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Psychosocial competencies and risky behaviours in Peru

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Abstract

We use a unique longitudinal dataset from Peru to investigate the relationship between psychosocial competencies related to the concepts of self-esteem, self-efficacy, and aspirations, and a number of risky behaviours at a crucial transition period between adolescence and early adulthood. First of all, we document a high prevalence of risky behaviours with 1 out of 2 individuals engaging in at least one risky activity by the age 19 with a dramatic increase between age 15 and 19. Second, we find a pronounced pro-male bias and some differences by area of residence particularly in drinking habits which are more prevalent in urban areas. Third, we find a negative correlation between early self-esteem and later risky behaviours which is robust to a number of specifications. Further, aspiring to higher education at the age of 15 is correlated to a lower probability of engaging in criminal behaviours at the age of 19. Similarly, aspirations protect girls from risky sexual behaviours.

JEL classification: J24, J13, O15.

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1 Introduction

Risky behaviours are associated with health problems, low productivity and more generally with a decline of individual and collective well-being in the short, medium and long run (see for example Parkes et al. 2010). The study of the determinants of risky and criminal activities is informed mainly by sociological and psychological literature establishing the link between cognitive skills, psychosocial competencies and risky behaviours (Agnew et al. 2002; Caspi et al. 1994; Pratt and Cullen 2000).[1]

The economic literature on crime and risky behaviours primarily adopts an opportunity cost framework. People choose to commit a crime or to engage in risky behaviours if their expected utility from engaging in that behaviour is greater than the expected utility from their outside options (for example in terms of labour market opportunities). Within this framework, more educated people or people with better cognitive abilities are less likely to be involved in risky behaviours (Lochner and Moretti 2004; Travis and Hindelang 1977). However, these models do not acknowledge the role of psychosocial competencies.

More recently, economists have gained an interest in studying the role of soft skills (or *non-cognitive skills*) as predictors of economic outcomes, such as educational attainments, health and labour market outcomes (see for example Borghans et al. 2008b; Chiteji 2010; Cobb-Clark and Tan 2011; Dohmen et al. 2010; Heckman et al. 2006;

Jaeger et al. 2010). Nevertheless, few economic papers analyse the role of soft skills on risky behaviours.

The aim of this study is to get a better understanding of the link between psychosocial competencies and risky behaviours at a crucial transition period between adolescence and early adulthood. Specifically, our analysis has three objectives. First, to document the prevalence of risky behaviours in the context of Peru, and the heterogeneity of these outcomes by gender and area of location. Second, to test the hypothesis that dimensions related to the concepts of self-esteem, self-efficacy, and aspirations have an impact on the occurrence of risky behaviours during adolescence. Third, to test the robustness of this association by applying statistical methods that allow to control for unobservable cofounders. To our knowledge this is the first study that looks at the predictive role of soft skills on risky behaviours—among the youth population—in a developing country. While the challenges faced by the youth are numerous, engaging in risky behaviours is highly prevalent in developing countries (Wellings et al. 2006), and this can be associated with worse labour market and health outcomes later in life. By looking at how early skills predict early engagement in risky activities, our study contributes to the understanding of the different channels through which soft skills accumulated over the life cycle explain labour market outcomes (and other life outcomes) later in life.

For this analysis, we exploit the longitudinal nature of the Young Lives data, a unique individual-level panel following a cohort of about 700 children in Peru over four rounds of data collection that took place between 2002 and 2013. The Young Lives data cover a critical phase of the life-cycle for human capital and skills accumulation following the same children between ages 8 and 19. Information on a number of risky behaviours are collected at the age of 15 and 19 which makes the Young Lives data particularly suitable for this analysis. Furthermore, rich information both at the household and individual level are collected which include children's cognitive and psychosocial competencies, school history, parental and children's aspirations and aspirations for education.[2] Based on the data available, we define indicators to measure the prevalence of (i) smoking behaviours; (ii) drinking behaviours; (iii) drinking and violence (engaging in violent or risky activities when drunk); (iv) consumption of illegal drugs; (v) criminal behaviours; (vi) possession of weapons; (vii) unprotected sex; and (viii) total number of risky and criminal behaviours.

Evidence on psychosocial competencies as a predictor of criminality and delinquency invites questions about the ability to prevent risky behaviours by shaping those skills. Furthermore, while the most 'sensitive' (productive) periods for investment in both cognitive skills and psychosocial competencies occur earlier in people's life, soft skills during adolescence are more malleable than cognitive skills (Carneiro and Heckman 2003; Cunha and Heckman 2007; 2008; Cunha et al. 2010; Knudsen et al. 2006). Of course, the differential plasticity of different skills by age has important implications for the design of effective policies.

There are three recent studies that have looked at the determinants of risky behaviours at age 15 in Peru using the first three rounds of Young Lives data: Cueto et al. (2011), Crookston et al. (2014), and Lavado et al. (2015). The study by Cueto et al. (2011) and colleagues highlights the importance of parent–child relations and peer effects in predicting smoking habits and unprotected sexual relations at early ages. Crookston et al. (2014) document the association between children victimization at school on subsequent risky behaviours. Finally, the study by Lavado et al. (2015) looks at the relationship between

cognitive and non-cognitive skills and consumption of cigarettes and alcohol and the early initiation of sexual activity. Overall, their results suggest a negative relation between risky behaviours and cognitive and non-cognitive skills.

However, the evidence these studies can provide is limited for two reasons. First, there is low prevalence of risky behaviours observed at age 15, which authors try to compensate by being very inclusive in the definitions used, particularly in the way smoking and drinking are defined. Second, there is an endogenous relationship between child characteristics and risky behaviour outcomes. There are reasons to think that psychosocial competencies and the outcomes of interest are jointly determined. Therefore, the main challenge is in assessing whether the effect of poor psychological resources on the probability in engaging in risky behaviours is due to potential endogeneity bias; either through reverse causality or uncontrolled confounding variables.

In this analysis we try to overcome both challenges. First (low prevalence), we show that in most cases the frequency of risky behaviours has increased considerably between age 15 and 19 which makes the empirical study more viable. Furthermore, the use of the last round of data allows us to broaden the scope of risky behaviours observed (at age 19, individuals were asked to report about criminal behaviours in addition to the other risky behaviours collected in previous rounds). Second (potential endogeneity bias), although this paper does not claim any causal relation, we exploit the fact that the data was collected over multiple periods to implement strategies that minimize both sources of endogeneity. To deal with reverse causality, we use lagged values of the psychosocial variables of interest, measured 3 years before the realization of the risky behaviours. To deal with omitted variable bias, we estimate a child fixed effects model, which purges bias due to unobservables that are constant over time.

These are our main findings. First, we find that the prevalence of risky behaviours is evident and increases significantly over time: by age 15, two out of 10 individuals had engaged in at least one risky behaviour, whereas by age 19 one out of two had. By age 19, the prevalence of smoking and drinking is 19 and 34%, respectively; 13% had consumed illegal drugs, 27% had had unprotected sex and 19% had engaged in criminal behaviours.

Second, with the exception of unprotected sex, there is a notorious pro-male bias in the prevalence of most of these behaviours. There are also some differences by area of location, particularly in drinking habits which are more prevalent in urban areas.

Third, and perhaps most importantly, we find a negative correlation between psychosocial competencies and risky behaviours. Keeping everything else constant, an improvement of 1 standard deviation in self-esteem at the age of 15 is associated with a reduction of 7, 6 and 8 percentage points respectively in the probability of smoking, drinking and engaging in violent behaviours while drinking at the age of 19. It is also associated with a reduction in the prevalence of criminal behaviours and in the possession of a weapon by 14 and 5 percentage points, respectively. No similar correlation is found with self-efficacy. These results are robust to a large set of controls at the child and household level, and to community characteristics that are fixed over time. Moreover, child fixed effects estimates show that these associations persist once controlling for time-invariant unobservable characteristics. We note further that early self-esteem, measured at the age of 12 is already a predictor of later drugs consumption, unprotected sex, criminal behaviours and the number of risky behaviours the adolescents engage with at the age of 19.

Finally, we find that aspiring to higher education at the age of 15 reduces the probability of engaging in criminal behaviours at the age of 19 by 23 percentage points. Furthermore, while on average girls are more at risk of unprotected sex, girls aspiring to higher education are less likely to have unprotected sex. Nevertheless, once we control for unobservable individual characteristics the correlation between aspirations and risky behaviours is no longer significant.

The remaining of the paper is structured as the following: Section 2 provides a conceptual framework for our analysis, including key references from the economics literature as well as from the psychological literature; Section 3 documents recent patterns in risky behaviours in Peru using the Demographic and Health Survey; Section 4 describes the data and the core predictors of risky behaviours used in the present analyses together with some statistics on risky behaviours using the Young Lives data; Section 5 discusses the empirical strategy and specifications adopted and finally Sections 6 and 7 report and discuss our findings.

2   Conceptual framework

The traditional economic approach to youth risk taking is, as mentioned, a utility maximization/opportunity-cost approach. Forward-looking individuals pursue a certain activity if the expected benefits of it exceeds the expected costs. One example of model using this approach is the "Theory of Rational Addiction" (TORA) developed by Becker and Murphy (1988). According to the TORA, the utility of an individual depends on the consumption of two goods, c and y. The difference between the two goods is that while the utility generated by the current consumption of y is completely independent of past choices, the present utility derived by the consumption of c depends on the past consumption of c. This is what characterize habits or addiction. In other words, the TORA assumes that instantaneous utility depends on current consumption of the addictive good, the stock of past consumption of the addictive good, and current consumption of all other goods.

Developmental psychology, although not necessarily in contrast to the traditional economic approach, considers a wider variety of factors determining youth decisions to engage in risky behaviours. As Fischhoff (1992) effectively summarizes, according to developmental psychologists, (risk) decision-making depends on three groups of factors: how people 'think' about the world, i.e. their capacity for thinking through problems, examining the alternative available and evaluating their implications ('cognitive' development); how people 'feel' about the world ('affective' development) and the roles that others play in people's choices ('social' development).

In this paper we conceptually integrate the psychology component into a more general economic model of decision making taking the inspiration from behavioural economics (O'Donoghue and Rabin 2001) and the economic literature on skills formation (Cunha and Heckman 2007).

As argued by Borghans et al. (2008a), preferences are central to conventional economic choice models. Agents decide in a decision horizon T the bundle of good to consume based on their preferences and constraints (typically, information constraints and budget constraints). They also acknowledged the role of dynamic constraints connected to asset, skills and traits formation. Their model is consistent with a framework were individual preferences change over time, individual decisions are time inconsistent and

discount rates as well as preferences may vary with 'age, mood, personality traits and cognition'. They argue that cognitive and personality traits can affect consumption choices through different mechanisms including risk aversion, inter-temporal preferences and the valuation of leisure.

Insights from behavioural economics are hugely important to understand why young people might behave differently than adults. Empirical evidence suggests that young people are excessively myopic with respect to the future and therefore are more likely to have inconsistent preferences over time (Gruber and Koszegi 2001; O'Donoghue and Rabin 2001). More specifically, they have the tendency to have a higher discount rate in the short run than in the long run. Young people respond to the uncertainty about the future by reducing the importance of the future, an effect known as hyperbolic discounting. Furthermore, they tend to under-appreciate the effect of changes in their states and the extent to which their preferences may adapt over time. Because of that, they tend to inappropriately project the current preferences onto their future tastes (projection bias) (Loewenstein et al. 2003; O'Donoghue and Rabin 2001). For this reason, random changes to their current states affect their long-run decision making. Also, youth tend to be less risk averse which is consistent with the myopia and hyperbolic discounting features (Gruber and Koszegi 2001; O'Donoghue and Rabin 2001). Moreover, risky decisions are made in uncertain environments and for many risky activities, the cost is one-time and permanent. Uncertainty and one-time cost with longer term implications might increase risk-taking behaviours and a mistake made in the past becomes permanent in its consequences. Finally, younger teens tend to be both more impatient and subject to peer pressure (Lewis 1981).

All these characteristics might help in explaining why risky behaviours are more prevalent among young people. On the other side, there are at least three factors which might counterbalance this: biology, income and law (Gruber 2001). Indeed, some risky activities (e.g. sexual intercourse) become desirable with age (*biology*). Moreover, some illegal activities for younger teens become legal at older ages (e.g. cigarettes consumption is illegal to under 19 in Peru) (*law*). Finally, older teens may have more money available to finance their risky activities (*income*).

2.1 Psychosocial competencies and cognitive skills as predictors of risky behaviours: evidence from policy and research

Many studies in the economic literature find evidence of contemporaneous correlation between different risky behaviours (Chaloupka and Laixuthai 1997; Dee 1999; DiNardo and Lemieux 2001; DuRant et al. 1999; Farrelly et al. 2001; Model 1993; Wiefferink et al. 2006). Those evidence support the 'bad seed' hypothesis, as described by Gruber (2001). The hypothesis is that there is a certain segment of the youth population that is predisposed towards risky activities, while others are not. In that case, policies targeting the segment of population at risk should work effectively. An alternative hypothesis in psychological literature is that there is a certain amount of risk that youths have the tendency to take ('conservation of risk' hypothesis). Reducing risky activity in one area would have a substitution effect by increasing risky activities in another. To date, most intervention programmes have been targeting specific groups of the population considered at risk, mainly by targeting single risk behaviours. Most recently, there are examples of interventions taking a broader approach and target more than one risky behaviour at time.

