ABSTRACT

Renee Ryberg: The Role of Noncognitive Skills in the Transition to the Workforce for Youth in Andhra Pradesh, India
(Under the direction of Michael J. Shanahan)

Research based on youth in the United States and Europe has established the importance of noncognitive skills for successful transitions to adulthood. The influence of noncognitive skills may vary by social and economic contexts, though, and nine in ten youth live in developing countries where these concepts have not been rigorously examined. I examine the role noncognitive skills play in the transition to the workforce among youth in Andhra Pradesh, India. Using data from the Young Lives study, this paper examines whether positive self-concept and social skills in early adolescence (age 11-12) predict whether youth (age 18-19) are in school, work, both, or are not currently in education, employment, or training (NEET) using multinomial logistic regression. Findings suggest that self-concept predicts youth staying in school while social skills predicts youth entering work or being NEET. These skills are especially influential for young women and youth from high castes.
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<table>
<thead>
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<th>Abbreviation</th>
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<tbody>
<tr>
<td>NEET</td>
<td>Not in education, employment, or training</td>
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<tr>
<td>OBC</td>
<td>Other backward castes</td>
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<td>OC</td>
<td>Other castes</td>
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INTRODUCTION

Research across disciplines ranging from educational psychology to economics has established the importance of noncognitive skills\(^1\) for successful transitions to adulthood. Skills such as grit, problem-solving, social skills, and self-control are associated with educational attainment and positive outcomes in the workforce. Noncognitive skills may even rival the predictive power of cognitive skills with respect to workforce outcomes (Kautz, T. D. et al. 2014).

However, the extant research on noncognitive skills and status attainment has been conducted almost exclusively in developed countries (Lippman, Laura H. et al. 2015). Such a focus is troubling because the vast majority of youth around the world live in developing countries, where the transition to adulthood may bear little resemblance to patterns observed in the developed world. In the developed world, adolescence, it has been argued, is extending into

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\(^1\) Researchers across many disciplines study noncognitive skills, but each discipline uses a different lexicon to refer to these competencies. Economists tend to discuss “noncognitive skills,” a term which was made popular by James Heckman and colleagues (2000). More recently, economists have backed away from this term, as many of the skills do indeed involve cognition (Heckman and Kautz 2014). Within psychology, different sub-disciplines use different language. Developmental psychologists talk about social and emotional learning; personality psychologists generally use the Big Five personality traits to describe these constructs; and positive psychologists tend to discuss “character virtues.” In the applied workforce and educational settings, still more terms are used to refer to these skills, including: behavior skills, core skills, employability skills, generic skills, skills, and, perhaps most commonly, soft skills (Duckworth, Angela 2015; Lippman, Laura H. et al. 2015).

Despite the diverse language used to refer to these skills, there are many overlaps between the constructs investigated among the disciplines. These skills include both interpersonal skills such as communication and problem-solving, and intrapersonal skills such as grit and locus of control. The following review of the literature spans these disciplines, using the term “noncognitive skills” while acknowledging that many of the “noncognitive skills” actually require relatively high levels of cognition. The term skill may also be some troublesome readers, as some of these skills are not explicitly abilities, but still enable an individual to accomplish a task. In this study, noncognitive skills refers to a broad set of competencies that youth may have, outside of the traditional cognitive domains of reading, writing, and math, that enable them to succeed in life. These include abilities traditionally thought of as skills, such as social skills, and skills that are more abstract and internal, such as self-concept.
emerging adulthood as youth stay in school longer and postpone entry into work and the establishment of an independent household. In contrast, youth in the developing world may resemble Western adolescents before the expansion of education systems, an “adolescence” marked by fewer years of schooling, and quick entry into work and family roles. Consequently, studies based on developed countries may provide little insight into the role noncognitive skills play for the majority of the world’s youth. Whether the existing research is applicable to the diverse set of developing countries in the world, where approximately 89 percent of the world’s youth live (Gupta, Monica Das et al. 2014), remains to be seen.

This paper examines the role that noncognitive skills play in the transition to the workforce for youth in Andhra Pradesh, India, which serves both as an example of a developing region and as a case study with its own socio-historical context. On the one hand, India is a typical developing country in that it has a “population pyramid” with a large base of young people, an educational system that does not adequately serve young people through the teenage years, and familial pressures on young people to contribute income to the household economy (Shanahan, Michael J., Mortimer, Jeylan T., and Kruger, Helga 2002). On the other hand, India is an interesting case study as it has unique gender and caste dynamics that may constrain youth’s opportunities as they transition to the workforce.

The paper begins by reviewing evidence on the importance of noncognitive skills in high-income countries, followed by a review of evidence from low-income countries. India’s unique cultural contexts are then examined. Taking advantage of an unparalleled data collection effort following youth for over 15 years, analyses examine the predictive power of noncognitive skills in early adolescence on transitions from education into the workforce. Results indicate that some noncognitive skills in early adolescence (ages 11-12), such as positive self-concept, predict
staying in school to ages 18-19, as opposed to entering the workforce, while others (i.e., social skills) may predict departure from school. The influence of noncognitive skills is especially important for young women, and youth from higher castes. Among employed youth, noncognitive skills do not, however, influence job quality, as measured by the level of danger they experience at work.
LITERATURE REVIEW

Evidence from high-income countries

Early research on the relationship between noncognitive skills and workforce outcomes took place in the fields of psychology and sociology. Psychologists have been interested in the role that personality plays throughout one’s career. The Big Five Factor Model — comprising agreeableness, conscientiousness, emotional stability/neuroticism, extraversion, and openness to experience — is a commonly-used approach. Many analyses have examined the relationship between these personality traits and employment outcomes, and meta-analyses of research across North America and Europe have shown that certain personality characteristics are associated with outcomes including job proficiency, training proficiency, absenteeism, and wages. Of the five traits, conscientiousness has the strongest relationship with employment outcomes (e.g., job proficiency, productivity, salary, tenure) across occupations including professionals, police, managers, sales, skilled labor, and semi-skilled labor. Emotional stability also has a consistently strong relationship with job performance across occupations in Europe, but not in North America. This difference has been attributed to methodological differences, but that has been refuted, and there may be unknown substantive difference in the two work settings (Barrick and Mount 1991; Salgado 1997).

Early work from sociology focused on the intergenerational influence of noncognitive skills and their potential role in perpetuating the intergenerational transmission of inequality. Melvin Kohn (1977, 2006; with Schooler 1982) — an early leader in this work — found that there is a reciprocal pattern between noncognitive skills and occupational positions among men
in the United States, Poland, and the Ukraine. Men with high levels of noncognitive skills, such as self-direction and ideational flexibility, entered occupations that value these skills, and these values were, in turn, reinforced by experiences in their occupations. This pattern created a cycle reinforcing the value of noncognitive skills that continues across the generations, as men’s parenting styles inculcate their skills into their children.

A flurry of research on noncognitive skills commenced in the early 2000s as economists began to study these associations from the vantage point of economic theories and methods. In a now seminal piece, Bowles, Gintis, and Osborne-Groves (2001) acknowledged that the “usual suspects” of parental background, educational attainment, and cognitive ability did not explain a large proportion of the variance in earnings. The authors attribute the unexplained variance to noncognitive behaviors, including “incentive-enhancing preferences,” which increase motivation to be productive at work, and “earnings-relevant behavioral traits” such as self-esteem.

Economists have attempted to improve estimates of the relationship between noncognitive skills and education and workforce outcomes. Heckman et al. (2006) found that noncognitive skills rival the importance of cognitive ability when predicting economic and social outcomes of youth, including educational attainment, employment status, wages, and occupational level (white or blue collar). This study inspired a proliferation of literature documenting the importance of noncognitive skills for employment outcomes. A recent review of the burgeoning interdisciplinary literature identified a set of notably salient skills for youth entering the workforce: higher-order thinking skills (including problem-solving, critical thinking, and decision-making), social skills, communication skills, self-control, and positive self-concept (Lippman, Laura H. et al. 2015).²

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² This literature review reviewed studies across developed and developing countries. However, the majority of studies reviewed were from developed contexts.
Evidence from low- and middle-income countries

Despite the proliferation of studies examining noncognitive skills in the United States and Europe, there is limited empirical evidence on the role that noncognitive skills play for youth outside of these contexts. Researchers have only recently started to investigate the role of noncognitive skills in low- and middle-income countries. In fact, a review of the literature could not find any peer-reviewed articles examining the link between noncognitive skills and employment outcomes in developing countries. A few working papers and nonacademic reports have, however, focused on the role of noncognitive skills and success in the workforce.

