Non-cognitive skills and the transition to adulthood for Australian youth

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Abstract

The determinants of successful transitions to adulthood are complex and not fully explained by cognitive skills. This study examines locus of control, a key "non-cognitive skill," measuring the extent to which a person believes their actions affect their outcomes. We use longitudinal data from the Australian Youth in Focus survey to first investigate how family socio-economic status, income support history, and volatility over the life course relate to level and change in locus of control. Second, we assess the extent to which locus of control predicts education and employment transitions and whether locus of control matters differently for advantaged versus disadvantaged youth. The results show that locus of control is shaped by parents' own locus of control, parental involvement during childhood, and childhood life events, but not family income support history. There is some evidence that locus of control among young people has an influence on education and employment and that this relationship may be particularly important for economically disadvantaged youth's decisions to enrol in University.

Introduction

The determinants of successful transitions to adulthood are of scientific and public policy interest, particularly for disadvantaged youth who are more likely than their peers from privileged backgrounds to be at risk of failure in their pathways to independence. Evidence clearly confirms that education (for example, high school completion and tertiary education attainment) is a major factor for lifting individuals' labour market outcomes and it largely explains the movement out of poverty for youth from low-income families. Yet, it is not fully understood, beyond background characteristics and cognitive skills, why certain young people terminate their schooling early, while others strive to obtain university degrees.

Focusing on Australian youth, and using a brand-new data set uniquely suited to addressing this question (the Australian Youth in Focus Survey), this paper examines whether locus of control, a key "non-cognitive skill," plays a role in the transition to adulthood in the realms of education and employment. Specifically, this paper aims to show whether, and in what ways, non-cognitive skills shape the transition to adulthood in terms of educational achievement, intention for further studies, and full engagement in either education and/or employment. We also investigate whether such associations differ for young people from economically advantaged and disadvantaged backgrounds. In brief, our findings show that locus of control is shaped by parental influence, childhood experience and life events, but not family welfare receipt. There is some evidence that locus of control among young people has an influence on education and employment and that this relationship may be particularly important for economically disadvantaged youth's decisions to enrol in University.

The remainder of the paper is organized as follows: Section 1 briefly reviews the relevant literature describing the associations between non-cognitive skills and human capital investments. Section 2 describes our data and analytic approach. Section 3 presents the results and Section 4 concludes.

1. Background

A growing body of research is focused on the effects of "non-cognitive skills" in human capital investments, labour market outcomes, and social behaviour (Andrisani, 1977; Coleman & DeLeire, 2003; Cuhna & Heckman, 2007; Duckworth & Seligman, 2005; Duncan & Dunifon, 1998; Goldsmith, Veum, & Darity, 1997; Heckman, Stixrud, & Urzua, 2006; Kalil & Kunz, 1999; Menaghan, 1990; Wang, Kick, Fraser, & Burns, 1999). Although there is far from universal consensus on what constitutes a "non-cognitive skill," many such studies focus on locus of control and related measures of self-efficacy. Locus of control is a psychological concept. It refers to the degree to which persons expect that a reinforcement or an outcome of their behaviour is contingent on their own behaviour (internal control) versus the degree to which persons expect that the reinforcement or outcome is a function of chance, luck, or fate and is under the control of powerful others, or is simply unpredictable (external control) (Rotter, 1990). Studies in psychology, sociology and, increasingly, economics, conclude that these "internal-external" attitudes play a substantively important role in men's and women's physical health, psychological well-being, and human capital development and, importantly, that these skills are distinct from measures of ability or other cognitive skills (Bandura, 1989; Benabou & Tirole, 2002; Gecas, 1989; Haidt & Rodin, 1999; Heckman et al., 2006; Wang et al., 1999).

Past empirical findings support a theoretical argument that individuals who believe that labour market success depends little on their schooling investments and more on luck, fate, or powerful others would be less likely to invest and succeed in school (Coleman & DeLeire, 2003). Self-beliefs of efficacy or control may shape behaviour through their impact on motivation and perseverance in the face of difficulty, cognitive processes such as persistence or task orientation, or affective processes, such as the ability to manage stress and anxiety in taxing situations (Bandura, 1989). Non-cognitive abilities appear to exert a stronger influence in schooling as compared to earnings (Heckman et al., 2006). Moreover, the locus of control

concept appears central in human capital investment decisions (Coleman & DeLeire, 2003; Heckman et al., 2006; Wang et al., 1999).

Locus of control and related characteristics may be especially relevant for those from economically disadvantaged backgrounds. Kane (1987), for example, suggested that growing up in poverty or with a lengthy history of welfare receipt instills a sense of "learned helplessness" and a lower sense of belief in one's ability, leading to fewer efforts to overcome one's disadvantaged circumstances. Thus, locus of control may be especially important in distinguishing those from disadvantaged backgrounds who are or are not able to successfully transition to adulthood. Related research in psychology has long been interested in why, faced with economic or demographic disadvantages, some youth avoid problematic outcomes. This research also aims to identify the individual characteristics that are most relevant in that process. In the psychology literature, disadvantaged children who defy the odds and develop successfully are labeled "resilient" and are said to benefit from the presence of specific "protective factors" (Luker, 1996; Luthar, 1991). Key individual-level protective factors identified in that literature include high levels of self-efficacy and self-esteem, as well as higher levels of basic cognitive skills and more positive expectations for the future (Garmezy, 1991; Luthar, 1991; Rutter, 1987; Sameroff, Siefer, Zax, & Barocas, 1987; Sameroff, Bartko, Baldwin, Baldwin, & Siefer, 1999). Protective factors can influence outcomes in various ways: by reducing the impact of the risk variable, reducing negative chain reactions associated with the risk variable, or opening up new opportunities (Rutter, 1987).

New empirical evidence highlights the importance of locus of control for human capital outcomes among low-income youth and young adults. Most recently, Leininger and Kalil (2009) studied the role of cognitive and non-cognitive factors in moderating experimental impacts of an adult education training program for women with very low education. They found that both cognitive and non-cognitive skills (in particular, locus of control) moderated treatment impacts.

Specifically, women with high cognitive skills but low non-cognitive skills (i.e., an external locus of control) were only half as likely to earn a degree within the context of the training program as their counterparts with high skills of both types. The Leininger and Kalil study is important given its use of experimental data to address this question. This is critical given inherent problems with establishing a causal impact of an external locus of control on schooling behaviour using observational data. Simultaneity bias is also a threat in the sense that education could alter low-income youth's sense of efficacy and control (Gottschalk, 2005).

In Australia, relatively little is known about the locus of control among youth, partly due to the scarcity of data[1] based on well-established instruments of this concept. Our paper takes advantage of a new and unique Australian longitudinal youth survey which contains information on locus of control, in addition to the data on socio-economic background and educational and employment outcomes of youth (for details of the survey, refer to the following section). The linkages between educational outcomes, disadvantage and locus of control were first explored using wave 1 data of this survey by Barón (2008), who found significant relationship between locus of control and young people's educational outcomes. Extending the analysis to include information from wave 2 data and including engagement in education or employment as one of the outcomes of interest, we ask the following research questions: (1) How does locus of control develop and what are its long and short-run correlates?; (2) Is locus of control an important predictor of successful educational outcomes during the transition to adulthood?; (3) Does locus of control relate differently to educational outcomes among youth from advantaged and disadvantaged backgrounds? The findings have implications for policy aiming at lifting education and employment outcomes across population subgroups.

[1] For example, the Longitudinal Surveys of Australian Youth (LSAY), which is a large-scale, nationally representative study of young Australians did not collect information on Locus of Control in any of the existing cohorts.

2. Data and methodology

Sample

The data for this study come from the Youth in Focus (YIF) survey which comprises a cohort of Australian youth aged 18 years in 2006[2] and one of their parents or guardians[3]. These young people were drawn from Australian government income support administrative records and information from the YIF survey can be linked to the histories of welfare payments received by young people and/or their families as recorded and regularly updated in the administrative data file. The youth and parent samples were also stratified into six income support categories depending on the timing and intensity of income support receipt (see Box 1 for a detailed description of the categories). These categories range from the one with no income support (or received only family tax credits known as Family Tax Benefit) to those receiving income support for 3 to 6 years or more. As the Australian income support system is almost universal, the youth sample excludes only young people from families in the top 20 percent of the income distribution who are not eligible for Family Tax Benefit. However, Child Care Benefits at the time of the data collection were not means tested and therefore youth from high income families were also captured in the sample. Comparing the YIF youth sample with the Australian Census data suggests that the administrative data capture about 98 per cent of the youths born in the period (Breunig et al., 2007).

[2] These selected young people were born in the six month period between 1 October 1987 and 31 March 1988.
[3] About 96.5% of these cases are biological mothers.

Box 1
Income support stratification

The young people in the Youth in Focus study are classified into one of six stratification categories based on their parents' receipt of income support.

A No parental income support (IS) history
B Prolonged income support exposure:
total duration of 6 years or longer

C Moderate income support exposure, older age of first exposure:
less than 6 years total duration, started after 1998 (youth 10 years old or more at first exposure)
E Moderate income support exposure, first exposure at early age:
less than 6 years total duration, first started before 1994 (youth less than 7 years old at first exposure)

D Minor income support exposure, first exposure at mid-age:
less than 3 years total duration, started between 1994 and 1998 (7 to 10 years old at first exposure)
F Moderate income support exposure, first exposure at mid-age:
more than 3 but less than 6 years total duration, started between 1994 and 1998 (7 to 10 years old at first exposure)

When wave 1 was conducted in 2006, about 4,000 young people and 3,900 parents (mostly mothers) were interviewed by phone, constituting approximately 2,400 parent-youth matched pairs. Young people were also asked to complete the questionnaire online or by return mail. Wave 2 was conducted in 2008/09 and approximately 2,360 young people were successfully re-interviewed and self-completed the questionnaire. The survey did not include parents in wave 2. For the purpose of the analysis, we use a balanced sample of approximately 1,500 cases of youth who participated in both phone interviews and returned the self-completion questionnaires in both waves.