More specifically, they aim to address some underlying determinants of risky behaviours which are believed to protect young people from, or predispose them to, distinct risky behaviours. Therefore, a better understanding of which childhood traits predict risky behaviours is crucial from a policy perspective.

Empirical evidence suggest that interventions focusing on improving cognitive skills or aimed at improving soft skills are effective in reducing risky behaviours. An example of an intervention aimed at improving opportunities for children coming from poor backgrounds is the well-known Perry Preschool Programme, an intervention targeting a sample of 3–4-year-old African–American children living in poverty and assessed to be at high risk of school failure. Although the literature originally focused on the cognitive impact of the intervention, long-term effects have in fact been more persistent in non-cognitive areas. Heckman et al. (2010) and Conti et al. (2015) show that Perry significantly enhanced adult outcomes including education, employment, earnings, marriage, participation in healthy behaviours, and reduced participation in crime teen pregnancy, and welfare dependency later in life. Interestingly, although the programme initially boosted the IQs of participants, this effect soon faded. A persistent effect of the programme has been found on improvements in personality skills (e.g. it reduces aggressive, antisocial, and rule-breaking behaviours). On the other side, Hill et al. (2011) show that several interventions that focus on personality rather than only on cognitive skills were effective at reducing delinquency and traits related to delinquency.

Few economic papers analyse the role of personality traits and non-cognitive skills on criminal activities, or more generally, risky behaviours. Heckman et al. (2006) find that self-esteem and locus of control measured during adolescence are as powerful as cognitive abilities in predicting adult earnings. Moreover, they find that personality factors for men affect the probability of daily smoking more than cognitive factors and the opposite is true for women. Similarly, Cunha et al. (2010) show that personality traits are relatively more important in predicting criminal activity than cognitive traits are. Further, Conti and Heckman (2010) suggest that personality and health status measured during adolescence explain more than 50% of the difference in poor health, depression and obesity at age 30. For males, personality traits and health endowments are more predictive than cognitive skills while for women they are equally predictive.

The role of self-efficacy and self-esteem as predictors of risky behaviours has been discussed in the psychological literature, particularly its role during the adolescence period. This is because during this stage individuals commonly start experimenting with risky activities (including alcohol abuse, smoking, drug use, and unprotected sex). Bandura et al. (2001) state that perceived self-efficacy (in the areas of academic, social, and self-regulatory efficacy) is important to resist peer pressure for transgressive activities, a view also shared by other authors (e.g. Wills 1994). Empirical evidence shows a negative relationship between self-efficacy and risky or delinquent behaviours, including use of alcohol and drugs, physical and verbal aggression, theft, cheating and lying (Bandura et al. 2001; Bandura et al. 2003). In addition, self-efficacy is thought to be important to change unhealthy behaviours, such as smoking (Schwarzer 2001).

In the case of self-esteem, a negative relationship with risky behaviours is expected (Donnellan et al. 2005). First, people with low self-esteem perceive that they have less social ties (Rosenberg 1965), which in turn decrease conformity to social norms and increase delinquency. Second, it is theorized that aggression and antisocial behaviour

are motivated by feelings of inferiority rooted in early childhood experiences. In addition, it is thought that self-esteem mediates the impact of stress, which is of a subjective nature (Baumeister et al. 2003). People with high self-esteem are likely to experience less stress because they interpret negative events more benignly, are more optimistic about their coping abilities, and perceive they have more control compared to people with low self-esteem.

Notwithstanding these arguments, others have argued that a positive relationship could arise, as noted by Baumeister et al. (2003). While it is true that young people with low self-esteem might be more prone to engage in risky behaviours—for solace when they feel bad about themselves, young people with arguably high self-esteem might have biases in their interpretation of events that allow them to feel better about themselves, either by minimizing their own vulnerability or by distorting how their parent will react. This is likely to be the case in particular for people with unrealistically high self-esteem, close to narcissism (Donnellan et al. 2005).

Baumeister et al. (2003) provide a review of the literature about the role of self-esteem on several life outcomes, including smoking, alcohol and drug abuse, and unprotected sex. They conclude that evidence linking low self-esteem to risky behaviours during the adolescence is mixed and inconclusive, with positive, negative and zero effects found, particularly in the case of alcohol use, whereas in the case of smoking, the relation is mainly negative. On the other hand, Donnellan et al. (2005) use data from three different datasets which strongly support the notion that low self-esteem is related to aggressive behaviour.

An important aspect is whether self-esteem and self-efficacy can be measuring similar dimensions of a person self-concept. In fact, some authors (Dercon and Krishnan 2009; Epstein et al. 2004) suggest that self-efficacy can be treated as a determinant of self-esteem. Wills (1994) shows empirical evidence that supports the notion that self-efficacy might be a more important factor than self-esteem, and suggests that, in absence of a control for self-efficacy, previous studies might have overstated the importance of self-esteem. Overall, what this seems to suggest is that it is important to control for both psychosocial dimensions in order to estimate the individual contribution of each.

At the heart of the traditional opportunity cost approach to risky behaviours and of intertemporal choice models described above, are individual expectations. As mentioned, people make decisions taking into account the present utility, their expectations about future utility. Present-biased time preferences are likely to be more frequent among people who are pessimistic about their future. Consistently with the 'opportunity cost' argument in the risky behaviour literature, if an outcome is perceived as inaccessible, people might believe that they have little to lose by engaging in risky behaviours. There is a considerable body of economic literature investigating the role of aspirations and subjective expectations for contraceptive choices (Delavande 2008), (sexual) risky behaviour (De Paula et al. 2013; Shapira 2013) and non-marital childbearing choices (Wolfe et al. 2007). As Dalton et al. (2016) argue, how far people aspire depends on their own beliefs about what they can achieve with effort, i.e. their own expectations. People would not aspire to an outcome that is perceived as inaccessible. However, given the endogenous nature of aspirations, the empirical distinction between aspirations and expectations is hard to achieve in a non-experimental setting and often aspirations are used interchangeably with expectations.

Finally, the decision making model described above, yields several important implications regarding the role that cognition plays for the probability to engage in risky behaviours. There are a number of mechanisms through with cognitive skills might affect individual decision making, some of which can be amplified by the interaction between cognitive skills and schooling. First, individuals with higher cognitive skills might be more able to access information and more efficient at interpreting it. Second, cognitive skills are likely to shape preferences. As argued by Dohmen et al. (2010), people with better cognition appear to be more patient. They are also more willing to take risks. One potential explanation is that they are better able to envision future consequences and somehow reduce ambiguity about the future. In this sense, increased cognitive ability favourably influences behaviours, particularly when information is limited or idiosyncratic.

Schooling is also considered a protective factor against risky behaviours (see for example Cutler and Lleras-Muney 2010). First, education promotes the accumulation of both cognitive and socio-emotional skills, which affects the way individuals process information and behave. Second, education shapes the nature of the social network available to the individual, which can have either a positive or a negative effect (Behrman 2015; Peters et al. 2010). Third, education might shape time preferences, e.g. because schooling focuses students' attention on the future (Becker and Mulligan 1997; Fuchs 1982). Fourth, people with more education might be better informed about negative health consequences, either because they learned about these consequences in school, or because better educated people find it easier to obtain and evaluate such information (De Walque 2007; Kenkel 1991). Fourth, education could also influence behavior by increasing the opportunity cost of engaging in risky behaviours, i.e. by increasing future income.

2.2   Other predictors of risky behaviours

The importance of family environment is well recognized by developmental research. Numerous studies show that children who grow up in single-parent families are more at risk of engaging in risky behaviours (see for example Evans et al. 1992). Adolescents from intact two-parent families tend delay the start of sexual activity relative to those in disrupted families (see for example Meschke and Silbereisen 1997). Clark and Loheac (2007) examine the consumption of tobacco, alcohol and marijuana in the USA and find that marijuana use is more widespread in single-parent families. They also find that smoking is more frequent amongst recent movers. Migration indeed might be potential source of instability. Gaviria and Raphael (2001) using secondary school data from the USA suggest that recent movers may be more susceptible to peer group pressure, at least with respect to the consumption of marijuana and cocaine.

Similarly, children who have older siblings have a higher probability of engaging in risky behaviours (Averett et al. 2011), and there might be a number of plausible explanations for that. It might be that older siblings affect their younger siblings' behaviours indirectly, by being a role model to them and directly by proving them more opportunities to interact with a different group of older friends. An alternative explanation might be that parents spend less time in supervising their younger offspring (Aizer 2004).

It is worth to highlight that single parenthood as well as some other socio-economic characteristics frequently associated with poverty are some of the stronger predictors of risky behaviours. Risky sexual behaviours are often a manifestation of lack of opportunities, deprivation and poverty. Nevertheless, although risky behaviours are generally

more prevalent in deprived socio-economic contexts, there is no consensus in the literature about the relative importance of different socio-economic indicators as independent determinants of adolescent risky behaviours. Some researchers have argued that parental educational attainment is a stronger predictor than other socio-economic indicators, such as household income or parental occupation (Goodman 1999).

Furthermore, it is not clear through which mechanisms the various indicators of socio-economic status might operate in affecting adolescents' behaviours. Skills and competencies formation might be one of them. For example, it has been observed that scarce family resources are associated with low self-esteem (Amato and Ochiltree 1986) which in turn might be related with a higher risk of engaging in criminal and health-detrimental activities. Also, children who live in single-parent families show more behavioural problems and lower self-confidence (see for example Steinberg 1987).

3   Patterns of risky behaviours in Peru

Information about the prevalence of risky behaviours among the youth population in Peru is scarce. The National Committee for a Life Without Drugs (DEVIDA) provides estimates for the consumption of alcohol, cigarettes and illegal drugs among the population from 12 to 65 years in Lima City—the capital of the country, where about one third of the population reside (DEVIDA 2013). According to DEVIDA, 12% consume cigarettes in the 12–18 age group, and the figure increases to 32% in the 19–29 age group. The prevalence of alcohol consumption increases from 32% at ages 12–18 to 69% at ages 19–29. In terms of gender differentials, there is a clear pro-male bias in the consumption of both cigarettes and alcohol. In the case of illegal drugs the prevalence is much lower, around 3% in both age groups. The main drug consumed is marijuana. In this case, there is also a pro-male bias in consumption.

With respect to the prevalence of unprotected sex, this information can be obtained from the Peru Demographic and Health survey, which contains nationally representative information for women in reproductive age, from 14 to 50 years old. We use this survey to construct indicators of sexual behaviours (ever had a sexual relation and age of first sexual intercourse) and unprotected sex for females. These results are reported in Table 1. To resemble the age periods observed in the Young Lives study, results are reported separately for adolescents aged 15 to 17, and young females aged 18 to 19. We find that the proportion of females that ever had sex increases from 18% at ages 15–17 to 53% at ages 18–19. On the other hand, the proportion of females that did not use a condom during the last intercourse (unprotected sex) is similar for both age groups, approximately two out of ten.

Although the above is useful as a first diagnosis, the data available presents some limitations and concerns for comparability with Young Lives data. First, there is no available

Table 1 Sexual behaviours and unprotected sex among young women in Peru

	Age 15–17		Age 18–19	
	Mean	*n*	Mean	*n*
Ever had sex (in %)	18.0	2800	53.0	1580
Age at first sexual intercourse (in years)	15.0	563	16.5	873
Used condom on last intercourse (in %)	24.0	500	22.0	764

Note: The source is the Peru Demographic and Health Survey from 2014. Results are nationally representative

information about the frequency of the consumption of cigarettes and alcohol. Therefore, it is not possible to determine whether the prevalence of cigarettes and alcohol consumption observed in Lima City corresponds to consumption habits as opposed to occasional consumption. Second, the information related to the consumption of legal and illegal drugs is not collected at the national level and, at best, is only informative of urban areas. Third, the information about sexual risky behaviours is only available for females. Fourth, all the information available was obtained through face-to-face interviews. Therefore, results are likely to be biased, particularly in the case of illegal drug consumption. Finally, there is no information available related to the prevalence of criminal behaviours.

In the next section we present the Young Lives data for Peru and show how this can be used to have a better understanding of the prevalence and the predictors of risky behaviours among the youth population as well as their determinants.

4   Data, definitions and descriptive statistics

4.1   Data

The data used in this paper comes from the Young Lives Panel Survey, a longitudinal study that follows 12,000 children in Ethiopia, India (Andhra Pradesh and Telangana), Peru and Vietnam over 15 years. The sample in each country consists of two cohorts—the older cohort who were born in 1994/95, and the younger cohort who were born in 2001/03. The first wave of the study was in 2002 (round 1), which was then followed by three subsequent rounds in 2006 (round 2), 2009 (round 3) and 2013 (round 4). The attrition rate across all four rounds is relatively low compared to other longitudinal studies, particularly for Peru where the attrition rate is 6.3% for the younger cohort and 10.3% for the older cohort.

