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Education and happiness in the school-to-work transition

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Longitudinal Surveys of Australian Youth

NCVER

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About the research

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Very few would argue that education does not enhance people's lives, with higher educational attainment being linked to better career paths and health. It is curious then that previous research has found that attaining higher levels of education is linked to lower levels of happiness or satisfaction with life. This would appear to be at odds with current policy promoting the value of further education. Could it be that attaining higher education sets people up to fail by encouraging expectations that can never be met?

Using data from the 1995 Year 9 cohort of the Longitudinal Surveys of Australian Youth (LSAY), Mike Dockery examined the relationship between individuals' highest level of education and their self-rated happiness. He also looked at the impact of factors such as family circumstances while at school and personality traits on this relationship.

Key messages

- Undertaking vocational qualifications, such as an apprenticeship or traineeship, has a positive impact on happiness during the training period, with happiness continuing after completion.
- For university graduates, it would appear that their university days were their glory days, with the graduates' high levels of happiness declining upon completion of their qualification. Unfortunately, as the cohort is only tracked until their mid-20s, it is not possible to determine whether this is a temporary dip upon entering the labour force or a more permanent state.
- Early school leavers and youth at risk (sole parents or low-income family) experience persistent adverse impacts on their career outcomes and wellbeing.

The young people who make up the 1995 and 1998 cohorts of LSAY have all been interviewed in relatively prosperous economic times. It will be interesting to see if, and to what degree, happiness varies for later cohorts, following the adverse global economic events of late 2008. It would also be interesting to track happiness past the mid-20s to see whether the differences between apprenticeships and university graduates, for example, persist.

Tom Karmel
Managing Director, NCVER

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Executive summary

It is generally accepted that education enriches people's lives. It is well established that higher educational attainment puts people on better career paths and is also believed to enhance outcomes in other life domains, such as health and relationships. One would therefore expect people who achieve higher levels of education to be happier, on average, than those with lower levels of education. However, a number of studies in the rapidly growing literature on subjective wellbeing have observed precisely the opposite empirical relationship in developed countries—that higher levels of educational attainment are associated with lower self-rated happiness or life satisfaction. These include studies based on data recently collected in Australia.

If this empirical finding indeed holds, it poses a challenge to conventional thinking and policy on the value of further education and/or the validity of commonly used measures of subjective wellbeing. Surprisingly, however, it has received very little attention from researchers. The principal objective of this research is to investigate the nature of the relationship between the highest level of education attained by individuals and their self-rated happiness. A review of the literature offers little guidance on how education might be expected to impact upon subjective wellbeing from a theoretical perspective, although several contributions suggest that overall happiness or life satisfaction may be shaped by a different set of factors for the more highly educated. Happiness research suggests that attaining higher levels of education may reduce happiness if it heightens individuals' expectations or aspirations; that is, the yardsticks against which people assess their current circumstances.

The analysis is based on data from the 1995 Year 9 cohort of the Longitudinal Surveys of Australian Youth (LSAY), one of a number of cohorts tracked as part of a wider series of surveys on the school-to-work transition. The students in this cohort were first surveyed as Year 9 students in 1995, with 11 annual follow-up surveys or interviews through to 2006, the year the bulk of the cohort turned 25. From 1997 onwards individuals were asked to indicate whether they were 'very happy', 'fairly happy', 'fairly unhappy' or 'very unhappy' with their life as a whole. The measurement of individuals' happiness is based on the responses to this question. The question is also asked with respect to 13 other aspects of individuals' lives, such as career prospects, social life and their life at home.

In addition to the usual benefits of longitudinal versus cross-sectional data in allowing controls for unobservable fixed effects, the LSAY data for this particular research question offer the advantage of a relatively large sample for which respondents' subjective happiness can be observed prior to, during and after completion of their highest educational qualification. Distinguishing between individuals' current level of educational attainment in each wave of the survey and the highest level of education they ultimately attain by the end of the survey is a key tool used. This allows us to determine whether differences in happiness by level of educational attainment are simply due to pre-existing individual attributes or to happiness levels changing as people gain higher levels of education. Both simple descriptive statistics and more sophisticated random-effects panel models are used to analyse the relationships between happiness and education and the role of other factors in shaping happiness in the school-to-work transition.

In the initial waves of the survey, there is a clear positive relationship between happiness and the level of education individuals would eventually attain. However, happiness levels converge, such that by age 25 years there is almost no difference in the mean reported levels of happiness by

educational attainment. Multivariate models that control for a range of initial effects of the individuals, including personality traits and family background, show that for the period overall there is no simple monotonic relationship between happiness and educational attainment: early school leavers and those who complete a university degree are found to have lower levels of happiness than those with intermediate vocational qualifications. Hence, any negative association between higher education and happiness is essentially limited to lower levels of wellbeing reported by university graduates relative to those with intermediate-level qualifications.

A further key finding is the rejection of the explanation that people who gain university degrees were always less happy. In fact, they are relatively happy while they are at school and while studying at university. It is upon completion of their degree that the happiness of university graduates declines. This is despite the fact that they do generally achieve better labour market outcomes upon entering the labour force. The inclusion of controls for labour market outcomes in the panel models only accentuates the lower level of happiness reported by university graduates, relative to those with intermediate vocational qualifications. By comparison, apprenticeships stand out as a pathway associated with a pronounced positive impact upon happiness during the training indenture.

Some other important determinants of happiness in the school-to-work transition include 'fixed' factors associated with family circumstances while at school and the personality traits of being an extrovert and of being calm or easygoing. Living in a sole-parent family at age 16 years, for example, has a lasting negative effect on wellbeing. In terms of developments during the transition, getting married or entering into a de facto relationship is associated with a pronounced increase in reported happiness, as is securing, upon entering the workforce, the job desired as a career.

It has not been possible using the LSAY data to adequately model changes in expectations or aspirations that are conditional upon educational attainment and these may well play an important role in the apparent decline in relative happiness for university graduates from around the age of 23 years. Analyses of changes in happiness in individual life domains failed to provide any clear explanation. Generally, completion of a university degree is associated with positive levels of happiness in individual life domains, and this would not lead to expectations of graduates having a relatively low level of happiness with their life overall. University graduates do appear to place greater weight on career issues, but completing a degree seems to increase happiness with both their career prospects and their future.

One explanation for the decline in happiness associated with gaining a university degree is proposed which is consistent with the empirical results: that the time in school and while studying at university are particularly happy times for those who go on to gain a university degree, with their subsequent work and life experiences seeming to be not quite as good in relative terms. Those who gain university qualifications come, on average, from more privileged backgrounds; they are the happiest while at school and are relatively happy while studying at university (though not as happy as apprentices). In short, these are good times. Post-university, they may be likely to indicate that they are somewhat less than 'very happy', because these good times set the benchmark for their evaluation. In contrast, their peers who left school early or gained intermediate-level qualifications were not so happy at school and may find the years following their transition from school to work to be relatively good times, and hence are more likely to report high levels of happiness.

Introduction

Education is widely seen as enhancing people's lives. It helps people achieve self-fulfilment and realise their potential as contributors to society. Higher educational attainment is associated with higher earnings and occupational status, and the provision of 'better education' is a common prescription for assisting socially and economically disadvantaged groups. In developing countries, greater education is seen as a way of enhancing living standards and facilitating many of the 'freedoms' that economic development brings and which people have reason to value (see Sen 1999). Education features prominently in the construction of measures of social or national progress, including the best-known index, the United Nations Human Development Index (Hall & Matthews 2008).

It is surprising to discover, then, that more educated people should be no happier or even less happy than people with lower levels of education. Instances of such a negative correlation between educational attainment and subjective wellbeing have been observed in a number of developed countries, including Australia. Equally surprising is that the result has attracted very little attention from researchers. If it is accepted at face value, then the policy implication is that people should be discouraged from pursuing higher levels of education. Surely few would subscribe to such a policy—it is clearly at odds with the conventional wisdom about the value of education and the assumptions underlying existing educational policy. Yet, to reject the finding is to reject the validity of empirical studies based upon subjective wellbeing in economics, about which there is a rapidly growing literature, and the policy inferences that can be drawn from them. Establishing whether or not more education actually 'causes' unhappiness is therefore of considerable significance.

This report presents the results of a detailed analysis of the links between educational attainment and self-reported happiness. The research is based on data from the Longitudinal Surveys of Australian Youth (LSAY) and funded through a grant under the LSAY Research, Innovation and Expansion Fund.[1] The LSAY data offer some valuable attributes for this purpose. Firstly, its longitudinal nature enables controls for unobservable fixed individual effects that are not possible with cross-sectional data. Second, it offers a large sample of people for whom self-assessed happiness is observed before, during and after attainment of their highest level of education. This allows investigation of the timing of changes in happiness over the school-to-work transition in relation to the accrual of educational qualifications.

The paper proceeds with a review of the existing literature setting out the theory and empirical evidence of the links between education and subjective wellbeing. The LSAY data and the key constructs relating to educational attainment and subjective wellbeing are described in the 'Data and key constructs' section. The section, 'Are the more-educated less happy', presents an initial assessment of how happiness changes over time, conditional upon eventual educational attainment and the correlations between overall happiness and happiness in different life domains. The nature of these relationships and other factors that shape happiness in the school-to-work transition are explored in more detail through multivariate models in the 'Modelling the determinants of happiness' section.

