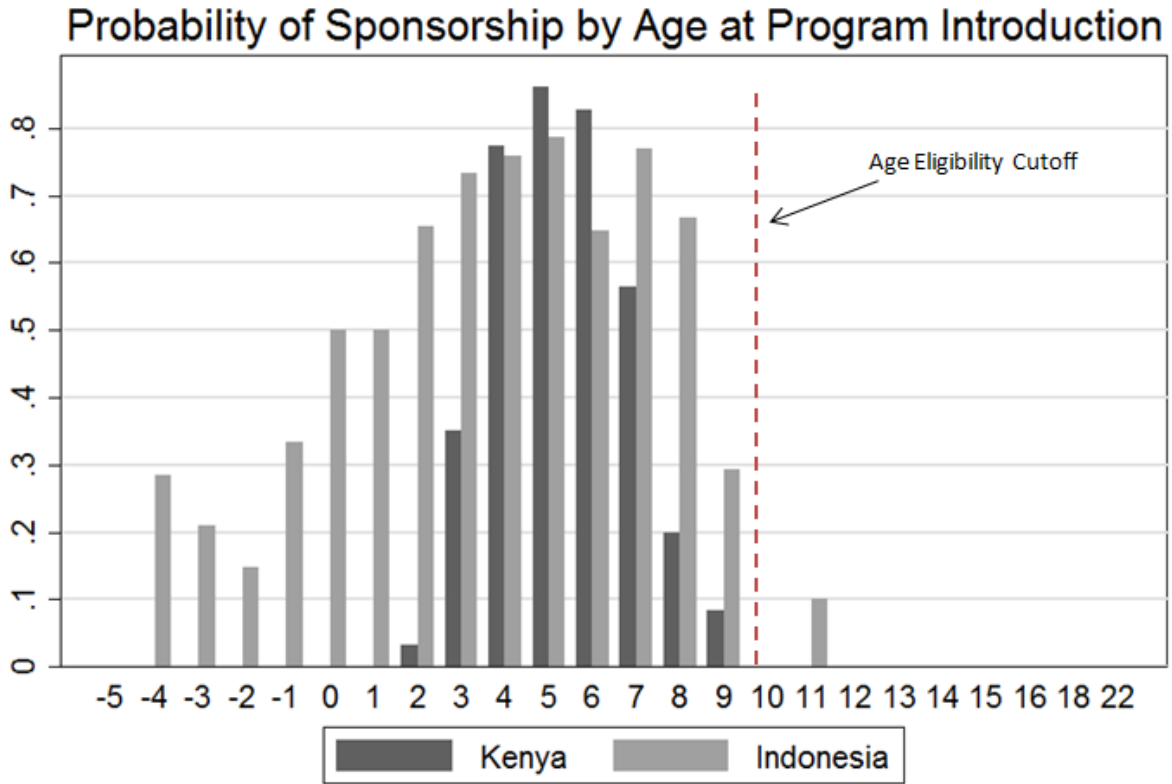
Figure 1. Discontinuity in sponsorship by age at time of program introduction

Figure 2a: Happiness, 17th percentile

Figure 2b: Happiness, 92nd percentile

Figure 3a: Self-Efficacy, 8th percentile

Figure 3b: Self-Efficacy, 94th percentile

Figure 4a: Hopelessness, 85th percentile

Figure 4b: Hopelessness, 7th percentile

Table 1. Characteristics of Study Communities

County	Treatment Communities (year of program rollout)	Sample Size	Time of Investigation	Instrument?	Drawings?
Kenya	Rironi (2003), Isinya (2003), Njoro (2003)	570	May-July 2011	Yes	No
Indonesia	Jakarta (two communities in 2003 and two in 2007)	542	May-July 2012	Yes	Yes

Table 2. Summary Statistics for Items Consistent across Both Countries

	Kenya (std. dev.)	Indonesia (std. dev.)	Both Countries Combined (std. dev.)
Self Esteem Index	−0.002	−0.001	−0.001
	(0.522)	(0.534)	(0.527)
Optimism index	−0.000	0.000	0.000
	(0.728)	(0.701)	(0.715)
Hope for White Collar Job (%)	0.900	0.552	0.742
	(0.300)	(0.498)	(0.438)
Expect White Collar Job (%)	0.818	0.557	0.694
	(0.387)	(0.497)	(0.461)
Years of Education Expected	15.449	14.992	15.230
	(1.320)	(2.200)	(1.810)
Aspirations Index	0.000	0.000	0.000
	(0.727)	(0.731)	(0.728)
Age	13.721	10.798	12.318
	(1.976)	(3.428)	(3.130)
Male	0.544	0.466	0.506
	(0.499)	(0.499)	(0.500)
Birth Order	3.249	3.398	3.320
	(2.129)	(1.384)	(1.812)
Family Size	4.788	3.530	4.186
	(2.221)	(1.346)	(1.958)
Observations	570	526	1,096

The self-esteem, optimism, and aspirations index was calculated only for those between ages 7 and 18 in Indonesia. The sample size for these rows is thus 470 in Indonesia and 1,040 in the combined sample.