Locus of control and achievement indicators in the Youth in Focus survey dataset

Locus of control

The locus of control measures in YIF are based on the Pearlin and Schooler's (1978) Mastery scale. These measures include seven specific aspects of locus of control. The specific survey question states: "The following statements describe the way some people feel about how

much control they have over their lives. How strongly do you agree or disagree (Strongly disagree, Disagree, Agree, and Strongly Agree) with the following statements?

(i) There is really no way I can solve some of the problems I have;

(ii) Sometimes I feel that I'm being pushed around in life;

(iii) I have little control over the things that happen to me;

(iv) I can do just about anything I really set my mind to;

(v) I often feel helpless in dealing with the problems of life;

(vi) What happens to me in the future mostly depends on me; and

(vii) There is little I can do to change many of the important things in my life.

Responses to these questions provide information on the degree to which young people believe that they themselves are in control of their lives and of the things and events that happen to them. Those individuals who believe that their life is controlled by fate, luck, or some outside force, are said to have *external locus of control*, and those who think that their future is determined by their own actions are said to have *internal locus of control*. The locus of control questions used in the YIF are worded "negatively", so that for all items except (iv) and (vi), disagreement implies internal locus of control. In contrast, disagreement with items (iv) and (vi) implies external locus of control.

Education and employment outcomes

The Youth in Focus survey data contain several indicators that can serve as measures of a young person's successful transition into adulthood. The survey collected data on the youth's education and employment at 18 and 20 years of age. This study uses data from the second wave as the outcome variables. By using indicators of youth achievement at 20 years of age we account for a (small) proportion of those young people who were still attending school at the

time of the wave 1 interview. By 20 years of age, it is expected that almost all young people will have left secondary school and progressed towards further studies or employment.

Four measures of education and employment outcomes (at wave 2) are analysed in the second part of this paper: completion of year 12, enrolment in university, intent to obtain a university degree, and full engagement in either education or employment. We chose not to analyse such standard labour market indicators as employment, labour earnings, or occupation because at age 20, a large percentage of young people have not yet completed their education and, if employed, would most likely be working part-time in so-called *'student'* jobs. The usual employment indicators would not provide a meaningful measure of young people's successful transition into the labour market. Instead, we adopt a composite indicator of "full engagement," a binary variable which takes the value of 1 if the young person is studying full-time, working full-time, or a combination of both.

The descriptive statistics on the four outcome variables, broken down by the income support stratification category, and the summary of education and employment activities of the young people are provided in Appendix Tables A4 to A6.

Explanatory variables

In addition to the income-support stratification variables detailed in Box 1, we control for a wide range of other potential covariates that could be related to the formation of youth's locus of control and affect their education and employment outcomes. These variables include basic demographic characteristics of youth such as gender, Indigenous and migrant status. In addition, we account for youth family formation (partnering and children), parental family structure and employment of parents when youth was 14 years of age (as reported by the youth). Other parental characteristics controlled for in our models include parents' migrant status and highest educational attainment. Furthermore, we include parents' own locus of control (reported by parents) as a covariate.

"Childhood volatility" is proxied in our models by the number of schools attended by youth and the number of different houses they lived in until they turned 18 years of age. It is expected that childhood volatility would have a negative effect on youth's locus of control, since changing homes, schools and friends can be very stressful for children and reinforce perceptions of having no control over their lives. Other measures of childhood stress and volatility include a range of events that may have happened in youth's life before they turned 18 or (for the regressions on change in locus of control) between 18 and 20 years of age. These variables were sourced from the self-completion questionnaire for youth, and include such events as financial crises suffered by the youth's family, youth having been assaulted or injured, and behavioural problems such as running away from home, hanging out with a bad crowd, and having alcohol or substance abuse problems. Lastly, we include as a control a measure of parental involvement in child's education, represented by a variable reported by youth in their self-completion questionnaire on whether the parents had often read to the youth at night when he/she was young. This measure serves as a proxy for parental investment in children's development.

Plan of analysis

In the following section, we present the results of our analysis of the three research questions. First, we discuss findings of the descriptive analysis of the single-item locus of control measures at both waves of the YIF survey, as well as of the changes in locus of control between the waves, focusing on differences between income support stratification categories and genders. Next, we use multivariate analysis tools to investigate factors affecting the levels of youth locus of control at wave 1, as well as the change in locus of control between waves. Finally, we analyse the extent to which locus of control measured at 18 years of age is correlated with subsequent education and employment outcomes at age 20, controlling for a wide range of potential covariates and paying particular attention to the degree of youth's childhood

disadvantage measured by the timing and intensity of their exposure to the income-support system.

3. Results

Descriptive analysis of the locus of control indicators

The locus of control variables in both waves of the YIF survey were coded on a 4-point scale (1 = strongly agree, 4 = strongly disagree). The change in single-item locus of control measures between the two waves was calculated by subtracting wave 1 responses from corresponding wave 2 responses. As five out of the seven locus of control questions are worded "negatively" and two "positively", for the purposes of the present analysis the scale was re-coded in such a way that higher values correspond to more internal locus of control (eg, "strongly disagree" for items (i), (ii), (iii), (v) and (vii) is coded as 4, while for items (iv) and (vi), the value 4 is assigned to those who responded "strongly agree").

In order to study the effects of childhood disadvantage on locus of control and future education and labour market outcomes, the young people in the Youth in Focus project are classified according to incidence, intensity and timing of their parents' income-support receipt. Table 1 provides information on the distribution of survey responses and the changes in locus of control between the waves of the survey, broken down by the stratification category of youth as well as by the youth's gender.

Overall, the data indicate that the young people in the study mostly have a strong sense of control over their lives, with the overwhelming majority of youth (85 per cent in wave 1 and 88 per cent in wave 2) believing (agreeing or strongly agreeing) that their actions can change many important things in their lives, and that they have control over things that happen to them. Furthermore, about 90 per cent of all young people surveyed felt that they could do just about anything they set their minds to, and 94 per cent believed that what happens to them in the future mostly depends on them. However, this sentiment is not uniform across all of the items – a

substantial share (31 per cent of youth in wave 1 and 27 per cent in wave 2) reported "often feeling helpless in dealing with life's problems," and 41 per cent (38 in wave 2) said that "sometimes they felt being pushed around in life."

Although it is generally thought that men have a more internal locus of control, there is only weak evidence of this in the YIF data. When the response categories are combined into two (agree versus disagree), the gender differences are at most 4 percentage points. There are only two exceptions. The first is item (v): "*I often feel helpless in dealing with the problems of life*". According to wave 1 data, 76 per cent of young men but only 65 per cent of young women disagreed with this statement. The wave 2 percentages are slightly higher, with 78 per cent of young men and 70 per cent of young women disagreeing with this statement. The other exception is item (vii) – "*There is little I can do to change many of the important things in my life*" – for which gender differences were actually reversed, with 84 per cent of young men and 86 per cent of young women disagreeing with this statement in wave 1 (in wave 2, the proportions were 87 and 88 per cent, correspondingly). These differences were, however, too small to be statistically significant.

The locus of control measures are also compared by stratification category, which is a summary variable that provides information on the incidence and intensity of income-support receipt by youth's parents or guardians while the young people were growing up and, on its own, may also serve as a proxy for the level of disadvantage the youth respondents were exposed to since childhood. The two first categories (A and B) include individuals with no parental income-support history and those with prolonged (6 years or more) exposure to the income-support system. This, coupled with the fact that by virtue of sample design these are the two most populated categories in the dataset, is the reason why the following discussion of the differences in locus of control across stratification categories is limited in most cases to differences between categories A and B.

In general, and as hypothesized, there is evidence in the YIF data that economic disadvantage is associated with more external locus of control. Young people who grew up in families dependent on income-support receipt for a long time are more likely than those whose parents never access the income-support system to feel that they cannot solve some of their problems or change many of the important things in their lives, that they are pushed around in life and have little control over things that happen to them, and to often feel helpless in dealing with life's problems. While in most cases the difference between the two categories is about 5 percentage points, the gap becomes much greater in wave 2 for two locus of control items: feeling pushed around in life (47 per cent of young people in category B agree with this statement, as opposed to only 31 per cent of category A), and feeling helpless in dealing with problems (the agreement rate for this statement is 34 per cent for category B and only 20 per cent for category A). The fact that differences across income support groups in locus of control widen substantially between ages 18 and 20 is interesting and suggests that the challenges associated with the transition to adulthood may be perceived differently for youth from privileged versus disadvantaged backgrounds.

On the other hand, 93 per cent of wave 1 respondents (94 per cent for wave 2) from category B believe that what happens to them in the future depends mostly on them, in comparison with 95 per cent of category A respondents in both waves. Furthermore, 89 per cent of category B respondents in wave 1 agree that they can do just about anything they really set their mind to, compared to 91 per cent of category A respondents (in wave 2, the proportions are virtually identical at 90.5 versus 91 per cent).

There is also some evidence of change in locus of control between the waves (which were conducted two years apart). On average, respondents tend to manifest a slightly more internal locus of control at wave 2. The overwhelming majority of respondents (more than 90 per cent) report only modest changes in their locus of control (0 or 1 point difference on single-item

responses between the two waves). Depending on the item, 50 to 60 per cent report no change at all. For two items (feeling pushed around in life and feeling helpless in dealing with life's problems), female respondents report a slightly greater change towards internal locus of control as opposed to male respondents. Category B respondents, however, experience a change towards external locus of control, albeit a minor one.

Factors affecting locus of control: multivariate analysis

This section presents results of the regression analysis of factors that might affect Locus of Control measures. The analysis is presented in two stages. First, a series of models are estimated with wave 1 locus of control measures as dependent variables; we use the seven single-item measures separately as well as an equal-weights index measure. The purpose is to understand how income support and childhood volatility over the life course shape locus of control at wave 1. Secondly, the change in locus of control measures between wave 1 and wave 2 is investigated as a function of personal characteristics and changes of statuses and events that occurred between the two waves of the survey. The aim is to assess how particular stable characteristics shape trajectories of locus of control during the transition to adulthood as well as to investigate the contribution of changes in experiences or statuses between wave 1 and wave 2 (or discrete events that occur during this period).