[1] The grant scheme is funded by the Department of Education, Employment and Workplace Relations and administered by the National Centre for Vocational Education Research.

The analysis provides some important and novel insights into the sources of the inverse relationship between subjective wellbeing and highest level of education attained in Australia, and these are set out in the conclusions. Of particular significance is the finding that the inverse relationship between educational attainment and happiness essentially applies only to the attainment of university-level qualifications, and that those young people who gain university qualifications did not have a predisposition to being relatively less happy. Initially they are the happiest of the cohort, and their subjective wellbeing declines upon completion of their degrees.

Education and happiness: A review of the literature

After a long-held reluctance by the economics discipline to embrace subjective wellbeing as a legitimate measure of economic outcomes, the past ten to 15 years have seen a burgeoning number of studies based on such measures. This 'happiness literature' has challenged orthodox economics on a number of fronts, starting from the very foundations of microeconomics. (Reviews can be found in Dockery 2003 and Frey & Stutzer 2002.) In microeconomics, individual wellbeing is seen as being derived from the 'utility' received through the consumption of goods and services. Utility is not measured directly; rather, economists use revealed preference to place different consumption possibilities into rank order. That is, consumers are assumed to be rational and utility-maximising. If a consumer chooses consumption Set A over Set B, then it follows axiomatically that Set A offers higher utility than Set B. Higher wealth expands the consumption set available to consumers, and thus increases in wealth directly increase utility and wellbeing.

Rather than relying on revealed preference, psychologists have long been asking people directly to assess their level of wellbeing, typically by asking them to rate their life satisfaction or level of happiness on some low-to-high scale. This approach has been challenged as being unscientific because the measure is subjective and cannot be directly observed, and indeed there are many limitations to such measures. Responses on such scales tend to be very tightly clustered between the 'happy' and 'very happy' points of the scales (or around 7 or 8 on a scale of 0 to 10). The fact that people of very different life experiences—the sick and the healthy, the rich and the poor—report being quite happy or satisfied with their lives casts doubt on the usefulness of the measure. Responses may also reflect fixed traits of individuals, such as personality characteristics, rather than their life circumstances. Or they may be affected by temporary mood swings and emotional states, meaning that their responses do not represent an evaluative assessment of the quality of their life. Despite these many limitations, subjective wellbeing has gained acceptance as a legitimate measure for empirical work and has been validated against objective physiological measures such as brain activity and frequency of smiling (Layard 2003).

It is in challenging the 'money does buy happiness' axiom of classical microeconomics that the happiness literature has been most influential. Evidence from cross-country studies indicates that there is a strong positive correlation between gross domestic product (GDP) per capita and average reported wellbeing among low-income countries, or up to an income level of around $US10 000 to $US15 000 per annum, but the relationship does not seem to hold for higher-income developed countries (Frey & Stutzer 2002). In 1974, Easterlin observed that in cross-sectional individual-level data, there is a clear positive correlation between people's income and happiness, yet since the Second World War there have been substantial increases in real incomes, while average happiness levels have not increased. Empirical evidence for this 'Easterlin Paradox', as it became known, has continued to be reported, based on data extending through the latter half of the twentieth century (see, for example, Easterlin 1995, 2001; Frey & Stutzer 2002). However, a rigorous re-analysis of the main datasets by Stevenson and Wolfers (2009) has challenged the empirical basis for the Easterlin Paradox, arguing instead that the data are consistent with positive correlations of life satisfaction or happiness with both income between individuals and income growth over time, and with the income gradient over time being roughly comparable in magnitude to the cross-sectional income gradient. This recent empirical challenge aside, the main explanation offered for the Easterlin Paradox is that it is people's income relative to others' that determines their happiness, and not their absolute level of income (McBride 2001; Ferrer-i-Carbonell 2005). This tendency for

people to compare themselves against others in assessing their wellbeing has become known more generally as 'rivalry'. Where rivalry effects dominate, the unfortunate consequence is that any increase in one person's happiness comes at the expense of another. Frank (1999) argues that people purchase particular goods to signal their wealth and status and that this rivalry leads to a zero-sum game of rising consumption and long working hours. Easterlin (2001) suggests that happiness is determined by people's circumstances relative to their aspirations. Whether people's happiness increases or decreases as wealth rises depends upon the rate at which they revise their aspiration levels (see also Stutzer 2004).

An extensive body of empirical research now exists that attempts to address this question of the importance of income or wealth and to identify other factors that determine subjective wellbeing. These typically involve the estimation of multivariate regression models in which the subjective rating of wellbeing is the dependent variable. The discrete, ordered form of the response variable lends itself to ordered probit or logit models. The availability of panel data has important advantages in controlling for fixed individual effects, such as fixed personality traits and differences in the way individuals interpret the scales. In developing countries it appears that income or wealth does have a positive but relatively small impact on wellbeing. Social status (or relative income), good health, satisfying employment and being married are other factors that are commonly identified as contributing positively to subjective wellbeing (see, as examples, Dolan, Peasegood & White 2008; Peiró 2006; Veenhoven 1991).

Education is commonly included as one of the control variables within these multivariate regression models and, when it is significant, generally a small and positive relationship is identified between individuals' level of educational attainment and their wellbeing. However, a surprising result that has appeared in several studies based on data from developed countries is that educational attainment has a *negative* estimated effect on wellbeing (Veenhoven 1996) and this includes recent studies based on Australian data (Dockery 2003; Headey & Wooden 2004; Hickson & Dockery 2008). Equally surprising is that very few papers have attempted to explain this result either from an empirical or theoretical perspective.

Education and happiness: Some theory

Human capital theory views education as an initial investment that generates a stream of later returns in the form of increased productivity, leading to better employment prospects and higher earnings (Becker 1962). However, increased education may offer benefits in a wide range of other spheres, such as health and marriage prospects (Hartog & Oosterbeek 1998, p.245; Haveman & Wolfe 1984). These considerations point to persons with higher education having better life outcomes and, one would assume, greater subjective wellbeing.

The role of rivalry and aspirations in the happiness literature's attempts to account for the seemingly weak relationship between income and happiness and for the 'Easterlin Paradox' can be applied equally to education. Education is known to improve incomes and outcomes in non-financial life domains. Individuals therefore are likely to expect better outcomes if they have achieved more education, and to a large extent they will have participated in education for the specific purpose of achieving these improved outcomes. If this raises their aspirations, and people's happiness is determined by their circumstances relative to their aspirations, then the contribution of education to happiness will be weakened. If aspirations are heightened disproportionately more than outcomes, then education may even be associated with lower happiness.

If rivalry effects dominate—if it is people's circumstances relative to others that determine their happiness rather than their absolute circumstances—then again the link between education and happiness may be ambiguous. It follows that as education levels generally have increased over time we should not expect any general increase in happiness, but that more-educated people should still on average be happier than less-educated people. However, level of education may change the reference group of people against which they assess their 'relative' standing. If people who graduate

from university, for example, now compare themselves with other professionals, then again happiness may not increase with educational attainment.

Michalos (2007) suggests that the relationship between education and happiness may depend in part on how broadly education is defined. Defining education as formal education leading to some kind of certification as opposed to the more general sense of the many ways in which learning occurs may be a substantial oversimplification. While this is an important and valid point, it is the more limited formal definition of education that is of interest here, since this paper seeks to explain the relationship between happiness and the attainment of formal educational qualifications. With a self-confessed degree of exaggeration, Michalos (2007, p.4) proposes four scenarios which seem instructive here:

- real paradise—people's living conditions are good and people accurately perceive them to be good (presumably such people would report being happy)
- real hell—people's living conditions are bad and people accurately perceive them to be bad (presumably such people would report being unhappy)
- fool's paradise—people's living conditions are bad but people inaccurately perceive them to be good (presumably such people would report being happy)
- fool's hell—people's living conditions are good but people inaccurately perceive them to be bad (presumably such people would report being unhappy).

If more-educated people are genuinely less happy, it may be that they are living in a 'fool's hell' or that less-educated people are living in a 'fool's paradise'. Even if there were such a causal negative relationship with education, Michalos questions the inference that could be drawn from happiness measures, from both a moral and policy perspective. He draws upon Socrates's view of wellbeing as meaning 'living well and doing well' to argue that there is more to life than being happy. In quoting Mill (1863):

> It is better to be a human being dissatisfied than a pig satisfied; better to be Socrates dissatisfied than a fool satisfied. (Cited by Michalos 2007, p.6)

He puts the point rather bluntly, and the discussion here is in no way intended to imply those of lower education are somehow less worthy. Rather, the argument is that education has an intrinsic contribution to 'living well and doing well' which may promote critical thought or heightened concern in some domains in life, and perhaps reduced 'pleasures' in other domains, but this should not be taken as reduced wellbeing defined more widely. Micholas proposes his Multiple Discrepancies Theory for interpreting wellbeing, whereby overall happiness and happiness in individual life domains, such as marriage and family life, working life, social life, and health, are interrelated and dependent upon perceived discrepancies between what one wants and what one has, possibly conditioned upon what one has had in the past.