These empirical studies are focused on Asia and South America. Individual studies have been conducted in China, Tajikistan, Uzbekistan, Peru, and Chile. The World Bank also has an ongoing large-scale study that is being conducted in over a dozen countries. No extant studies have examined noncognitive skills and the workforce in India. The studies examine a wide variety of noncognitive skills, ranging from the Big Five Factor Model and grit to educational aspirations and self-esteem. They are more limited in the outcomes they examine, however, and focus exclusively on wages and employment status.

There is a good deal of agreement among studies conducted in the developed world and those from low- and middle-income countries. All of the studies reviewed from low- and middle-income countries found relationships between noncognitive skills and an employment outcome. In rural China, internalizing behaviors, high educational aspirations, and resilience (operationalized as a hybrid measure of optimism, self-efficacy, relationships with adults and peers, interpersonal sensitivity, and emotional control) all help keep youth in school rather than entering the workforce (Glewwe, Huang, and Park 2013). Similarly, decision-making skills are
related to being employed among adults in Tajikistan (Nikoloski, Zlatko and Ajwad, Mohamed Ihsan 2014).

Studies examining wages find a positive association between wages and grit across a number of settings (Diaz, Juan Jose, Arias, Omar, and Tudela, David Vera 2012; Lavado, Velarde, and Yamada 2013; World Bank 2014), and wages and self-efficacy in Chile (Bassi, Marina and Galiani, Sebastian 2009). The most frequently examined noncognitive correlates of wages were the Big Five personality traits. In the large-scale study examining more than a dozen countries, conscientiousness was the most consistent correlate of high wages (World Bank 2014). Two studies in Peru found that emotional stability is positively associated with higher wages, while agreeableness is negatively related (Diaz, Juan Jose et al. 2012; Lavado et al. 2013). These findings are consistent with results in the developed country literature (i.e., Barrick and Mount 1991; Nyhus and Pons 2005; Salgado 1997).

In contrast, other findings from these same studies deviate from and even contradict those in the developed world. In rural China, youth with higher levels of self-esteem were more likely to work than be in school (Glewwe et al. 2013). Based on the developed country literature, one would expect self-esteem to be protective against working and help youth stay in school. Additionally, having a fixed mindset (believing that intelligence is fixed rather than malleable) was related to being employed in Uzbekistan (Nikoloski, Zlatko and Ajwad, Mohamed Ihsan 2014). In the American literature, a growth mindset, which is the opposite of a fixed mindset, is frequently related to positive outcomes (Dweck, Carol 2008). With regards to wages, no noncognitive skills predicted wages in rural China (Glewwe et al. 2013). Additionally, in Peru, a general latent noncognitive construct was related to lower wages. The authors argue that noncognitive skills are not valued in the workforce and women are actually penalized for having
them (Lavado et al. 2013). Perhaps noncognitive skills are not valued because employees with them tend to recognize problems within the workplace and take initiative to try to fix them, whereas employers prefer to have submissive employees.

The largest contrast with the developed country literature is in regards to conscientiousness. Conscientiousness is the Big Five personality construct most consistently linked to workforce outcomes in the developed world (Barrick and Mount 1991; Salgado 1997); however, two of the studies referenced above found no relationship between conscientiousness and wages. Rather, these studies found that emotional stability was related to higher wages (Diaz, Juan Jose et al. 2012; Lavado et al. 2013). Emotional stability has previously been found to relate to positive employment outcomes in Europe, but not in North America (Barrick and Mount 1991; Salgado 1997).

The studies described above are valuable in that they are the first attempts at explaining the role of noncognitive skills and success in the workplace in developing countries. However, they are collectively limited in significant ways. First, their methodological quality varies dramatically. All of the studies are cross-sectional in nature (the exception being Glewwe et al. 2013), with noncognitive skills measured at the same time point as the outcome(s). This limits any potential causal interpretations, as noncognitive skills could help jobseekers find jobs or employees earn higher wages, or, employment could build noncognitive skills. These studies are also limited by available measures. Many of the studies took advantage of the Big Five Factor Model of personality, which has been validated around the world. Others, however, used a “hodge podge” of measures and do not report whether they are appropriate for use in the countries in which they were used.
To summarize, there is some evidence that noncognitive skills play the same role in developing countries as they do in developed countries. Intuitively, it makes sense that noncognitive skills may be universally important. No matter the setting, humans need interpersonal skills to be able to communicate and get along with one another in order to be successful at work, whether they are selling soap in an outdoor market, harvesting sugar cane in a field, or providing technical support over the Internet. Intrapersonal skills such as self-confidence and self-efficacy make tasks seem manageable. In short, the work world requires noncognitive skills. Nevertheless, the extant evidence in the developing world is not as clear-cut as it is in North America and Europe. Some studies fail to find the most robust relationships in the developed world, and other findings even run contrary to those found in high-income countries.

There are also theoretical reasons to believe that noncognitive skills may not be predictive of the transition to the workforce for youth in Andhra Pradesh. Previous research has shown that macro economic and cultural forces can constrain or enhance the predictive power of noncognitive skills. For example, a study found that economic conditions limit the role that planful competence plays in predicting educational attainment. Planful competence predicted educational attainment for individuals who came of age after the Great Depression in the United States, but not for those who came of age during the Great Depression. During the Great Depression, adolescents’ individual choices were constrained by their social contexts: "Adolescent planfulness is less predictive of adult attainment when social institutions, such as education and work, fail to offer viable alternatives, as in the Great Depression" (Shanahan, Elder, and Miech 1997:55).
The macro economic and cultural settings in developing countries are clearly different from those in developed countries, in ways that may limit the influence of noncognitive skills. Even the universality of adolescence as a developmental stage has been questioned. Some children, especially those from lower social classes, are thrown straight into adulthood, skipping altogether the period of adolescence typical in the developed world (Saraswathi, T. S. 1999). In India, for example, young girls may be promised to arranged marriages before they reach puberty, and young men may be pushed out of school and into work to help support their families before puberty (Saraswathi, T. S. 1999). It seems clear that the transition to adulthood looks very different in and across developing countries, and youths’ opportunities may be constrained, limiting the influence of their noncognitive skills.

Due to the strength of the evidence that indicates the importance of cognitive and noncognitive skills across high-, middle-, and low-income countries, however, I hypothesize that noncognitive skills will also be important predictors of whether youth are involved in education, work, or are not in education, employment, or training (NEET) in Andhra Pradesh. Specifically, I predict that noncognitive skills will help youth stay in school and lower their chances of working or being idle (Hypothesis 1).
THE INDIAN CONTEXT

Because India is so different from the contexts in which noncognitive skills have traditionally been studied, both economically and culturally, it is important to ground the present study in the context of India, and Andhra Pradesh in particular. India is classified as a lower-middle income country by the World Bank (World Bank 2015c), with an average gross national income per capita of just over $5,372 (World Bank 2016a). About one in four (24%) people live in extreme poverty in India, on under $1.25 per day (World Bank 2015a:25).

In the process of modernization, India has adopted western neo-liberal ideas, and its government is working to increase educational opportunities for its youth (Morrow 2013b). Education is rapidly expanding, and with the passage of the Right to Free and Compulsory Education Act in 2009, education became compulsory to age 14 (Morrow 2013b). Primary education has reached close to universal coverage, with 93 percent of children enrolled in primary school (World Bank 2015b). In grade 10, at approximately age 15, students take entrance exams for secondary school. For youth in rural areas of Andhra Pradesh, attending secondary school may require migrating and living away from family in a dorm (Morrow 2013b). The Indian government is considering making access to secondary education universal through age 18 (Morrow 2013b). Beyond secondary school, India has moderate rates of tertiary education, with about one in four men and one in five women enrolling in college (World Bank 2016b, 2016c).