Table 3. Summary Statistics for Kenya

	Mean, All (std. dev.)	Mean, Sponsored (std. dev.)	Mean, Non-Sponsored (std. dev.)	Difference, t-test (std. error)
Self Esteem Index	-0.002	0.055	-0.082	0.137***
	(0.522)	(0.497)	(0.545)	(0.040)
Optimism index	-0.000	0.041	-0.058	0.099*
	(0.728)	(0.684)	(0.783)	(0.058)
Hope for White Collar Job (%)	0.900	0.919	0.873	0.046*
	(0.300)	(0.273)	(0.333)	(0.027)
Expect White Collar Job (%)	0.818	0.850	0.772	0.078**
	(0.387)	(0.358)	(0.420)	(0.035)
Years of Education Expected	15.449	15.574	15.274	0.299***
	(1.320)	(0.956)	(1.691)	(0.111)
Aspirations Index	0.000	0.077	-0.108	0.185***
	(0.727)	(0.667)	(0.791)	(0.064)
Age	13.721	13.366	14.219	-0.853***
	(1.976)	(1.204)	(2.635)	(0.161)
Male	0.544	0.547	0.540	0.006
	(0.499)	(0.499)	(0.499)	(0.042)
Birth Order	3.249	3.150	3.388	-0.238**
	(2.129)	(2.180)	(2.051)	(0.105)
Family Size	4.788	4.471	5.232	-0.761***
	(2.221)	(2.247)	(2.110)	(0.103)
Mother's Education	7.633	7.771	7.442	0.329
	(4.021)	(4.066)	(3.959)	(0.205)
Father's Education	8.657	8.840	8.420	0.419**
	(3.936)	(4.021)	(3.822)	(0.196)
Missing Mother's Education	0.025	0.030	0.017	0.013
	(0.155)	(0.171)	(0.129)	(0.009)
Missing Father's Education	0.165	0.192	0.127	0.066***
	(0.371)	(0.395)	(0.333)	(0.019)

Full sample = 570: 333 sponsored children, 237 non-sponsored siblings of sponsored children. All t-tests include robust standard errors clustered at household level.

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

Table 4. OLS Estimations for Kenya

VARIABLES	(1) Self Esteem Index	(2) Optimism Index	(3) Hope for White Collar Job	(4) Expect White Collar Job	(5) Years of Education Expected	(6) Aspirations Index
Sponsored	0.166***	0.089	0.041	0.072**	0.180*	0.132**
	(0.044)	(0.064)	(0.027)	(0.034)	(0.098)	(0.062)
Age	0.030**	0.010	-0.011	-0.015*	-0.033	-0.035**
	(0.012)	(0.016)	(0.007)	(0.009)	(0.027)	(0.016)
Male	0.023	0.023	-0.114***	-0.095***	0.128	-0.137**
	(0.043)	(0.064)	(0.024)	(0.033)	(0.111)	(0.061)
Birth Order	0.002	0.012	-0.007	-0.011	0.079	0.012
	(0.021)	(0.029)	(0.011)	(0.014)	(0.062)	(0.032)
Family Size	0.003	-0.029	0.008	0.018	-0.131**	-0.016
	(0.023)	(0.030)	(0.012)	(0.014)	(0.064)	(0.032)
Observations	570	570	570	570	570	570
Adjusted R²	0.033	-0.003	0.052	0.031	0.127	0.029

*** $p<0.01$, ** $p<0.05$, * $p<0.1$, Robust standard errors clustered at the household level in parentheses. Village fixed effects and dummy variables for parent's education (including a dummy for missing parent's education) are included in all regressions.

Table 5. IV Estimations for Kenya

VARIABLES	(1) Self Esteem Index	(2) Optimism Index	(3) Hope for White Collar Job	(4) Expect White Collar Job	(5) Years of Education Expected	(6) Aspirations Index
Sponsored	0.158**	0.004	0.100**	0.093*	0.275*	0.326***
	(0.065)	(0.090)	(0.043)	(0.053)	(0.155)	(0.097)
Age	0.030***	0.006	-0.008	-0.014	-0.028	-0.025
	(0.011)	(0.016)	(0.007)	(0.009)	(0.026)	(0.016)
Male	0.023	0.025	-0.115***	-0.096***	0.127	-0.140**
	(0.043)	(0.063)	(0.023)	(0.032)	(0.109)	(0.060)
Birth Order	0.003	0.016	-0.010	-0.012	0.075	0.003
	(0.021)	(0.029)	(0.011)	(0.013)	(0.059)	(0.031)
Family Size	0.002	-0.035	0.012	0.019	-0.124**	-0.002
	(0.023)	(0.030)	(0.012)	(0.014)	(0.061)	(0.030)
Observations	570	570	570	570	570	570
Adjusted R²	0.033	-0.006	0.044	0.030	0.125	0.012