Overall, the theoretical links between education and wellbeing are not well developed. Some of the limitations and complexities facing theorists and empirical analysts are discussed by Desjardins (2008), including the problem that the objectives of education, or the dimensions of wellbeing that should be enhanced by education, are not clear. Desjardins identifies three broad levels at which education can be seen to impact upon wellbeing: through an absolute mechanism in which education directly enhances individuals' resources and capabilities to influence their own wellbeing; through a relative mechanism where one's level of education enhances their relative position and influence in society; and through a cumulative mechanism in which rising levels of education have positive externalities for society as a whole or for groups within society through, for example, greater levels of trust, civil engagement and innovation. This concept of relative mechanisms has a clear parallel to the effects of rivalry discussed above.

An important link between education and wellbeing identified by Desjardins is that of agency, which has been identified by psychologists and sociologists as being important to wellbeing. Education may influence both individual and collective agency. At an individual level agency refers

to 'the capacity of an individual to act, i.e. to make choices and decisions and behave accordingly' and encompasses beliefs, emotions and identity (Desjardins 2008, p. 29). Collective agency relates to the effectiveness and stability of political process and the quality of institutions. Kitayama and Markus (2000) suggest that more-educated people are likely to display a higher level of agency, including higher levels of control, self-esteem, independence and individualism:

> People with lower levels of education often report high levels of happiness and life satisfaction, but they are less likely to manifest many of the other features of the independent self; they show relatively lower levels of control, self-esteem, optimism, and are less likely to have elaborated self-concepts. (Kitayama & Markus 2000, p.127)

These insights suggest that the differences between the more-educated and less-educated might lie in the constituent dimensions of wellbeing. Michalos's discussion of the 'good life' and Multiple Discrepancies Theory points to overall wellbeing for the highly educated and less-educated being shaped by different factors. These considerations all indicate a need to analyse happiness across separate life domains, such as work and home life, in order to fully understand the differences in subjective wellbeing for those of different levels of education.

Empirical evidence

According to Hartog and Oosterbeek (citing Veenhoven 1996 as their source):

> Education correlates strongly (and positively) with happiness scores in poor nations and weakly in rich nations. Recently, in developed nations even negative correlations are found. Happiness is generally found to be unrelated to intelligence as measured by concurrent tests. (Hartog & Oosterbeek 1998, p.247)

Peiró (2006) presents the results of multivariate, ordered logit models of happiness for 15 countries using 1995–96 data from the World Values Survey. The models, which include income, health status and employment among the controls, find a significant relationship between happiness and education in only two of the 15 countries—Australia and Taiwan—and in both cases the estimated effect was positive. For Australia the positive effect applied only to secondary education, with the effect of a university education being insignificant. When the dependent variable is life satisfaction, rather than happiness, only the model for the Dominican Republic returns a positive effect of education. In cross-country regressions based on the World Values Survey data, Inglehart and Klingemann find no significant effect of a country's educational enrolments on mean life satisfaction (2000, pp.180–1).

Despite the importance of this issue, only six empirical studies have so far been identified in which the relationship between education and happiness is a major focus (Hartog & Oosterbeek 1998; Hickson & Dockery 2008; Michalos 2007; Ross & Van Willigen 1997; Stevenson & Wolfers 2008; Witter et al. 1984). Hartog and Oosterbeek (1998) use panel data for a Dutch cohort who were aged 41years in 1993. They find a parabolic relationship in which happiness is highest for individuals with higher-level secondary education, after which it declines. The relationship still holds, although the estimated coefficients are slightly smaller with the addition of a wide range of controls, including IQ measured at age 12 and father's education. It is the inclusion of controls for health and wealth that partly account for the education effect:

> Apparently, the parabolic schooling effect on happiness works through a parabolic relationship with health and wealth, both of which positively relate to happiness ... the most remarkable finding is that those with only a secondary education of a general, non-vocational nature appear to come out on top: they are healthier, happier and wealthier than any of the other schooling groups. (Hartog & Oosterbeek 1998, p.254)

Evidence for the United States suggests a modest positive association between educational attainment and subjective wellbeing in that country. Witter et al. (1984) undertake a meta-analysis of US studies that report coefficients on the effect of education on happiness to find that it has a

positive effect. However, the studies they include appear to use mainly linear specifications (years of schooling), whereas Hartog and Oosterbeek (1998) stress the importance of allowing for a non-linear relationship. Also Witter et al.'s meta-analysis is based on pre-1984 studies, and Veenhoven (1996) has suggested that the effect of education has changed to become negative over time. Even though Witter et al. (1984) identify a generally positive effect, Michalos (2007, p.13) notes that educational attainment accounts for only one to three per cent of the variation in adult wellbeing in the 90 studies they reviewed. Analysing US data from 1972 to 2006, Stevenson and Wolfers (2008) do enter education as a series of dummy categories (college graduate, some college, high school graduate, did not graduate from high school) and find a steady increase in happiness with education from one category to the next. Moreover, the premium associated with higher education seems to have increased over time. Ross and Van Willigen (1997) investigate the relationship between education and a range of measures of subjective quality of life. They find education guards against all tested measures of distress, such as anxiety and depression, but no significant total effect of education on job dissatisfaction. After controlling for job characteristics, the more-educated are found to be less satisfied with their work, leading the authors to conclude that the more-educated experience less distress, primarily because education provides access to non-alienating work, but the higher expectations of the more-educated result in no increase in overall job satisfaction.

The more recent studies that indicate a negative relationship between education and wellbeing include a number of Australian studies, of which several are based on the Household, Income and Labour Dynamics in Australian Survey (HILDA) (Dockery 2003; Headey & Wooden 2004; Hickson & Dockery 2008). Using data from the 1995 Year 9 cohort of LSAY, Dockery (2005) also finds that school leavers who had higher school achievement scores in Year 9 were less happy. This is consistent with earlier findings by Marks and Fleming (1999) for the school leavers in the late 1970s and early 1980s, where the longitudinal Youth in Transition data were used.

Since education has a positive effect on other life domains, such as health and income, the inclusion of these variables along with education among the independent variables means that the coefficient on the education variable must be interpreted as some sort of 'residual' effect of education, after allowing for its impact on other life domains. If these intermediary variables were excluded, then surely the 'full' effect of education would be to increase happiness. However, using data from the 2002 wave of HILDA, Hickson and Dockery (2008) show that, even in a reduced model including only age, gender, marital and disability status, education has a negative and highly significant effect on life satisfaction. Their findings were largely unchanged whether a linear 'years of schooling' variable or a more flexible specification with a series of dummy variables representing the different education levels was used. The simple mean ratings of life satisfaction (on a scale from 0–10) for Australians who had only completed Year 11 or below was 8.03, compared with 7.79 for those with a university degree.

Hickson and Dockery's (2008) attempts to account for the negative association between education and life satisfaction by modelling the formation of higher expectations, based primarily on parental education, were largely unsuccessful. Clark and Oswald (1994) found that, among unemployed persons, those with higher levels of education were far less happy than those with lower levels of education. This may be interpreted as their state of unemployment incurring higher opportunity costs in terms of foregone earnings, but is also consistent with higher expectations among the more-educated playing a role in determining happiness. Estimates on the effects of 'over-education' and 'under-education' that have recently been applied in wage equations may be an interesting avenue of investigation. For Australia, Mavromaras, McGuinness and Fok (2009) and Voon and Miller (2005) have found that years of 'over-education' relative to the typical educational requirements of a worker's job have a lower impact on wages. This may similarly impact upon happiness.

From the theoretical considerations discussed above it can be seen that the explanation for the negative relationship between educational attainment and happiness may lie in the differential effect of education upon satisfaction within individual life domains, and in turn the relationship between satisfaction within these domains and overall happiness. Some evidence on this can be gleaned from existing empirical studies. Headey and Wooden (2004) report multivariate models for overall

life satisfaction, financial satisfaction, mental health and financial stress. The coefficients suggest that education has a negative effect on life satisfaction, but it increases satisfaction with financial circumstances and reduces the likelihood of experiencing financial stress. No significant association with mental health was reported. In addition to models for happiness reported in Peiró (2006), and noted above, models for life satisfaction across 15 different countries show a generally negative association with education (the one significant exception being Nigeria), and little evidence of a positive relationship with financial satisfaction (the exceptions being Taiwan and Russia).

The data and key constructs

This section presents an overview of the Longitudinal Surveys of Australian Youth and the data compiled from the 1995 Year 9 cohort. The derivation of variables for the two key constructs to be used in the analysis, individuals' subjective wellbeing (or happiness) and their level of educational attainment, are then presented, along with some relevant descriptive statistics for the sample.

The LSAY data

The Longitudinal Surveys of Australian Youth refers to a series of surveys tracking cohorts of young Australians through the transition from high school to further education and into the world of work. Forerunners to the most recent series of LSAY surveys were the Australian Youth Survey, surveys of nationally representative samples of 16 to 19-year-olds between 1989 and 1997, and the Youth in Transition surveys, which tracked four cohorts born in 1961, 1965, 1970 and 1975 from their mid-teens to early adulthood.[2] The current series of LSAY commence with nationally representative samples of high school students, who are then surveyed annually over a period of ten years. The first of these cohorts, the 'Y95 cohort', comprised a sample of people who were first surveyed as Year 9 students in 1995. Subsequent cohorts have been established, with the surveying of Year 9 students in 1998, and of 15-year-olds in 2003 and 2006. This study uses the data from the Y95 cohort as, at the time of writing, it was the only cohort for which longitudinal data for the full panel were available.