Locus of control at wave 1

Summary statistics for the locus of control items at Wave 1, as well as for the explanatory variables in the next set of regressions are presented in Appendix Tables A1-A3. The data on personal characteristics of youth and youth family indicators when youth was 14 years of age were taken from the YIF phone questionnaire for the youth; data on parental education and parents' locus of control were sourced from the parent questionnaire; and the data on youth locus of control and events in the life of the young people were taken from the YIF self-completion questionnaires (SCQ) for youth. As mentioned, one other variable that was taken from the youth

SCQ was whether the parents (or people responsible for youth) often read to youth at night while the youth was young.

The single-item locus of control (LOC) measures take values from 1 to 4 (re-arranged in such a way that higher values correspond to a more internal locus of control). The LOC index variable is constructed by aggregating all single-item locus of control measures. The results of wave 1 locus of control estimations are provided in Table 2. Columns (i) to (vii) report results of the single-item models estimated using ordered logistic regression, and the last column reports results of the OLS estimation of the LOC index model.

On the whole, individuals' demographic indicators do not appear to be correlated with locus of control at wave 1. Income-support history is not significant among the factors affecting locus of control (the only exception is item (i), which shows that young people who grew up in families with no income-support history (category A) tend to have more external locus of control, although this relationship has only weak statistical significance and is of the opposite sign to what we would have predicted based on the correlations). There are no significant gender differences[4]; personal characteristics such as migrant and Indigenous status also do not appear to affect locus of control. Finally, youth's own family status (variable 'couple') is not significant in the index regression and in the single-item regressions except for item (v).

Childhood volatility, represented in the model by the number of homes youth lived in before turning 18 years of age and the total number of schools youth attended, is expected to produce a more external sense of control. However, we find mixed evidence for this. ~~(~~The data show that the number of houses youth had lived in is, in fact, linked to a more internal locus of control~~)~~ In contrast, and more in line with predictions, the number of schools attended by youth is negatively correlated with locus of control in all regressions where it is significant (items (iv) and (v)).

[4] The only exception is item (v) "*I often feel helpless in dealing with the problems of life*"; young men tend to have a more internal locus of control for this item.

The model also accounts for parental characteristics, such as mother's and father's country of birth and highest level of education (drawn from the parent questionnaire) and parental family structure and employment status when youth was 14 years of age (drawn from the youth questionnaire). While mother's education is positively associated with youth's locus of control, the same cannot be said about father's education level, which is only significant in the regression for item (iii) and has an unexpected negative sign.

Parental locus of control is also strongly correlated with the locus of control exhibited by youth. Few datasets have this information for both parents and their offspring, although it can be expected that locus of control is to some degree inherited from parents or passed on through parent-child interactions. Our results indeed show that parental locus of control is one of the strongest correlates of the locus of control reported by young people.

As mentioned, parental involvement is proxied in the model by the indicator variable that the youth's parents had often read to youth at night when he or she was young. We find strong evidence that parental involvement into their child's development is positively associated with a more internal locus of control. The coefficients are significant for the index of locus of control and all locus of control items with the exception of item (i) and item (iii).

Life events experienced by youth during their childhood and adolescence are also important correlates of locus of control. Such events as being treated for mental or emotional issue, getting in trouble with the police, having been in contact with a guidance officer and hanging out with a bad crowd are strongly associated with a more external locus of control. Surprisingly, family events (such as alcohol or drug abuse problems in youth's household) are not significant, with the exception of family undergoing a financial crisis, which, as might be expected, is negatively related to items (ii) and (v) in youth's locus of control.

Predictors of locus of control across income support groups

We have also analysed the predictors of wave 1 locus of control separately for youth in categories A (no income support) and B (intensive income support) only, both for the single-item measures and the index measure (results not shown in tables). Running the estimations separately for each group reduced the explanatory power of the model since splitting the sample eliminated a substantial portion of variance in the independent variables, with each stratification category representing a more or less homogeneous group of people with similar characteristics. In addition, at least with regard to some of the control variables, certain categories appear more homogeneous than others. For instance, parents of youth in the least disadvantaged category (A) not only display a significantly more internal locus of control when compared to parents of the young people in the most disadvantaged category (B), but they also have less variation in their answers than do parents from category B. Perhaps for this reason, parental locus of control appears to be a more significant correlate for youth in category B than for youth in category A. It could also be, however, that parents' own locus of control is an especially important "protective factor" for youth from disadvantaged backgrounds, all else equal.

The second independent variable that appears to relate differently to the wave 1 locus of control of youth growing up in different levels of disadvantage is the variable for parents often reading at night to youth when they were young. As with parental locus of control, this variable is more strongly correlated with youth's internal locus of control for young people exposed to more severe economic disadvantage. Again, this suggests that, all else equal, the "returns" to parental involvement during childhood in terms of youth's locus of control are greater for more economically disadvantaged youth.

Regarding other explanatory variables, their relationship with youth locus of control is as expected, with the exception of parental education variables. Parental education characteristics either lose their significance or become associated with more external locus of control, especially for category B. This finding is somewhat surprising and merits further investigation. It could

be, for example, that if obtaining a degree did not translate into a good outcome for the parent that will have dampening effect on youth's locus of control).

Change in locus of control between the waves of the survey

We also investigate factors that could be correlated with the change in locus of control between wave 1 and wave 2 of the Youth in Focus survey (when the young person was 18 and 20 years of age, respectively). Our approach in this section is two-fold. First, we use fixed-effects estimation to examine how changes in locus of control are associated with changes in family, education and employment statuses or significant life events that occurred between the two waves of the survey. While the fixed-effects estimation does not determine the direction of causality, it will eliminate the effect of any unobserved variable that is related to both locus of control and the events that happen to an individual (for instance, cognitive ability may be related to both locus of control and educational outcomes). Fixed-effects regression will also not account for time-varying characteristics. This may lead to a lack of variance among independent variables and result in weak predictive power of the model. Moreover, estimating the fixed effects model effectively assumes that prior outlooks have no causal effect on either current outlooks or changes in outlooks across time. This assumption may not be appropriate when dealing with socio-psychological variables, which are not "created anew" each period but rather are directly determined by the past states (Finkel 1995).

For these reasons, we also estimate a "conditional" change-score model, where the change in the locus of control index is modelled as a function of both current (changes in statuses and events between waves), and lagged regressors (locus of control, background characteristics, statuses and events at wave 1). This is done in order to understand whether certain individual characteristics make people more resilient in coping with changes in their lives.[5]

[5] The initial specification of the conditional change-score model included, in addition to change variables, all of the explanatory variables from the wave 1 locus of control regression. However, these were not significant, either individually or jointly, and were eventually excluded from the model. This was most likely due to the fact that

Table 3 reports the estimation results for the final specifications. Column (1) reports conditional change-score results, and column (2) shows results of the fixed-effects model. Since the wave 1 locus of control measure was significantly related to the change in locus of control between the waves, the sample was divided into external, average and internal locus of control[6], and the fixed-effects model re-estimated for each group.

In the conditional change-score regression, young people belonging to category A were found to have higher (more internal) locus of control at wave 2 compared to their counterparts whose families had a history of income-support exposure.

Among events that young people have experienced between the two waves, those with significant correlations with locus of control all have expected signs (with the exception of pregnancy indicator – at 18 to 20 years of age, it would not be expected that early pregnancy is associated with a more internal locus of control). Being treated for mental or emotional problem and outstanding personal achievement were particularly strongly correlated with changes in locus of control. Other notable correlates include major changes in diet, family closeness, being injured or assaulted, and having experienced financial problems. All of these are associated with a more external locus of control, although the relationship is not present across all estimations.

Becoming independent through independent living is associated with a more internal locus of control. Education-related variables do not seem to be statistically significant, with the exception of completing a course of study for the group with an external locus of control (associated with improvements in their locus of control) and completion of year 12 for the group with 'average' locus of control (but here, the estimated sign is negative which is not what we would expect). A new job is weakly related to an improvement in locus of control in the conditional change-score model only, and a birth of a child between the waves also does not

whatever relationship exists between the background variables and locus of control, it is already accounted for by the inclusion of wave 1 locus of control index into the model.

[6] Youth were considered 'internal' if their wave 1 locus of control score was in the bottom 25th percentile of the distribution, and 'external' if their wave 1 locus of control score was in the 75th percentile, with the rest being classified as 'average'.

seem to be significant although this latter finding may be due to lack of variance in this regressor.

Overall, our results from these analyses support the conclusion that normative events (i.e., the events that are part of a normal life-cycle pattern, such as graduation, marriage, or having children) affect people's views and perceptions only if they happen at non-standard times (too early, or too late), and it is the non-normative, off-time events that are more strongly related to changes in people's outlooks and self-assessment (Gecas 1989).

Running the same set of estimations separately for youth in stratification categories A and B reduces the explanatory power of the models, for some sub-groups significantly, however, it does not fundamentally alter the conclusions drawn in this section.

Effect of locus of control on education and employment outcomes

Finally, we assess the extent to which locus of control (measured at wave 1) predicts subsequent educational and employment transitions (i.e., from Wave 1 to Wave 2), controlling for a wide range of potential confounders. These results are presented in Table 4. We use linear probability model[7] to investigate the effect of locus of control on the four chosen outcomes, controlling for a range of youth demographic characteristics, as well as parental education and employment status, and parental involvement during childhood. The locus of control indicator used for this analysis is an equal-weights index created by averaging the standardised[8] single-item locus of control measures at wave 1. We also run regressions using the single-item locus of control measures separately, as well as estimate linear probability and probit models for each income support category separately to test the sensitivity of results.