*** $p<0.01$, ** $p<0.05$, * $p<0.1$, Robust standard errors clustered at the household level in parentheses. Village fixed effects and dummy variables for parent's education (including a dummy for missing parent's education) are included in all regressions. Dummies for age at program rollout are used as an instrument for sponsorship, with those 10 and older grouped together. F-statistic for first stage estimation: 72.12

Table 6. Summary Statistics for Survey Questions for Indonesia

	Mean, All (std. dev.)	Mean, Sponsored (std. dev.)	Mean, Non-Sponsored (std. dev.)	Difference *t*-test (std. error)
Self Esteem Index	-0.001	0.003	-0.005	0.008
	(0.534)	(0.515)	(0.563)	(0.048)
Optimism index	0.000	0.034	-0.049	0.083
	(0.701)	(0.691)	(0.714)	(0.066)
Hope for White Collar Job (%)	0.566	0.545	0.596	-0.051
	(0.496)	(0.499)	(0.492)	(0.048)
Expect White Collar Job (%)	0.573	0.529	0.635	-0.106**
	(0.495)	(0.500)	(0.483)	(0.045)
Years of Education Expected	15.089	15.307	14.777	0.530**
	(2.111)	(1.883)	(2.371)	(0.191)
Aspirations Index	0.000	0.018	-0.025	0.043
	(0.731)	(0.730)	(0.732)	(0.064)
Age	11.140	11.260	10.969	0.291
	(2.817)	(2.351)	(3.374)	(0.262)
Male	0.457	0.455	0.461	-0.006
	(0.499)	(0.499)	(0.500)	(0.046)
Birth Order	3.415	3.493	3.302	0.191
	(1.363)	(1.366)	(1.355)	(0.123)
Family Size	3.530	3.493	3.583	-0.091
	(1.330)	(1.366)	(1.279)	(0.122)

Full sample = 470: 277 sponsored children, 58 waitlisted children, 90 siblings of sponsored children, and 45 siblings of waitlisted children. Note that the first column differs from that of table 2 since this sample is restricted to those between 7 and 19 years of age to facilitate comparison to the results from Kenya. All *t*-tests include robust standard errors clustered at household level.

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

Table 7. OLS Estimations for Indonesia

VARIABLES	(1) Self Esteem Index	(2) Optimism Index	(3) Hope for White Collar Job	(4) Expect White Collar Job	(5) Years of Education Expected	(6) Aspirations Index
Sponsored	-0.042	0.060	0.009	-0.089	0.374	0.020
	(0.065)	(0.089)	(0.046)	(0.057)	(0.261)	(0.073)
Treated Household	0.069	0.051	-0.103*	-0.029	0.188	0.029
	(0.082)	(0.108)	(0.059)	(0.064)	(0.356)	(0.101)
Age	0.022**	0.053***	-0.000	0.005	0.082**	0.020*
	(0.010)	(0.012)	(0.008)	(0.008)	(0.036)	(0.012)
Male	0.013	0.139**	-0.573***	-0.442***	-0.122	-0.544***
	(0.049)	(0.065)	(0.041)	(0.044)	(0.191)	(0.064)
Birth Order	0.015	-0.040	0.021	0.023	-0.052	-0.022
	(0.061)	(0.053)	(0.048)	(0.054)	(0.249)	(0.086)
Family Size	-0.005	0.094*	-0.019	-0.032	-0.019	-0.004
	(0.060)	(0.055)	(0.051)	(0.057)	(0.257)	(0.090)
Observations	468	468	422	459	468	468
Adjusted R²	0.002	0.058	0.333	0.216	0.032	0.132

*** $p<0.01$, ** $p<0.05$, * $p<0.1$, Robust standard errors clustered at the household level in parentheses. Village fixed effects included in all regressions.