The sample for the 1995 Year 9 cohort was established through random selection of two Year 9 classes from a representative sample (by state and sector) of 300 schools. In the first survey 13 613 Year 9 students completed a written questionnaire, along with reading and numeracy tests designed to measure 'school achievement'. The cohort was surveyed using a further written questionnaire in 1996, and then by telephone interview from 1997 to 2006. The initial questionnaire collected basic information on how students felt they were faring at school, their plans for further schooling and after leaving school, jobs they held, their attitudes towards school life and other very basic socioeconomic information about their family. The low quality of the data on the socioeconomic background of the family, such as parental occupation, education level and wealth or income, is one major limitation of the LSAY data. The 1996 questionnaire again covered experiences at school, part-time work, plans for further schooling and post-school study, activities of those who had left school, personal interests and activities, and the presence of consumer durables at home.

The phone interviews from 1997 to 2006 followed a standard format, with ten sections as follows (there was no Section I included):

- Section A: School
- Section B: Transition from school
- Section C: Post-school education and training
- Section D: Work
- Section E: Job history

[2] See <http://www.acer.edu.au/lsay/study.html>.

- ✧ Section F: Job search activity
- ✧ Section G: Not in the labour force
- ✧ Section H: Health, living arrangement and finance
- ✧ Section J: General attitudes
- ✧ Section K: Tracking questions.

Sections A and B became redundant in the later surveys as none of the sample was at school or had made the transition from school in the intervening year. In 2001, an additional set of questions was included to retrospectively identify all episodes of education and training the individual had commenced since leaving school. This was primarily to collect information on episodes that individuals commenced and also withdrew from or deferred between interviews, and which thus were not included in the scope of the previous questions (See Hillman & McMillan 2003).

From the 13 613 respondents to the initial survey, 3914 people (or 29%) completed the final wave 12 survey in 2006. Table 1 shows the sample numbers and attrition rates over the term of the survey. The column headings include the year of the survey, along with the corresponding wave, modal age and modal school year for those who remained in school, in order to provide a convenient cross-reference for readers of this report. Attrition was very high between the first and second years of the survey, although some individuals rejoined the survey in 1997. From 1998 onwards, the annual rate of attrition was around 10%. A total of 3518 people in the cohort responded to all 12 waves of the survey.

Table 1 Y95 Year 9 cohort: Respondents by wave

Year	1995	1996	1997	1998	1999	2000
Wave	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
Age (mode)	14 yrs	15 yrs	16 yrs	17 yrs	18 yrs	19 yrs
School year (mode)	Year 9	Year 10	Year 11	Year 12		
Respondents	13 613	9 837	10 307	9 738	8 783	7 889
Attrition from (%):						
Wave 1	n.a.	27.7	24.3	28.5	35.5	42.0
Previous wave	n.a.	27.7	-4.8	5.5	9.8	10.2

Year	2001	2002	2003	2004	2005	2006
Wave	Wave 7	Wave 8	Wave 9	Wave 10	Wave 11	Wave 12
Age (mode)	20 yrs	21 yrs	22 yrs	23 yrs	24 yrs	25 yrs
Respondents	6 876	6 095	5 354	4 660	4 233	3 914
Attrition from (%):						
Wave 1	49.5	55.2	60.7	65.8	68.9	71.2
Previous wave	12.8	11.4	12.2	13.0	9.2	7.5

Wellbeing measures in LSAY

From 1997 onwards, in the general attitudes section of the telephone interview respondents were asked to rate their happiness with 14 different aspects of their lives. With minimal changes over the waves, the question was put in the following way:

> I am now going to read out a list of different aspects of your life. As I read them tell me whether you are very happy, fairly happy, fairly unhappy or very unhappy with each one. Firstly, how happy are you with … (Fleming 1999, p.108)

The items are:

- ✧ the work you do (at school, at home or in a job)
- ✧ what you do in your spare time
- ✧ how you get on with people in general
- ✧ the money you get each week
- ✧ your social life
- ✧ your independence—being able to do what you want
- ✧ your career prospects
- ✧ your future
- ✧ your life as a whole
- ✧ your standard of living
- ✧ the way the country is run
- ✧ the state of the economy
- ✧ where you live
- ✧ your life at home.

These questions were asked in random order, a technique used to prevent the subject of prior questions remaining foremost in respondents' minds and influencing their subsequent responses. For example, asking someone how happy they are with the state of the economy just prior to asking about their standard of living may negatively bias their response to the latter question in bad economic times, or positively in good economic times.[3]

Individuals' assessments of happiness with 'your life as a whole' constitute the principal measure of wellbeing used in this study. As noted in the literature review, a well-established feature and limitation of the measurement of subjective wellbeing on Likert scales is the very similar and limited distributions that are obtained across a wide diversity of populations. On a commonly used scale of 1 to 10, where 1 represents the lowest level of happiness or life satisfaction and 10, the highest, the mean response from a sample population in developed countries is typically between 7 and 8, with relatively few people willing to allocate a level to the 'unhappy' or 'dissatisfied' side of the scale. This holds true of the LSAY Y95 cohort. Table 2 shows that the vast bulk of youth—all but one or two per cent in each year—indicated that they were either fairly happy or very happy with their lives as a whole. The mean in each of these ten years is close to 3.5, or midway between the 'fairly happy' and 'very happy' points, with a standard deviation of around 0.53. Although the changes in the means over time are small, the differences when compared with the 1997 base year are statistically significant for each subsequent year.[4] The limited variation offered by the 4-point scale used in LSAY may also be considered a limitation. However, happiness data from LSAY have previously been used successfully in econometric work (Dockery 2005), as have data derived from similar scales applied elsewhere. The Euro-Barometer surveys carried out annually in the European Union since 1973, for example, ask respondents to indicate how satisfied they are with their lives as a whole, by choosing either very satisfied, reasonably satisfied, not very satisfied or not at all satisfied (Inglehart & Klingemann 2000, p.166).

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[3] In surveys of US college students, Kahneman (1999) found that there was almost no correlation (0.12) between the number of dates a student had been on recently and their happiness, but a strong positive correlation of 0.66 when the questionnaire was reordered such that the question on dating immediately preceded the question on happiness.

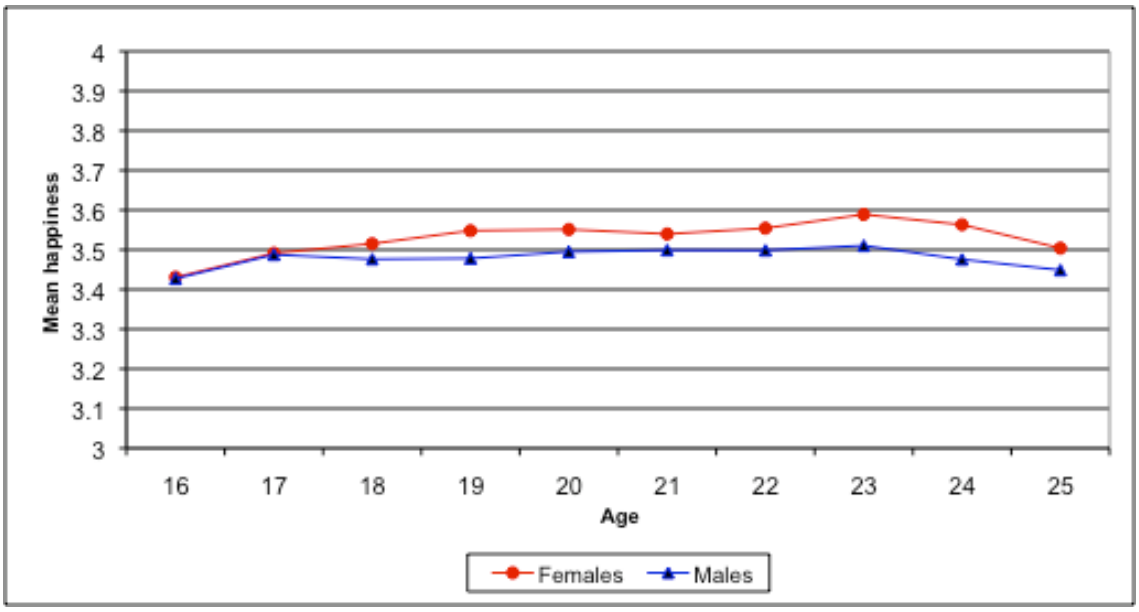
[4] The differences are significant at the 1% level by the standard t-test. Differences in the distributions across the four levels of the happiness scale are also significant at the 1% level using the Mantel-Haenszel Chi-Square test, although caution needs to be exercised in using this statistic when there are very small proportions in some strata, as in the case here.