We pay particular attention to the differences in education and employment outcomes across childhood income-support stratification categories. The descriptive analysis shows that there are significant differences in the percentage of young people who complete Year 12, enrol

[7] We chose to use linear probability model (LPM) rather than probit or logit models due to the ease of interpretation of the interaction coefficients estimated via LPM (Ai and Norton, 2003; Norton and Ai, 2004).
[8] With the mean set to 0, and standard deviation of 1.

in university, or find full-time employment to be fully engaged in the society (Appendix Table A6). These differences are particularly pronounced between Categories A (no parental income-support history) and B (intensive exposure to income support).

Unfortunately, the YIF survey does not have a good measure of cognitive ability (such as IQ score or results of other cognitive ability tests), which should preferably be controlled for in the model. The survey dataset has information on academic performance in the last year of school attended by a young person, relative to performance of his or her classmates, and Equivalent National Tertiary Entrance Rank (ENTER) scores for those youth who obtained them. Although these are expected to be highly correlated with educational and employment outcomes, it is likely that academic performance, especially in the later years of schooling, does not only characterise inherent cognitive ability, but also depends on the non-cognitive skills and motivation of the student, and it would be difficult to disentangle the separate effects of the two types of skills. Hence, we omit these "cognitive ability" measures in the analysis.

Table 4 presents the results of a comparison of two competing models. In one model, it is assumed that youth's locus of control has the same effect on outcomes independent of exposure to disadvantage. These results are reported in column (1) for each outcome estimation. We also test whether locus of control is as important for the least-disadvantaged youth as it is for the most-disadvantaged. In other words, we assess whether locus of control shapes outcomes differently between youth with various degrees of economic disadvantage. Therefore, we also estimate the model where the effect of locus of control is allowed to vary depending on the income-support category of the youth. These results are reported in column (2) of each outcome estimation.

The results show that even after controlling for a host of parental background characteristics, young people who have had exposure to income support while growing up are less likely to complete secondary school, enrol in university and participate fully in education or

employment. This suggests either that the effect of exposure to income support on youth's poorer education and employment outcomes operates beyond factors like lower parental socio-economic status and education, or that it reflects unobserved adverse selection of parents onto income support on factors that also affect long-run youth outcomes.

Regarding the locus of control indicators, there is evidence that these skills are important for university enrolment and full engagement. There is about a 2.5 percentage point increase in the probability of university enrolment, and a 3.5 percentage point increase in the probability of full engagement for each one standard deviation increase in the locus of control index. The size of the locus of control effect is about one fifth of the size of the effect associated with youth having a prolonged exposure to income support for the university enrolment (youth who belong to category B are 13 percentage points less likely to be enrolled in university compared to the young people whose parents had no income-support history), and is about 40% of the size of the effect for being in category B in the full engagement estimation (youth in category B are 8.5 percentage points less likely to be fully engaged at 20 years of age than their least-disadvantaged counterparts). On average across the sample, since about 50 per cent overall is enrolled in university and 78 per cent are fully engaged, an increase of one standard deviation in locus of control would increase university enrolment by 5 per cent, and full engagement, by about 4.5 per cent.

On the other hand, year 12 completion and plans to obtain a university degree do not seem to be related to locus of control. One possible reason why this might be the case for the Year 12 completion is the high proportion of the young people in our sample (84 per cent) who complete Year 12. Other research using this dataset (Cobb-Clark and Sartbayeva, 2007) has pointed to this, noting that while the proportion of young people completing high school in Australia is quite high, the nature of their high school credentials may differ significantly between the most and the least disadvantaged youth.

Finally, there is also some evidence in favour of the hypothesis that non-cognitive skills are more important in determining the outcomes of disadvantaged youth compared to those young people from more privileged backgrounds, although the effect does not appear across all the estimations. When the effect of locus of control is interacted with income support category, the significant effects on education and employment are found for categories B (intensive income support exposure) and E (moderate income support exposure at an early age) only, and they are most consistent for category B (see final rows of Table 4). While there does not appear to be any effect of locus of control on education and employment outcomes for any of the other income support categories, those young people from category B who believe that they themselves are in control of their lives and the events that happen to them are more likely to complete year 12, enrol in university and /or find a full-time job by the time they are 20 years old.

More specifically, while a young person whose parents had a prolonged history of reliance on income support (category B) with an average level of locus of control is 13.5 percentage points less likely to enrol in university than a young person from the least-disadvantaged family (category A), a one standard deviation increase in the locus of control for category B youth is associated with a 6 percentage points increase in the likelihood of university enrolment (or a 16 per cent increase given that the current university enrolment rate for category B youth is 35 per cent). The size of this effect is about three times that obtained on average across the sample (as reported above). While the coefficients on locus of control for other categories (C through F) in the university enrolment regression are not individually significant, we cannot reject the hypothesis that they are in fact the same as category B locus of control effects. On the other hand, we can reject the hypothesis that locus of control is equally important for youth's university participation for those from prolonged income-support (category B) and non-income-support (category A) families.

The results for other outcomes are not as clear-cut. While the coefficient on locus of control for the most-disadvantaged youth (category B) is also individually significant in regressions on Year 12 completion and full engagement, we cannot reject the hypothesis that it is equal to locus of control effects for other income support categories. Hence, university enrolment remains the only outcome among those considered in this paper where we find significant differences in the effects of locus of control across levels of disadvantage.

Sensitivity analysis

In order to gauge the sensitivity of results to the composition of the locus of control index, we also estimate education/employment outcomes models using single-item locus of control measures in place of an equal-weights index variable. As before, we estimate two competing models, the first of which assumes that the effect of locus of control on outcomes does not vary by stratification category, while the second accommodates the assumption that the locus of control may have different effect depending on the extent of disadvantage experienced by young people (results not shown in tables).

As with the results of the index locus of control estimations reported earlier in this section, the locus of control items (assuming equal effects across stratification categories) are jointly significant in university enrolment and full engagement models only. For item (i), an internal locus of control is actually associated with worse education and employment outcomes, which is not what would have been expected. However, we find that these results are driven by youth in category A only. On the other hand, items (iv) "*I can do just about anything I really set my mind to*" and (v) "*I often feel helpless in dealing with life's problems*" are significant in regressions on intended university enrolment and full engagement, respectively – more internal responses to item (iv) are associated with 3 percentage points higher probability of intended university enrolment, while those who give more internal responses to item (v) are 3.1 percentage points

more likely to be fully engaged (this last effect is almost the same as the estimated 3.5 percentage point effect of locus of control on full engagement in the weighted-index regression).

For the model where the effects of the locus of control items are assumed to vary between the income stratification categories, the conclusions reached earlier still hold. While the effect of more internal locus of control for categories of youth with no or minor exposure to income support on education and employment outcomes is mixed or non-existent, the two most disadvantaged categories (B – most intensive income-support exposure, and E – moderate income-support exposure at an early age) benefit from having more internal locus of control in terms of higher likelihood of current or intended university enrolment, or full engagement.

Results of the single-item regressions also indicate that different single-item locus of control measures are of importance to different income-support categories. For instance, for category B (intensive income-support exposure) the single most important measure of the locus of control in terms of its effect on outcomes is item (v) "*I often feel helpless in dealing with life's problems*". A one standard deviation increase in this item for category B respondents is associated with an 6.1 percentage point increase in the likelihood of their enrolling in university and with a 6.7 percentage point increase in the likelihood of being fully engaged. For youth in category E more internal responses to item (vii) "*There is little I can do to change many of the important things in my life*" are correlated with higher probability of either current or intended university enrolment, and internal responses to item (v) are correlated with higher probability of full engagement. In contrast, for category A (no parental income-support history) more internal responses to items (i) "*There is really no way I can solve some of the problems I have*" and (ii) "*Sometimes I feel that I'm being pushed around in life*" are associated with decreased likelihood of school completion (item (ii)) and university enrolment or intended completion of university degree (item (i)), although internal responses to item (iv) are positively associated with intended university enrolment and full engagement. This reinforces the idea that each of the seven items

measures a slightly different aspect of locus of control which may or may not be important for a given individual or group of individuals.

Another type of sensitivity analysis was estimating probit and linear probability (OLS) models separately for each income-support category. Although we cannot compare the magnitude of the estimated effect for locus of control on the outcome indicators (Hoetker 2004), we can draw conclusions about the importance of locus of control for different categories based on significance of locus of control coefficients across groups. We find that locus of control is significant for category B (prolonged income-support exposure) in university enrolment and full engagements models, and for category E (moderate income-support exposure at an early age) in full engagement model only. This is consistent with findings presented in the main analysis part of the paper.

4. Conclusions

Locus of control is increasingly recognized as a key measure of "non-cognitive skills" that has potentially important implications for human capital development, and perhaps even more important implications for the achievement and attainment of disadvantaged youth.

The present study used a rich new data set from Australia to examine the correlates of locus of control during the transition to adulthood. Our data provide superior information on youth's lifetime economic status (as indicated by families' extent of exposure to the income-support system during the youth's childhood, with data drawn from administrative records), thus allowing us to explore the differential correlates of locus of control for disadvantaged youth and their more advantaged peers.

We found that economically disadvantaged youth have a more external locus of control than their more advantaged peers, especially on the items (ii) "*I often feel I am pushed around in life*" and (v) "*I often feel helpless in dealing with the problems of life*". How does locus of control develop? They key correlates of locus of control at Wave 1 are parental socio-economic

status, mother's locus of control, the extent of parental involvement with the child when the child was young, the incidence of negative events such as running away from home, falling in with a bad crowd and being treated for a mental or emotional issue. Not surprisingly, some of these reflect events and conditions that are more likely to characterize the childhood circumstances of disadvantaged youth. Similarly, changes in locus of control in the short term are most strongly related to "off-time" events in youth's lives. Again, economically disadvantaged youth are more likely to have these "off-time" experiences (see Cobb-Clark and Sartbayeva (2007 and 2009) for a detailed discussion of youth characteristics and outcomes by income support stratification category). We also found evidence that parents' own locus of control and their involvement with their children during early childhood were stronger correlates of the locus of control of economically disadvantaged youth than their more advantaged peers.