Table 8. IV Estimations for Indonesia

VARIABLES	(1) Self Esteem Index	(2) Optimism Index	(3) Hope for White Collar Job	(4) Expect White Collar Job	(5) Years of Education Expected	(6) Aspirations Index
Sponsored	-0.084	0.120	0.036	-0.128	0.399	0.021
	(0.122)	(0.159)	(0.104)	(0.105)	(0.446)	(0.152)
Treated Household	0.102	0.004	-0.124	0.001	0.168	0.028
	(0.118)	(0.154)	(0.095)	(0.095)	(0.435)	(0.148)
Age	0.021**	0.055***	0.000	0.004	0.083**	0.020*
	(0.010)	(0.012)	(0.008)	(0.008)	(0.037)	(0.012)
Male	0.012	0.140**	-0.573***	-0.443***	-0.122	-0.544***
	(0.048)	(0.064)	(0.041)	(0.043)	(0.189)	(0.063)
Birth Order	0.016	-0.041	0.020	0.024	-0.053	-0.022
	(0.060)	(0.052)	(0.047)	(0.054)	(0.247)	(0.085)
Family Size	-0.006	0.096*	-0.018	-0.033	-0.018	-0.004
	(0.060)	(0.054)	(0.051)	(0.056)	(0.256)	(0.089)
Observations	468	468	422	459	468	468
Adjusted R²	0.001	0.057	0.333	0.215	0.032	0.132

*** $p<0.01$, ** $p<0.05$, * $p<0.1$, Robust standard errors clustered at the household level in parentheses. Village fixed effects included in all regressions. Dummies for age at program rollout used as an instrument for sponsorship with those 10 and older grouped together. F-statistic for first-stage estimation in columns 1, 2, 5, and 6: 73.10, column 3: 64.94, column 4: 76.39

Table 9. OLS Estimations for Indonesia and Kenya Combined

VARIABLES	(1) Self Esteem Index	(2) Optimism Index	(3) Hope for White Collar Job	(4) Expect White Collar Job	(5) Years of Education Expected	(6) Aspirations Index
Sponsored	0.094***	0.090*	0.038	0.028	0.279**	0.113**
	(0.036)	(0.050)	(0.025)	(0.030)	(0.111)	(0.049)
Treated Household	-0.039	0.026	-0.115**	-0.099*	0.255	-0.032
	(0.065)	(0.086)	(0.055)	(0.052)	(0.266)	(0.085)
Age	0.026***	0.038***	-0.001	-0.001	0.040*	0.001
	(0.007)	(0.010)	(0.006)	(0.006)	(0.024)	(0.010)
Male	0.022	0.068	-0.312***	-0.253***	-0.006	-0.334***
	(0.032)	(0.046)	(0.024)	(0.028)	(0.106)	(0.045)
Birth Order	0.013	0.026	0.004	0.004	0.103*	0.027
	(0.019)	(0.027)	(0.012)	(0.013)	(0.062)	(0.030)
Family Size	-0.008	-0.022	-0.003	-0.002	-0.167***	-0.041
	(0.020)	(0.027)	(0.012)	(0.013)	(0.064)	(0.030)
Observations	1,038	1,038	992	1,029	1,038	1,038
Adjusted R^2	0.008	0.013	0.288	0.158	0.068	0.051

*** $p<0.01$, ** $p<0.05$, * $p<0.1$, Robust standard errors clustered at the household level in parentheses. Village fixed effects included in all regressions.

Table 10. IV Estimations for Indonesia and Kenya Combined

VARIABLES	(1) Self Esteem Index	(2) Optimism Index	(3) Hope for White Collar Job	(4) Expect White Collar Job	(5) Years of Education Expected	(6) Aspirations Index
Sponsored	0.061	0.114	0.129**	0.073	0.654***	0.375***
	(0.070)	(0.093)	(0.056)	(0.060)	(0.230)	(0.102)
Treated Household	0.025***	0.039***	0.002	0.001	0.052**	0.009
	(0.007)	(0.010)	(0.006)	(0.006)	(0.025)	(0.010)
Age	-0.013	0.007	-0.186***	-0.134**	-0.038	-0.235**
	(0.081)	(0.108)	(0.066)	(0.066)	(0.311)	(0.113)
Male	0.021	0.068	-0.311***	-0.253***	-0.005	-0.333***
	(0.032)	(0.045)	(0.024)	(0.028)	(0.105)	(0.045)
Birth Order	0.015	0.025	-0.001	0.002	0.082	0.013
	(0.019)	(0.027)	(0.012)	(0.013)	(0.061)	(0.029)
Family Size	-0.011	-0.020	0.005	0.001	-0.138**	-0.020
	(0.021)	(0.028)	(0.013)	(0.014)	(0.064)	(0.030)
Observations	1,038	1,038	992	1,029	1,038	1,038
Adjusted R^2	0.008	0.013	0.279	0.156	0.059	0.027

*** $p<0.01$, ** $p<0.05$, * $p<0.1$, Robust standard errors in parentheses, controls for village fixed effects. Dummies for age at program rollout used as an instrument for sponsorship, with those aged two and younger grouped together, and age 10 and older grouped together. Treated household dummy only for Indonesia as all households in Kenya were treated. F-statistic for first-stage estimation in columns 1, 2, 5, and 6: 71.74, column 3: 64.05, column 4: 71.22.