The Indian government may also be encouraging education by discouraging child labor. There are reports of a proposed ban on child labor under the age of 18 (Morrow 2013b). As it
currently stands, youth labor force participation is relatively low in India, compared to other countries with similar income levels, where just over half of young men ages 15-24 (51%) and less than one in five young women (18%) are in the labor force (World Bank 2016d, 2016e). A large majority (approximately 84%) of the labor force work in the informal sector and/or informal employment (International Labour Organization, Department of Statistics 2012). Unemployment rates for both young men and young women ages 15-24 are moderate, at around 11 percent (World Bank 2016f, 2016g). The largest sectors of the economy in Andhra Pradesh are agriculture, manufacturing, and services (Rao, R. V. Chandrasekhar 2015).

Youth in India and their parents are feeling the tension between traditional obligations to their families on one hand and a fortified emphasis on education based on western ideals on the other. Education is highly valued, but requires sacrifice on the part of families, and its payoffs in the local economy are unknown. As a result, a sizeable minority of children go to school and work at the same time. As Virginia Morrow explains based on research on adolescents in Andhra Pradesh: “the two fields of activity [meaning school and work] are not easily separated. Children’s formal schooling may be negatively affected by working. At the same time, children may chose to work, when schooling is of poor quality and poverty makes their work a necessity for survival in labour intense activities like subsistence and market farming” (Morrow 2013a:92). The labor market that youth enter after schooling is uncertain. Agriculture is no longer seen as a field for youth to aspire to in Andhra Pradesh (Morrow 2013b). As such, “children and parents seem to be balancing the need for survival in the present against anticipated benefits of schooling in the future” all in the context of “tension between aspirations of the global model of childhood and youth imagined in neo-liberal policies, and local experiences and environments” (Morrow 2013b:267).
As there is uncertainty in the context of Andhra Pradesh as to whether work or education is a more valued outcome, I make no judgment about the value of either work or school, and use value-neutral language and methods throughout this paper.

**Gender**

In India, a youth’s opportunities in their transition to adulthood are largely shaped by their gender and family background (Saraswathi, T. S. 1999; Verma, Suman 2000). Gender differences have been documented across India, and in Andhra Pradesh in particular. Differences along gender lines have appeared in parents’ educational expectations for their children, enrollment rates, and spending on girls’ education. In the past, parents expressed lower educational aspirations for their daughters and daughters were less likely to be enrolled in school. More recently, daughters and sons were equally likely to be enrolled in school, but more money was spent on boys’ education than that of girls (Morrow 2013b).

The gender differences in employment are also striking for young Indians. While they complete education at levels comparable to young men, young women are much less likely than men to be in the labor market. More than twice as many young men as young women work. This difference may be partially attributable to cultural norms, including early-arranged marriages that limit opportunities for women to enter the workforce.

In India, women’s roles are exclusively focused outward toward other people, rather than inward on themselves (Bhogle, Sudha 1999). Girls are socialized from an early age to focus on the feminine roles of wife, mother, and daughter-in-law, rather than on individual roles such as student or worker. Once a girl has reached puberty, she is considered mature and requires special protection to not become a mother before marriage. In southern India, for example, a young woman is restricted in her relationships with men, and assumes greater responsibility in household duties such as childcare and cooking. In fact, education is frequently seen as a means
to obtaining a suitable partner, rather than as a means to a career (Morrow 2013b; Saraswathi, T. S. 1999). Due to the cultural constraints placed on women’s roles, I predict that noncognitive skills predict whether young men are employed, in education, or NEET, but that such a relationship does not exist for young women (*Hypothesis 2*).

**Caste**

In addition to gender, Indian society is stratified by caste. The caste system can be defined as a system that divides Hindu society into hereditary groups that are distinguished from one another, and linked to one another, by three characteristics: division of labor, hierarchy, and separation (Bougle 1958, as cited in Dumont, Louis 1970; Ghurye, G. S. 1932). Castes correspond to hereditary professions in which one is traditionally required to work. These occupations are ranked according to a hierarchy in which some occupations and castes are considered higher than others. Traditionally, there was strict separation between castes, and members of different castes could not marry or have contact with (i.e., eat or drink with) members of other castes. The system has become less rigid over time, though, so that one is not necessarily obligated to work in the profession to which he or she are assigned at birth, or to always marry within the same caste.

The caste system in India is extremely complicated. Castes vary from region to region, and each caste has hierarchical divisions within it (Dumont, Louis 1970). To simplify data collection on the plethora of castes, the Indian government has developed four groups of castes used for administrative data collection: scheduled castes (SC), scheduled tribes (ST), other backwards castes (OBC), and other castes (OC). The SCs, formally known as the untouchables,
are the lowest of the caste structure, and traditionally were not even considered part of it.³ STs are also low castes, made up of nationally recognized indigenous people. They frequently live in areas isolated from mainstream society, such as mountains and forests (Morrow 2013a). The OBCs are another group of low castes, and the people making up this category are considered to be “backwards” in that they are not proportionally represented in education or professions (Government of India Ministry of Law and Justice 2015; Government of India Ministry of Social Justice and Empowerment 2009). These three groups of lower castes are protected by the Indian Constitution in an attempt to make amends for historical discrimination. All other castes, which are predominantly upper castes, fall into the OC category (Galub, S., Reddy, P. Prudhvikar, and Himaz, Rozana 2008:2). In 2006, twenty percent of the population belonged to SCs, nine percent belonged to STs, 41 percent belonged to BCs, and 31 percent belonged to OCs (Anon 2007).

Despite the loosening of social norms associated with the caste system, and the affirmative action programs and quotas aimed at combating India’s discriminatory history, castes continues to impact the lives of young people in India. Youth from lower castes continue to have fewer opportunities than youth from higher castes. In fact, one study found that educational gaps along caste lines are larger than those along gender lines (Pells 2011, as cited in Morrow 2013b). Those in lower castes, for example, are more likely to continue in the occupations that they were assigned at birth (Seiter, Liann Nicole 2009). Boys in lower castes, in particular, are more likely to be tracked into schools taught in local languages, rather than English, that limit their occupational possibilities outside of traditional occupations. Low-caste

³ The traditional class system was made up of four varna: the Brahman, the Kshatriya, the Vaishya, and the Shudra. These varna were divided into thousands of jati, or castes. The untouchables and tribal groups were considered outside of this system, or as part of a fifth unofficial varna called the pancama (The editors of Encyclopaedia Britannica 2016). In 1950, with the enactment of the Indian Constitution, untouchability was outlawed, however, and became a protected category (Government of India Ministry of Law and Justice 2015). In the classification system used by the Indian government, the scheduled caste is included as the most disadvantaged group.
girls, in contrast, are more likely to attend English-speaking schools that expand their occupational options (Munshi, Kaivan and Rosenzweig, Mark 2006). The third hypothesis, then, is that noncognitive skills will not be as important in determining whether youth are employed, in education, or NEET for youth of lower castes than youth from upper castes, as they do not have the same opportunities (Hypothesis 3).\(^4\)

\(^4\) This hypothesis contrasts with findings based in the United States that noncognitive skills are more important for youth from low-income backgrounds (Shanahan, Michael J. et al. 2014), and even one of the main motivations for studying noncognitive skills in the United States (the idea that they act to level the playing field). However, because the caste structure in India is so distinct from the class structure in the United States, opportunities for youth from lower castes may be so constrained that they do not have opportunities to interact with others from higher castes that may have opportunities for them.
METHODOLOGY

Young Lives

Young Lives is an ongoing longitudinal study of two cohorts of children across four diverse developing countries: Ethiopia, India, Peru, and Vietnam, designed to study the causes and consequences of poverty. The study is conducted by the University of Oxford, with local partnerships within each country.5

The present study uses data from the face-to-face surveys of the older cohort of children, who were born in 1994-1995, from Andhra Pradesh, India.6 They have been interviewed four times, as of 2016, at ages 7-8, 11-12, 14-15, and 18-19.