The Young Lives sample for Peru gathers information for approximately 700 older cohort children and 2,000 younger cohort children with an over-sampling of poor areas. The original sample was spread over 20 clusters in different geographical regions.[3] More specifically, the 20 clusters were randomly selected from the universe of districts in 2002, excluding the wealthiest 5%. Each district was given a probability of being selected proportional to its population size. Then, within each selected district, an area was randomly selected and families with children aged 6 to 18 months and 7 to 8 years were selected to be part of the younger cohort and older cohort respectively. Although Young Lives is not intended to be nationally representative, it is worth highlighting that because of the sampling procedure used, the Young Lives sample for Peru has been found to optimally reflect the diversity of children and families in Peru, excluding the wealthiest 5%.[4] In the present analysis, we use the older cohort data aged 8 years old in 2002, 15 years old in 2009 and 19 in 2013. For this cohort, data on risky behaviours was collected in both round 3 and 4 (ages 15 and 19).

A key challenge involved in the collection of risky behaviours data is the danger of substantial under-reporting, both due to cultural reasons as well as legal reasons in the case of the consumption of illegal drugs. This problem is particularly acute in face-to-face interviews. Although Young Lives administers face-to-face interviews for both the child and her family, the information on risky behaviours comes from a self-administered questionnaire which includes a set of questions about alcohol, cigarettes and drug consumption together with sexual behaviours, contraceptives use and knowledge about sexual and reproductive health. This questionnaire was applied in Rounds 3 and 4 following a meticulous protocol with the aim of minimizing under-reporting.

The protocol of the self-administered questionnaire, which is typically applied at the end of the visit, is as follows. The interviewer explains to the child that she will be asked a number of questions about aspects that might be considered sensitive, such as consumption of alcohol, cigarettes and even drugs, together with sexual behaviours, contraceptives use and knowledge about sexual and reproductive health. She is told that she is free to choose to complete the questionnaire or not, and she is free to leave questions blank if she wishes to do so. Then the interviewer mentions that all her answers will remain confidential and that, once she completes the questionnaire, he will put the paper in a sealed envelope, and that neither the questionnaire nor the envelope will contain her name, but a code. Once the interviewer gives this information, the child is asked whether she wants to complete the questionnaire. If she agrees, she is left alone for 15 minutes. Finally, once she completes the questionnaire, this questionnaire will be sealed in an envelope with the code that corresponds to the child.

The aim of the protocol previously described is to assure the child that her answers will remain confidential (as it is indeed the case). Following this procedure, the percentage of children that decided to answer the questionnaire was very high. In Round 4, only 3.8% of the sample refused to complete the self-administered questionnaire. From those that agreed to answer, 1.6% left all the self-administered questions blank. Among those that decided to go on, the proportion of missing answers is relatively small, especially for questions related to smoking, drinking, possession of a weapon, and criminal behaviours (1.3% of missing answers in questions related to the consumption of cigarettes; 0.5% for alcohol consumption; up to 1.0% for alcohol consumption and engagement in risky activities; 0.5% for possession of a weapon; and, up to 1.5% for questions related to criminal behaviours).The proportion is slightly larger for sexual relations (4.0% for questions related to use of condoms during last sexual intercourse) and consumption of illegal drugs (up to 5.8%). Although there can be some level of under-reporting hidden in the answers that were left blank, the fact that a small proportion of children answered this way leads us to believe that this is unlikely to cause a meaningful bias in our results, particularly because we do capture a high proportion of adolescents engaged in risky behaviours, as will be shown in the following sections.

4.2   Risky behaviours: definition and statistics using Young Lives data

In this paper we investigate a number of risky behaviours for which information are available at both age 15 and 19. More specifically, we look at smoking participation, alcohol and drug consumption, unprotected sex and weapons possession. More details on the survey questions administered are available in Table 2. In Tables 13 and 14 we report their distribution by age, gender and rural/urban location.

Based on these survey questions, we define seven risky behaviours indicators for the empirical analysis. In the remaining part of this section, we define them and we highlight a number of stylized patterns emerging from our data. In Table 3 we report the prevalence of risky behaviours at the age of 15 and 19, by gender and by rural/urban location alongside tests for statistical significance.

Smoking participation ('smoking' variable) is defined as a dummy variable equal to 1 for those individuals who reported to smoke cigarettes at least once per month. At the age of 19, about 19% of our sample report to be smoking (Table 3). On average they smoke their

Table 2 Definitions of the variables

Variables	Description
Risky behaviours	
Smoking	Dummy variable equal to 1 if she/he is 'smoking at least once a month' (or more frequently), and 0 otherwise. The survey question used is the following: 'How often do you smoke cigarettes now?'.
Drinking	Dummy variable equal to 1 if she/he has been drunk at least once in his/her life, and 0 otherwise. The survey question used is the following: 'Have you ever been drunk from too much alcohol?'.
Drinking & violence	Dummy variable equal to 1 if she/he engaged in risky behaviours (got into fights/caused trouble, felt sick or fell over, have sex) while drinking and 0 otherwise (including also those who never drunk alcohol before). The survey questions used are the following: 'During the past 12 months, how many of these things happened to you because you had been drinking alcohol?' and 'During your life, have you ever been drunk from alcohol while having sex?'.
Drug consumption	Dummy variable equal to 1 if she/he has ever consumed any of the drugs listed before, 0 otherwise:
	'Have you ever tried any of the following drugs?'
	Inhalants (terokal, gasoline, etc), Marijuana, Coca paste - PBC, Cocaine, Ecstasy, Methamphetamines, Hallucinogens (san pedro, ayahuasca, etc), Other drugs (crack, heroin, opium, ketamine, hashish, etc.)
Unprotected sex	Dummy variable equal to 1 if she/he did not use condoms in the last sexual relationship (or she/he used other birth control methods or emergency contraception) and 0 for those who used condom, or never had sex.
	The survey questions used are the following:
	'The last time you had sex, what did you do to prevent getting pregnant or a disease?'
	— We used a condom
	— Drink infusion or mate
	— Use after morning pill
	— Use injections to prevent getting pregnant
	— I don't know if use any method
	— We did not use any method
	— Other method
Criminal behaviour	An index measuring the intensity of criminal behaviour, defined by the sum of the following dummy variables: whether the YL child has carried a weapon in the last 30 days, ever been arrested by the police or taken into custody for an illegal or delinquent offense, ever been a member of a gang, or ever sentenced to spend time in a corrections institution such as a jail/prison/youth institution (juvenile hall, reform school, training school).
Carrying a weapon	Dummy variable equal to 1 if she/he carried a weapon during the last 30 days and 0 otherwise. The survey question used is the following: 'During the last 30 days, on how many days did you carry a weapon such as a knife, machete or gun to be able to protect yourself?'
No. of risky behaviours	An index created to measure the intensity of risky behaviour and equal to the sum of all the dummy variables defined above (smoking, alcohol and drugs consumption, carrying weapons and having unprotected sex).
Child's educational aspirations	'Imagine you had no constraints and could study for as long as you liked, or go back to school if you have already left. What level of formal education would you like to complete?'. Child's educational aspirations are collected at the age of 12, 15 and 18. We define a dummy variable equal to 1 for those children with high aspirations (aspiring to university) and 0 otherwise.
Psychosocial competencies	This is the procedure adopted to compute the self-efficacy and self-esteem indicators: (i) all relevant questions are recoded to be positive outcomes, (ii) relevant questions are all normalized to z-scores (subtract mean and divide by SD) and then (iii) an average of the relevant z-scores is taken across the non-missing values of the questions. All the questions are on Likert-type scales going from 1 to 4 in Round 2 (R2) and from 1 to 5 in Round 3 (R3). The questions differs a little from round to rounds specified below.

Table 2 Definitions of the variables *(Continued)*

Self-efficacy index	If I try hard, I can improve my situation life
	Other people in my family make all the decisions about how I spend my time
	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 future
	I have no choice about the work I do - I must work
Self-esteem index	I feel proud to show my friends or other visitors where I live
	I am ashamed of my clothes
	I feel proud of the job my [caregiver/household head] does
	I am often embarrassed because I do not have the right books, pencils and other equipment for school
	I am proud of my achievements at school
	I am ashamed of my shoes
	I am worried that I don't have the correct uniform
	I am proud of the work I have to do
	I feel my clothing is right for all occasions.
Other controls	
Gender	Dummy variable equal to 1 for boys and 0 for girls
Age	Age in years
Residency - rural	Dummy variable equal to 1 if the child's household resides in rural areas and 0 otherwise
Migration	A dummy variable equal to 1 if he/she migrated between age 15 and 19 and 0 if at age 19 she/he still live in the same community as at age 19.
Wealth index	A composite measure of living standards. The variable takes values between 0 and 1, such that a larger value reflects a wealthier household. The wealth index is the simple average of three sub-indexes: a housing quality index (quality of floor, wall, roof and number of rooms per capita), an access to services index (access to drinking water, electricity, sewage and type of fuel used for cooking) and a consumer durables index (TV, radio, fridge, microwave, computer, etc.). In the analysis we use the wealth index segmented in tertiles: bottom, middle and top tertiles
Parents' education	Father's and mother's education, segmented into three categories for none or primary education (less than grade 8), secondary education (grade 10) and higher education (above grade 10) as their highest level of education completed
Single parent	Dummy variable equal to 0 if she/he is living with both biological parents, and 1 if he/she is living with only one biological parent, the biological parent and his/her partner, or is an orphan
Child has older siblings	A dummy equal to 1 if she/he has older siblings
Number of siblings	Number of siblings
Delayed enrollment	Dummy variable that indicates 1 if the YL child has ever delayed school enrollment and 0 if not
Raven's test score (z-score)	Total number of correct responses in the Raven test, standardized by round
PPVT (z-score)	Standardized score for the Peabody Picture Vocabulary Test by rounds
Math (z-score)	Standardized score for the Maths test by rounds
Enrollment	Dummy variable that indicates 1 if the YL child is enrolled in school or not

first cigarette at the age of 16. Most of them (89%) report to smoke only one cigarette (or less) per day (see Table 13 in the Appendix).

With respect to alcohol consumption, there is a growing public concern about how much alcohol young people are drinking in their teenage years. According to our data, drinking is the activity with the highest prevalence at both age 15 and 19. At the age of 15, about 65% of the sample report that they never drink alcohol and, among those who do, most of them drink exclusively in special occasions or very sporadically. By the age of 19, the number of young people drinking increase tremendously, although most of them do not drink on a regular basis.[5]

Table 3 Risky behaviours by gender and urban/rural at age 15 and 19

	Mean			p value	Mean		p value
	Total	Urban	Rural	t test	Female	Male	t test
Age 15							
Smoking	0.07	0.06	0.08	0.512	0.04	0.09	0.045
Drinking	0.09	0.10	0.05	0.072	0.09	0.08	0.818
Drinking & violence	0.13	0.14	0.10	0.227	0.12	0.13	0.680
Drugs consumption	0.03	0.03	0.01	0.315	0.02	0.03	0.618
Risky sexual behaviour	0.06	0.06	0.05	0.664	0.05	0.06	0.623
Carrying a weapon	0.08	0.07	0.11	0.132	0.07	0.09	0.375
No. of risky behaviours: 0	0.78	0.77	0.80	0.467	0.81	0.75	0.130
No. of risky behaviours: 1	0.16	0.17	0.14	0.458	0.14	0.18	0.294
No. of risky behaviours: 2	0.03	0.04	0.02	0.364	0.03	0.04	0.363
No. of risky behaviours: 3	0.03	0.02	0.04	0.397	0.02	0.03	0.618
Observations	548	406	142		271	277	
Age 19							
Smoking	0.19	0.20	0.18	0.548	0.08	0.29	0.000
Drinking	0.34	0.38	0.24	0.007	0.21	0.45	0.000
Drinking & violence	0.41	0.44	0.30	0.006	0.26	0.53	0.000
Drugs consumption	0.13	0.13	0.14	0.797	0.07	0.19	0.000
Risky sexual behaviour	0.27	0.28	0.24	0.369	0.29	0.26	0.346
Carrying a weapon	0.06	0.06	0.08	0.470	0.05	0.07	0.265
Criminal behaviour	0.20	0.19	0.22	0.701	0.13	0.26	0.010
No. of risky behaviours: 0	0.44	0.43	0.48	0.305	0.57	0.33	0.000
No. of risky behaviours: 1	0.26	0.26	0.27	0.923	0.22	0.30	0.039
No. of risky behaviours: 2	0.17	0.17	0.15	0.559	0.16	0.18	0.602
No. of risky behaviours: 3	0.13	0.14	0.10	0.315	0.05	0.19	0.000
Observations	490	370	120		228	262	

Although the proportion of 19-year-old teenagers who drink regularly is quite low (less than 1% drink alcohol on a daily basis and 3% at least once per week), alcohol consumption increases tremendously between age 15 and 19 as for the number of times they abuse from alcohol consumption. The excessive alcohol consumption not only puts their own health at risk but also makes them more likely to get involved in anti-social behaviours.

We defined two variables for the excess of alcohol consumption: the 'drinking' variable equal to 1 for those adolescents who got drunk at least once in their life (and 0 otherwise) and the 'drinking and violence' variable equal to 1 for those who engaged in risky behaviours (either having sex, engaging in a fight, feeling sick or drunk) while drinking. By the age of 19, about 34% of the sample report of having been drunk and 41% of having engaged in risky behaviours while drinking (Table 3).

With respect to sexual behaviours, about 67% of our sample had sex by the age of 19, on average having the first sexual relation at the age of 16 (see Table 13 in the Appendix). We define a variable to capture those young people at risk of sexual transmitted diseases (STDs).[6] The 'unprotected sex' variable is equal to 1 for those who did not use a condom in the last sexual relationship (including also those who used other birth control methods or emergency contraception) and 0 for those who had protected sex (using condoms) or never had sex.