Table 2 Self-ratings of happiness with 'your life as a whole', 1997–2006

Happiness rating	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Very unhappy (%)	0.3	0.2	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.2
Fairly unhappy (%)	2.5	1.7	1.7	1.0	1.0	0.9	0.8	0.9	0.9	1.2
Fairly happy (%)	51.3	46.9	45.8	45.8	45.3	45.8	45.4	42.6	45.7	49.2
Very happy (%)	45.9	51.1	52.1	53.0	53.7	53.2	53.7	56.4	53.3	49.4
Total (%)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Mean	3.43	3.49	3.50	3.52	3.52	3.52	3.53	3.55	3.52	3.48
Sample	10 278	9 721	8 773	7 878	6 863	6 089	5 345	4 655	4 226	3 907

The figures are very similar for males and females, as shown in figure 1. Males had slightly lower mean happiness than females in each year, and these differences are statistically significant from 1998 onwards, the year in which most of the cohort turned 18.[5]

Figure 1 Mean happiness by gender and age, 1997–2006



A limitation of this analysis is that, due to attrition from the survey, it is not exactly the same group of people being compared in each year. The bottom of table 2 shows that the number of respondents to the happiness question declines from 10 278 in 1997 to 3907 by the end of the survey. However, if the above analysis is restricted to the 3907 people who responded in 2006, the results are virtually identical in relation to the means over time and gender differences. This suggests there is minimal attrition bias in relation to the happiness variable.

Table 3 presents the mean happiness ratings for the 13 items relating to other life domains. It can be seen that the tendency to report a generally high level of happiness applies across a broad spectrum of aspects of people's lives and that the mean responses are remarkably stable over time. The items for which people express the lowest satisfaction are the way the country is run and the state of the economy. These results are consistent with Cummins's Theory of Subjective Wellbeing Homeostatsis, which suggests that humans have evolved such that subjective wellbeing is maintained at a positive level by psychological devices—essentially to feel good about themselves.

[5] Differences in the means from 1998 to 2006 are significant at the 1% level by the standard t-test. The significance of the differences in the distributions between males and females in each of these years is confirmed using the Mantel-Haenszel Chi-Square test (see cautionary note, previous footnote).

However, people are much more willing to report negatively about societal or 'distal' factors, such as the government's performance or the state of the economy, as such negative assessments do not violate their need for positive self-evaluation (see Cummins et al. 2003). Average happiness with 'the money you get each week' is also relatively low and fits with this interpretation.

Table 3 Mean self-ratings of happiness with individual life aspects, 1997–2006

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Work you do	3.28	3.21	3.26	3.26	3.27	3.25	3.26	3.30	3.29	3.25
Spare time	3.56	3.48	3.47	3.47	3.46	3.43	3.43	3.45	3.43	3.39
Get on with people	3.54	3.58	3.60	3.59	3.58	3.57	3.57	3.60	3.58	3.52
Money you get	3.06	3.00	2.97	2.98	2.97	2.97	2.97	3.00	3.03	3.01
Social life	3.47	3.54	3.55	3.53	3.52	3.49	3.46	3.46	3.44	3.37
Independence	3.36	3.48	3.62	3.63	3.64	3.62	3.62	3.66	3.65	3.60
Career prospects	3.22	3.27	3.32	3.35	3.33	3.32	3.33	3.35	3.36	3.28
Your future	3.28	3.31	3.38	3.42	3.44	3.42	3.45	3.49	3.48	3.43
Standard of living	3.61	3.61	3.62	3.61	3.57	3.53	3.51	3.54	3.52	3.47
How country is run	2.75	2.68	2.77	2.71	2.72	2.67	2.70	2.69	2.62	2.62
State of economy	2.65	2.64	2.82	2.59	2.69	2.74	2.84	2.88	2.82	2.79
Where you live	3.51	3.51	3.51	3.50	3.46	3.45	3.45	3.48	3.45	3.40
Life at home	3.55	3.52	3.52	3.53	3.51	3.50	3.51	3.56	3.54	3.50

Some notable trends in reported happiness over the duration of the survey include an increase in the young people's level of satisfaction with 'your independence—being able to do what you want', as might be expected, and declines in average reported happiness with 'what you do in your spare time', 'your standard of living' and 'the way the country is run'. The fall in happiness with what young people do in their spare time is likely to reflect the pressures associated with the transition into the workforce.

Although young people report being fairly happy to very happy with the vast majority of these life domains, there is nothing in the survey to tell us how much importance they place on them. To assess which of these domains is most important in shaping overall happiness, the Spearman rank correlation coefficients between individuals' happiness ratings with each of the 13 individual domains and happiness with life overall are calculated. In the data pooled across all waves of the survey, all correlations are positive and highly significant. The strongest correlates with overall happiness are how happy you are at home (0.49), how happy you are with your future (0.46), how happy you are with how you get along with people and your social life (both 0.44) and your standard of living (0.43). Satisfaction with the state of the economy and how the country is run (both 0.15) have the weakest bivariate association with overall happiness, along with happiness with money received each week (0.27). The relative ranking of each item remains quite consistent as the cohort ages. In the school years happiness at home has the strongest association with overall happiness, followed by standard of living and the youth's future outlook. By the last three years, the youths' future outlook has the strongest correlation, marginally stronger than happiness at home.

Educational attainment

To capture the highest level of education attained in each year of the survey, derived variables, created by NCVER, are used to generate a continuous educational attainment variable, as set out in table 4. Completion of a certificate I, certificate II or a traineeship is treated as the equivalent of an additional year of school and thus an increase of one unit in the variable. This approach has some limitations and inevitably involves an assignment of qualifications in the hierarchy that may be debated. Of greater significance is that, when such a variable is used as an independent variable in regression models, it assumes equivalent 'distances' between the points. That is, the difference

between 3 and 2 (completing Year 12 versus completing Year 11) is treated mathematically as equivalent to the difference between 7 and 6 (completing a university degree versus completing a diploma). While this clearly represents only a broad generalisation or approximation of the underlying qualitative differences in levels of educational qualifications, the linear specification has many advantages in terms of modelling and interpretation. Including separate dummies for each level of education is cumbersome and still requires assumptions relating to the aggregation of different qualifications. Another alternative is to use the years of education associated with each level of qualification as the continuous variable. Past experience suggests this is unlikely to have any substantive impact upon the findings.

Table 4 Measurement of highest educational qualification attained

Value of variable	Level of schooling/qualifications reported in LSAY
1	Completed Year 10 or fewer years of school only
2	Completed Year 11 or completed Year 10 and a certificate I/II/traineeship
3	Completed Year 12 or completed Year 11 and a certificate I/II/traineeship
4	Completed Year 12 and a certificate I/II/traineeship
5	Completed a certificate III/IV or an apprenticeship
6	Completed a diploma
7	Completed a university undergraduate degree
8	Completed a postgraduate diploma or degree (including PhD)

A summary of the educational attainment of the cohort from the 1999 survey onwards is provided in table 5. For the vast bulk of the cohort, 1999 is the year in which they turned 18, and is the first year out of high school for those who completed Year 12. By 2006, around one-quarter of the cohort had completed only Year 12 (or Year 11 plus a certificate I/II) as their highest level of education attained, 11% had completed an apprenticeship or certificate III/IV and 35% of the cohort had gained an undergraduate degree. Note that these figures are subject to attrition and are likely to overstate the educational attainment of the cohort, because those with lower levels of educational attainment are more likely to drop out of the survey. As one indication of this, the retention rate to 2006 of those who had completed Year 12 high school by 1999 was 48% compared with 35% for those who had not completed Year 12.

Table 5 Highest level of education attained, 1999–2006 (%)

Year (modal age) Educational attainment	1999 (18)	2000 (19)	2001 (20)	2002 (21)	2003 (22)	2004 (23)	2005 (24)	2006 (25)
1 Year 10 or less	8	6	4	4	3	3	3	3
2 Year 11 or Yr 10 + cert. I/II	14	11	10	9	8	7	7	7
3 Year 12 or Yr 11 + cert. I/II	71	68	59	47	37	29	25	23
4 Year 12 + cert. I/II	6	9	10	9	9	8	8	7
5 Apprenticeship/cert. III/IV	0	5	9	9	10	10	11	11
6 Diploma	0	1	5	6	7	7	7	8
7 Undergraduate degree	0	0	3	15	24	32	34	35
8 Postgraduate quals	0	0	1	1	2	3	5	7
All	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Sample	8783	7889	6876	6095	5354	4660	4233	3914

Are the more-educated less happy?

Evidence that, in developed countries, gaining more education fails to enhance the subjective wellbeing of individuals and possibly even impacts negatively on wellbeing was reviewed earlier. This includes clear evidence of such a negative relationship for Australia from a representative household sample, the HILDA survey (Hickson & Dockery 2008). LSAY data offer a distinct advantage over HILDA data for studying this issue in the form of a large sample for which respondents' subjective happiness can be observed prior to, during and after completion of their highest educational qualification. To what extent is the relationship evident in the data from the LSAY Y95 cohort? The last three columns of table 6 show the mean happiness ratings by contemporaneously recorded level of educational attainment. In the final year of the survey the group with the highest average happiness is those with Year 11 or equivalent qualifications, followed closely by those who only completed Year 10, those with apprenticeship-level qualifications and those who completed Year 12 and a certificate. The average happiness levels of people in those groups all exceed the average happiness levels of those who had attained a diploma, undergraduate or higher degree. However, it is those who completed Year 12 and gained no further qualification who had the lowest level of happiness. This picture is largely the reverse of that obtained two years earlier, in 2004, when those with qualifications beyond Year 12 reported higher levels of happiness than those with Year 12 or below qualifications (see also figure 2). In 2006, there are in fact no statistically significant differences in mean happiness for any of the qualification levels.