Young Lives uses a multi-stage sampling design. In Andhra Pradesh, 20 sentinel sites were selected to capture a diverse set of both urban and rural communities. Sites were purposefully selected to represent certain indicators including climate poverty, with an overrepresentation of poor communities. Within each site, households with children of appropriate ages were identified and then children were randomly selected to be part of the sample (Young Lives 2011). Due to the non-random selection of sentinel sites, the data from Young Lives are not nationally representative.7

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5 Young Lives has been sponsored by a number of European aid agencies including the UK Department for International Development (DFID), Irish Aid, and the Netherlands Ministry of Foreign Affairs. For additional sponsors, see http://www.younglives.org.uk/who-we-are/funders. For a list of local partners, see http://www.younglives.org.uk/who-we-are/young-lives-partners

6 In 2014, Andhra Pradesh was split into two states: Andhra Pradesh and Telangana. The same sample of youth continues to be followed in these two states.

7 Other publications using this dataset do not adjust for this complex sampling structure (For example, see: Camfield, Laura 2012; Dornan, Paul 2016; Rolleston, Caine 2014).
Young Lives provides an unparalleled opportunity to investigate the role of noncognitive skills for the transition to adulthood in developing countries. This survey is particularly suitable to this study as it has multiple indicators of noncognitive skills, and its longitudinal format allows noncognitive skills to be measured prior to an adolescent’s transition to the workforce.

Measures

*Independent variables.* Noncognitive skills are measured when respondents are 11 or 12 years old (Round 2). The noncognitive items asked in Young Lives are unique, and do not appear to be based on any conventional scales. Previous studies using Young Lives have broken a subset of these items into the constructs of self-efficacy and self-esteem. However, these measures had poor measurement properties, and reported alphas of 0.67 and 0.59, respectively (Dercon, Stefan and Krishnan, Pramila 2009). With the goal of assessing two of the most salient skills for workforce success (Lippman, Laura H. et al. 2015), I attempted to composite measures of positive self-concept and social skills.

First, I chose the items that most theoretically tapped into positive self-concept, and examined the relationships between the items and an underlying construct using confirmatory factor analysis in *Mplus.* The resulting measure contains items that tap both self-efficacy and self-esteem, but analyses indicate that there is one underlying construct, which aligns with the operationalization of self-concept set forth by Lippman et al.. The measure is composed of the following items: “If I try hard, I can improve my situation in life”; “I like to make plans for my future studies and work”; “If I study hard at school I will be rewarded by a better job in the

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8 Chronbach’s alpha is a crude approximation of scale quality; however, it is the only information available in this article.

9 The fit statistics for the positive self-concept measure are as follows: Chi-square test of model fit p-value = 0.166; RMSEA = 0.022; CFI = 0.995; TLI = 0.991; BIC = -82.030. The r-square values of each variable range from 0.07 to 0.52.
future”; “I feel proud to show my friends or other visitors where I live”; “I am ashamed of my clothes”; and “I am proud of my achievements at school.” Response options are on a four-point Likert scale ranging from “Strongly Agree” to “Strongly Disagree.” Positively-worded items were recoded so that a higher value indicates more positive self-concept on all items. A scale was constructed by standardizing each item, and then taking the mean of available items. Many of these items were only asked of youth who were in school at age 11-12 (Round 2), and, in order to use these items, the sample was limited to youth who were enrolled in school at age 11-12 in 2006 (n=883).

I also attempted to create a composite measure of social skills. A confirmatory factor analysis revealed that the most theoretically relevant items were not related to an underlying construct. Therefore, social skills is operationalized with two individual items: “Do you find it hard to talk to other children in your class?” and “Do you help other children who have a problem at school?” Response options are never, sometimes, and always. Items were recoded so that a higher value indicates more social skills. Because the items in Young Lives are unique, the resulting positive self-concept and social skills measures are also unique and not directly comparable to anything in the extant literature. The correlations between the three noncognitive skills are low, ranging from -0.08 to 0.06.

Cognitive skills are also measured at age 11-12 (Round 2), using the Peabody Picture Vocabulary Test (PPVT-III) to assess verbal ability and a 10-item mathematics achievement test to assess math ability (Cueto, Santiago et al. 2009). Rasch scores are used for the present study.

Gender and caste are measured when youth are seven or eight years old (Round 1 in 2002). In Young Lives, caste is broken down into the four categories defined by the Indian government: Scheduled Tribe (ST), Scheduled Caste (SC), Backward Caste (BC), and Other
Caste (OC). For the purpose of these analyses, caste has been broken down into a dichotomous indicator of lower caste, made up of ST, SC, and BC, and upper caste (OC). The three lower castes are all protected by the government as they have experienced harsh discrimination in the past.

*Control variables.* The demographic background variables are all measured at the first round of data collection, before the transition to adulthood began. They are lagged in order to address any potential reciprocal relationship between them and the outcome. The control variables include the child’s household wealth index,\(^\text{10}\) urbanicity, household size, and a dummy variable indicating whether the caregiver has completed primary education.

*Dependent variables.* The dependent variable, “transition to adulthood status,” is measured when youth are 18-19 years old (Round 4 in 2013). At this age, youth are on the cusp of adulthood in India. More than one-half of youth in the study have completed their education. Thirty-seven percent of women are married, and, of these, more than one-half have become mothers (Singh, Abhijeet and Revollo, Patricia Espinoza 2016).\(^\text{11}\)

The main dependent variable in this study is “transition to adulthood status,” a nominal variable indicating whether an individual is a student, a worker, working while in school, or NEET. This variable is constructed based on four items from Round 4. A youth is considered a student if he/she is currently in full-time education and has not worked on a family farm, worked for someone outside of the household, or worked for their own or a family business in the past week. A youth is considered a worker if he/she reports working for at least one hour in the past week on either on a family farm, for someone outside of the household, or for their own or a

---

\(^{10}\) The household wealth index is an average of three indices corresponding to housing quality, consumer durables, and services (including electricity, water, toilet, and cooking fuel). It can range from 0 to 1, with higher values indicating more wealth (Kumra, Neha 2008).

\(^{11}\) Childbearing is not asked of unmarried women, as this is a very sensitive topic.
family business. If a youth reports being in school and working in the past week, they are classified as a student worker. If an individual does not participate in school or work, as defined above, he/she is coded as NEET.

**Missing data**

Young Lives has relatively low levels of missing data. The attrition rates for Young Lives are much lower than for other longitudinal studies in similar country contexts (Outes-Leon, Ingo and Dercon, Stefan 2008; Young Lives 2014, 2015). Nevertheless, as with any longitudinal studies, there is some missing data. In India, 1,008 children were interviewed at age 7-8 (Round 1), and 952 (94.4%) were interviewed in Round 4 at age 18-19 (Young Lives 2014). The highest levels of missing data are found in Round 2, on some of the noncognitive and cognitive measures. Cognitive test scores are missing for between six and eight percent of original Round 1 respondents. The individual noncognitive items were missing for less than two percent to almost 13 percent of cases, depending on the item. Among those who were enrolled in school at age 11-12, there is much less missing data. The highest levels of missing data for this analytic sample are on the cognitive measures, with four percent of cases missing math scores and six percent of cases missing vocabulary scores.

An analysis of attrition based on the initial two rounds of the study found little evidence of attrition bias (Outes-Leon, Ingo and Dercon, Stefan 2008). Missing data is addressed using multiple imputation. Four series of imputations were run (each with 20 imputations): one for the entire sample with the outcome of transition to adulthood status; one for males with the outcome of transition to adulthood status; one for females with the outcome of transition to adulthood status; and one for the male and female working sample with the outcome of dangerous working conditions.
ANALYTIC STRATEGY

Modeling

Hypotheses 1 through 3 are examined using a series of multinomial logistic regression models with cluster-robust standard errors. The cluster-robust standard errors correct for the multi-level data structure (individuals nested within communities). Models are estimated for the full sample and also for males and females, separately.

The first set of models tests whether noncognitive skills in early adolescence predict whether student are involved in education, work, both, or are NEET in late adolescence (Hypothesis 1). This relationship can be represented by the following general equation:

\[ \eta_{ij} = \log \frac{\pi_{ij}}{\pi_{ij}} = \alpha_j + \beta_j x_i \]

where \( j \) refers to the outcome categories: \( J \) refers to the reference category of being in school, while the other \( j \) refer to the other categories of working, working while in school, or being NEET. \( \alpha_j \) is a constant and \( \beta_j \) is a vector of coefficients for each \( j \) up to \( j-1 \). Three equations are simultaneously modeled, one comparing only working to only being in school, one comparing being NEET to being in school, and one comparing working and being in school concurrently to only being in school.