Finally, we found evidence, as hypothesized, that locus of control, as measured at age 18 is associated with a higher chance of subsequently completing year 12, enrolling in university and /or finding a full-time job by the age of 20. However, this was only true for youth who had significant exposure to the income-support system during their childhood; i.e., the most economically disadvantaged youth in the sample. Moreover, among these outcomes we considered, university enrolment is the only one where we find significant differences in the effects of locus of control across levels of disadvantage.

The size of the locus of control effect on the likelihood of university enrolment, on average in the sample, is impressive given the wide range of covariates included in the regressions. For instance, in the total sample, its impact on this outcome is about one third of the size of the effect associated with youth having a prolonged exposure to income support during childhood. Moreover, the effect size for locus of control on the likelihood of university enrolment for economically disadvantaged youth is substantial, representing a 16% increase on mean levels of university enrolment in this group. This corresponds to the large literature in developmental

psychology pointing to the relevance of specific "protective factors" that operate under conditions of risk (here, economic disadvantage) to produce better outcomes for those who have that factor. Measures such as self-efficacy and related constructs such as motivation have long been proposed as key measures of "non-cognitive skills" and here we add to that evidence.

Is locus of control malleable? These are important questions for policy interventions that aim to increase human capital, perhaps especially among the economically disadvantaged. Theoretically, an external locus of control develops from a history of observing that one's actions do not affect desired outcomes. Early life experiences, such as the nature of parent-child interactions, level of exposure to stressful events, and number of personal mastery experiences all play important roles in the development of locus of control (Gecas, 1989). Our analyses also show this to be true. Individuals exposed to frequent non-contingency and uncontrollability develop the self-view that there is little or no return to the relevant investment or behavior, a process termed "learned helplessness" (Haidt & Rodin, 1999). Dahl (2004), however, provides evidence that the prefrontal cortex (the region of the brain that governs emotion and self-regulation) is malleable into the early 20's, which suggests there may be a substantial opportunity for intervention. Gottschalk (2005) recently used experimental data to show that work itself can significantly alter locus of control in welfare recipients, especially among younger individuals.

How does locus of control matter from the perspective of optimal human capital policy? Prior work (Leininger & Kalil, 2008) with low-income young women suggest that it is relevant to the process of attaining an educational credential, but not necessarily so for employment. Our results correspond to those findings, insofar as our primary findings related locus of control for university enrolment (though it must be noted that our sample is not old enough to adequately assess employment outcomes). Cunha and Heckman (2007) argue that an equity-efficiency trade-off exists for investments in adolescence and adulthood (but not early childhood). The

proposed work can inform the policy question of whether interventions might have a higher return for more "able" adults than less able adults. Previous discussions of this topic (e.g., Heckman & Krueger, 2003) focused exclusively on cognitive skills. It is unclear if the same principle applies with respect to non-cognitive skills and thus, which types of interventions may be required for those at risk of unsuccessful transitions to adulthood.

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Table 1. Youth's locus of control by income support stratification category and gender, waves 1 and 2

	Income support stratification category								
	A	**B**	**C**	**D**	**E**	**F**	**Male**	**Female**	**Total**
Item 1. There is really no way I can solve some of the problems I have									
Total respondents	*475*	*454*	*192*	*170*	*136*	*69*	*596*	*900*	*1,496*
Per cent agree or strongly agree; w1	19.6	25.1	18.8	15.9	18.4	18.8	18.8	21.8	20.6
Per cent agree or strongly agree; w2	17.3	24.9	17.2	15.3	17.7	24.6	18.3	20.7	19.7
Difference									
Per cent changed towards external	23.8	25.3	21.9	25.3	28.7	26.1	24.7	24.8	24.7
Per cent stable	50.1	47.4	54.2	51.8	41.2	53.6	51.2	48.1	49.3
Per cent changed towards internal	26.1	27.3	24.0	22.9	30.2	20.3	24.2	27.1	25.9
Item 2. Sometimes I feel that I'm being pushed around in life									
Total respondents	*476*	*457*	*192*	*170*	*136*	*69*	*598*	*902*	*1,500*
Per cent agree or strongly agree; w1	36.1	44.0	43.2	41.8	37.5	42.0	37.8	42.2	40.5
Per cent agree or strongly agree; w2	30.9	46.8	40.6	32.4	32.4	47.8	35.8	39.6	38.1
Difference									
Per cent changed towards external	19.8	29.1	20.3	23.5	25.7	18.8	24.2	23.2	23.6
Per cent stable	52.3	45.5	54.2	42.9	41.9	59.4	49.3	48.5	48.8
Per cent changed towards internal	27.9	25.4	25.5	33.5	32.4	21.7	26.4	28.4	27.6
Item 3. I have little control over things that happen to me									
Total respondents	*476*	*456*	*192*	*169*	*136*	*69*	*597*	*901*	*1,498*
Per cent agree or strongly agree; w1	12.0	17.3	16.7	10.7	17.7	20.3	14.2	15.4	15.0
Per cent agree or strongly agree; w2	9.5	14.7	13.0	11.8	12.5	13.0	10.6	13.3	12.2
Difference									
Per cent changed towards external	21.0	21.7	24.5	20.1	22.1	14.5	19.8	22.4	21.4
Per cent stable	57.1	54.0	50.0	58.0	52.2	62.3	58.6	52.8	55.1
Per cent changed towards internal	21.9	24.3	25.5	21.9	25.7	23.2	21.6	24.8	23.5
Item 4. I can do just about anything I really set my mind to									
Total respondents	*474*	*453*	*191*	*170*	*136*	*69*	*595*	*898*	*1,493*
Per cent agree or strongly agree; w1	91.6	88.5	91.6	92.4	94.1	88.4	90.4	91.1	90.8
Per cent agree or strongly agree; w2	90.5	91.0	91.1	90.6	91.2	88.4	91.1	90.4	90.7
Difference									
Per cent changed towards external	19.6	16.8	24.1	21.8	22.8	17.4	20.0	19.6	19.8
Per cent stable	62.5	62.3	60.2	63.5	53.7	62.3	61.3	61.5	61.4
Per cent changed towards internal	17.9	21.0	15.7	14.7	23.5	20.3	18.7	18.9	18.8
Item 5. I often feel helpless in dealing with the problems of life									
Total respondents	*475*	*453*	*191*	*170*	*135*	*68*	*594*	*898*	*1,492*
Per cent agree or strongly agree; w1	29.3	34.2	32.5	22.9	31.1	32.4	24.2	35.1	30.8
Per cent agree or strongly agree; w2	19.6	34.4	28.3	27.1	26.7	25.0	22.4	30.0	26.9
Difference									
Per cent changed towards external	17.7	27.6	24.1	30.6	20.7	27.9	23.9	23.6	23.7
Per cent stable	55.6	45.7	46.6	45.3	54.1	41.2	51.4	48.2	49.5
Per cent changed towards internal	26.7	26.7	29.3	24.1	25.2	30.9	24.8	28.2	26.8

Table 1. Youth's locus of control by income support stratification category and gender, waves 1 and 2 (continued)

	Income support stratification category								
	A	**B**	**C**	**D**	**E**	**F**	**Male**	**Female**	**Total**
Item 6. What happens to me in the future mostly depends on me									
Total respondents	*475*	*457*	*192*	*170*	*136*	*69*	*598*	*901*	*1,499*
Per cent agree or strongly agree; w1	95.4	93.0	93.8	95.3	89.7	92.8	95.0	93.0	93.8
Per cent agree or strongly agree; w2	95.4	94.1	97.4	91.8	93.4	89.9	94.8	94.1	94.4
Difference									
Per cent changed towards external	20.0	20.8	19.3	21.2	21.3	33.3	20.1	21.6	21.0
Per cent stable	59.0	56.7	57.8	58.2	52.9	46.4	59.9	54.9	56.9
Per cent changed towards internal	21.1	22.5	22.9	20.6	25.7	20.3	20.1	23.4	22.1
Item 7. There is little I can do to change many of the important things in my life									
Total respondents	*475*	*455*	*192*	*170*	*136*	*69*	*596*	*901*	*1,497*
Per cent agree or strongly agree; w1	11.6	17.4	12.0	15.3	16.2	15.9	15.6	13.7	14.4
Per cent agree or strongly agree; w2	10.1	14.3	11.5	10.6	14.0	17.4	12.9	11.9	12.3
Difference									
Per cent changed towards external	21.9	24.4	18.2	21.8	24.3	34.8	22.7	23.2	23.0
Per cent stable	57.9	53.0	58.3	53.5	51.5	42.0	55.9	53.8	54.6
Per cent changed towards internal	20.2	22.6	23.4	24.7	24.3	23.2	21.5	23.0	22.4

Table 2. Results of ordered logit and OLS estimations of factors affecting youth's locus of control at wave 1[a, b]