Table 11. Drawing Analysis of Psychological Factors Summary Statistics

	Mean, All (std. dev.)	Mean, Sponsored (std. dev.)	Mean, Non-Sponsored (std. dev.)	Difference t-test (std. error)
Huge Figure^	0.036	0.049	0.021	0.028*
	(0.187)	(0.215)	(0.144)	(0.016)
Monster^	0.074	0.045	0.109	-0.064***
	(0.262)	(0.208)	(0.313)	(0.023)
Long Arms^	0.203	0.240	0.160	0.080**
	(0.403)	(0.428)	(0.367)	(0.036)
Shading	0.253	0.250	0.256	-0.006
	(0.435)	(0.434)	(0.438)	(0.038)
Missing Mouth or Nose^	0.266	0.229	0.311	-0.082**
	(0.442)	(0.421)	(0.464)	(0.038)
Frowning or Crying^	0.165	0.156	0.176	-0.020
	(0.372)	(0.364)	(0.382)	(0.035)
Dark Colors^	0.477	0.424	0.542	-0.118***
	(0.500)	(0.495)	(0.499)	(0.044)
Single Color^	0.160	0.135	0.189	-0.054*
	(0.367)	(0.343)	(0.392)	(0.032)
Weather (-1 if lightning, 1 if sun)	0.072	0.066	0.080	-0.014
	(0.452)	(0.500)	(0.387)	(0.037)
Smiling	0.679	0.733	0.613	0.119***
	(0.467)	(0.443)	(0.488)	(0.044)
Cheery Colors	0.477	0.531	0.412	0.119***
	(0.500)	(0.500)	(0.493)	(0.044)
Tiny Figure^+	0.276	0.215	0.349	-0.133***
	(0.447)	(0.412)	(0.478)	(0.039)
Poor Integration of Body Parts^+	0.099	0.059	0.147	-0.088***
	(0.299)	(0.236)	(0.355)	(0.026)
Missing Arms or Hands^+	0.477	0.490	0.462	0.027
	(0.500)	(0.501)	(0.500)	(0.046)
Missing Legs^	0.112	0.073	0.160	-0.087***
	(0.316)	(0.260)	(0.367)	(0.029)
Erasure Marks or Scribble Outs^	0.078	0.066	0.092	-0.026
	(0.268)	(0.249)	(0.290)	(0.023)
Carrying Umbrella/Sought Shelter	0.317	0.358	0.269	0.089**
	(0.466)	(0.480)	(0.444)	(0.041)
Body Language	0.141	0.219	0.046	0.173**
	(0.802)	(0.812)	(0.781)	(0.068)
Tiny Head^	0.015	0.010	0.021	-0.011
	(0.123)	(0.102)	(0.144)	(0.011)
Short Arms^	0.219	0.191	0.252	-0.061
	(0.414)	(0.394)	(0.435)	(0.037)

Full sample = 526: 288 sponsored, 79 waitlist, 112 sibling of sponsored, 47 sibling of waitlist, *** $p<0.01$, ** $p<0.05$, * $p<0.1$. All t-tests include robust standard errors clustered at household level.
^indicates this measure is taken as "negative" indicators and the rest are positive, +are used in the drawing self −esteem index.

Table 12. Drawing Analysis Summary Statistics

	Mean, All (std. dev.)	Mean, Sponsored (std. dev.)	Mean, Non-Sponsored (std. dev.)	Difference *t*-test (std. error)
Happiness Factor	0.000	0.092	-0.111	0.203**
	(0.923)	(0.900)	(0.941)	(0.082)
Self-Efficacy Factor	-0.000	0.100	-0.121	0.221***
	(0.955)	(0.947)	(0.953)	(0.084)
Hopelessness Factor	-0.000	-0.153	0.185	-0.338***
	(0.762)	(0.657)	(0.838)	(0.065)
Age	10.798	11.045	10.500	0.545*
	(3.428)	(2.547)	(4.244)	(0.303)
Male	0.466	0.458	0.475	-0.016
	(0.499)	(0.499)	(0.500)	(0.043)
Birth Order	3.398	3.488	3.288	0.200*
	(1.384)	(1.369)	(1.397)	(0.119)
Family Size	3.530	3.488	3.581	-0.093
	(1.346)	(1.369)	(1.320)	(0.118)

Full sample = 526: 288 sponsored, 79 waitlist, 112 sibling of sponsored, 47 sibling of waitlist, *** $p<0.01$, ** $p<0.05$, * $p<0.1$. All *t*-tests include robust standard errors clustered at household level.