For drug consumption, we define an indicator to identify those who ever tried any drugs; about 13% by the age of 19.

Similarly, the dummy variable for weapon possession is equal to 1 for those who during the last 30 days carried a weapon at least once.

Overall, looking at the incidence of risky behaviours by age, we notice that risky behaviours increase significantly between the age of 15 and the age of 19, in correspondence with the transition from childhood to adolescence (Table 3). It is worth to note that by the age of 19 male engagement in risky behaviours is about two to three times that of females in smoking, drinking and taking drugs and criminal behaviours. There is also an urban-rural difference in drinking, where adolescents living in urban areas drink more (10% by the age of 15 and 38% by the age of 19) relative to those in rural areas (5% by the age of 15 and 24% by the age of 19) and by the age of 19 are more likely to engage in risky behaviours while drinking.

However, not only the prevalence but also the intensity of risky behaviours increases over time. We define a variable counting the number of risky activities the young people have been involved in by the age of 15 and 19.[7] By the age of 15, about 22% of young people have engaged with at least one risky behaviour. By the age of 19, slightly more than one out of two had engaged in at least one type of risky behaviour, with a distinctive pro-male bias (67% among males, 43% among females). While 26% of the population engaged in only one risky activity, a consistent segment of the youth population (29%), mainly male population, undertakes more than one of these activities.

Our data reports quite a remarkable diffusion of risky behaviours among Peruvian adolescents and a worrisome predisposition towards risky activities for the relevant part of them. Although our data do not provide full support to either the 'bad seed' or the 'conservation of risk' hypothesis, it is worth to note that there is evidence of a certain persistence (or recidivism) in risky behaviours. Those who engage in risky behaviours at the age of 15 are indeed more likely to engage in risky behaviours at the age of 19. The average 'number of risky behaviours' at the age 15 is strongly correlated with the same measured 4 years later (standardized correlation coefficient of 0.6). Recidivism is more evident in some risky behaviours than others, particularly in drug consumption, drinking and smoking. In fact, adolescents who consume drugs at age 15 are 64 percentage points more likely to consume drugs at age 19. Similarly, drinking (smoking) at age 15 increases the probability of smoking (drinking) at age 19 by 38 percentage points (39 percentage points).

In the next section we characterize further who are these young people, what is their history, their past experience, their ability and psycho-social well-being and where do they live using a multivariate approach.

4.3 Psycho-social competencies and cognitive skills in Young Lives data

In this section we briefly define the core predictors of risky behaviours used in the analysis.

As discussed in Section 2, psychosocial competencies have been identified as important factors in predicting risky behaviours. In our data, we capture them through two indicators that have been administered in the last three rounds of the Young Lives survey: the self-esteem scale and the self-efficacy scale. In the Young Lives database, these scales are referred as the pride index and the agency index, respectively. The self-esteem scale builds on the self-esteem concept by Rosenberg (1965). The objective is to measure a child's overall evaluation of his or her own worth. In turn, the self-efficacy scale builds on the concept of locus of control by Rotter (1966) and self-efficacy by Bandura (1993).

In this case, the objective is to measures a child's sense of agency or mastery over his/her own life. Each scale is measured based on respondents' degree of agreement or disagreement with a number of positive and negative statements measured on a 4-point Likert scale (the full list of statements are reported in Table 2). Statements are adapted to measure specific dimensions of the children's living circumstances. In order to calculate each scale, all statements were recoded to be positive outcomes, standardized (normalized to z-scores), and then averaged. The internal consistency of these scales is shown in (Dercon and Krishnan 2009).[8]

Another core predictor for risky behaviours investigated in this analysis is individual aspirations. The measure of aspirations considered in this study reflects a combination of aspirations and beliefs about the likelihood of achieving the aspired outcomes. Specifically, Young Lives collects information about educational aspirations by asking the child the following question: 'Imagine you had no constraints and could study for as long as you liked, or go back to school if you have already left. What level of formal education would you like to complete?'. In this study, we define a dummy variable equal to 1 for individuals with high aspirations, i.e. for those children who aspire to go to university, and 0 otherwise. It is important to note that aspirations are understood to be shaped to a large extent by self-efficacy (Bandura et al. 2001).

Finally, we look at a set of predictors relating to education, namely school enrollment and cognitive development. Related to the latter, we include an indicator of literacy measured by the Peabody Picture Vocabulary Test (PPVT), a test of receptive vocabulary. The task of the test taker is to select the picture that best represents the meaning of a stimulus word presented orally by the examiner. The items used were validated independently for local teams in each country and are age-standardized. The PPVT was administered since round 2, when the children were 8 years old. To measure early age cognitive skills, in round 1 Young Lives administer the Raven test, a widely used test of abstract reasoning and regarded as a non-verbal estimate of fluid intelligence.

Besides the PPVT and the Raven test, a numeracy test was administered. Given that Young Lives is not a school-linked study, numeracy assessments are not aligned with school curricula; however, the contents of the tests could be linked with learning that should be emphasized in schools. In order to account for wide variations in the grade and skill levels of individuals both within and across countries, the tests incorporated questions with differing levels of difficulty: at the basic level the tests included questions assessing basic number identification and quantity discrimination; at the intermediate level, questions on calculation and measurement; and at the advanced level, questions related to problem solving embedded in hypothetical contexts that simulate real-life situations (e.g. tables in newspapers). The numeracy skills indicator used in this analysis is the number of correct answers in the Math test. Notably, the cognitive tests have been collected for all children regardless whether they are attending school or not. This feature of the data avoids any selection problem which commonly arises using school-based data. A validation of the psychomethric properties of the PPVT and Math scores can be found in Cueto and Leon (2012) in and Cueto et al. (2009).

5   Empirical strategy

In this section we define a multivariate set-up, estimating linear probability (OLS) models. Our dependent variables are the risky behaviours as defined in the previous sections.

With the exception of the intensity variable (number of risky behaviours), the dependent variable is a variable equal to 1 if the young person engages in risky behaviours at the age of 19, and 0 otherwise.

First of all, we investigate the predictors of risky behaviours looking at the association between risky behaviours measured at the age of 19 and psychosocial competencies measured at the age of 15, controlling for schooling achievement and a broad set of early (or time-invariant) individual and household-level characteristics as follows:

$$Y_{ij,19} = \beta_0 + \alpha_i + \beta_1 \text{self} - \text{efficacy}_{i,15} + \beta_2 \text{self} - \text{esteem}_{i,15}$$
$$+ X_{i,15}\Gamma + \omega_{ij,19} + \epsilon_{i,19} \tag{1}$$

In this model $Y_{ij,19}$ denotes risky behaviour outcomes of individual i living in the community j observed at age 19; $\text{self} - \text{efficacy}_{i,15}$ and $\text{self} - \text{esteem}_{i,15}$ are measured at the age of 15; $X_{i,15}$ is a vector of pre-determined characteristics of individual i recognized as potential predictors of risky behaviours.[9]

In light of the results of past research, $X_{i,15}$ includes a number of indicators of household socio-economic status; information about family structure (number of siblings, whether he is living only with one biological parent, whether the young person has an older sibling); child demographic characteristics (gender and age at the time of the 2013/14 survey round); a dummy variable equal to 1 whether the child at the age of 19 is living in the same community as when he/she was 15 years old and 0 otherwise; and individual schooling and cognitive skills. The term α_i reflects unobserved individual characteristics that are constant over time. Finally, $\epsilon_{i,19}$ is an idiosyncratic error and we approximate the socio-economic status of the natal household by using mother's education level, an indicator for the rural/urban location where the household resides, and the tercile of wealth index, a composite measure of living standards including housing quality, access to service and a consumer durable index as defined in Table 2.

Finally, we look at a set of predictors relating to education. More specifically we look at school enrolment, delayed enrolment and school achievement. School achievement, measured either by the Raven test score or the Peabody Picture Vocabulary Test (PPVT) and a Math test, can also be considered as a proxy of the child's cognitive skills. Notably, the two tests have been collected for all children regardless whether they are attending school or not. This feature of the data avoids any selection problem which commonly arises using school-based data.

Similarly, we investigate the correlation between educational aspirations measured at the age of 15 and risky behaviours at the age of 19. According to the 'opportunity cost' argument, we would expect to find a negative correlation between aspirations and risky behaviours if the perceived cost of engaging in risky behaviours increases with aspirations. The descriptive statistics presented in Table 4 indeed shows that adolescents engaging in at least one risky behaviour at the age of 19 have lower aspirations than 'not at risk' adolescents.

Given that aspirations is likely to feed into the child's self-efficacy and self-esteem, we estimate a separate model similar to the one discussed above but including a dummy variable equal to 1 for those children that at the age of 15 aspire to complete higher education (university), and 0 otherwise:

$$Y_{ij,19} = \theta_0 + \alpha_i + \theta_1 \text{aspirations}_{i,15} + X_{i,15}\Gamma + \omega_{ij,19} + \epsilon_{i,19} \tag{2}$$

Table 4 Descriptive statistics

	Total		Not at risk		At risk		t test
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	p value
Child is male	0.53	0.500	0.40	0.491	0.63	0.483	0.000
Age in R4	18.41	0.582	18.36	0.540	18.46	0.610	0.052
Mother's education - primary school or none	0.33	0.472	0.32	0.468	0.34	0.476	0.600
Mother's education - secondary school	0.42	0.493	0.40	0.490	0.43	0.496	0.404
Mother's education - higher education	0.16	0.365	0.19	0.391	0.14	0.343	0.114
Descriptives, age 15							
Type site - rural, age 15	0.22	0.418	0.24	0.431	0.21	0.407	0.351
Migrated between 15 and 19	0.08	0.268	0.07	0.254	0.08	0.278	0.535
First tercile of wealth	0.32	0.469	0.30	0.461	0.34	0.475	0.392
Second tercile of wealth	0.34	0.473	0.35	0.477	0.33	0.471	0.711
Third tercile of wealth	0.34	0.474	0.35	0.478	0.33	0.471	0.634
Single parent, age 15	0.26	0.440	0.21	0.406	0.30	0.461	0.016
Child has older siblings	0.35	0.478	0.35	0.478	0.35	0.478	0.974
Number of siblings	1.92	1.281	1.98	1.303	1.87	1.264	0.367
Self-efficacy	0.02	0.521	0.08	0.525	−0.03	0.514	0.015
Self-esteem	0.00	0.594	0.04	0.601	−0.02	0.589	0.229
Child aspirations	0.92	0.26	0.95	0.220	0.90	0.294	0.064
Mother's aspirations	0.93	0.247	0.95	0.210	0.92	0.273	0.125
Child is enrolled	0.94	0.232	0.96	0.189	0.93	0.261	0.085
PPVT (standardized)	−0.02	1.009	0.03	1.015	−0.06	1.005	0.337
Math (standardized)	−0.01	0.998	0.09	1.062	−0.08	0.940	0.069
Observations	490		217		273		
Descriptives, age 12							
Migrated between age 7 and 15	0.13	0.338	0.12	0.323	0.14	0.351	0.393
Self-efficacy	0.01	0.515	0.04	0.468	−0.02	0.549	0.192
Self-esteem	0.04	0.666	0.07	0.641	0.01	0.686	0.264
Child aspirations	0.92	0.272	0.94	0.240	0.90	0.294	0.151
Mother's aspirations	0.95	0.213	0.95	0.223	0.96	0.206	0.672
Raven (standardized)	0.02	1.009	0.05	1.053	−0.01	0.975	0.512
Observations	524		230		294		

In both Eqs. 1 and 2, self-efficacy, self-esteem and aspirations are measured at the age of 15. An empirical question is whether the psychosocial competencies measured at younger ages predict later risky behaviours. Young Lives collect self-efficacy, self-esteem and aspirations at both age 12 and 15 which allow us to look at the long-term association with risky behaviours. We also report results for this long-term specification. In this case, all control variables are either time invariant or measured as early as possible (at age 8). In this case, the Raven score measured at age 8 is used as indicator of school achievement.

Although informative, an estimation of the risky behaviour equations using cross-sectional data would be unbiased only under very strong assumption about the role of unobservable variables. In absence of plausibly exogenous variations in the regressors, their estimation raise endogeneity concerns and might lead to biased interpretations. Therefore, our intention is not to identify causal effects. Rather, the estimated parameters should be interpreted as partial correlations which may be revelatory about potential drivers of risky behaviours at different ages and the channels through which such effects may be mediated.

Further, we exploit the fact that we have repeated measures of risky behaviours and we estimate the outcome of interest using a child fixed effects model, as follows:

$$\triangle Y_{ij,19-15} = \beta_1 \triangle \text{self} - \text{efficacy}_{i,19-15} + \beta_2 \triangle \text{self} - \text{esteem}_{i,19-15}$$
$$+ \triangle X_{i,19-15}\Gamma + \triangle \omega_{ij,19-15} + \triangle \epsilon_{i,19-15} \qquad (3)$$

and similarly,

$$\triangle Y_{ij,19-15} = \theta_1 \triangle \text{aspirations}_{i,19-15}$$
$$+ \triangle X_{i,19-15}\Gamma + \triangle \omega_{ij,19-15} + \triangle \epsilon_{i,19-15} \qquad (4)$$

In this specification, the role of self-efficacy and self-esteem is identified by exploiting changes between ages 12 and 15 that in turn lead to changes in risky behaviours between ages 15 and 19. In doing so, we implicitly assume the relevant coefficients are age-independent. This strategy has the advantage that it controls for individual unobservable characteristics that are constant over time.