	Single-item LOC measures ordered logit analysis							Index OLS
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	
Category A	-0.197*	-0.096	0.055	-0.067	-0.097	-0.010	0.045	-0.170
	(0.114)	(0.112)	(0.117)	(0.118)	(0.115)	(0.117)	(0.116)	(0.182)
Male	0.139	0.036	-0.094	0.049	0.283***	-0.080	0.002	0.128
	(0.100)	(0.098)	(0.104)	(0.104)	(0.101)	(0.104)	(0.103)	(0.161)
Indigenous	-0.030	0.182	0.217	0.252	0.110	-0.407	-0.031	-0.017
	(0.284)	(0.277)	(0.292)	(0.292)	(0.287)	(0.294)	(0.287)	(0.453)
Migrant	0.252	-0.036	-0.253	-0.475*	-0.136	0.010	0.194	-0.181
	(0.230)	(0.230)	(0.234)	(0.244)	(0.232)	(0.240)	(0.237)	(0.368)
Couple	-0.029	0.231	-0.311	0.211	0.544**	0.291	0.072	0.371
	(0.280)	(0.262)	(0.285)	(0.286)	(0.274)	(0.275)	(0.277)	(0.426)
Houses	0.016	0.004	0.049**	0.026	0.044**	-0.002	0.031	0.053*
	(0.019)	(0.019)	(0.019)	(0.020)	(0.019)	(0.020)	(0.019)	(0.030)
Schools	-0.016	-0.017	-0.039	-0.085**	-0.098**	0.016	-0.013	-0.092
	(0.041)	(0.041)	(0.042)	(0.043)	(0.042)	(0.042)	(0.041)	(0.064)
Two-parent	0.127	-0.065	-0.055	0.233	0.116	0.081	0.190	0.155
	(0.143)	(0.140)	(0.148)	(0.151)	(0.145)	(0.148)	(0.146)	(0.232)
Migrant parent	-0.075	-0.083	0.012	0.116	-0.132	0.117	-0.125	-0.123
	(0.107)	(0.105)	(0.110)	(0.112)	(0.108)	(0.110)	(0.110)	(0.172)
Mom w. yr12	0.161	0.027	0.112	0.148	-0.135	0.337*	0.092	0.239
	(0.190)	(0.185)	(0.194)	(0.201)	(0.190)	(0.199)	(0.197)	(0.306)
Mom w. diploma	0.223*	0.147	0.303**	0.379***	-0.003	0.265**	0.108	0.466**
	(0.117)	(0.116)	(0.122)	(0.122)	(0.119)	(0.121)	(0.120)	(0.190)
Mom w. Bachelor	0.067	0.046	0.416***	0.089	-0.247	0.171	0.105	0.212
	(0.155)	(0.151)	(0.159)	(0.160)	(0.155)	(0.159)	(0.156)	(0.247)
Dad w. yr12	0.093	0.083	-0.236	-0.218	-0.031	0.148	0.168	0.011
	(0.144)	(0.142)	(0.148)	(0.150)	(0.145)	(0.148)	(0.146)	(0.231)
Dad w. diploma	0.149	0.080	-0.089	-0.002	0.084	-0.171	0.112	0.077
	(0.127)	(0.124)	(0.131)	(0.131)	(0.128)	(0.131)	(0.130)	(0.204)
Dad w. Bachelor	-0.086	0.052	-0.340**	0.004	-0.038	-0.014	0.138	-0.077
	(0.150)	(0.145)	(0.153)	(0.156)	(0.148)	(0.154)	(0.152)	(0.240)
Mom working	-0.127	-0.121	-0.135	-0.136	0.115	-0.018	-0.077	-0.177
	(0.111)	(0.109)	(0.114)	(0.115)	(0.111)	(0.115)	(0.113)	(0.178)
Mom's work unknown	-0.773**	-0.558	-0.894**	0.394	-0.492	-0.512	-1.047***	-1.500**
	(0.364)	(0.383)	(0.386)	(0.379)	(0.378)	(0.386)	(0.362)	(0.613)
No mom	-0.355	-0.227	-1.193**	-0.325	-0.619	-1.102*	-0.768	-1.677**
	(0.463)	(0.484)	(0.549)	(0.541)	(0.505)	(0.565)	(0.546)	(0.830)
Dad working	-0.034	0.102	0.487***	0.296	0.076	0.345*	0.061	0.376
	(0.176)	(0.177)	(0.187)	(0.185)	(0.177)	(0.184)	(0.178)	(0.286)
No dad	0.071	0.020	0.101	0.281	0.222	0.326	-0.040	0.233
	(0.238)	(0.235)	(0.249)	(0.254)	(0.238)	(0.247)	(0.243)	(0.383)
Read at night	0.161	0.277***	0.163	0.404***	0.332***	0.177*	0.179*	0.553***
	(0.098)	(0.097)	(0.102)	(0.103)	(0.099)	(0.102)	(0.101)	(0.158)
Financial crisis	0.049	-0.319***	-0.074	0.189	-0.199*	0.062	0.035	-0.127
	(0.118)	(0.117)	(0.122)	(0.123)	(0.118)	(0.122)	(0.120)	(0.189)
Substance: f	0.005	-0.079	0.090	0.249*	-0.098	0.171	-0.002	0.053
	(0.131)	(0.129)	(0.135)	(0.135)	(0.130)	(0.134)	(0.132)	(0.208)
Ran away	-0.117	-0.028	-0.073	-0.217	-0.309**	-0.194	0.259*	-0.276
	(0.150)	(0.148)	(0.157)	(0.159)	(0.151)	(0.157)	(0.156)	(0.242)

Table 2. Results of ordered logit and OLS estimations of factors affecting youth's locus of control at wave 1[a, b] (continued)

	Single-item LOC measures ordered logit analysis							Index OLS
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	
Bad crowd	-0.053	-0.514***	-0.024	-0.111	-0.342**	-0.035	-0.292*	-0.467**
	(0.147)	(0.146)	(0.153)	(0.153)	(0.148)	(0.152)	(0.150)	(0.237)
Injury/assault	-0.322*	-0.039	-0.074	-0.102	0.144	-0.087	-0.098	-0.304
	(0.187)	(0.184)	(0.192)	(0.196)	(0.184)	(0.191)	(0.189)	(0.293)
Mental issue	-0.794***	-0.475***	-0.757***	-0.349**	-0.908***	-0.351**	-0.300*	-1.361***
	(0.157)	(0.153)	(0.161)	(0.161)	(0.152)	(0.158)	(0.156)	(0.244)
Guidance officer	-0.044	-0.463***	-0.312**	-0.169	-0.450***	-0.225	-0.134	-0.594***
	(0.143)	(0.141)	(0.146)	(0.149)	(0.142)	(0.146)	(0.146)	(0.228)
Police	-0.127	0.136	-0.202	-0.362**	0.192	0.107	-0.314**	-0.174
	(0.144)	(0.141)	(0.147)	(0.150)	(0.143)	(0.148)	(0.147)	(0.230)
Substance: y	-0.198	-0.064	-0.091	0.088	-0.471***	0.329*	0.045	-0.165
	(0.167)	(0.161)	(0.171)	(0.173)	(0.167)	(0.172)	(0.169)	(0.266)
PLOC 1st	0.164***	0.063	0.005	0.123**	0.063	0.065	0.114*	0.227**
	(0.060)	(0.059)	(0.061)	(0.063)	(0.060)	(0.062)	(0.061)	(0.096)
PLOC 2st	0.046	0.051	-0.008	0.050	0.091	0.020	-0.012	0.094
	(0.060)	(0.059)	(0.062)	(0.062)	(0.060)	(0.061)	(0.060)	(0.095)
PLOC 3st	0.068	0.150**	0.165**	-0.033	0.137**	0.057	0.187***	0.273***
	(0.064)	(0.063)	(0.066)	(0.066)	(0.063)	(0.066)	(0.065)	(0.102)
PLOC 4st	0.009	0.046	0.028	0.036	0.027	0.004	-0.034	0.037
	(0.056)	(0.055)	(0.058)	(0.058)	(0.056)	(0.059)	(0.058)	(0.090)
PLOC 5st	0.007	-0.056	0.035	0.027	0.055	-0.073	-0.017	-0.006
	(0.062)	(0.062)	(0.065)	(0.066)	(0.063)	(0.066)	(0.064)	(0.101)
PLOC 6st	0.014	0.005	0.087	0.128**	0.025	0.249***	0.057	0.160*
	(0.054)	(0.053)	(0.056)	(0.056)	(0.054)	(0.057)	(0.055)	(0.086)
PLOC 7st	-0.045	-0.025	-0.107*	-0.036	-0.084	-0.151**	-0.001	-0.162*
	(0.060)	(0.059)	(0.062)	(0.063)	(0.061)	(0.063)	(0.062)	(0.097)
Const								21.342***
								(0.430)
/cut1	-3.767	-3.717	-4.062	-3.917	-3.472	-3.739	-3.842	
	(0.308)	(0.298)	(0.339)	(0.348)	(0.298)	(0.343)	(0.325)	
/cut2	-1.447	-0.605	-1.737	-1.917	-1.016	-2.194	-1.542	
	(0.269)	(0.265)	(0.284)	(0.287)	(0.273)	(0.290)	(0.273)	
/cut3	0.991	1.414	1.156	1.193	1.566	0.822	1.204	
	(0.268)	(0.268)	(0.281)	(0.282)	(0.275)	(0.279)	(0.272)	
Number of obs	1,657	1,656	1,654	1,654	1,654	1,654	1,654	Number of obs 1,641
LR chi2(37)	108.98	127.74	116.88	97.46	228.33	72.80	85.06	F-stat (37,1603) 5.49
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Prob > F 0.000
Log likelihood	-1759.7	-1847.5	-1593.4	-1506.8	-1765.3	-1475.3	-1644.6	R2 0.112
Pseudo R2	0.030	0.033	0.035	0.031	0.061	0.024	0.025	Adj R2 0.092

Table notes:

a. Ordered log-odds regression coefficients are reported for ordered logit estimations in columns (i) – (vii).

b. For description and summary statistics on explanatory and dependent variables, see Tables A1 and A2.