Table 6 Mean happiness by educational attainment, selected years 1997–2006

Highest level of education attained	Attainment measured in 2004				Measured contemporaneously		
	1997 (16)	1999 (18)	2001 (20)	2003 (22)	2004 (23)	2005 (24)	2006 (25)
Year 10 or less	3.28***	3.45	3.50	3.53	3.55	3.51	3.50
Year 11 or Yr 10 + cert. I/II	3.38*	3.43**	3.50	3.49	3.52	3.58**	3.51
Year 12 or Yr 11 + cert. I/II	3.44	3.48	3.48***	3.48***	3.51***	3.48***	3.46
Year 12 + cert. I/II	3.43	3.51	3.56	3.59**	3.59	3.54	3.49
Apprent./cert. III/IV	3.41	3.53	3.54	3.56	3.57	3.54	3.50
Diploma	3.44	3.51	3.52	3.55	3.63***	3.59**	3.48
Undergrad. degree	3.48***	3.53***	3.57***	3.56**	3.57	3.52	3.47
Postgraduate quals	3.50*	3.48	3.54	3.51	3.58	3.55	3.48
All	**3.43**	**3.50**	**3.52**	**3.53**	**3.55**	**3.52**	**3.48**
Spearman's rank correlation coeff.	0.06	0.04	0.06	0.04	0.04	0.01	-0.01
Prob. |ρ| > 0	0.000	0.003	0.000	0.003	0.009	0.502	0.488

Notes: ***, ** and * denote that the mean for persons with that level of qualification is significantly different from that for all others in the cohort in that year at the 1, 5 and 10% levels, respectively, according to the standard t-test.

There is a subtle and important difference in the way the figures are calculated in the columns for 1997, 1999, 2001 and 2003. Educational attainment for these columns is based on qualifications as of 2004. This is to show how happiness varies according to the level of education anticipated to be achieved in the future. The reference year of 2004 for educational qualifications is chosen rather

than the final year in which the cohort was surveyed because the educational profile is relatively stable between 2004 and 2006, and the earlier date allows inclusion of roughly 750 individuals who dropped out of the survey after 2004. Looking at the column for 1997, we see that at around age 16, those young people who were destined not to complete school were the least happy of all, while those who would go on to gain a diploma or university-level education were the happiest.[6] Mean happiness for those who would gain a university degree is consistently and significantly higher than for others in the cohort up until 2003, or around age 22. Similarly, the correlation coefficients between the measure of the individuals' educational attainment and their subjective happiness rating show a small positive and highly significant correlation between (eventual) educational attainment and happiness in the initial years, which then declines over the term of the survey. By 2006 it has turned negative, although the correlations are insignificantly different from zero in both 2005 and 2006.

These trends are summarised in figure 2, which shows the mean happiness levels by educational attainment relative to the mean for the sample in each year. A point above the zero line indicates a higher-than-average level of happiness compared with the full cohort in that year, and a point below the zero line represents below-average happiness for the year. By and large, persons who are destined to achieve low levels of educational attainment (panel a in figure 2) initially report relatively lower happiness, but this converges towards the mean as the cohort ages. In contrast, those who went on to complete higher levels of education, particularly university qualifications, start off in positive territory, and also converge towards the mean for the cohort in later years (panel b in figure 2).

Taken over the full time span of the survey, it seems there is no strong evidence of a straightforward negative relationship between educational attainment and happiness. From 1997 to 2005 apprentices are significantly happier in statistical terms than those who complete only Year 12.[7] From 1997 to 2005, those who would gain a university degree are significantly happier than those who would complete only Year 12, but in 2006 there is no significant difference, even between university graduates and those who did not progress past Year 10. So at least some of the paradox portrayed in the literature review has emerged in these data by the end of the survey, and this seems contrary to general impressions of the impact of education on people's lives. Moreover, a general shift seems apparent during the transition from school to work, in which the relative happiness of those who gain higher educational qualifications declines. An important question is whether or not this trend continues beyond the age of 25—the evidence cited from HILDA suggests it does. The phase from 2004 to 2006, or between ages of 23 to 25 years, appears to be something of a turning point, where relative levels of subjective wellbeing of the lower-educated and high-educated begin to reverse.

Unfortunately, the cohort was not surveyed beyond this point and it is not possible to observe how these trends play out, but this still provides an important piece of information. One explanation for a negative correlation between educational attainment and happiness is that it simply represents fixed effects: those who gain higher levels of education were always less happy. This explanation can be rejected with some confidence. Among the Y95 LSAY cohort, those who were to become highly educated were initially the happiest (on average). This edge in subjective wellbeing over their peers who remain less well educated is soon lost in the post-school period. This is largely the result of subjective wellbeing among the less-educated rising, while the happiness of the more-educated remains relatively unchanged. A plausible explanation for this phenomenon is that those who gain only low levels of education had lower levels of happiness while in school or subsequent education,

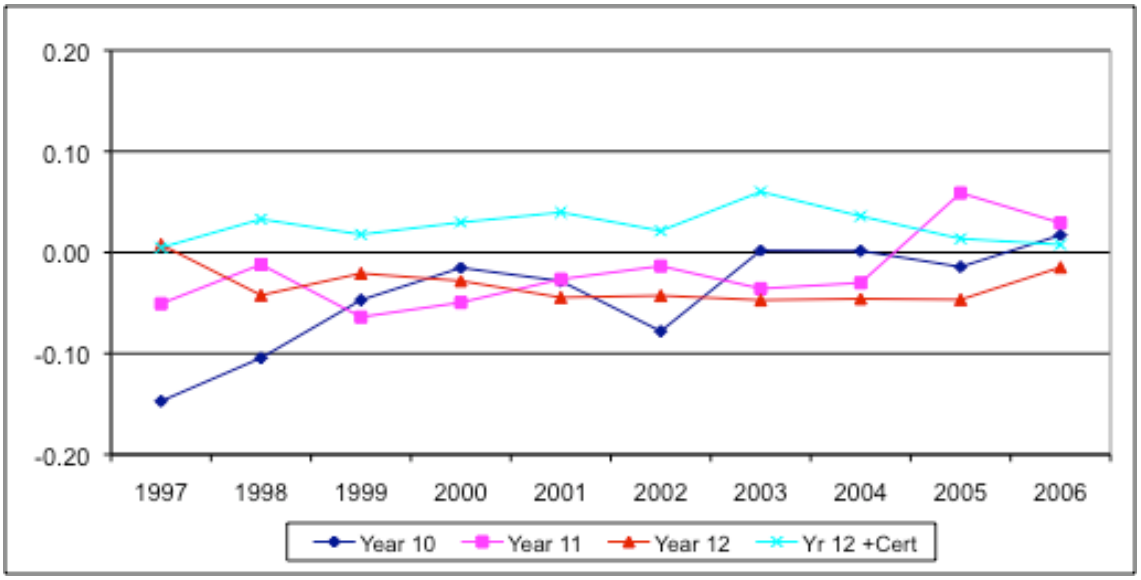
[6] These results seem to be largely unaffected by sample attrition. If table 6 is reproduced using only those who remained in the sample to 2006, the general patterns hold and there is at most a deviation of 0.04 in the means in any one cell of the table. The overall means in each year differ by no more than 0.013, with both negative and positive deviations suggesting no systematic attrition bias with respect to the happiness variable conditional upon educational qualifications.

[7] Statistical significance here is based on a 10% or lower probability of rejecting the hypothesis of the equality of the means by the standard t-test.

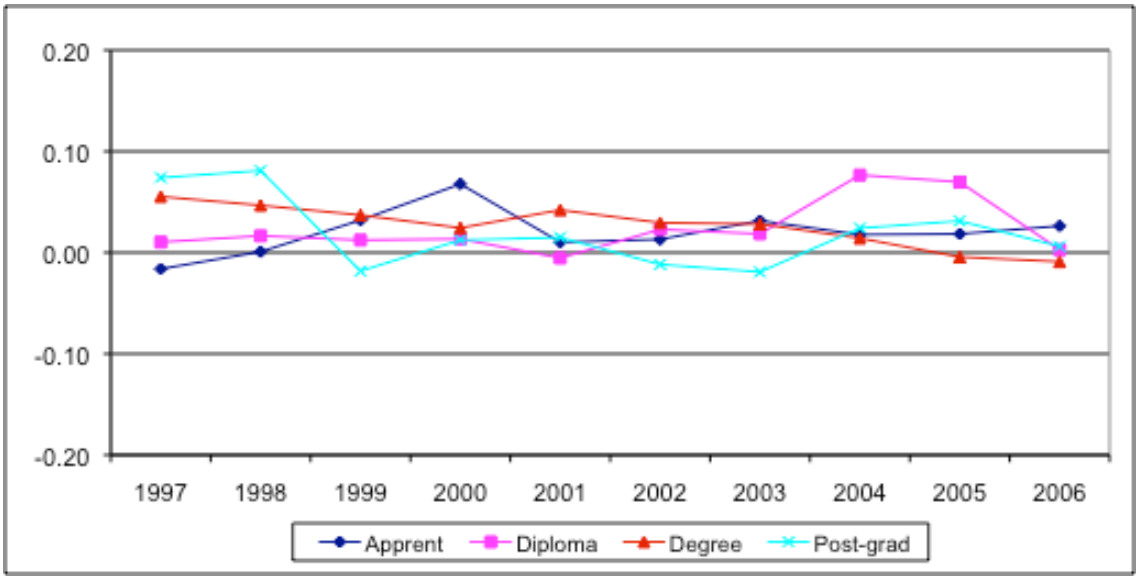
and their happiness rises when they make the transition to the workforce or other activities. Equally, those who gained higher levels of education were probably relatively happy in school and further education, and hence their happiness does not rise to the same extent as they progress from the education system.