Next, the models are run separately by gender in order to examine whether noncognitive skills function similarly for young men and women (Hypothesis 2). The third set of models introduces interaction terms between noncognitive skills and castes in order to examine whether noncognitive skills function similarly across high and low castes (Hypothesis 3).
The multinomial logistic regression makes no assumptions about the ways in which individuals make decision (i.e., that one outcome is more favorable than another) nor does it place a value judgment on any of the categories. An advantage of this type of model is its ability to allow the cognitive and noncognitive skills to have different influences on each outcome. For example, cognitive skills may be more salient to participating in the workforce than to being NEET.

Where appropriate, predicted probabilities will be presented to help illustrate the influence of noncognitive skills. These predicted probabilities are calculated using the mi predictnl function in Stata, which generates predicted probabilities based on the observed covariate values in the raw data. They are not based on a microsimulation (for example setting all covariates equal to their means and varying only the variable of interest), but rather are predicted probabilities for the exact values of the given cases in the data. The predicted probabilities are generated in this way across all 20 imputed datasets and then combined using Rubin’s rule (Rubin, D. B. 1987).
RESULTS

Descriptive statistics

One-half (49.7%) of the participants in the sample are female, and three-quarters (75.0%) live in rural areas. On average, they live in a household with 4.6 other people, and with a caregiver who has not completed primary education. Just 32.0 percent of youth live with a caregiver who has completed primary education. The participants come from a variety of caste backgrounds: 20.6 percent come from the scheduled caste; 10.8 percent from scheduled tribe, 45.7 percent from backward castes, and 23.0 percent from other higher castes.

The self-concept scale has been standardized with a mean of 0. The social skill variables each have a mean score of approximately 2.5, indicating that, on average, students report finding it hard to talk to other children in their class between sometimes or never, and that they help other children with problems at school between sometimes or always. The math and vocabulary test scores have been standardized with a mean of 300.\textsuperscript{12} Table 1 presents descriptive statistics for the sample, after multiple imputation.

\textsuperscript{12} Standardization was based on the full sample. Means are slightly different for the analytic sample because youth who were not in school at age 11-12 are excluded.
Table 1. Descriptive statistics for full sample, males, and females, post-multiple imputation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Full Sample</th>
<th></th>
<th></th>
<th>Males</th>
<th></th>
<th></th>
<th>Females</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>Standard Error</td>
<td>N</td>
<td>Mean</td>
<td>Standard Error</td>
<td>N</td>
<td>Mean</td>
<td>Standard Error</td>
</tr>
<tr>
<td><strong>Dependent Variables (Round 4)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Transition to adulthood status</td>
<td>845</td>
<td>2.141</td>
<td>0.035</td>
<td>425</td>
<td>2.167</td>
<td>0.054</td>
<td>420</td>
<td>2.114</td>
<td>0.043</td>
</tr>
<tr>
<td>Worker only</td>
<td>0.303</td>
<td>0.016</td>
<td></td>
<td>0.334</td>
<td>0.023</td>
<td></td>
<td>0.271</td>
<td>0.022</td>
<td></td>
</tr>
<tr>
<td>Student only</td>
<td>0.400</td>
<td>0.017</td>
<td></td>
<td>0.388</td>
<td>0.024</td>
<td></td>
<td>0.412</td>
<td>0.024</td>
<td></td>
</tr>
<tr>
<td>Worker and student</td>
<td>0.150</td>
<td>0.012</td>
<td></td>
<td>0.224</td>
<td>0.020</td>
<td></td>
<td>0.069</td>
<td>0.012</td>
<td></td>
</tr>
<tr>
<td>NEET</td>
<td>0.147</td>
<td>0.012</td>
<td></td>
<td>0.054</td>
<td>0.011</td>
<td></td>
<td>0.248</td>
<td>0.021</td>
<td></td>
</tr>
<tr>
<td><strong>Independent Variables (Round 2)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self concept</td>
<td>845</td>
<td>0.018</td>
<td>0.019</td>
<td>425</td>
<td>0.035</td>
<td>0.026</td>
<td>420</td>
<td>0.007</td>
<td>0.029</td>
</tr>
<tr>
<td>Help other children</td>
<td>845</td>
<td>2.466</td>
<td>0.020</td>
<td>425</td>
<td>2.468</td>
<td>0.026</td>
<td>420</td>
<td>2.464</td>
<td>0.030</td>
</tr>
<tr>
<td>Hard to talk to children</td>
<td>845</td>
<td>2.681</td>
<td>0.024</td>
<td>425</td>
<td>2.689</td>
<td>0.033</td>
<td>420</td>
<td>2.673</td>
<td>0.034</td>
</tr>
<tr>
<td>Math test score</td>
<td>845</td>
<td>308.010</td>
<td>1.460</td>
<td>425</td>
<td>308.295</td>
<td>2.081</td>
<td>420</td>
<td>308.133</td>
<td>2.064</td>
</tr>
<tr>
<td>Vocabulary test score</td>
<td>845</td>
<td>305.445</td>
<td>1.683</td>
<td>425</td>
<td>307.968</td>
<td>2.249</td>
<td>420</td>
<td>303.686</td>
<td>2.433</td>
</tr>
<tr>
<td><strong>Control Variables (Round 1)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>845</td>
<td>0.497</td>
<td>0.017</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wealth index</td>
<td>845</td>
<td>0.419</td>
<td>0.007</td>
<td>425</td>
<td>0.420</td>
<td>0.010</td>
<td>420</td>
<td>0.417</td>
<td>0.010</td>
</tr>
<tr>
<td>Rural</td>
<td>845</td>
<td>0.750</td>
<td>0.015</td>
<td>425</td>
<td>0.746</td>
<td>0.021</td>
<td>420</td>
<td>0.755</td>
<td>0.021</td>
</tr>
<tr>
<td>Household size</td>
<td>845</td>
<td>5.569</td>
<td>0.072</td>
<td>425</td>
<td>5.539</td>
<td>0.106</td>
<td>420</td>
<td>5.600</td>
<td>0.097</td>
</tr>
<tr>
<td>Caregiver has primary education</td>
<td>845</td>
<td>0.320</td>
<td>0.016</td>
<td>425</td>
<td>0.311</td>
<td>0.022</td>
<td>420</td>
<td>0.329</td>
<td>0.023</td>
</tr>
<tr>
<td>Caste</td>
<td>845</td>
<td>2.710</td>
<td>0.036</td>
<td>425</td>
<td>2.699</td>
<td>0.050</td>
<td>420</td>
<td>2.721</td>
<td>0.051</td>
</tr>
<tr>
<td>Scheduled caste</td>
<td>0.206</td>
<td>0.014</td>
<td>0.209</td>
<td>0.020</td>
<td></td>
<td></td>
<td>0.202</td>
<td>0.020</td>
<td></td>
</tr>
<tr>
<td>Scheduled tribe</td>
<td>0.108</td>
<td>0.011</td>
<td>0.094</td>
<td>0.014</td>
<td></td>
<td></td>
<td>0.121</td>
<td>0.016</td>
<td></td>
</tr>
<tr>
<td>Backwards caste</td>
<td>0.457</td>
<td>0.017</td>
<td>0.485</td>
<td>0.024</td>
<td></td>
<td></td>
<td>0.429</td>
<td>0.024</td>
<td></td>
</tr>
<tr>
<td>Other caste</td>
<td>0.230</td>
<td>0.014</td>
<td>0.212</td>
<td>0.020</td>
<td></td>
<td></td>
<td>0.248</td>
<td>0.021</td>
<td></td>
</tr>
</tbody>
</table>

The transition to adulthood status varies considerably by gender (See Figure 1). Over one-third (33.4%) of young men are working at age 18-19; or are in school (38.8%); approximately one-fifth (22.4%) are both working and enrolled in school; and just five (5.4) percent are NEET. In contrast, about one-quarter of young women are working (27.1%), and two-fifths are in school (41.2%), while just seven (6.9) percent are doing both at the same time and one-quarter are NEET (24.8%). Of the young women who are NEET, three-fifths (60.6%) are married, compared with just one-fifth (19.9%) of women who are not NEET.