Table 3. Factors associated with change in locus of control index between waves

	OLS	FE	FE by wave 1 LOC		
			External	Average	Internal
Wave 1 locus of control	-0.572***				
	(0.022)				
Category A	0.265*				
	(0.154)				
Events occurred between waves:					
Birth of child	-0.288	-0.445	-0.943	0.241	0.773
	(0.554)	(0.670)	(1.202)	(0.933)	(1.064)
Started living independently	0.481**	0.514**	0.230	0.670**	0.238
	(0.211)	(0.254)	(0.467)	(0.312)	(0.441)
Completed Year 12	-0.058	-0.089	0.301	-0.650*	0.285
	(0.264)	(0.319)	(0.577)	(0.393)	(0.561)
Began a course of study	-0.181	-0.015	0.215	0.005	-0.630
	(0.202)	(0.244)	(0.462)	(0.287)	(0.444)
Completed a course of study	0.184	0.224	0.764**	-0.162	0.138
	(0.165)	(0.200)	(0.363)	(0.257)	(0.325)
Someone close died	0.111	0.112	0.236	0.005	0.233
	(0.155)	(0.187)	(0.355)	(0.230)	(0.310)
Financial problems	-0.539**	-0.416	-0.364	-0.688*	-0.345
	(0.255)	(0.308)	(0.522)	(0.385)	(0.581)
Family/friend had a substance abuse problem	0.061	0.246	0.163	0.273	-0.219
	(0.186)	(0.223)	(0.392)	(0.276)	(0.396)
Trouble with police	0.073	0.079	0.302	0.211	-0.574
	(0.205)	(0.247)	(0.453)	(0.305)	(0.435)
Youth had a substance abuse problem	0.087	0.074	-0.307	0.031	0.121
	(0.273)	(0.329)	(0.504)	(0.439)	(0.643)
Youth/partner got pregnant	0.963**	0.893*	2.036**	0.297	-0.015
	(0.430)	(0.519)	(0.802)	(0.765)	(0.873)
Abortion	-1.025**	-1.125**	-1.328	-0.777	-0.335
	(0.461)	(0.557)	(0.857)	(0.804)	(0.973)
Injury/ assault	-0.317*	-0.315	-0.471	-0.149	-0.715**
	(0.168)	(0.202)	(0.371)	(0.247)	(0.348)
Treated for mental or emotional problem	-0.878***	-0.264	-1.248***	-0.197	-1.334**
	(0.215)	(0.258)	(0.394)	(0.338)	(0.540)
New job	0.293*	0.187	0.578	0.223	-0.092
	(0.173)	(0.209)	(0.400)	(0.257)	(0.342)
Personal achievement	0.746***	0.457**	0.996***	0.499**	0.658**
	(0.158)	(0.190)	(0.367)	(0.230)	(0.322)
Moved house	0.107	0.013	-0.096	0.010	0.369
	(0.166)	(0.200)	(0.379)	(0.243)	(0.338)
Increased social activities	0.189	-0.115	-0.431	0.221	0.142
	(0.156)	(0.188)	(0.369)	(0.233)	(0.303)
Decreased social activities	-0.283	0.070	0.203	-0.562**	0.025
	(0.179)	(0.215)	(0.380)	(0.271)	(0.375)
Major change in diet	-0.493***	-0.231	-0.654*	-0.414*	-0.296
	(0.154)	(0.185)	(0.370)	(0.223)	(0.309)
Major change in family closeness	-0.603***	-0.200	-0.303	-0.412*	-0.763**
	(0.163)	(0.195)	(0.353)	(0.239)	(0.339)
Constant	12.288***	-0.084	1.938***	0.186	-1.666***
	(0.522)	(0.232)	(0.462)	(0.272)	(0.400)

Table 3. Factors associated with change in locus of control index between waves (continued)

	OLS	FE	FE by wave 1 LOC		
			External	Average	Internal
Number of observations	1,461	1,461	373	681	407
F-stat	31.00	1.60	2.47	1.97	2.42
Prob > F	0.000	0.041	0.000	0.006	0.001
R2	0.332	0.023	0.129	0.059	0.117
Adjusted R2	0.321	0.009	0.077	0.029	0.068

Table 4. Results of linear probability model estimations of educational and employment outcomes at wave 2

	Year 12		University		Intended university		Full engagement	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Category B	-0.077***	-0.077***	-0.129***	-0.135***	-0.092**	-0.093**	-0.086**	-0.088**
	(0.030)	(0.030)	(0.041)	(0.041)	(0.041)	(0.041)	(0.036)	(0.036)
Category C	-0.054*	-0.057*	-0.113**	-0.119***	-0.074*	-0.077*	-0.047	-0.050
	(0.032)	(0.033)	(0.045)	(0.045)	(0.045)	(0.045)	(0.038)	(0.038)
Category D or F	-0.029	-0.029	-0.098**	-0.104**	-0.132***	-0.133***	-0.023	-0.025
	(0.028)	(0.028)	(0.041)	(0.041)	(0.040)	(0.040)	(0.033)	(0.033)
Category E	-0.061*	-0.062*	-0.087*	-0.097**	-0.121**	-0.127***	-0.010	-0.017
	(0.036)	(0.037)	(0.049)	(0.048)	(0.048)	(0.048)	(0.041)	(0.043)
Male	-0.055***	-0.055***	-0.114***	-0.112***	-0.139***	-0.138***	0.038*	0.040*
	(0.020)	(0.021)	(0.027)	(0.027)	(0.027)	(0.027)	(0.023)	(0.023)
Indigenous	-0.195**	-0.190**	-0.112*	-0.102	-0.083	-0.076	-0.082	-0.075
	(0.076)	(0.078)	(0.066)	(0.066)	(0.074)	(0.074)	(0.074)	(0.075)
Migrant	-0.029	-0.031	0.109*	0.107*	0.059	0.057	-0.055	-0.056
	(0.042)	(0.042)	(0.058)	(0.058)	(0.053)	(0.054)	(0.054)	(0.054)
Child at wave 2	-0.209**	-0.207**	-0.218***	-0.217***	-0.214**	-0.218**	-0.542***	-0.546***
	(0.088)	(0.089)	(0.066)	(0.068)	(0.086)	(0.087)	(0.073)	(0.073)
Physical disability	-0.043	-0.041	-0.000	0.003	0.038	0.040	0.007	0.009
	(0.039)	(0.039)	(0.045)	(0.046)	(0.044)	(0.044)	(0.039)	(0.039)
Developmental disability	-0.127**	-0.130**	-0.152***	-0.153***	-0.144***	-0.146***	-0.174***	-0.176***
	(0.054)	(0.054)	(0.053)	(0.054)	(0.055)	(0.055)	(0.060)	(0.059)
Two-parent	0.021	0.022	-0.043	-0.042	-0.070*	-0.070*	-0.003	-0.003
	(0.031)	(0.031)	(0.038)	(0.039)	(0.040)	(0.040)	(0.037)	(0.037)
Migrant parent	0.072***	0.072***	0.055*	0.053*	0.068**	0.068**	-0.029	-0.029
	(0.021)	(0.021)	(0.030)	(0.030)	(0.030)	(0.030)	(0.025)	(0.025)
Mom w. yr12	0.059*	0.060*	0.145***	0.148***	0.142***	0.142***	-0.016	-0.016
	(0.035)	(0.035)	(0.053)	(0.053)	(0.053)	(0.053)	(0.045)	(0.045)
Mom w. diploma	0.005	0.010	0.032	0.033	0.060*	0.063*	0.034	0.036
	(0.027)	(0.027)	(0.033)	(0.033)	(0.034)	(0.034)	(0.028)	(0.029)
Mom w. Bachelor	0.033	0.036	0.106**	0.103**	0.159***	0.157***	0.007	0.005
	(0.030)	(0.030)	(0.043)	(0.043)	(0.041)	(0.042)	(0.036)	(0.037)
Dad w. yr12	0.056*	0.058*	0.072*	0.072*	0.067	0.070*	-0.003	-0.000
	(0.031)	(0.031)	(0.041)	(0.041)	(0.041)	(0.041)	(0.035)	(0.035)
Dad w. diploma	0.076***	0.079***	0.123***	0.126***	0.115***	0.120***	0.032	0.036
	(0.026)	(0.027)	(0.037)	(0.037)	(0.036)	(0.036)	(0.030)	(0.030)
Dad w. Bachelor	0.109***	0.111***	0.295***	0.297***	0.221***	0.224***	0.086***	0.089***
	(0.026)	(0.026)	(0.039)	(0.039)	(0.038)	(0.038)	(0.031)	(0.031)
Mom working	0.010	0.010	0.013	0.012	-0.019	-0.020	0.015	0.013
	(0.024)	(0.024)	(0.030)	(0.030)	(0.031)	(0.031)	(0.027)	(0.027)
Mom's work nk	-0.187	-0.179	-0.226***	-0.213***	-0.290***	-0.285***	-0.162	-0.157
	(0.121)	(0.121)	(0.068)	(0.069)	(0.082)	(0.082)	(0.109)	(0.109)
No mom	-0.103	-0.104	-0.285***	-0.280***	-0.428***	-0.428***	-0.340***	-0.338***
	(0.119)	(0.118)	(0.093)	(0.094)	(0.094)	(0.094)	(0.123)	(0.125)
Dad working	-0.013	-0.012	0.090*	0.092**	0.012	0.013	0.052	0.053
	(0.040)	(0.040)	(0.047)	(0.047)	(0.050)	(0.050)	(0.046)	(0.046)
No dad	-0.095	-0.091	-0.005	0.005	-0.099	-0.096	0.059	0.063
	(0.060)	(0.060)	(0.064)	(0.064)	(0.068)	(0.068)	(0.062)	(0.062)
Read at night	0.039*	0.037*	0.046*	0.044	0.028	0.027	-0.004	-0.005
	(0.021)	(0.021)	(0.028)	(0.028)	(0.028)	(0.028)	(0.023)	(0.023)

Table 4. Results of linear probability model estimations of educational and employment outcomes at wave 2 (continued)

	Year 12		University		Intended university		Full engagement	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
LOC1	0.010		0.025*		0.007		0.035***	
	(0.011)		(0.013)		(0.013)		(0.012)	
LOC1*categoryA		0.002		-0.016		-0.003		0.022
		(0.014)		(0.023)		(0.022)		(0.018)
LOC1*categoryB		0.041*		0.057**		0.024		0.049**
		(0.024)		(0.025)		(0.025)		(0.024)
LOC1*categoryC		-0.028		0.001		-0.026		0.007
		(0.035)		(0.041)		(0.044)		(0.042)
LOC1*categoryDF		-0.007		0.048		-0.008		0.029
		(0.029)		(0.035)		(0.034)		(0.029)
LOC1*categoryE		0.017		0.062*		0.047		0.077**
		(0.038)		(0.035)		(0.035)		(0.036)
Constant	0.821***	0.816***	0.392***	0.394***	0.609***	0.606***	0.748***	0.746***
	(0.060)	(0.060)	(0.075)	(0.075)	(0.079)	(0.080)	(0.069)	(0.069)
No of obs	1,274	1,274	1,274	1,274	1,271	1,271	1,272	1,272
F-stat	5.34	4.73	18.21	15.99	13.16	11.54	7.64	6.64
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R2	0.117	0.120	0.173	0.177	0.147	0.149	0.110	0.112

Note: for description of explanatory variables, see Table A1.
Robust standard errors in parentheses.