6 Understanding risky behaviours

As an initial exploration of factors that might affect the probability of engaging in risky behaviours at the age of 19, we compare the mean characteristics of the predictors listed above for adolescents 'at risk' (engaging in at least one risky behaviour by the age of 19) and adolescents 'not at risk'. All predictors are measured when the adolescent was 12 and 15 years old. These differences are presented in Table 4 alongside tests for statistical significance.

Looking first at the individual characteristics, young people engaging in risky behaviours by the age of 19 are more likely to be boys and slightly older than those who are not at risk. Young people 'at risk' have lower self-efficacy (slightly lower self-esteem) and are less likely to aspire to university at the age of 15. Furthermore, risky behaviours are more prevalent among young people having lower cognitive skills (performing worse in the Math test) and those who have already dropped out of school by the age of 15.

Interestingly, risky behaviours are not necessarily a phenomenon prevalent among young people living in poverty. Indeed, young people living in poverty are as likely as young people living in less poor households to engage in risky behaviours.

Additionally, there is no difference in the prevalence of risky behaviours in rural and urban areas and the level of parental education is the same among young people at risk and not at risk. Notably, risky behaviours are more prevalent in single-parent households.

While the differences in mean characteristics across young people engaging in risky behaviours and their peers are instructive, Sections 6.1 and 6.2 go a step forward in the identification of the potential predictors of young people's engagement in risky behaviours within a multivariate set-up, as described in Section 5.

6.1 Main results

The main results of the analysis are reported in Tables 5 and 6. Outcomes are measured at age 19 whereas, unless otherwise expressed, predictors are measured at age 15. Smoking, drinking and drinking and violence are the outcomes for which the highest proportion of the variance is explained by the selected predictors, with an R-squared of around 20%. In contrast, for drug consumption, unprotected sex and criminal related outcomes between 10 and 13% of the variance is explained.

Table 5 Psychosocial competencies at age 15 on participation in risky behaviours at age 19

	Smoking	Drinking	Drinking & violence	Drugs consumption	Unprotected sex.	Criminal beh.	Carried a weapon	No. of risky beh.
Self-efficacy, age 15	−0.008	−0.041	−0.026	−0.019	−0.027	0.004	−0.022	−0.117
	(0.799)	(0.360)	(0.616)	(0.672)	(0.550)	(0.942)	(0.390)	(0.361)
Self-esteem, age 15	−0.065**	−0.062*	−0.076**	−0.017	−0.020	−0.144*	−0.045**	−0.210**
	(0.011)	(0.063)	(0.023)	(0.532)	(0.648)	(0.060)	(0.019)	(0.015)
Child is male	0.221***	0.225***	0.251***	0.128***	−0.034	0.130***	0.022	0.562***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.455)	(0.004)	(0.235)	(0.000)
Age in R4	0.092***	0.100**	0.099**	0.036	−0.004	−0.004	−0.024	0.201*
	(0.006)	(0.036)	(0.021)	(0.121)	(0.943)	(0.920)	(0.400)	(0.059)
Type site - rural, age 15	−0.079	−0.270***	−0.224**	0.025	0.062	0.123	0.033	−0.228
	(0.408)	(0.000)	(0.010)	(0.703)	(0.389)	(0.236)	(0.375)	(0.220)
Migrated between 15 and 18	0.061	0.137	0.162	0.024	0.132	−0.143	−0.088**	0.265
	(0.422)	(0.117)	(0.115)	(0.763)	(0.170)	(0.303)	(0.024)	(0.350)
Second tercile of wealth, age 15	−0.010	0.079	0.079	−0.007	−0.006	−0.064	−0.005	0.051
	(0.888)	(0.265)	(0.275)	(0.854)	(0.903)	(0.280)	(0.870)	(0.766)
Third tercile of wealth, age 15	−0.097	0.071	0.044	−0.024	0.054	−0.030	−0.027	−0.024
	(0.176)	(0.379)	(0.655)	(0.667)	(0.434)	(0.635)	(0.259)	(0.899)
Mother's education - secondary school	0.040	−0.025	0.029	0.026	0.038	0.003	−0.018	0.062
	(0.317)	(0.547)	(0.516)	(0.471)	(0.459)	(0.929)	(0.489)	(0.521)
Mother's education - higher education	0.059	0.006	0.062	0.039	−0.066	0.093	0.020	0.057
	(0.377)	(0.944)	(0.464)	(0.572)	(0.244)	(0.242)	(0.491)	(0.762)
Single parent, age 15	0.071	0.038	0.089	0.072	0.140***	0.167**	0.047*	0.367**
	(0.285)	(0.490)	(0.113)	(0.197)	(0.006)	(0.024)	(0.099)	(0.021)
Child has older siblings	0.004	0.048	0.057	0.028	−0.037	0.019	0.009	0.051
	(0.903)	(0.281)	(0.157)	(0.429)	(0.267)	(0.800)	(0.676)	(0.604)
Number of siblings, age 15	−0.012	−0.013	−0.004	0.010	0.001	0.048*	0.020	0.006
	(0.384)	(0.462)	(0.858)	(0.300)	(0.964)	(0.069)	(0.137)	(0.854)
Child is enrolled, age 15	−0.072	−0.098	−0.134	0.007	−0.048	−0.269**	−0.049	−0.260
	(0.395)	(0.339)	(0.127)	(0.937)	(0.494)	(0.010)	(0.547)	(0.136)
PPVT z-score, age 15	−0.051*	−0.026	−0.003	−0.045	0.037	−0.024	0.015	−0.069
	(0.063)	(0.551)	(0.926)	(0.188)	(0.254)	(0.667)	(0.375)	(0.478)
Math z-score, age 15	0.009	−0.001	−0.024	−0.015	−0.016	−0.016	−0.020	−0.043
	(0.703)	(0.954)	(0.216)	(0.464)	(0.561)	(0.514)	(0.118)	(0.290)
Number of observations	490	490	490	490	490	490	490	490
R-squared	0.207	0.193	0.195	0.114	0.104	0.130	0.099	0.182

Note: The table reports the estimates of the linear probability model with standard errors (in parentheses) clustered at cluster level. *p<0.1; **p<0.05; ***p<0.01. All controls were included as reported together with dummy variables for the cluster that individuals were recruited in the 2002 round; coefficients for these are not reported

Table 6 Educational Aspirations at age 15 on participation in risky behaviours at age 19

	Smoking	Drinking	Drinking & violence	Drugs consumption	Unprotected sex	Criminal beh.	Carried a weapon	No. of risky beh.
Child aspired for higher education, age 15	−0.090	−0.119	−0.093	−0.123	−0.070	−0.226**	−0.044	−0.447*
	(0.391)	(0.121)	(0.310)	(0.178)	(0.274)	(0.042)	(0.461)	(0.081)
Child is male	0.221***	0.229***	0.254***	0.128***	−0.032	0.128***	0.025	0.571***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.510)	(0.003)	(0.177)	(0.000)
Age in R4	0.091***	0.099**	0.098**	0.035	−0.004	−0.005	−0.025	0.195*
	(0.009)	(0.040)	(0.026)	(0.124)	(0.925)	(0.886)	(0.365)	(0.063)
Type site - rural, age 15	−0.084	−0.277***	−0.229***	0.018	0.058	0.110	0.030	−0.255
	(0.379)	(0.000)	(0.010)	(0.769)	(0.411)	(0.276)	(0.343)	(0.145)
Migrated between 15 and 18	0.070	0.149*	0.173*	0.031	0.138	−0.122	−0.082**	0.305
	(0.308)	(0.077)	(0.078)	(0.668)	(0.139)	(0.314)	(0.038)	(0.226)
Second tercile of wealth, age 15	−0.015	0.073	0.071	−0.008	−0.008	−0.073	−0.011	0.031
	(0.821)	(0.277)	(0.307)	(0.834)	(0.860)	(0.162)	(0.731)	(0.840)
Third tercile of wealth, age 15	−0.106	0.060	0.032	−0.024	0.049	−0.045	−0.036	−0.056
	(0.136)	(0.444)	(0.746)	(0.661)	(0.451)	(0.507)	(0.138)	(0.753)
Mother's education - secondary school	0.037	−0.031	0.022	0.027	0.036	−0.002	−0.023	0.045
	(0.383)	(0.449)	(0.594)	(0.439)	(0.483)	(0.939)	(0.322)	(0.556)
Mother's education - higher education	0.043	−0.010	0.042	0.037	−0.071	0.060	0.008	0.006
	(0.520)	(0.891)	(0.604)	(0.568)	(0.201)	(0.512)	(0.808)	(0.973)
Single parent, age 15	0.068	0.036	0.087	0.070	0.139***	0.161**	0.045	0.358**
	(0.293)	(0.511)	(0.117)	(0.192)	(0.007)	(0.024)	(0.110)	(0.022)
Child has older siblings	−0.001	0.039	0.049	0.026	−0.041	0.009	0.003	0.026
	(0.966)	(0.359)	(0.221)	(0.459)	(0.165)	(0.899)	(0.876)	(0.780)
Number of siblings, age 15	−0.015	−0.017	−0.008	0.008	−0.001	0.041	0.017	−0.007
	(0.284)	(0.345)	(0.709)	(0.402)	(0.949)	(0.107)	(0.209)	(0.834)
Child is enrolled, age 15	−0.042	−0.062	−0.106	0.046	−0.027	−0.192	−0.036	−0.122
	(0.682)	(0.575)	(0.268)	(0.620)	(0.717)	(0.112)	(0.695)	(0.552)
PPVT z-score, age 15	−0.052**	−0.028	−0.007	−0.041	0.036	−0.023	0.011	−0.074
	(0.049)	(0.517)	(0.850)	(0.178)	(0.253)	(0.661)	(0.473)	(0.424)
Math z-score, age 15	0.013	0.001	−0.021	−0.015	−0.016	−0.007	−0.018	−0.036
	(0.543)	(0.946)	(0.304)	(0.457)	(0.575)	(0.757)	(0.160)	(0.374)
Number of observations	490	490	490	490	490	490	490	490
R-squared	0.201	0.188	0.188	0.119	0.104	0.117	0.085	0.174

Note: The table reports the estimates of the linear probability model with standard errors (in parentheses) clustered at cluster level, *p <0.1 **p <0.05 ***p <0.01. All controls were included as reported together with dummy variables for the cluster that individuals were recruited in the 2002 round; coefficients for these are not reported

The four most consistent predictors of risky and criminal behaviours are gender, age, self-esteem and whether the individual comes from a single-parent household. The fact that there are differential patterns by gender and age was already evident in the descriptive statistics. The probability of smoking, drinking and engaging in drinking and violence increases respectively by 22, 23 and 25 percentage points for males compared to females. Similarly, males are 13 percentage points more likely than females of consuming drugs and engaging in criminal behaviours. Although the average age is 19, many individual were aged 18 at the moment of the interview. We find that moving from 18 to 19 years old increases the likelihood of smoking, drinking and drinking and violence by around 10 percentage points in all cases.

Beyond the role of gender and age, our main finding is related to the association between self-esteem and risky and criminal behaviours. Given that the estimation controls for demographic and socio-economic characteristics, as well as for schooling achievement and time-invariant community characteristics, among other aspects, the estimated parameter can be interpreted as a robust association. Keeping other factors constant, a 1 standard deviation increase in self-esteem at age 15 reduces the likelihood of engaging in smoking, drinking, and drinking and violence by 7, 6 and 8 percentage points (respectively); it also reduces the likelihood of criminal behaviours and carrying a weapon by 14 percentage points and 4 percentage points. In contrast, the association with self-efficacy is not statistically significant, though it is interesting to observe that the estimated coefficients have the expected (negative) sign.

About the role of family structure, a specific dimension that plays a role is whether the individual comes from a single-parent household, which increases the likelihood of engaging in risky sex, in criminal behaviours and carrying a weapon by 14, 17 and 5 percentage points, respectively. In addition, the number of siblings is positively associated with criminal behaviours.

It is interesting to observe that living in a rural area reduces drinking by 27 percentage points and drinking and violence by 23 percentage points.

Finally, keeping other factors constant, we find a strong negative association between school enrollment and criminal behaviours. Also, an increase of one standard deviation in the PPVT test is associated with a reduction in smoking of 5 percentage points.

From the factors previously mentioned, gender, age, self-esteem and living in a single-parent household stand out as factors that systematically predict risky and criminal behaviours. These are also the factors that predict the (overall) number of risky behaviours in which the individual has engaged.

Also, it is interesting to observe that psychosocial competences do not play any role in predicting risky sexual behaviours. This is quite surprising given that previous literature suggest self-efficacy (or self-confidence) to be one of the key factors for contraceptive uses and particularly for the use of condom which, particularly for girls, requires negotiating its use with the partner (see for example Salazar et al. 2005).