Figure 1. Transition to adulthood status by gender at ages 18-19

Bivariate statistics

When examined in a bivariate framework, there is a significant relationship between self-concept and transition to adulthood status. Youth with higher levels of self-concept have lower odds of working compared with being students. Youth with higher levels of self-concept also have lower odds of being NEET than students. In a bivariate sense, the social skill indicators are not related to transition to adulthood status.
The findings about self-concept are illustrated in Figure 2, which describes the predicted probabilities of being in each transition to adulthood status based on levels of self-concept in real cases in Young Lives. Keep in mind that only the differences between working and being a student and being NEET and being a student are statistically significant. Examine the downward sloping red (work only) and yellow (NEET) lines: as self-concept increases, from left to right, the probability of working or being NEET decreases. Youth with the lowest values of self-concept (shown on the left-hand side of the graph) have approximately a two-thirds probability of working, a one-third probability of being NEET, a one-tenth probability of being in school, and a very low probability of working while being in school. At the same time, youth with average self-concept have about a two-fifths probability of being in school, a one-third probability of working, and lower probabilities of being NEET or being student workers, at around fifteen percent. The outlined density plot in Figure 2 illustrates the distribution of self-concept.
Figure 2. Predicted transition to adulthood status by self-concept

Multivariate results

The first three columns in Table 2 present findings from the multinomial logistic regression examining the relationship between cognitive and noncognitive skills and transition to adulthood status for the entire sample. This model tests Hypothesis 1, that noncognitive skills help keep youth in school rather than transitioning to the workforce. Results show that youth with higher levels of self-concept in early adolescence are less likely to be workers than to be students, in comparison to youth with lower levels of self-concept (b=-0.518, p<.01).

---

A series of four models builds in blocks of variables up to the final model presented in Table 2. The first three models test the relationship between the outcome and the control variables, noncognitive variables, and cognitive variables independently. The fourth model includes both noncognitive and cognitive skills. The presented model brings all of these variables together. Results are generally consistent across models.
Table 2. Multinomial logistic regression results for full sample, males, and females

<table>
<thead>
<tr>
<th></th>
<th>Full sample (reference student only)</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Worker only</td>
<td>NEET</td>
<td>Worker and student</td>
</tr>
<tr>
<td>Female</td>
<td>-0.297</td>
<td>1.531***</td>
<td>-1.249***</td>
</tr>
<tr>
<td></td>
<td>(0.234)</td>
<td>(0.292)</td>
<td>(0.230)</td>
</tr>
<tr>
<td>Wealth index</td>
<td>-2.543***</td>
<td>-2.695***</td>
<td>-0.443</td>
</tr>
<tr>
<td></td>
<td>(0.673)</td>
<td>(0.616)</td>
<td>(0.745)</td>
</tr>
<tr>
<td>Rural</td>
<td>0.094</td>
<td>-0.824*</td>
<td>0.938*</td>
</tr>
<tr>
<td></td>
<td>(0.350)</td>
<td>(0.321)</td>
<td>(0.372)</td>
</tr>
<tr>
<td>Household size</td>
<td>0.010</td>
<td>-0.002</td>
<td>-0.002</td>
</tr>
<tr>
<td></td>
<td>(0.043)</td>
<td>(0.059)</td>
<td>(0.054)</td>
</tr>
<tr>
<td>Caregiver has primary education</td>
<td>-0.932**</td>
<td>-0.353</td>
<td>-0.531*</td>
</tr>
<tr>
<td></td>
<td>(0.309)</td>
<td>(0.283)</td>
<td>(0.248)</td>
</tr>
<tr>
<td>High caste</td>
<td>-0.195</td>
<td>-0.520*</td>
<td>-0.333</td>
</tr>
<tr>
<td></td>
<td>(0.227)</td>
<td>(0.260)</td>
<td>(0.286)</td>
</tr>
<tr>
<td>Self-concept</td>
<td>-0.518**</td>
<td>-0.414</td>
<td>0.112</td>
</tr>
<tr>
<td></td>
<td>(0.177)</td>
<td>(0.212)</td>
<td>(0.279)</td>
</tr>
<tr>
<td>Help Child (Never omitted)</td>
<td>1.027*</td>
<td>0.087</td>
<td>0.459</td>
</tr>
<tr>
<td>Sometimes</td>
<td>(0.479)</td>
<td>(0.432)</td>
<td>(0.683)</td>
</tr>
<tr>
<td>Always</td>
<td>0.943*</td>
<td>0.155</td>
<td>0.778</td>
</tr>
<tr>
<td></td>
<td>(0.478)</td>
<td>(0.416)</td>
<td>(0.667)</td>
</tr>
<tr>
<td>Hard talk (Always omitted)</td>
<td>0.222</td>
<td>1.070*</td>
<td>1.005*</td>
</tr>
<tr>
<td>Sometimes</td>
<td>(0.577)</td>
<td>(0.522)</td>
<td>(0.488)</td>
</tr>
<tr>
<td>Never</td>
<td>0.155</td>
<td>0.302</td>
<td>0.333</td>
</tr>
<tr>
<td></td>
<td>(0.281)</td>
<td>(0.378)</td>
<td>(0.346)</td>
</tr>
<tr>
<td>Math test</td>
<td>-0.007*</td>
<td>-0.010*</td>
<td>-0.000</td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td>(0.004)</td>
<td>(0.003)</td>
</tr>
<tr>
<td>PPVT test</td>
<td>-0.009***</td>
<td>-0.004</td>
<td>-0.004</td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.003)</td>
<td>(0.003)</td>
</tr>
<tr>
<td>Constant</td>
<td>4.892***</td>
<td>3.927***</td>
<td>-0.340</td>
</tr>
<tr>
<td></td>
<td>(1.122)</td>
<td>(1.161)</td>
<td>(1.239)</td>
</tr>
<tr>
<td>N</td>
<td>845</td>
<td>425</td>
<td>420</td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
</tbody>
</table>

* <.05 ** <.01 ***<.001 (2-tailed)

Note: For the male model, the social skill variables, help child and hard talk, were dichotomized. Hard talk is coded Always or Sometimes = 0, Never=1. Help child is coded Never or Sometimes=0, Always=1.

Social skills, on the other hand, may be associated with *increases* in the likelihood that a youth is a worker, works while in school, or is NEET, compared to being a student only. Specifically, helping other children is associated with an increased likelihood of working (b=1.027, p<.05; b=0.943, p<.05), and not finding it hard to talk to other children is associated with increased likelihoods of being NEET (b=1.070, p<.05) or student workers (b=1.005, p<.05), in comparison to being students. This finding, that social skills are positively related to outcomes other than being in school, is unexpected, as extant literature finds that noncognitive skills tend to work in the same direction as one another.

Math and vocabulary test scores are associated with a smaller likelihood of working or being NEET, compared to being a student (math in reference to working: b= -0.007, p<.05; math in reference to being NEET: b= -0.010, p<.05 ; vocabulary in reference to working: b= -0.009, p<.001). Results also show that young women are more likely to be NEET (b=1.531, p<.001) and less likely to work and be in school at the same time (b= -1.249, p<.001) than be students, than males. Those growing up in rural areas are less likely to be NEET than students (b= -0.824, p<.05), and are more likely to both work and be in school at the same time (b= 0.938, p<.05), compared to those in urban areas. Both growing up in a wealthier household (b= -2.543, p<.001), and having a caregiver with primary education (b= -0.932, p<.01) are associated with lower odds of working, compared with being in school. Additionally, wealth is associated with lower odds of being NEET (b= -2.695, p<.001), while educated caregivers are associated with a smaller chance that they work while in school (b= -0.531, p<.05). Youth from higher castes are less likely to be NEET (b= -0.520, p<.05), but not the two working outcomes. This effect appears to be gender-based, as discussed below.
Thus with respect to Hypothesis 1, self-concept is associated with reduced odds of youth entering the workforce, while social skills are associated with a higher likelihood of departure from school. Previous research finds that noncognitive skills tend to work in the same direction, but these results show differential effects based on the individual skill.

The role of gender. This model was also examined for males and females separately because young men and women may have different paths into adulthood, especially into being NEET (Hypothesis 2). Among males, the relationships between the control variables and the outcome are much the same as in the full sample, though caste is not related to transition to adulthood status. Self-concept is not significantly related to transition to adulthood status among young men, but is positively associated with being NEET (b=1.418, p<.05). This finding is in the opposite direction of Hypothesis 2. There is no statistically significant relationship between either of the social skill variables and any of the three outcome categories. For boys, math scores are related to lower odds of working (b= -0.011, p<.01 ), while vocabulary does not have an influence.