Figure 2 Happiness relative to overall mean by educational attainment, 1997–2006

(a) Lower educational attainment categories



(b) Highest educational attainment categories



Educational attainment and domain satisfaction

To investigate potential contributors to the differences in happiness levels by educational attainment and the trends observed in the school-to-work transition, the data on happiness with the 13 individual life domains are explored in more detail. Correlations between the 8-level variable capturing educational attainment and happiness with each domain are presented in table 7. Note that the correlation statistics for 1997, 2000 and 2003 are calculated using the happiness ratings given in those years and educational attainment achieved by 2004, while the calculation for 2006 uses the contemporaneous values for all variables. While the correlations are small in magnitude, it can be seen that generally people who are, or who later become, more highly educated report being happier in most life domains, since the vast bulk of coefficients are positive. This includes happiness with one's future and career prospects, and the relationship between happiness with career prospects and educational attainment seems to strengthen through the transition from school to work. At age 16 young people destined to become more educated are typically happier with their lives at home and standard of living; however, by the final survey there is no significant association between education and happiness in either of these domains. Recall that happiness with life at home and with the future have the strongest correlations with overall happiness.

Table 7 Spearman's rank correlation coefficients between happiness ratings and educational attainment, selected years

	1997 (Ed. attain. in 2004)		2000 (Ed. attain. in 2004)		2003 (Ed. attain. in 2004)		2006 (Ed. attain. in 2006)	
	Coeff.	P|ρ|> 0	Coeff.	P|ρ|> 0	Coeff.	P|ρ|> 0	Coeff.	P|ρ|> 0
Work you do	0.002		-0.028	*	0.034	**	-0.003	
Spare time	0.006		-0.008		0.002		0.007	
Get on with people	0.010		-0.004		0.042	***	0.265	
Money you get	0.000		0.021		0.009		0.023	
Social life	-0.033	**	0.029	**	0.016		0.008	
Independence	-0.037	**	-0.008		0.026	*	0.015	
Career prospects	0.031	**	0.133	***	0.129	***	0.076	***
Your future	0.033	**	0.080	***	0.082	***	0.036	**
Standard of living	0.057	***	0.017		0.035	**	0.000	
How country is run	0.087	***	0.047	***	0.056	***	0.043	***
State of economy	0.045	***	0.079	***	0.003		0.007	
Where you live	0.012		0.044	***	0.046	***	0.067	***
Life at home	0.044	***	0.033	**	0.022		0.008	
Life as a whole	**0.055**	***	**0.039**	***	**0.043**	***	**-0.011**	

Notes: ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

It should be noted that the use of correlation coefficients has limitations, in that the effects of educational attainment are not monotonically increasing or decreasing as the approach assumes, but a summary statistic has obvious advantages over presenting data for all levels of educational attainment. When the relationships are investigated using means (not reported), it is clear that happiness levels for people with intermediate vocational skills, such as apprenticeships and diplomas, often do not fit comfortably between those with lower and higher levels of education.

It is possible that more- and less-educated people place different weightings on different life domains. To test this, the correlations between happiness in each domain and overall happiness are calculated separately by level of education in 2004 (table 8). For this purpose, the number of categories of educational attainment is reduced by two from the classification presented in table 6 on account of the large number of statistics to be reported. The Year 10 or less and Year 11 categories are combined into one category and the undergraduate and postgraduate university degrees are also combined. For these larger groupings, the results reported above are similar for both subcategories,

and this also helps to address smaller sample sizes for those who did not complete Year 12 and for those with postgraduate degrees, meaning there should be little loss of information.

The patterns are generally similar for each qualification level, but there are some notable exceptions. Comparing university-qualified persons with those who did not complete Year 12, the results suggest that the university graduates' subjective wellbeing is shaped more strongly by their happiness with their careers and how the economy is run. Persons who did not complete school seem to place greater importance on happiness with their life at home and their standard of living. It is interesting to note that how the country is run had by far the stronger association with happiness for university graduates, and this is one of the factors with which people express the lowest levels of happiness. The variation with eventual education level also holds for the early years of the survey—happiness with how the country was run seems to have no bearing on the happiness of those who were to leave school early. Here, as elsewhere, the results for those with intermediate levels of qualifications make it clear that associations do not change monotonically with educational attainment.

Table 8 Spearman's rank correlation coefficients between happiness with individual life domains and overall happiness, by educational attainment, 2004 (modal age = 23)

	Year 11 or less	Year 12 or Yr 11 + cert. I/II	Year 12 + cert. I/II	Apprent-iceship	Diploma	University degree
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Work you do	0.338	0.368	0.391	0.411	0.314	0.352
Spare time	0.435	0.452	0.393	0.442	0.397	0.457
Get on with people	0.494	0.476	0.486	0.407	0.464	0.500
Money you get	0.327	0.273	0.406	0.248	0.283	0.287
Social life	0.458	0.445	0.398	0.457	0.432	0.472
Independence	0.426	0.397	0.421	0.369	0.460	0.375
Career prospects	0.276	0.364	0.359	0.340	0.275	0.401
Your future	0.506	0.494	0.553	0.452	0.465	0.500
Standard of living	0.506	0.499	0.462	0.363	0.408	0.443
How country is run	0.095	0.138	0.152	0.108	0.092	0.180
State of economy	0.154	0.124	0.159	0.108	0.112	0.170
Where you live	0.394	0.398	0.438	0.336	0.351	0.402
Life at home	0.567	0.496	0.481	0.439	0.448	0.493
Life as a whole	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**

Summary

The descriptive analyses of the relationship between highest level of education attained and subjective wellbeing show that there is no simple linear relationship in which observed happiness increases or decreases with educational attainment in adolescence and early adulthood. Those who gain university-level qualifications were happier than their peers when they were aged 16, and those who would leave school before Year 12 were the least happy. However, by age 25 years there are no significant differences in average happiness by level of education—those with the lowest levels of educational attainment actually reported being happier than those who gained university degrees. Those who were to gain intermediate-level vocational qualifications seem to be consistently happier than average in the school-to-work transition, although the differences are generally not significant in a statistical sense.

Previous literature suggests that a source of differences in subjective wellbeing for persons of varying levels of education is likely to lie in differences in happiness with individual life domains, or in the different weightings placed on the various aspects of life. Those with higher levels of education consistently display greater relative satisfaction with their future and their career

prospects, and they are also more strongly career-oriented and place greater importance on the way the economy is run. However, their relative satisfaction with their standard of living, life at home, how the country is run and the state of the economy appears to decline over this period. Two key points to take from the descriptive analysis is that differences in happiness levels by education are not driven by fixed personality traits, but change over time, probably in relation to current activities and circumstances. Second, the results for people with intermediate-level skills highlight the need in any multivariate modelling to model educational attainment as a series of dummy variables rather than a linear specification.

Modelling the determinants of happiness

This section presents the results of multivariate models estimated to identify the role of education and other factors in shaping the happiness of young Australians in the transition from school to work. The nature of the dependent variable—the happiness rating on an ordinal, discrete scale—lends itself to estimation by the ordered probit model for cross-sections. The cross-sectional models have the general form of:

(1) $$H_i = \alpha + \beta X_i + \varepsilon_i$$

Where H_i represents the happiness rating (H = 1 to 4) for individual i, X_i a vector of explanatory variables and β the associated vector of coefficients to be estimated. However, the longitudinal nature of the data is most fully exploited through panel models which take into account the fact that there are repeat observations on individuals. To the best of the author's knowledge no equivalent of the ordered probit model is available for panel models, and to estimate these models the response variable needs to be reduced from a 4-point ordinal scale to a binary variable. Given the distribution of the happiness responses, the specification used is a dependent variable which takes on a value of 1 if the individual indicates they are 'very happy' with their life as a whole and a value of zero otherwise. This is the most appropriate choice, given that the models can be unreliable if the sample is highly concentrated in one of the two categories, as would be the case with any other specification, given the very low proportion of people indicating either 'fairly unhappy' or 'very unhappy'. The estimated model then takes the form:

(2) $$H_{it} = \alpha + \beta X_{it} + \nu_i + \mu_{it}$$

where there are up to a maximum of ten observations (t = 1997 to 2006) for each individual i. The error term has two components: ν_i which is specific to the individual and constant over time, and u_{it}, which is a standard error term normally distributed independently of H_{it} with mean zero and which varies across individuals and over time. This is commonly referred to as the random-effects model. It is used here in preference to the fixed-effects model for several reasons. As will be seen, quite rich controls for individual effects are already available in the data and can be included in the random-effects model. Second, the fixed-effects model can only include individuals for whom there is some variation in the dependent variable, which would result in the omission from the estimations of a large proportion of the sample. Finally, the fixed-effects model cannot provide estimates of the effects of explanatory variables, which are constant over time for each individual. Here, the coefficients for some time-invariant variables are of considerable interest, most obviously, the effect of the level of education an individual will ultimately attain.