Table 13. Rotated Factor Loadings

	Happiness	Self-Efficacy	Hopelessness	Uniqueness
Hopefulness Question 1	0.014	-0.016	-0.178	0.968
Hopefulness Question 2	0.022	-0.087	-0.085	0.985
Hopefulness Question 3	0.027	-0.041	0.103	0.987
Huge Figure	0.005	-0.037	0.019	0.998
Monster	-0.044	-0.059	0.428	0.812
Long Arms	0.046	-0.014	-0.067	0.993
Shading	-0.009	0.144	-0.084	0.972
Missing Mouth or Nose	-0.390	0.129	0.316	0.732
Frowning or Crying	-0.685	-0.138	-0.190	0.475
Dark Colors	-0.048	-0.928	-0.033	0.135
Single Color	-0.031	-0.383	0.205	0.810
Weather	0.023	0.141	0.195	0.942
Smiling	0.896	0.011	-0.134	0.179
Cheery Colors	0.082	0.921	-0.017	0.145
Tiny Figure	-0.138	-0.026	0.105	0.969
Poor Integration of Body Parts	-0.045	0.000	0.450	0.796
Missing Arms or Hands	-0.268	0.054	0.133	0.908
Missing Legs	-0.189	0.078	0.329	0.850
Erasure Marks or Scribble Outs	0.029	-0.049	0.181	0.964
Carrying Umbrella/Sought Shelter	0.000	0.176	-0.158	0.944
Body Language	0.706	0.187	0.071	0.462
Tiny Head	0.032	-0.084	0.092	0.984
Short Arms	0.009	-0.052	0.043	0.995
Self Esteem Question 1	-0.012	0.058	0.283	0.916
Self Esteem Question 2	-0.031	0.060	0.227	0.944

Table 14. Estimations for Drawings

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Happiness			Self-Efficacy			Hopelessness		
	(1', no fe)	(1', fe)	(3', fe)	(1', no fe)	(1', fe)	(3', fe)	(1', no fe)	(1', fe)	(3', fe)
Sponsored	0.238**	0.250**	0.551***	0.320**	0.327***	0.128	-0.351**	-0.397**	-0.883***
	(0.104)	(0.105)	(0.199)	(0.102)	(0.102)	(0.185)	(0.078)	(0.081)	(0.142)
Treated Household	-0.083	-0.103	-0.327*	-0.154	-0.181	-0.032	0.105	0.120	0.483***
	(0.132)	(0.131)	(0.176)	(0.129)	(0.127)	(0.171)	(0.102)	(0.102)	(0.136)
Age	0.010	0.013	0.017	-0.041***	-0.037***	-0.040***	-0.074***	-0.071***	-0.078***
	(0.012)	(0.013)	(0.013)	(0.012)	(0.013)	(0.013)	(0.010)	(0.010)	(0.011)
Male	-0.171**	-0.169**	-0.165**	-0.299***	-0.300***	-0.303***	0.127**	0.109*	0.102*
	(0.077)	(0.077)	(0.078)	(0.080)	(0.080)	(0.081)	(0.060)	(0.058)	(0.061)
OLS or IV	OLS	OLS	IV	OLS	OLS	IV	OLS	OLS	IV
Community FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Observations	526	526	526	526	526	526	526	526	526
Adjusted R²	0.015	0.013	-0.003	0.057	0.060	0.054	0.156	0.195	0.134

*** $p<0.01$, ** $p<0.05$, * $p<0.1$. Robust standard errors in parentheses clustered at household level. Dummies for age at program rollout used as an instrument for sponsorship. F-statistic for first-stage estimation of IV estimates: 38.23

APPENDIX

Table A1. OLS Estimations for Indonesia – Family has 1 or 2 children

VARIABLES	(1) Self Esteem Index	(2) Optimism Index	(3) Hope White Collar Job	(4) Expect White Collar Job	(5) Years of Education Expected	(6) Aspirations Index
Sponsored	-0.078	0.066	-0.116	-0.114	1.114	0.081
	(0.162)	(0.208)	(0.138)	(0.171)	(0.795)	(0.228)
Treated Household	0.217	0.046	0.048	0.079	-0.247	0.037
	(0.155)	(0.244)	(0.158)	(0.173)	(1.008)	(0.287)
Age	-0.006	0.118***	-0.018	-0.010	0.386***	0.077**
	(0.019)	(0.021)	(0.019)	(0.024)	(0.119)	(0.037)
Male	0.135	0.250**	-0.573***	-0.395***	-0.501	-0.612***
	(0.116)	(0.124)	(0.100)	(0.112)	(0.469)	(0.174)
Birth Order	-0.037	0.067	0.093	-0.136	-1.400	-0.368
	(0.122)	(0.211)	(0.221)	(0.127)	(0.940)	(0.261)
Observations	95	95	86	94	95	95
Adjusted R²	-0.033	0.181	0.304	0.150	0.160	0.158