More generally, unprotected sex is the behaviour for which fewer predictors turn out to be statistically significant (only one, coming from a single-parent household) which suggest that other important predictors might have been neglected. Factors such as being born to a teenage mother, knowledge on sexual and reproductive health, access to contraceptive methods, age of the sexual debut and relationship status are some of the factors commonly correlated with teenage pregnancy and motherhood (see for example

Azevedo et al. 2013; Ermisch and Pevalin 2003). Furthermore, being married or in a stable relationship might influence the decision to use of using contraceptive methods. Nevertheless, these factors have been not included in the analysis mainly for two reasons: first, to preserve comparability across the different risky behaviours considered; second, some of those variables are only collected at Round 4.[10]

In Table 6 we report the results for the risky behaviours models including educational aspirations. Keeping everything else constant, in this model we observe that aspiring for higher education reduced the likelihood of engaging in criminal behaviours by 23 percentage points. Higher aspirations are also negatively correlated with the total number of risky behaviours. The role played by the other predictors (the same as in the previous model) remains very similar. One noticeable difference is that, once aspirations are controlled for, school enrollment does not predict criminal behaviours which suggest that aspirations measured and school enrollment both measured at the age of 15 are strongly correlated.

To further explore the possible differential correlation of psychosocial competencies to risky behaviours by gender, in Tables 7 and 8 we replicate the same results adding an interaction between male gender, self-esteem and self-efficacy, and between male gender and aspirations, respectively. There are two noticeable results: first, while on average boys are more likely than girls to smoke, an increase in boys' self-esteem by one standard deviation reduce boys' probability to smoke by 11 percentage point more than for girls. Second, girls aspiring to higher education are relatively less likely to engage in unprotected sex (by 20 percentage points).

So far we show that psychosocial competencies and aspirations measured at the age of 15 predict many risky behaviours that occur at the age of 19. An empirical questions is whether this correlation is constant over time and psychosocial competencies and aspirations measured earlier in life similarly predict later behaviours.

In Tables 9 and 10 we report the estimates for the risky behaviour model where early psychosocial competencies and aspirations are measured at the age of 12. Analogous to previous results, early self-esteem is negatively correlated with a number of risky behaviours: drinking and engaging in violent behaviours, drugs consumption, unprotected sex, carrying a weapon. Similarly, children aspiring to higher education at the age of 12 are less likely to engage in criminal behaviours and to carry weapons at the age of 19. In both cases, higher self-esteem and aspiring to higher education is negatively correlated with the intensity of engagement in risky behaviours more generally. This seems to suggest that higher self-esteem during childhood and throughout adolescence might play a protective role against risky behaviours later on in life. On the contrary, self-efficacy at the age of 12 (as well as at age 15) is not associated to risky behaviours at age 19.

6.2 Fixed effects estimates

In order to obtain a better identification of the relationship between psychosocial competencies and the outcomes of interest, we report individual fixed effects estimates obtained by differencing risky and criminal behaviours at ages 19 and 15 on differences in psychosocial competencies at ages 15 and 12, as well as on differences in all the other control variables at ages 15 and 12. These results are reported in Tables 11 and 12. For this part of the analysis, the criminal behaviours variable is dropped because it is not observed at age 15. Gender and maternal education do not vary over time and age varies uniformly across all children between survey waves, thus they are also dropped.

Table 7 Psychosocial competencies at age 15 on Risky Behaviours at age 19, with gender interactions

	Smoking	Drinking	Drinking & violence	Drugs consumption	Unprotected sex.	Criminal beh.	Carried a weapon	No. of risky beh.
Self-efficacy, age 15	−0.057	−0.002	0.013	−0.057	−0.066	0.002	−0.042	−0.225
	(0.273)	(0.963)	(0.796)	(0.153)	(0.400)	(0.982)	(0.159)	(0.106)
Self-esteem, age 15	−0.012	−0.053	−0.040	−0.018	−0.026	−0.099*	−0.039*	−0.148
	(0.655)	(0.207)	(0.437)	(0.598)	(0.646)	(0.098)	(0.052)	(0.112)
Male x self-efficacy, age 15	0.085	−0.067	−0.067	0.065	0.067	0.004	0.035	0.185
	(0.339)	(0.319)	(0.284)	(0.364)	(0.519)	(0.967)	(0.349)	(0.429)
Male x self-esteem, age 15	−0.111*	−0.020	−0.076	0.003	0.012	−0.094	−0.012	−0.129
	(0.087)	(0.750)	(0.361)	(0.950)	(0.894)	(0.360)	(0.799)	(0.424)
Child is male	0.218***	0.228***	0.253***	0.125***	−0.037	0.130***	0.021	0.556***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.428)	(0.005)	(0.259)	(0.000)
Age in R4	0.098***	0.098**	0.098**	0.039*	−0.001	−0.002	−0.022	0.212**
	(0.003)	(0.043)	(0.027)	(0.074)	(0.991)	(0.962)	(0.431)	(0.046)
Type site − rural, age 15	−0.066	−0.262***	−0.207**	0.021	0.056	0.138	0.033	−0.218
	(0.505)	(0.000)	(0.023)	(0.749)	(0.469)	(0.165)	(0.348)	(0.260)
Migrated between 15 and 18	0.052	0.133	0.152	0.026	0.136	−0.152	−0.089**	0.258
	(0.503)	(0.141)	(0.157)	(0.739)	(0.154)	(0.274)	(0.017)	(0.366)
Second tercile of wealth, age 15	−0.004	0.081	0.083	−0.008	−0.007	−0.059	−0.005	0.057
	(0.949)	(0.262)	(0.250)	(0.845)	(0.887)	(0.316)	(0.882)	(0.743)
Third tercile of wealth, age 15	−0.086	0.070	0.048	−0.022	0.055	−0.023	−0.025	−0.008
	(0.219)	(0.380)	(0.623)	(0.691)	(0.419)	(0.706)	(0.310)	(0.966)
Mother's education - secondary school	0.039	−0.025	0.028	0.027	0.039	0.002	−0.018	0.061
	(0.332)	(0.539)	(0.525)	(0.465)	(0.462)	(0.960)	(0.486)	(0.524)
Mother's education - higher education	0.059	0.003	0.058	0.041	−0.064	0.091	0.021	0.060
	(0.363)	(0.966)	(0.477)	(0.561)	(0.248)	(0.240)	(0.464)	(0.751)
Single parent, age 15	0.071	0.039	0.090	0.071	0.139***	0.168**	0.047*	0.367**
	(0.284)	(0.492)	(0.114)	(0.190)	(0.007)	(0.024)	(0.098)	(0.021)

Table 7 Psychosocial competencies at age 15 on Risky Behaviours at age 19, with gender interactions (*Continued*)

Child has older siblings	0.004	0.045	0.053	0.030	−0.034	0.016	0.010	0.054
	(0.905)	(0.313)	(0.185)	(0.416)	(0.317)	(0.824)	(0.648)	(0.588)
Number of siblings, age 15	−0.012	−0.013	−0.004	0.010	0.001	0.048*	0.020	0.006
	(0.371)	(0.462)	(0.850)	(0.298)	(0.963)	(0.067)	(0.141)	(0.864)
Child is enrolled, age 15	−0.057	−0.091	−0.117	0.003	−0.054	−0.252**	−0.048	−0.247
	(0.519)	(0.396)	(0.206)	(0.975)	(0.478)	(0.010)	(0.545)	(0.184)
PPVT z-score, age 15	−0.049*	−0.026	−0.004	−0.044	0.038	−0.023	0.015	−0.067
	(0.052)	(0.543)	(0.917)	(0.187)	(0.252)	(0.671)	(0.358)	(0.484)
Math z-score, age 15	0.010	−0.000	−0.023	−0.015	−0.016	−0.015	−0.020	−0.042
	(0.659)	(0.977)	(0.255)	(0.452)	(0.558)	(0.552)	(0.119)	(0.296)
Number of observations	490	490	490	490	490	490	490	490
R-squared	0.214	0.195	0.199	0.117	0.106	0.132	0.100	0.184

Note: The table reports the estimates of the linear probability model with standard errors (in parentheses) clustered at cluster level, *$p < 0.1$ **$p < 0.05$ ***$p < 0.01$. All controls were included as reported together with dummy variables for the cluster that individuals were recruited in the 2002 round; coefficients for these are not reported

Table 8 Educational Aspirations at age 15 on participation in risky behaviours at age 19, with gender interactions

	Smoking	Drinking	Drinking & violence	Drugs consumption	Unprotected sex.	Criminal beh.	Carried a weapon	No. of risky beh.
Child aspired for higher education, age 15	−0.107	−0.175	−0.156	−0.071	−0.201**	−0.287	−0.162	−0.717*
	(0.469)	(0.209)	(0.365)	(0.443)	(0.012)	(0.117)	(0.119)	(0.051)
Male x Child aspired for higher education, age 15	0.030	0.098	0.112	−0.090	0.229	0.107	0.206*	0.473
	(0.868)	(0.616)	(0.618)	(0.436)	(0.122)	(0.594)	(0.070)	(0.298)
Child is male	0.193	0.138	0.150	0.212**	−0.244	0.029	−0.167	0.132
	(0.243)	(0.446)	(0.472)	(0.047)	(0.131)	(0.890)	(0.143)	(0.750)
Age in R4	0.091**	0.098**	0.097**	0.036	−0.006	−0.006	−0.026	0.193*
	(0.010)	(0.042)	(0.028)	(0.121)	(0.904)	(0.877)	(0.354)	(0.071)
Type site - rural, age 15	−0.086	−0.282***	−0.234***	0.022	0.048	0.105	0.021	−0.276
	(0.354)	(0.000)	(0.009)	(0.725)	(0.495)	(0.279)	(0.490)	(0.101)
Migrated between 15 and 18	0.071	0.153*	0.178*	0.027	0.147	−0.118	−0.073*	0.325
	(0.304)	(0.077)	(0.071)	(0.712)	(0.107)	(0.309)	(0.076)	(0.174)
Second tercile of wealth, age 15	−0.014	0.074	0.073	−0.009	−0.005	−0.072	−0.007	0.038
	(0.829)	(0.267)	(0.296)	(0.806)	(0.915)	(0.170)	(0.808)	(0.803)
Third tercile of wealth, age 15	−0.105	0.060	0.033	−0.025	0.050	−0.044	−0.035	−0.054
	(0.139)	(0.442)	(0.743)	(0.654)	(0.438)	(0.514)	(0.144)	(0.762)
Mother's education - secondary school	0.037	−0.031	0.022	0.027	0.036	−0.002	−0.023	0.046
	(0.382)	(0.451)	(0.590)	(0.440)	(0.488)	(0.943)	(0.324)	(0.554)
Mother's education - higher education	0.042	−0.013	0.038	0.039	−0.078	0.057	0.002	−0.008
	(0.525)	(0.863)	(0.640)	(0.538)	(0.157)	(0.543)	(0.950)	(0.964)
Single parent, age 15	0.068	0.036	0.087	0.070	0.138***	0.160**	0.045	0.357**
	(0.292)	(0.509)	(0.115)	(0.195)	(0.008)	(0.023)	(0.125)	(0.021)
Child has older siblings	−0.002	0.037	0.046	0.028	−0.046	0.006	−0.002	0.015
	(0.950)	(0.383)	(0.243)	(0.404)	(0.133)	(0.929)	(0.924)	(0.875)
Number of siblings, age 15	−0.015	−0.017	−0.008	0.008	−0.001	0.041	0.017	−0.007
	(0.285)	(0.337)	(0.707)	(0.399)	(0.955)	(0.105)	(0.198)	(0.836)

Table 8 Educational Aspirations at age 15 on participation in risky behaviours at age 19, with gender interactions (*Continued*)

Chils is enrolled, age 15	−0.042	−0.062	−0.105	0.046	−0.026	−0.192	−0.035	−0.120
	(0.683)	(0.587)	(0.292)	(0.619)	(0.735)	(0.111)	(0.703)	(0.578)
PPVT z-score, age 15	−0.052**	−0.029	−0.008	−0.041	0.035	−0.023	0.010	−0.076
	(0.046)	(0.504)	(0.834)	(0.186)	(0.270)	(0.651)	(0.530)	(0.401)
Math z-score, age 15	0.013	0.001	−0.020	−0.016	−0.015	−0.006	−0.017	−0.033
	(0.527)	(0.920)	(0.327)	(0.448)	(0.606)	(0.775)	(0.203)	(0.406)
Number of observations	490	490	490	490	490	490	490	490
R-squared	0.201	0.188	0.188	0.121	0.108	0.118	0.097	0.177

Note: The table reports the estimates of the linear probability model with standard errors (in parentheses) clustered at cluster level, *$p <0.1$ **$p <0.05$ ***$p <0.01$. All controls were included as reported together with dummy variables for the cluster that individuals were recruited in the 2002 round; coefficients for these are not reported

Table 9 Psychosocial competencies at age 12 on participation in risky behaviour at age 19