Among young women, the odds that one enters the workforce or is NEET decrease as self-concept increases. Girls with higher self-concept at age 11-12 are less likely to be working (b=0.549, p<.05) or NEET (b=0.734, p<.01) at age 18-19 than in school. Helping other children, either sometimes (b=1.704, p<.05) or always (b=1.403, p<.05) in comparison to never, is related to an increased likelihood of working. Social skills are not related to being NEET or student workers. Cognitive ability is associated with decreased odds girls falling into statuses other than being in school (math in reference to being NEET: b= -0.009, p<.05; vocabulary in

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14 For the male subsample, the social skills were dichotomized to indicate whether the individual always helped other children (versus sometimes or never) and whether the individual never had a hard time talking to other children (versus sometimes or always). The full model, with three categories for each social skill, produced an error with a nonsymmetrical or highly singular variance matrix.
reference to working: b= -0.014, p<.001). Wealthy girls are less likely to be NEET (b=-2.529, p<.01), as are those from high castes (b=-0.903, p<.01). Rural girls are more likely to work than urban girls (b=1.368, p<.05).

In summary, social skills are associated with increased probabilities of working for young women while self-concept is associated with a decreased likelihood of working or being NEET. Meanwhile, for young men, self-concept is associated with being NEET. Cognitive skills are related to increased probabilities of being in school for both young men and women, though math appears to be more influential for males, and vocabulary more influential for females. Figure 3 presents predicted probabilities for being in each outcome category for males and females separately. Keep in mind that the data presented are descriptive, and based on the actual Young Lives data, and do not involve any microsimulation. The green line, showing the predicted probability of being a student based on self-concept, is steeper for women (right panel) than men (left panel), indicating the stronger relationship between self-concept and being in youth in school for young women. Meanwhile, the yellow line representing NEET status slopes upward for men, showing that self-concept predicts being NEET for young men, and it slopes downward for women, showing that self-concept decreases the likelihood of being NEET for young women.
The role of caste. A second set of models examines the interplay between castes and noncognitive skills (Hypothesis 4). The interactions between caste and noncognitive skills were examined among all respondents, young men, and young women, respectively. Table 3 presents results for the full sample. Gender differences are discussed as relevant.
<table>
<thead>
<tr>
<th></th>
<th>Self-concept interaction</th>
<th>Help child interaction</th>
<th>Hard talk interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Worker only</td>
<td>NEET</td>
<td>Worker only</td>
</tr>
<tr>
<td>Female</td>
<td>-0.306 (0.233)</td>
<td>1.525*** (0.292)</td>
<td>-1.261*** (0.226)</td>
</tr>
<tr>
<td>Wealth index</td>
<td>-2.587*** (0.672)</td>
<td>-2.706*** (0.616)</td>
<td>-0.489 (0.737)</td>
</tr>
<tr>
<td>Rural</td>
<td>0.084 (0.355)</td>
<td>-0.826* (0.322)</td>
<td>0.935* (0.373)</td>
</tr>
<tr>
<td>Household size</td>
<td>0.013 (0.043)</td>
<td>-0.001 (0.059)</td>
<td>0.002 (0.054)</td>
</tr>
<tr>
<td>Caregiver has primary</td>
<td>-0.924** (0.310)</td>
<td>-0.351 (0.285)</td>
<td>-0.523* (0.250)</td>
</tr>
<tr>
<td>education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High caste</td>
<td>-0.178 (0.232)</td>
<td>-0.467 (0.265)</td>
<td>-0.203 (0.309)</td>
</tr>
<tr>
<td>Self-concept</td>
<td>-0.361 (0.203)</td>
<td>-0.382 (0.236)</td>
<td>0.322 (0.313)</td>
</tr>
<tr>
<td>High caste*Self-concept</td>
<td>-0.812* (0.364)</td>
<td>0.012 (0.554)</td>
<td>-0.981 (0.527)</td>
</tr>
<tr>
<td>Help child (Never omitted)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sometimes</td>
<td>1.082* (0.471)</td>
<td>0.101 (0.435)</td>
<td>0.517 (0.690)</td>
</tr>
<tr>
<td>Always</td>
<td>1.005* (0.470)</td>
<td>0.164 (0.417)</td>
<td>0.840 (0.677)</td>
</tr>
<tr>
<td>Hard talk (Always omitted)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sometimes</td>
<td>0.174 (0.586)</td>
<td>1.080* (0.518)</td>
<td>0.985* (0.494)</td>
</tr>
<tr>
<td>Never</td>
<td>0.163 (0.280)</td>
<td>0.303 (0.379)</td>
<td>0.347 (0.348)</td>
</tr>
<tr>
<td>Math test</td>
<td>-0.007* (0.003)</td>
<td>-0.010* (0.004)</td>
<td>-0.000 (0.003)</td>
</tr>
<tr>
<td>PPVT test</td>
<td>-0.009*** (0.003)</td>
<td>-0.004 (0.003)</td>
<td>-0.004 (0.003)</td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.003)</td>
<td>(0.003)</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>High caste*Help child (Never omitted)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High caste*Sometimes</td>
<td>0.313</td>
<td>0.871</td>
<td>13.150***</td>
</tr>
<tr>
<td>High caste*Always</td>
<td>0.572</td>
<td>1.220</td>
<td>13.220***</td>
</tr>
<tr>
<td>High caste*Hard talk (Always omitted)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High caste*Sometimes</td>
<td>0.585</td>
<td>0.474</td>
<td>-13.440***</td>
</tr>
<tr>
<td>High caste*Never</td>
<td>-0.785</td>
<td>-0.183</td>
<td>0.066</td>
</tr>
<tr>
<td>Constant</td>
<td>4.794***</td>
<td>3.870***</td>
<td>-0.509</td>
</tr>
<tr>
<td></td>
<td>(1.130)</td>
<td>(1.159)</td>
<td>(1.271)</td>
</tr>
</tbody>
</table>

N=845

* <.05 ** <.01 ***<.001

The first model examines the interaction between high caste and positive self-concept. The main effect of self-concept is not a significant predictor of being a worker, NEET, or student worker, suggesting that self-concept is not related to transition to adulthood status for youth from low castes. The interaction between high caste and self-concept is significant and negative for being a worker (b=-0.812, p<.05), though, indicating that for youth in high castes, self-concept is associated with lower odds of being a worker, even though there is no relationship for youth in low castes.

The heightened importance of self-concept decreasing the odds of working for youth from high castes is illustrated in Figure 4. The dashed green line, representing the predicted probability of being in school for youth from high castes, is much steeper than the solid green line, representing the predicted probability of being in school for low-caste youth. Similarly, the dashed red line slopes downward more steeply than the solid red line, indicating a stronger relationship between self-concept and the probability of working for high-caste youth than low-caste youth.

This effect does not reach statistical significance for males or females alone. However, among females, self-concept is associated with lower odds of being NEET for youth from low castes (b=-0.615, p<.05) and self-concept is associated with lower odds of working while being a student for high-caste young women (b=-2.673, p<.001). All of the significant effects are in the same direction, with self-concept linked to decreased likelihoods of all statuses other than being in school. In two out of the three significant findings, self-concept is significant for youth from higher castes, but not from lower castes. These findings are in line with Hypothesis 3, that noncognitive skills matter more for high castes than low castes.

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15 Again, the visualization in Figure 4 is based on purely descriptive data.
The second and third sets of columns in Table 3 examine the intersection of caste and social skills. These models show very little in terms of the influence of social skills on being either a worker or NEET in comparison to being a student.