*** $p<0.01$, ** $p<0.05$, * $p<0.1$, Robust standard errors in parentheses clustered at household level, controls for village fixed effects

Table A2. IV Estimations for Indonesia – Family has 1 or 2 children

VARIABLES	(1) Self Esteem Index	(2) Optimism Index	(3) Hope White Collar Job	(4) Expect White Collar Job	(5) Years of Education Expected	(6) Aspirations Index
Sponsored	-0.121	0.044	-0.174	-0.282	1.790*	0.141
	(0.240)	(0.229)	(0.225)	(0.240)	(1.043)	(0.353)
Treated Household	0.254	0.065	0.099	0.221	-0.821	-0.014
	(0.213)	(0.257)	(0.217)	(0.219)	(1.051)	(0.351)
Age	-0.007	0.117***	-0.020	-0.015	0.407***	0.079**
	(0.020)	(0.020)	(0.018)	(0.022)	(0.121)	(0.036)
Male	0.133	0.249**	-0.576***	-0.403***	-0.466	-0.609***
	(0.110)	(0.118)	(0.096)	(0.105)	(0.457)	(0.166)
Birth Order	-0.038	0.066	0.091	-0.140	-1.383	-0.366
	(0.114)	(0.201)	(0.207)	(0.122)	(0.883)	(0.247)
Observations	95	95	86	94	95	95
Adjusted R²	-0.034	0.181	0.302	0.137	0.151	0.157

*** $p<0.01$, ** $p<0.05$, * $p<0.1$, Robust standard errors in parentheses clustered at household level, controls for village fixed effects. Dummies for age at program rollout used as an instrument for sponsorship. F-statistic for first-stage estimation in columns 1, 2, 5, and 6: 430.57, column 3: 219.80, column 4: 376.68.

Table A3. Alternative IV Estimations for Indonesia – Children two and younger at program introduction grouped together

VARIABLES	(1) Self Esteem Index	(2) Optimism Index	(3) Hope for White Collar Job	(4) Expect White Collar Job	(5) Years of Education Expected	(6) Aspirations Index
Sponsored	-0.135	0.076	0.061	-0.110	0.371	0.029
	(0.130)	(0.166)	(0.110)	(0.110)	(0.453)	(0.158)
Treated Household	0.142	0.039	-0.143	-0.012	0.190	0.022
	(0.124)	(0.159)	(0.099)	(0.098)	(0.441)	(0.151)
Age	0.020**	0.054***	0.001	0.004	0.082**	0.021*
	(0.010)	(0.012)	(0.008)	(0.008)	(0.037)	(0.012)
Male	0.011	0.139**	-0.573***	-0.442***	-0.122	-0.544***
	(0.048)	(0.064)	(0.041)	(0.043)	(0.189)	(0.063)
Birth Order	0.017	-0.040	0.020	0.024	-0.052	-0.022
	(0.060)	(0.052)	(0.047)	(0.054)	(0.246)	(0.085)
Family Size	-0.008	0.094*	-0.017	-0.032	-0.019	-0.004
	(0.060)	(0.054)	(0.051)	(0.056)	(0.256)	(0.089)
Observations	468	468	422	459	468	468
Adjusted R²	-0.002	0.058	0.332	0.216	0.032	0.132

*** $p<0.01$, ** $p<0.05$, * $p<0.1$, Robust standard errors in parentheses clustered at household level, controls for village fixed effects. Dummies for age at program rollout used as an instrument for sponsorship. F-statistic for first-stage estimation in columns 1, 2, 5, and 6: 111.53, column 3: 101.18, column 4: 116.85.

Table A4. Alternative Drawing Analysis Summary Statistics

	Mean, All (std. dev.)	Mean, Sponsored (std. dev.)	Mean, Non-Sponsored (std. dev.)	Difference t-test (std. error)
Unhappiness Factor	-0.000	-0.091	0.110	-0.200**
	(0.920)	(0.900)	(0.933)	(0.081)
Self-Efficacy Factor	-0.000	0.099	-0.120	0.220***
	(0.955)	(0.952)	(0.947)	(0.084)
Hopelessness Factor	0.000	-0.105	0.127	-0.232***
	(0.754)	(0.660)	(0.838)	(0.067)

Full sample = 526: 288 sponsored, 79 waitlist, 112 sibling of sponsored, 47 sibling of waitlist, *** $p<0.01$, ** $p<0.05$, * $p<0.1$. All t-tests include robust standard errors clustered at household level.