	Smoking	Drinking	Drinking & violence	Drugs consumption	Unprotected sex.	Criminal beh.	Carried a weapon	No. of risky beh.
Self-efficacy, age 12	0.033	−0.015	0.023	0.002	0.052	0.027	−0.000	0.072
	(0.142)	(0.579)	(0.470)	(0.946)	(0.117)	(0.170)	(0.998)	(0.219)
Self-esteem, age 12	−0.020	−0.023	−0.057*	−0.055**	−0.076*	−0.038	−0.034*	−0.208***
	(0.514)	(0.385)	(0.084)	(0.012)	(0.061)	(0.153)	(0.051)	(0.005)
Child is male	0.235***	0.246***	0.273***	0.118***	−0.025	0.124***	0.029	0.602***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.567)	(0.008)	(0.156)	(0.000)
Age in R4	0.108***	0.121**	0.114**	0.032	−0.006	0.002	−0.026	0.230**
	(0.001)	(0.010)	(0.011)	(0.232)	(0.884)	(0.952)	(0.261)	(0.029)
Type site - rural, age 7	−0.089***	−0.265***	−0.282***	−0.013	−0.075	−0.059	−0.055	−0.496**
	(0.001)	(0.002)	(0.002)	(0.624)	(0.515)	(0.407)	(0.427)	(0.012)
Migrated between age 7 and 15	0.116**	0.178**	0.179**	0.105***	0.136**	0.091	−0.011	0.523***
	(0.025)	(0.040)	(0.044)	(0.007)	(0.020)	(0.312)	(0.781)	(0.000)
Second tercile of wealth, age 7	0.023	0.123*	0.104	0.011	0.013	−0.003	−0.010	0.159
	(0.650)	(0.064)	(0.117)	(0.760)	(0.787)	(0.967)	(0.770)	(0.190)
Third tercile of wealth, age 7	0.002	0.136**	0.131*	0.068	0.075	−0.036	−0.036	0.245
	(0.981)	(0.015)	(0.060)	(0.281)	(0.207)	(0.648)	(0.301)	(0.122)
Mother's education - secondary school	−0.004	−0.084**	−0.030	0.018	−0.004	−0.035	−0.028	−0.101
	(0.936)	(0.043)	(0.448)	(0.584)	(0.932)	(0.451)	(0.205)	(0.247)
Mother's education - higher education	−0.028	−0.089	−0.051	−0.031	−0.083*	0.019	0.001	−0.230
	(0.692)	(0.277)	(0.598)	(0.633)	(0.095)	(0.838)	(0.984)	(0.254)
Single parent, age 7	0.056	0.007	0.022	0.085	0.080	0.120	0.042	0.271
	(0.317)	(0.869)	(0.642)	(0.104)	(0.146)	(0.179)	(0.197)	(0.124)
Child has older siblings	−0.002	0.018	0.039	0.016	−0.025	0.002	−0.006	0.001
	(0.934)	(0.654)	(0.342)	(0.657)	(0.387)	(0.972)	(0.712)	(0.994)
Number of siblings, age 7	−0.014	−0.022	−0.029*	0.001	−0.002	0.029	0.010	−0.026
	(0.183)	(0.154)	(0.053)	(0.900)	(0.872)	(0.165)	(0.397)	(0.352)
Standardized values of (raven)	−0.010	0.001	−0.006	−0.012	0.006	0.026	0.002	−0.014
	(0.456)	(0.966)	(0.700)	(0.473)	(0.783)	(0.325)	(0.885)	(0.701)
Number of observations	524	524	524	524	524	524	524	524
R-squared	0.175	0.189	0.195	0.099	0.108	0.067	0.074	0.179

Note: The table reports the estimates of the linear probability model with standard errors (in parentheses) clustered at cluster level, * $p <0.1$ ** $p <0.05$ *** $p <0.01$. All controls were included as reported together with dummy variables for the cluster that individuals were recruited in the 2002 round; coefficients for these are not reported

Table 10 Child's educational aspirations at age 12 on participation in risky behaviour at age 19

	Smoking	Drinking	Drinking & violence	Drugs consumption	Unprotected sex	Criminal beh.	Carried a weapon	No. of risky beh.
Child aspired for higher education, age 12	−0.118	−0.031	−0.018	−0.112	0.034	−0.315**	−0.160**	−0.387*
	(0.105)	(0.469)	(0.723)	(0.127)	(0.671)	(0.013)	(0.011)	(0.050)
Child is male	0.229***	0.244***	0.268***	0.112***	−0.032	0.112***	0.023	0.575***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.486)	(0.009)	(0.208)	(0.000)
Age in R4	0.106***	0.120**	0.110**	0.029	−0.014	−0.000	−0.027	0.215**
	(0.002)	(0.010)	(0.013)	(0.280)	(0.760)	(0.996)	(0.206)	(0.048)
Type site - rural, age 8	−0.099***	−0.272***	−0.301***	−0.032*	−0.101	−0.078	−0.069	−0.574***
	(0.000)	(0.001)	(0.000)	(0.070)	(0.343)	(0.249)	(0.259)	(0.000)
Migrated between age 8 and 15	0.121**	0.177**	0.181**	0.107***	0.140**	0.098	−0.009	0.536***
	(0.014)	(0.039)	(0.043)	(0.002)	(0.013)	(0.294)	(0.845)	(0.000)
Second tercile of wealth, age 8	0.031	0.125*	0.101	0.018	0.003	0.023	0.003	0.180
	(0.536)	(0.058)	(0.123)	(0.658)	(0.940)	(0.738)	(0.939)	(0.141)
Third tercile of wealth, age 8	0.009	0.138**	0.129*	0.074	0.066	−0.013	−0.025	0.262*
	(0.893)	(0.012)	(0.057)	(0.234)	(0.260)	(0.868)	(0.455)	(0.085)
Mother's education - secondary school	−0.005	−0.085**	−0.033	0.016	−0.008	−0.037	−0.030	−0.112
	(0.911)	(0.038)	(0.409)	(0.649)	(0.871)	(0.367)	(0.109)	(0.197)
Mother's education - higher education	−0.032	−0.091	−0.059	−0.037	−0.096*	0.014	−0.003	−0.260
	(0.661)	(0.266)	(0.544)	(0.544)	(0.055)	(0.884)	(0.930)	(0.209)
Single parent, age 8	0.048	0.005	0.023	0.079	0.086	0.098	0.031	0.250
	(0.361)	(0.898)	(0.616)	(0.132)	(0.101)	(0.245)	(0.304)	(0.132)
Child has older siblings	−0.005	0.018	0.035	0.013	−0.030	−0.002	−0.008	−0.012
	(0.853)	(0.656)	(0.372)	(0.705)	(0.280)	(0.977)	(0.586)	(0.878)
Number of siblings, age 8	−0.013	−0.021	−0.026*	0.003	0.002	0.029	0.011	−0.018
	(0.183)	(0.179)	(0.090)	(0.698)	(0.879)	(0.161)	(0.381)	(0.544)
Standardized values of (raven), age 8	−0.007	−0.001	−0.005	−0.012	0.008	0.030	0.003	−0.009
	(0.592)	(0.968)	(0.763)	(0.471)	(0.708)	(0.282)	(0.842)	(0.788)
Number of observations	524	524	524	524	524	524	524	524
R-squared	0.178	0.188	0.190	0.098	0.097	0.088	0.099	0.176

Note: The table reports the estimates of the linear probability model with standard errors (in parentheses) clustered at cluster level, *p <0.1 **p <0.05 ***p <0.01. All controls were included as reported together with dummy variables for the cluster that individuals were recruited in the 2002 round; coefficients for these are not reported

Table 11 Fixed effects estimation of psychosocial competencies on participation in risky behaviours at age 19

	Smoking	Drinking	Drinking & violence	Drugs consumption	Unprotected sex.	Carried a weapon	No. of risky beh.
Self-efficacy	−0.030	0.027	0.042	0.015	−0.026	−0.053**	−0.068
	(0.422)	(0.480)	(0.263)	(0.606)	(0.467)	(0.045)	(0.456)
Self-esteem	−0.048*	−0.096***	−0.090**	−0.010	0.009	−0.030	−0.174**
	(0.074)	(0.003)	(0.012)	(0.696)	(0.793)	(0.204)	(0.024)
Type site - rural	−0.259***	−0.581***	−0.718***	−0.246***	−0.338***	0.034	−1.391***
	(0.002)	(0.000)	(0.000)	(0.000)	(0.001)	(0.578)	(0.000)
Migrated between rounds	0.150**	0.276***	0.359***	0.096*	0.131	−0.038	0.616***
	(0.022)	(0.000)	(0.000)	(0.059)	(0.107)	(0.503)	(0.001)
Wealth tercile : middle	−0.047	0.050	0.012	−0.023	0.048	0.018	0.046
	(0.410)	(0.410)	(0.853)	(0.465)	(0.450)	(0.659)	(0.735)
Wealth tercile: top	−0.132*	0.085	0.012	−0.087**	0.022	−0.007	−0.120
	(0.057)	(0.280)	(0.887)	(0.044)	(0.791)	(0.888)	(0.488)
Single parent	0.079	0.139	0.193**	0.044	0.133*	0.029	0.424**
	(0.264)	(0.111)	(0.025)	(0.277)	(0.092)	(0.261)	(0.018)
Number of siblings	−0.011	−0.011	−0.009	0.002	−0.043*	0.000	−0.063
	(0.547)	(0.610)	(0.708)	(0.910)	(0.064)	(0.972)	(0.250)
Child is enrolled	−0.095	−0.210**	−0.160	−0.148*	−0.256**	0.110	−0.598***
	(0.222)	(0.046)	(0.157)	(0.086)	(0.013)	(0.231)	(0.006)
PPVT z-score	−0.029	−0.087***	−0.049	−0.049***	0.000	0.000	−0.166**
	(0.247)	(0.007)	(0.179)	(0.009)	(0.999)	(0.983)	(0.015)
Math z-score	−0.028	−0.068**	−0.071**	0.018	−0.028	−0.020	−0.127*
	(0.276)	(0.015)	(0.016)	(0.376)	(0.342)	(0.269)	(0.071)
Number of observations	872	872	872	872	872	872	872
R-squared	0.064	0.139	0.156	0.074	0.097	0.033	0.168

Note: The table reports the estimates for the individual fixed effects model, *p <0.1 **p <0.05 ***p <0.01. All controls were included as reported

Table 12 Fixed effects estimation of educational aspirations on participation in risky behaviours at age 19

	Smoking	Drinking	Drinking & violence	Drugs consumption	Unprotected sex.	Carried a weapon	No. of risky beh.
Child aspired for higher education	0.071	0.060	0.041	0.028	−0.035	0.035	0.160
	(0.367)	(0.459)	(0.641)	(0.682)	(0.629)	(0.598)	(0.431)
Type site - rural	−0.237***	−0.527***	−0.665***	−0.235***	−0.352***	0.040	−1.312***
	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.520)	(0.000)
Migrated between rounds	0.141**	0.248***	0.331***	0.091*	0.138*	−0.038	0.579***
	(0.025)	(0.002)	(0.000)	(0.068)	(0.090)	(0.501)	(0.003)
Wealth tercile : middle	−0.059	0.032	−0.004	−0.024	0.048	0.008	0.005
	(0.308)	(0.606)	(0.952)	(0.461)	(0.455)	(0.848)	(0.972)
Wealth tercile: top	−0.145**	0.070	0.001	−0.089**	0.024	−0.017	−0.157
	(0.038)	(0.379)	(0.995)	(0.046)	(0.779)	(0.749)	(0.379)
Single parent	0.073	0.135	0.191**	0.044	0.133*	0.023	0.409**
	(0.314)	(0.124)	(0.026)	(0.275)	(0.090)	(0.354)	(0.023)
Number of siblings	−0.012	−0.013	−0.011	0.001	−0.042*	0.000	−0.065
	(0.519)	(0.538)	(0.640)	(0.936)	(0.069)	(0.974)	(0.227)
Child is enrolled	−0.128	−0.229**	−0.170	−0.151*	−0.255**	0.081	−0.682***
	(0.116)	(0.045)	(0.171)	(0.079)	(0.013)	(0.386)	(0.004)
PPVT z-score	−0.026	−0.088***	−0.050	−0.051***	0.003	0.005	−0.157**
	(0.307)	(0.006)	(0.157)	(0.005)	(0.935)	(0.789)	(0.019)
Math z-score	−0.021	−0.058**	−0.062**	0.019	−0.029	−0.015	−0.104
	(0.399)	(0.045)	(0.037)	(0.346)	(0.324)	(0.400)	(0.138)
Number of observations	872	872	872	872	872	872	872
R-squared	0.055	0.123	0.141	0.074	0.096	0.011	0.156

Note: The table reports the estimates for the individual fixed effects model, *p <0.1 **p <0.05 ***p <0.01. All controls were included as reported

In Table 11, we report the results for the individual fixed effects estimates using self-esteem and self-efficacy as predictors of risky behaviours. The results are qualitatively similar to the ones discussed above. An increase in self-esteem is negatively correlated to the the prevalence of risky behaviours over time. More specifically, one standard deviation increase in self-esteem reduces smoking, drinking and engaging in drinking and violence by 5, 10 and 9 percentage points respectively; it does not predict the likelihood of carrying a weapon, but the point estimate is very similar (3 percentage points). In contrast to the results in the previous model, self-efficacy is predictive of carrying a weapon. One standard deviation increase in self-efficacy reduces the probability of carrying a weapon by 5 percentage points. Besides this, in this set of estimations schooling achievement is found to play a more prominent role. School enrollment reduces the likelihood of drinking, drugs consumption, and risky sex. A similar role is played by vocabulary and math achievement. In addition, coming from a single-parent household, area of location and migration remain as important predictors of risky behaviours.

In Table 11, we report the results for the individual fixed effect model including aspirations among the predictors. However, in this case we are not able to detect a relationship between aspirations and the outcomes of interest.

To summarize, the fixed effects estimates show that the relationship between self-esteem and risky behaviours is very robust, whereas the relationship between self-efficacy, aspirations and risky behaviours is not. In addition, there seems to be a lot of meaningful variation over time in the control variables, which allows us to show that coming from a single-parent household, area of location, migration and schooling achievement are also important factors that play a role in the determination of risky and criminal behaviours.