APPENDIX

Table A1. Explanatory variables for wave 1 locus of control regressions: summary statistics

Variable	Explanation	Obs	Mean	Std. Dev.	Min	Max
Category A	No income support (IS) or unknown					
Category B	Intensive (IS): >6 years total	1,640	0.27	0.45	0	1
Category C	Moderate IS, older age of first exposure: after 1998 and <=6yrs total	1,640	0.13	0.34	0	1
Category D	Minor non-recent IS: between 1994 and 1998 and <3 yrs	1,640	0.12	0.32	0	1
Category E	Moderate IS before 1994 and <6 yrs	1,640	0.10	0.29	0	1
Category F	Moderate non-recent IS: between 1994 and 1998 and >3 yrs but <6 yrs	1,640	0.05	0.23	0	1
Male	Male	1,640	0.45	0.50	0	1
Indigenous	Indigenous	1,640	0.03	0.17	0	1
Migrant	Migrant	1,640	0.05	0.22	0	1
Couple	Couple	1,640	0.03	0.18	0	1
Houses	Number of homes youth lived in before 18	1,640	3.68	3.22	1	34
Schools	Number of schools attended	1,640	2.93	1.43	0	20
Two-parent	Lived with both parents at 14	1,640	0.73	0.44	0	1
Migrant parent	Either parent is a migrant					
Mother w. yr 12	Mother's highest education is Year 12	1,640	0.08	0.28	0	1
Mother w. diploma	Mother's highest education in Diploma or Certificate	1,640	0.43	0.50	0	1
Mother w. Bachelor	Mother's highest education is University	1,640	0.20	0.40	0	1
Father w. yr 12	Father's highest education is Year 12	1,640	0.15	0.36	0	1
Father w. diploma	Father's highest education in Diploma or Certificate	1,640	0.24	0.43	0	1
Father w. Bachelor	Father's highest education is University	1,640	0.18	0.38	0	1
Mother working	Mother has a job when youth was 14	1,640	0.69	0.46	0	1
Mother's work nk	Mother's employment status unknown	1,640	0.02	0.13	0	1
No mother	No mother substitute at 14	1,640	0.01	0.10	0	1
Father working	Father has a job when youth was 14	1,640	0.81	0.39	0	1
Father's work nk	Father's employment status unknown	1,640	0.01	0.12	0	1
No father	No father substitute at 14	1,640	0.11	0.31	0	1
Read at night	Parents often read to youth a night	1,640	0.53	0.50	0	1
Financial crisis	Youth's family had a major financial crisis	1,640	0.27	0.44	0	1
Substance: family	Someone in youth's household had an alcohol or drug-use problem					
Ran away	Youth ran away from home	1,640	0.16	0.36	0	1
Bad crowd	Youth started to hang out with a bad crowd	1,640	0.19	0.39	0	1
Injury/assault	Youth was seriously injured or assaulted	1,640	0.09	0.29	0	1
Mental issue	Youth was treated for a mental or emotional issue	1,640	0.14	0.34	0	1
Guidance officer	Youth had contact with guidance officer	1,640	0.15	0.36	0	1
Police	Youth had trouble with police	1,640	0.19	0.39	0	1
Substance: youth	Youth had problems with alcohol or drugs					
PLOC 1st	Parental LOC item 1 standardised	1,640	0.08	0.96	-2.04	1.41
PLOC 2st	Parental LOC item 2 standardised	1,640	0.07	0.96	-2.07	1.64
PLOC 3st	Parental LOC item 3 standardised	1,640	0.05	0.96	-2.78	1.44
PLOC 4st	Parental LOC item 4 standardised	1,640	0.01	0.98	-1.33	3.56
PLOC 5st	Parental LOC item 5 standardised	1,640	0.09	0.96	-2.66	1.54
PLOC 6st	Parental LOC item 6 standardised	1,640	0.02	1.00	-1.15	3.84
PLOC 7st	Parental LOC item 7 standardised	1,640	0.05	0.98	-2.99	1.56

Table A2. Descriptive statistics: locus of control items

Item No.	Questionnaire item	Obs	Mean	Std. Dev.	Min	Max
(i)	There is really no way I can solve some of the problems I have	1,640	3.07	0.74	1	4
(ii)	Sometimes I feel that I'm being pushed around in life	1,640	2.75	0.79	1	4
(iii)	I have little control over the things that happen to me	1,640	3.15	0.67	1	4
(iv)	I can do just about anything I really set my mind to	1,640	1.75	0.64	1	4
(v)	I often feel helpless in dealing with the problems of life	1,640	2.85	0.77	1	4
(vi)	What happens to me in the future mostly depends on me	1,640	1.63	0.64	1	4
(vii)	There is little I can do to change many of the important things in my life	1,640	3.14	0.69	1	4
	Equal-weights index of locus of control	1,640	21.58	3.21	7	28

Table A3. Explanatory variables for the change in locus of control regression: summary statistics

Variable	Obs	Mean	Std. dev.	Min	Max
Events occurred between wave 1 and wave2:					
Birth of child	1,461	0.025	0.155	0	1
Became independent (moved out of parents' or relatives' home)	1,461	0.165	0.371	0	1
Completed Year 12	1,461	0.097	0.295	0	1
Started a course of study	1,461	0.183	0.387	0	1
Completed a course of study	1,461	0.268	0.443	0	1
Death of family member/friend	1,461	0.386	0.487	0	1
Financial problems	1,461	0.116	0.321	0	1
Someone close to youth had a substance abuse problem	1,461	0.254	0.435	0	1
Trouble with police	1,461	0.189	0.392	0	1
Youth had a substance abuse problem	1,461	0.109	0.312	0	1
Youth or partner got pregnant	1,461	0.107	0.310	0	1
Youth or partner had an abortion	1,461	0.077	0.267	0	1
Injury/assault	1,461	0.330	0.470	0	1
Treated for mental or emotional issue	1,461	0.165	0.371	0	1
New job	1,461	0.775	0.417	0	1
Outstanding personal achievement	1,461	0.581	0.494	0	1
Changed residence,	1,461	0.505	0.500	0	1
Increased social activities	1,461	0.507	0.500	0	1
Decreased social activities	1,461	0.260	0.439	0	1
Major change in diet	1,461	0.525	0.500	0	1
Major change in closeness of family members	1,461	0.389	0.488	0	1

Table A4. Main activity at the time of wave 2 interview

	Income support stratification category								
	A	**B**	**C**	**D**	**E**	**F**	**Male**	**Female**	**Total**
Total respondents	**691**	**755**	**308**	**256**	**218**	**129**	**1,068**	**1,289**	**2,357**
Percentage by category:									
FT education, unknown work	0.1	0.1	0.0	0.0	0.5	0.0	0.1	0.2	0.1
FT education only	9.6	12.6	10.7	9.0	6.9	14.0	10.5	10.7	10.6
FT employment only	18.0	22.1	20.5	26.6	24.8	25.6	24.9	18.9	21.6
FT education, PT work	38.5	22.3	29.2	27.7	27.1	18.6	20.9	35.3	28.8
FT work, PT education	7.4	6.2	7.1	4.3	6.9	7.0	8.7	4.8	6.6
FT education, FT work	8.8	7.8	9.7	13.7	8.7	7.8	14.2	4.8	9.1
Total percentage fully engaged	***82.4***	***71.1***	***77.2***	***81.3***	***74.9***	***73.0***	***79.3***	***74.7***	***76.8***
PT education, PT work	2.8	3.2	2.9	2.7	4.1	1.6	2.2	3.7	3.0
PT education only	1.7	2.0	1.0	0.4	1.8	2.3	1.6	1.6	1.6
PT work only	8.8	11.3	11.0	10.6	11.9	13.2	9.5	11.6	10.6
Not in education or employment	4.3	12.5	7.8	5.1	7.3	10.1	7.5	8.5	8.1
Total percentage not fully engaged	***17.6***	***29.0***	***22.7***	***18.8***	***25.1***	***27.2***	***20.8***	***25.4***	***23.3***

Table A5. Summary of education and employment outcomes, wave 2

Variable	Explanation	Obs	Mean	Std.dev.	Min	Max
Year 12	Completed Year 12 by wave 2	1,269	0.842	0.365	0	1
University	Enrolled in (or have completed) a university course of study by wave 2	1,269	0.496	0.500	0	1
Intended university	Intends to obtain a university degree at wave 2 (including those enrolled in university)	1,269	0.590	0.492	0	1
Full engagement	Fully engaged with full-time studies or full-time work, or a combination, at wave 2	1,269	0.780	0.414	0	1

Table A6. Education and employment outcomes by income support stratification category and gender, wave 2

	Income support stratification category							
	A	B	C	D	E	F	Male	Female
Number of observations	*692*	*757*	*308*	*256*	*219*	*130*	*1,069*	*1,293*
Completed year 12	89.45	71.73	81.17	85.55	78.54	80.00	76.61	84.15
Enrolled in university	56.65	34.74	42.21	42.58	41.10	42.31	36.30	50.35
Intends to obtain a university degree	65.99	48.15	58.17	50.78	49.32	47.69	46.44	62.15
Full engagement	82.34	70.60	76.95	80.86	74.31	72.87	79.12	74.24