Table A5. Alternative Rotated Factor Loadings

	Unhappiness	Self-Efficacy	Hopelessness	Uniqueness
Hopefulness Question 1	0.019	0.009	-0.301	0.909
Hopefulness Question 2	0.014	-0.063	-0.245	0.936
Hopefulness Question 3	-0.020	-0.038	0.049	0.996
Huge Figure	-0.008	-0.043	0.006	0.998
Monster	0.066	-0.044	0.127	0.978
Shading	0.030	0.166	-0.147	0.950
Missing Mouth or Nose	0.354	0.100	0.423	0.686
Frowning or Crying	0.705	-0.115	-0.207	0.447
Dark Colors	0.052	-0.931	-0.053	0.128
Single Color	0.037	-0.383	0.117	0.838
Weather	-0.030	0.133	0.177	0.950
Smiling	-0.882	0.018	-0.217	0.175
Cheery Colors	-0.078	0.926	-0.022	0.136
Tiny Figure	0.147	-0.016	0.033	0.977
Missing Arms or Hands	0.242	0.025	0.238	0.884
Missing Legs	0.145	0.032	0.445	0.780
Body Language	-0.722	0.164	0.110	0.440
Self Esteem Question 1	0.004	0.043	0.252	0.935
Self Esteem Question 2	0.016	0.038	0.249	0.936

Table A6. Alternative Estimations for Drawings

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Unhappiness			Self-Efficacy			Hopelessness		
	(1', no fe)	(1', fe)	(3', fe)	(1', no fe)	(1', fe)	(3', fe)	(1', no fe)	(1', fe)	(3', fe)
Sponsored	-0.233**	-0.241**	-0.501**	0.322***	0.334***	0.165	-0.248***	-0.296***	-0.867***
	(0.104)	(0.105)	(0.196)	(0.102)	(0.102)	(0.183)	(0.076)	(0.077)	(0.162)
Treated Household	0.076	0.095	0.289*	-0.164	-0.191	-0.065	0.103	0.108	0.534***
	(0.131)	(0.129)	(0.174)	(0.127)	(0.126)	(0.167)	(0.101)	(0.100)	(0.145)
Age	-0.008	-0.011	-0.014	-0.040***	-0.036***	-0.038***	-0.065***	-0.061***	-0.069***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.013)	(0.011)	(0.011)	(0.012)
Male	0.166**	0.165**	0.162**	-0.306***	-0.305***	-0.307***	0.129**	0.109*	0.102
	(0.077)	(0.077)	(0.078)	(0.080)	(0.080)	(0.081)	(0.062)	(0.059)	(0.063)
OLS	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Village FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
IV	No	No	Yes	No	No	Yes	No	No	Yes
Observations	526	526	526	526	526	526	526	526	526
Adjusted R²	0.014	0.012	0.000	0.057	0.059	0.055	0.108	0.155	0.069

*** $p<0.01$, ** $p<0.05$, * $p<0.1$, robust standard errors in parentheses, dummies for age at program rollout used as an instrument for sponsorship. F-statistic for first-stage estimation: 38.23

Table A7. Estimations for Drawings – Family has 1 or 2 Children

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Happiness			Self-Efficacy			Hopelessness		
	(1', no fe)	(1', fe)	(3', fe)	(1', no fe)	(1', fe)	(3', fe)	(1', no fe)	(1', fe)	(3', fe)
Sponsored	0.163	0.198	-0.075	0.284	0.287	0.183	-0.650***	-0.761***	-1.067***
	(0.198)	(0.200)	(0.257)	(0.248)	(0.249)	(0.359)	(0.219)	(0.201)	(0.318)
Treated Household	0.170	0.255	0.468*	-0.142	-0.146	-0.065	0.404*	0.442**	0.680**
	(0.247)	(0.237)	(0.271)	(0.286)	(0.290)	(0.336)	(0.240)	(0.211)	(0.314)
Age	0.050**	0.053**	0.048*	-0.026	-0.026	-0.028	-0.102***	-0.105***	-0.111***
	(0.022)	(0.024)	(0.024)	(0.025)	(0.025)	(0.026)	(0.026)	(0.027)	(0.027)
Male	-0.295*	-0.319*	-0.345*	-0.255	-0.247	-0.257	0.112	0.035	0.006
	(0.155)	(0.163)	(0.173)	(0.184)	(0.188)	(0.196)	(0.134)	(0.136)	(0.145)
OLS	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Village FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
IV	No	No	Yes	No	No	Yes	No	No	Yes
Observations	108	108	108	108	108	108	108	108	108
Adjusted R²	0.071	0.173	0.160	0.015	-0.014	-0.016	0.215	0.266	0.248

*** $p<0.01$, ** $p<0.05$, * $p<0.1$, robust standard errors in parentheses, dummies for age at program rollout used as an instrument for sponsorship. F-statistic for first-stage estimation: 10.09