7 Conclusions and discussion

There is a growing concern about the prevalence of risky behaviours among the youth population, which ultimately leads to worse outcomes later in life, including lower salaries and worse socio-economic and life outcomes. On the other hand, there is little evidence about the prevalence of these behaviours and their determinants in the context of developing countries. Our aim is to try to fill this gap using a unique individual-level panel data from Peru following a cohort of children for over a decade between the ages of 8 and 19.

We constructed indicators to measure the prevalence of smoking and drinking; engaging in risky behaviours when drunk; consumption of illegal drugs; unprotected sex; criminal behaviours; possession of weapons; and total number of risky behaviours. While we do not claim any causal relation, the methods used allow us to deal with bias arising from reverse causality and omitted variables that are constant over time.

From this analysis we identify a number of drivers of risky behaviours. In particular, there is a specific group of the youth at risk; boys, living in urban areas and growing up in single-parents households. In the case of girls, they are more likely to be exposed to unprotected sex. Although these groups are identified for the Peruvian context, similar patterns are likely to be observed in countries with similar characteristics (middle-income countries with relatively high levels of poverty and low levels of secondary school attainment).

We also observe a dramatic increases in risky behaviours between age 15 and 19 which suggests that policy interventions aiming at preventing risky behaviour should be put

in place at age 15 or earlier, when risky behaviours only manifest in a small part of the population.

Although the present analysis is not sufficient to claim any causal relation between socio-emotional competencies and risky behaviours provides some interesting hints. Our results suggest that psychosocial competencies, and self-esteem and high aspirations in particular, might play a role in reducing risky behaviours.This connects well with evidence from the psychological literature that finds a similar relationship in developed countries. To our knowledge this evidence is unique in the developing countries context, and provides an important message: policies aimed at promoting soft skills during childhood and adolescence can play an important role as a mechanism to reduce risky and criminal activities among the youth.

From a policy perspective, considering the age range analysed as well as the fact that, by age 15, most Peruvian adolescents are still attending school, we argue that it is worth to explore whether interventions designed to take place at secondary-level schools can reduce the engagement of adolescents in risky behaviours.

In terms of more comprehensive interventions, the Minister of Education in Peru is currently implementing an Extended School Day Program (*Jornada Escolar Completa*, JEC). This initiative seeks both to extend the length of the school-day and to provide better services to students at the secondary level in urban areas.

Theoretically, JEC and similar initiatives can have direct as well as indirect effects on the prevalence of risky behaviours. First of all, longer school hours implies that students spend a greater number of hours per day under adult supervision, limiting the possibility to engage in risky behaviours (Bellei 2009; Aguero and Beleche 2013). Further, inasmuch as extended school days have been found to improve academic achievement in middle-income countries, this type of programme can be expected to reduce the prevalence of risky behaviours by increasing the opportunity cost of engaging in them (indirect effect).

Finally, as part of the JEC programme in Peru a full-time psychologist has been incorporated into every JEC school to improve students' psycho-social well-being. Our results suggest improving psychological competencies might be an additional mechanisms through which the JEC might reduce the prevalence of risky behaviours.

Similar programme are currently being implemented in the Latin American region (in Chile, Colombia, Mexico and Uruguay). In the case of Chile, a nation-wide education reform extended the school day from 32 to 39 hours per week. Berthelon and Kruger (2011) find teens living in municipalities with greater access to full-day high schools had a lower probability of becoming mothers during their adolescence. An increase of 20 percentage points in the municipal share of full-day high schools reduces the probability of motherhood in adolescence by 3.3%. This encouraging findings from Chile suggests that it is worthwhile to explore the potential effects of this type of reforms and risky behaviours. Further research on JEC in Peru and its effect on risky behaviours will be done using the next round of data.

Endnotes

[1] There is an ongoing debate, and little agreement, on how to refer to those skills which represent the "patterns of thought, feelings and behaviour" Borghans et al. (2008b) and that encompass those traits that are not directly represented by cognitive skills or by formal conceptual understanding. The current list includes such terms as behavioural

skills, soft skills, personality traits, non-cognitive skills or abilities, character, life-skills, socio-emotional and psychosocial skills or competencies. In this paper, we use the term "soft skills" and "psychosocial competencies" interchangeably.

[2] It is important to note that information about cognitive and psychosocial competencies are collected for all children regardless of their school enrollment status which avoids any selection problem commonly arising using school-based tests.

[3] These include 3 clusters in the department of Lima, and 17 in Amazonas, Ancash, Apurimac, Arequipa, Ayacucho, Cajamarca, Huanuco, Junin, La Libertad, Piura, Puno, San Martin and Tumbes.

[4] For more details about the sampling design see (Escobal and Flores 2008).

[5] In other words they could be defined as "social drinkers". "Social drinking" refers to casual drinking in a social setting without necessarily an intent to get drunk.

[6] Unfortunately, Young Lives collects information only about the use of contraceptive methods in the last sexual relationship.

[7] The intensity variable includes all the risky behaviours variables as defined above. With respect to alcohol consumption we include the "drinking" variable only.

[8] It is worth noting that the correlation between these scales is 0.25. This suggests that the two scales capture different dimensions of the child.

[9] Table 2 documents the indicators used in the analysis, and their definitions or procedure of computation.

[10] It is important to note that including a dummy for marital/cohabiting status and an indicator for the child's knowledge about sexual reproductive the estimated coefficients for self-efficacy and self-esteem do not qualitatively change. however, the inclusion of those variables improve the statistical fit of our model and the R-squared increases from 0.09 to 0.16.

Appendix

Table 13 Consumption of cigarettes, alcohols and drugs

	Age 15		Age 19	
	%	n	%	n
Alcohol consumption				
How often do you drink alcohol?				
Everyday	0.5	3	0.7	4
At least once a week	1.6	10	3.0	18
At least once a month	3.6	23	5.9	35
Only on special occasions	16.2	104	31.8	190
Hardly ever	13.1	84	29.1	174
I never drink alcohol	65.1	417	29.6	177
How much do you usually drink per day?				
I never drink alcohol	69.5	417	35.5	177
1 cup/glass or less	18.3	152	28.8	213
2 cups/glasses	6.5	38	13.2	76
3 cups/glasses or more	5.7	34	22.6	132
Have you ever been drunk for too much alcohol?				
Yes	11.5	68	35.2	211
No	88.5	522	64.8	388

Table 13 Consumption of cigarettes, alcohols and drugs *(Continued)*

Cigarettes consumption				
How old were you when you tried a cigarette for the first time?				
Average age	NA		16.0	
How often do you smoke cigarettes now?				
Everyday	0.6	4	1.0	6
At least once a week	3.0	19	6.8	40
At least once a month	3.7	24	12.2	72
Hardly ever	14.0	90	27.1	160
I never smoke cigarettes	78.7	505	53.0	313
How many cigarettes do you usually smoke per day?				
I never smoke cigarettes	78.7	505	67.3	313
1 cigarette or less per day	18.5	119	27.1	248
2 to 5 cigarettes per day	2.3	15	5.0	27
6 or more per day	0.5	3	0.5	3
Drugs consumption				
Have you ever tried drugs?				
Yes	3.1	20	14.2	84
No	96.7	617	85.8	508
Sexual behaviours				
How old were you when you had sex for the first time?				
Average age	NA			16
Ever had sex?				
Yes	19.4	109	67.2	391
No	80.6	453	32.8	191
Used condom on last sexual relation				
Yes	12.6	71	40.5	236
No	6.8	38	26.5	155
Never had sex	80.6	453	32.8	191
Criminal behaviours				
During the last 30 days, on how many days did you carry a weapon?				
Never	91.9	588	3.2	567
1 day	5.6	36	0.7	19
2 to 3 days	0.8	5	1.5	4
More than 4 days	1.7	11	94.7	9
Have you ever been member of a gang?				
Yes		NA	5.5	33
No		NA	94.5	565
Have you ever been arrested by the police for illegal behaviour?				
Yes		NA	5.8	35
No		NA	94.2	567
Have you ever been sentenced to spend time in a corrections institution?				
Yes		NA	6.7	10
No		NA	93.4	591

Table 14 Consumption of cigarettes, alcohols and drugs at Age 18 by gender and location

	Female		Male			Urban		Rural		
	%	n	%	n	test	%	n	%	n	test
Alcohol consumption										
How often do you drink alcohol?										
Everyday	0.4	1	0.7	2	−0.3	0.5	2	0.7	1	−0.3
At least once a week	0.8	2	5.3	16	−4.5***	3.9	17	0.7	1	3.1*
At least once a month	3.3	9	7.9	24	−4.6**	5.7	25	5.8	8	−0.1
Only on special occasions	30.6	83	32.9	100	−2.3	33.5	148	26.8	37	6.7
Hardly ever	24.0	65	34.5	105	−10.55***	30.8	136	25.4	35	5.4
I never drink alcohol	41.0	111	18.8	57	22.21***	25.8	114	40.6	56	−14.8***
How much do you usually drink per day?										
I never drink alcohol	41.0	111	18.8	57	22.21***	31.2	114	46.3	56	−14.8***
1 cup/glass or less	38.4	104	32.9	100	5.48	29.5	160	27.2	46	2.87
2 cups/glasses 60	8.9	24	16.5	50	−7.59***	14.2	60	10.3	14	3.43
3 cups/glasses or more	11.8	32	31.9	97	−20.10***	25.1	108	16.2	22	8.49**
Have you ever been drunk for too much alcohol?										
Yes	22.4	60	44.4	134	−22.0***	37.7	165	22.6	31	15.0***
No	77.6	208	55.6	168		62.3	273	77.4	106	
Cigarettes consumption										
How old were you when you tried a cigarette for the first time?										
Average age	16.1		16.0			14.1		16.5		
How often do you smoke cigarettes now?										
Everyday	0.7	2	1.3	4	−0.6	1.4	6	0.0	0	1.4
At least once a week	2.6	7	10.7	32	−8.1***	7.5	33	5.1	7	2.4
At least once a month	4.4	12	18.4	55	−14.0***	11.6	51	11.7	16	−0.0
Hardly ever	18.8	51	35.1	105	−16.3***	27.2	119	28.5	39	−1.3
I never smoke cigarettes	73.4	199	34.5	103	39.0***	52.3	229	54.7	75	−2.5
How many cigarettes do you usually smoke per day?										
I never smoke cigarettes	73.4	199	34.4	103	39.0***	52.3	229	54.7	75	−2.5
1 cigarette or less per day	25.1	68	57.5	172	−32.4***	42.0	184	42.3	58	−0.3
2 to 5 cigarettes per day	1.5	4	7.0	21	−5.6***	5.3	23	2.2	3	3.6
6 or more per day	0.0	0	1.0	3	−1.0*	0.5	2	0.7	1	−0.3

Table 14 Consumption of cigarettes, alcohols and drugs at Age 18 by gender and location (*Continued*)

Drugs consumption										
Have you ever tried drugs?										
Yes	7.6	20	18.8	57	−11.23***	14.0	61	12.4	17	1.6
No	92.4	244	81.2	246		86.0	374	87.6	120	
Sexual behaviours										
How old were you when you had sex for the first time?										
Average age	16.6		16.0			16.1		16.5		
Ever had sex?										
Yes	55.1	146	78.8	231	−23.7***	66.7	288	70.2	92	−3.56
No	44.9	119	21.2	62		33.3	144	29.8	39	
Used condom on last sexual relation										
Yes	24.2	64	55.6	163	−31.5 ***	39.8	172	43.5	57	−3.7
No	30.9	82	23.2	68	7.7 **	26.9	116	26.7	35	0.1
Never had sex	44.9	119	21.2	62	23.7 ***	33.3	144	29.8	39	3.6
Criminal behaviours										
During the last 30 days, on how many days did you carry a weapon?										
Never	96.0	262	93.7	284	2.2	95.3	422	93.5	129	1.8
1 day	2.2	6	4.0	12	−1.8	3.2	14	2.9	4	0.3
2 to 3 days	0.8	2	0.7	2	0.1	0.5	2	1.5	2	−1.0
More than 4 days	1.1	3	1.7	5	0.6	1.1	5	2.2	3	−1.0
Have you ever been member of a gang?										
Yes	2.9	8	7.6	23	−4.7**	5.9	26	3.6	5	2.3
No	97.1	264	92.4	280		94.1	416	96.4	133	
Have you ever been arrested by the police for illegal behaviour?										
Yes	2.6	7	8.2	25	−5.6***	5.4	24	5.8	8	−0.4
No	97.4	267	91.8	280		94.6	421	94.2	131	
Have you ever been sentenced to spend time in a corrections institution?										
Yes	4.0	11	8.5	26	−4.5**	5.9	26	7.9	11	−2.1
No	96.0	262	91.5	279		94.1	418	92.1	128	

Abbreviations
DEVIDA: The national committee for a life without drugs; JEC: Extended school day programme (*Jornada Escolar completa*); OLS: Ordinary least squares; PPVT: Peabody picture vocabulary test; R2: Round 2; R3: Round 3; R4: Round 4; STDs: Sexual transmitted disesases; TORA: Theory of rational addiction; US: United States

Competing interests
The IZA Journal of Labor & Development is committed to the IZA Guiding Principles of Research Integrity. The authors declare that they have observed these principles.

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