However, social skills are related to a youth’s probability of being a student worker. Helping other children is positively associated with being a student worker for youth from high castes (b=13.150, p<.001; b=13.220, p<.001), while there is no relationship for low castes. This finding also holds true for the female-only model (b=14.78, p<.001; b=15.00, p<.001), where
helping other children is *positively* associated with being a worker (b=11.93, p<.001; b=12.54, p<.001) for youth from high castes.\textsuperscript{16}

The other indicator of social skills, not finding it hard to talk to other students, has a main effect positively related to being a worker and a student among the full sample, indicating that finding it hard to talk to other students sometimes, as opposed to always, *increases* the probability of being a student worker (b=1.234, p<.05) for youth from low castes. The interaction between high caste and this term is negative and significant (b=-13.440, p<.001), indicating that talking to other students decreases the odds of being a student worker for high caste youth, even though it is *predictive* of being a student worker for low-caste youth. The findings are similar for the male subsample. For the males, there is no relationship between finding it hard to talk to other children and being a student worker among low-caste youth. However, it decreases the odds of being a student worker for high-caste youth (b=-15.080, p<.001). For the females, however, the results reflect the opposite pattern. Again, there is no relationship between the skill and being a student-worker among low-caste youth; however, this skill *positively predicts* being a student worker for high-caste young women (b=11.710, p<.01).

The ability to talk to other students is also related to being NEET and working, for males and females, respectively. For males, this skill is *positively* associated with being NEET for low-caste youth only (b=14.810, p<.001; b=14.020, p<.001). For females, this skill is *positively* related to working for low-caste youth (b=0.966, p<.05) but decreases the odds of working for high-caste youth (b=-2.294, p<.01).

Taken together, with respect to Hypothesis 3, these findings indicate that noncognitive skills may be more potent for high-caste youth than low-caste youth. Results are most clear-cut

\textsuperscript{16} Unfortunately, this relationship could not be examined on the male sample. The variance matrix was asymmetrical or highly singular.
with self-concept, which has a stronger negative relationship with being out-of-school for high-caste youth. Social skills also seem to be more potent for high-caste youth than low-caste youth, but the direction of this relationship (i.e., whether social skills protect against or promote being out-of-school) is less clear. The ability to talk to other children is related to youth in high castes staying in school. Meanwhile, helping other children is actually *positively* related to being out of school for youth in high castes. For youth in low castes, not finding it hard to talk to other children is *positively* related to being out-of-school. These findings indicate that there may be different mechanisms at play which influence the entry into work while being a student for youth from different caste backgrounds.

Cognitive skills are also related to transition to adulthood status in the expected direction in these models. Vocabulary skills are associated with a decreased likelihood of youth working in all three models. Similarly, math skills are associated with a decreased likelihood of youth working or being NEET.
DISCUSSION

As the importance of noncognitive skills has been well documented in the United States and Europe, the role they play in the developing world has remained under-studied. This study examines three hypotheses surrounding the role of noncognitive skills in the transition to the workforce for youth in Andhra Pradesh, India.

There is some evidence to support Hypothesis 1, namely that noncognitive skills in early adolescence predict whether a youth is involved in education, work, both, or is NEET in early adulthood. Positive self-concept, in particular, is associated with a lower likelihood of youth working in comparison to being in school. The relationship between social skills and transition to adulthood status is in the opposite direction; evidence indicates that higher levels of social skills may be associated with children working, working while going to school, or being NEET in late adolescence rather than going to school. Self-concept is linked to a smaller probability that youth leave school, while social skills may entice them to do so. It could be that because education is so valued in India, students who are doing well in school at age 11, when self-concept is measured, may feel especially good about themselves. This self-concept could then lead to continuing to do well in school. Meanwhile, social skills could potentially enhance youths’ value as potential employees. This finding of different skills being related to different outcomes has not been found in the developed world. Future work in the developing world should examine whether similar trends exist elsewhere.

These patterns differ by gender, but not in the way that was postulated by Hypothesis 2. Rather than noncognitive skills being more influential for boys than girls, as predicted, they
appear to be more important for girls than boys. Girls with higher levels of self-concept in early adolescence are less likely to work in early adulthood, compared with being a student. Self-concept is not related to working for boys, though, and is actually associated with being idle. For girls, social skills are linked to working, while they have no predictive power for boys. One potential mechanism for this link is that girls who are helpful to others are seen as valuable and are recruited into the workforce at an earlier age, rather than continuing with their schooling. Alternatively, as India has worked toward gender equality in education, it could be that those girls with especially positive self-concepts are able to negotiate roles within the family that allow them to stay in school longer. This explanation aligns with the previous finding of girls being sent to English-speaking schools that expand their future options.

Across the models, cognitive skills act in the expected direction. Youth with math and vocabulary skills are more likely to remain in school than work or be NEET. Math appears to be more influential for young men, and vocabulary appears to be more influential for young women.

In addition to varying by gender, the influence of noncognitive skills also varies by caste, above and beyond wealth, such that noncognitive skills are most influential for youth from higher castes. This finding is consistent with Hypothesis 3. While there is no way of knowing the mechanism behind this relationship from the current data, perhaps there are more opportunities for noncognitive skills to translate into outcomes for youth from higher castes than youth from lower castes. Whatever the mechanism is, it seems clear that noncognitive skills are more potent for youth from higher-caste backgrounds than youth from lower-caste backgrounds.

Limitations

There are a number of limitations of the present study. While Young Lives provides one of the first opportunities to rigorously evaluate the role of noncognitive skills outside of the
developed world, it is not perfect. The data provide a unique opportunity to examine youth as they transition to adulthood. As they are currently undergoing this transition, though, it is impossible to know how noncognitive skills will influence their long-term trajectories. As more data are released, it will be important to continue this line of inquiry.

The measures available in Young Lives are not comparable to those frequently used in developed countries. The measures in Young Lives were not asked of all youth, and therefore this study is limited to youth who were enrolled in school at age 11-12. These youth may be more advantaged than those not enrolled in school, and so these results may not be generalizable to the most disadvantaged children. Additionally, the items in Young Lives developed from extant instruments, but appear to have been developed uniquely for this survey. They complement those used in other developing countries, notably the Big Five personality traits and grit used by the World Bank. Because the items available in Young Lives are original, and have not been validated, this study conducted confirmatory factor analysis to develop a measure of positive self-concept. Each item loads onto the latent variable of self-concept with a fairly low r-squared value (ranging from .07 to .52). These low loadings indicate that there is a considerable amount of measurement error. In the future, analyses using these variables should use structural equation modeling in order to account for the measurement error that cannot be addressed with the present analyses. That these items are used to form an unorthodox measure of positive self-concept is a limitation of this study. Future work on this dataset should continue to investigate what noncognitive skills can be measured with the available items.

Multinomial logistic regression poses some additional limitations for the present study. With this type of model, heteroskedasticity is especially problematic and the self-concept variable is highly skewed, which may indicate a heteroskedasticity issue. It is also very difficult to compare
coefficients across models using multinomial logistic regression, as standard errors are based on the unobserved heterogeneity, unlike in linear models. This unobserved heterogeneity varies between models including different sets of variables, and between estimates based on different samples, making direct comparisons between models or samples impossible (Mood 2010). In this paper, I have been careful to interpret each model within itself only, and have avoided making direct comparisons between models, or between subgroups. When I do make comparisons, it is with predicted probabilities rather than coefficients. As with any descriptive multivariate model, the results presented above cannot be interpreted causally.
CONCLUSION

Despite these limitations, the present study contributes to the field’s understanding of noncognitive skills in a novel setting. Noncognitive skills, notably positive self-concept and social skills, are influential in an adolescent’s transition to adulthood outside of the developed world. Their influence is not uniform, but varies according to the type of skill measured, the youth’s gender, and his or her social status. Future work should continue to investigate the role that noncognitive skills play in the lives of young people in diverse settings, and under what conditions these skills are influential.

This research is especially timely, as not only do nine in ten youth currently live in developing countries, but many developing nations are currently undergoing or will soon undergo the demographic transition, resulting in a disproportionately large cohort of youth. Without too many elders to support, these large youth cohorts offer a tremendous opportunity for countries to improve the livelihoods of their people. As this study demonstrates, certain noncognitive skills are related to youth to pursuing more years of education and others are related to them entering the workforce. At this point, it is unclear whether one outcome is more desirable than the other, or under what conditions each outcome is beneficial. With additional research, countries may be able to use noncognitive skills as one means by which to capitalize on their youth populations, and turn them into demographic dividends.
REFERENCES


Seiter, Liann Nicole. 2009. “Emerging Adulthood in India.” Brigham Young University, Provo, UT.