The section commences with the development of the panel models and a discussion of the results. This includes justification of the independent variables included and their functional forms. Later, the preferred models are used to also estimate cross-sectional ordered probit models in each wave of the survey to demonstrate how the effects of education and other variables on happiness change over time in the school-to-work transition. Finally, panel models of the happiness ratings in individual life domains are estimated in an attempt to identify specific aspects of people's lives for which happiness is affected by level of educational attainment.

Panel models of happiness with life overall

Models of the form (2) above are estimated using STATA's xtlogit routine, and the results reported in table 9. The modelling strategy in this section is as follows. The initial model (1) includes mainly 'fixed' information from the first few waves of the survey, plus marital status. Variables are then added relating to the individual's highest level of education attained as measured in each year of the survey (model 2). These variables therefore estimate the total effect on happiness of gaining a given qualification, after controlling for age and the individual's background characteristics. The model is then expanded to include details of the young person's activities in each year and other labour market outcomes (model 3). Inclusion of the activity variables provides a more detailed analysis of happiness in relation to the pathways taken in gaining different levels of qualifications, such as the longer average time in school for those who enter university and the greater number of years in work for early school leavers. Inclusion of labour market outcome variables tests whether the effects of different levels of educational attainment are mediated through differences in labour market outcomes. In model 4, the variables for educational attainment in each year of the survey are replaced with time-invariant variables for the individual's eventual level of educational attainment. This is to contrast the time-varying effect of gaining a given qualification (models 2 and 3) with the average tendency for people who ultimately gain different levels of educational attainment to be relatively happy or unhappy over this period. Finally, models are estimated separately for those who only complete Year 12, those who gain post-school vocational qualifications and those who gain a university degree or higher (table 10), to investigate whether there are differences between the groups in terms of which factors enhance or reduce happiness.

There is a wide range of potential background variables available for inclusion as explanators of young people's happiness. Dummy variables capturing the survey wave are included in all panel models to capture year and age effects. Demographic variables include gender, English-speaking background, and whether, in 1997, the student lived with both parents, one parent only or with neither of their parents. Indigenous status was tested but found not to be significant in the models and hence was dropped from the analysis. Disability status was one of the intended explanators, but the questions on disability status are not consistent over the years of the survey and in fact were unavailable in the later years, other than what can be deduced from the receipt of disability payments. Consequently, no disability variable was included.

Parents' socioeconomic status is known to be one of the major predictors of success in the school-to-work transition, and so may also be expected to influence young people's sense of wellbeing. However, there are no robust measures of parental socioeconomic status available in the Y95 LSAY. Common proxies for parental socioeconomic status are parental education, occupation and wealth or income. In 1995 the Year 9 students were asked their father's and mother's occupations and the highest levels of education each completed. For the father's occupation, the available variables are unusable (either missing or coded as 'don't know' or other indeterminable responses) in around 20% of cases, and are higher for the mother's occupation. The children were even less clear about their parents' education, with roughly one-third of responses being unusable. Two variables were tested to capture socioeconomic status, one a variable based on both parents' occupations and the second based on a set of questions included in wave 2. Respondents were asked to indicate whether or not the following items were present in their home: washing machine, dishwasher, colour television, microwave oven, mobile phone, compact disc player, video camera, computer, piano and swimming pool. The number of items present is simply summed to give a 'wealth index', although the presence of a piano was not included in the wealth index on the basis that it was reflective of other preferences rather than wealth. Of these variables tested to capture socioeconomic background, the wealth index performs best and has been retained in the models. The variable based on parental occupation has fewer missing observations but was not significant in any of the models.

A series of questions in the 1997 survey asked respondents how they saw themselves with respect to eight different traits: agreeable, open to new experiences, popular, intellectual, calm,

hardworking, outgoing and confident. Responses were on a 4-point scale of 'not at all', 'not really', 'fairly' and 'very'. A factor analysis of these variables generates two factors with Eigenvalues greater than 1 and which align with the personality traits of extroversion (Eigenvalue = 2.17) and being calm or easygoing (1.09). Dockery (2005) demonstrates that these factor scores are strong predictors of happiness in the LSAY data, consistent with an extensive literature on the link between personality traits and subjective wellbeing.

Two variables are included to capture school aptitude and performance in Year 9. The student's scores in the standardised reading and mathematics tests are added to the model in the form of the quartile of the student's combined score from the two tests. In 1996 students were also asked how well they thought they were doing in their school subjects overall when compared with most of the students in their level. The options for responding were 'very well', 'better than average', 'about average', 'not very well, and 'very poorly', and a variable ranging from 1 (very poorly) to 5 (very well) was also tested. These two variables are of particular interest because they are likely to capture characteristics of the individuals related to the level of education they would later attain. Hence their inclusion may serve to further distinguish between the effects of initial individual traits on happiness and those that develop conditional on educational attainment.

Results from the panel logit models are reported in table 9. To save space, the results for the dummy variables for each wave of the survey are not reported here, but are provided in table A1 of the appendix. These generally show happiness peaking at around age 23 years. The coefficients presented are the odds ratios, whereby a figure of less than 1 indicates that the effect of a one-unit increase in that variable is to reduce the likelihood of a person indicating that they are very happy with their life as a whole, while a value greater than 1 means that the variable increases the likelihood. Taking the basic model (1), all variables other than those capturing marital status are fixed: for any one individual they have the same value in all years. The odds ratio associated with being male of 0.83 implies that males are estimated to be 17% (or 1 minus 0.83) less likely to report being very happy when all other variables are evaluated at their means. For continuous (as opposed to dummy) variables, the effect is interpreted in reference to a 1-unit increase. The odds ratio associated with the wealth index, for example, is 1.07. Hence every 1-unit increase in the wealth index increases the estimated likelihood of a person reporting being 'very happy' by 7%.

An important first observation is that the models support the validity of the 4-point happiness measure. The models reported are highly significant overall, implying that they explain a non-trivial proportion of variation in reported happiness, and the likelihood ratio test confirms that the random-effects panel model, which recognises repeat observations on individuals, is superior to simply treating the data as pooled, independent observations. Being married or partnered as opposed to single displays the large positive effect on happiness which is almost universally observed in such models of subjective wellbeing. The family background variables also have the expected signs: being from a sole-parent family or having left home by 1997 and being from a non-English-speaking background each have a sizeable negative impact upon happiness. This latter variable is based on whether English is the main language spoken at home in Year 9. The family 'wealth index', as noted, has a positive association with the young person's happiness.

The personality trait of extroversion has a very large impact on subjective wellbeing. A person with a 1-unit higher factor score—which is equivalent to one standard deviation for the sample—is 62% more likely to indicate they are very happy with their life as a whole. The factor score for the personality trait of calmness has a lesser, but still large association with happiness. The results for the school-related variables are less intuitive. Youth who achieved higher scores on the standardised maths and readings tests in Year 9 are actually less likely to report being very happy in later years—about 9% less for each quartile. By contrast, the higher the assessment of their performance in school subjects overall compared with other students, the happier they were in later life. This may be capturing a general tendency to respond positively. Note that, while the modal response to this question was 'about average', given by 46% of the sample, only around 4% indicated they were doing below average (not very well or poorly).

Educational attainment variables are added in models (2) to (4). In models (2) and (3) educational attainment relates to the highest level of qualification that had been achieved at the time of the survey, so it is measured contemporaneously with the individual's happiness rating. This specification therefore captures the effect on happiness of a change in educational attainment as qualifications are completed. The results of model (2) suggest that those who have completed Year 12 plus a certificate I or II are the happiest. The happiness of those who have completed an apprenticeship, diploma or a university degree is not statistically different from those who completed Year 12 with no further qualification (the comparison category[8]). Those who failed to complete school and did not gain any post-school qualifications are by far the least happy, being around 13% less likely to report being very happy than those who completed only Year 12. The results of model (2) therefore suggest that gaining a university degree is not associated with an increase in happiness, at least not relative to completing Year 12 and gaining no further qualification. The happiness of those with university degrees relative to those with other levels of qualification can be tested by changing the comparison category for the regression. When those who have gained a university degree are used as the default category, the results show that they have significantly lower happiness than those who had completed Year 12 plus a certificate I/II and those who completed a diploma as their highest level of qualification; nevertheless, they are significantly happier than early school leavers.

In model (4) educational attainment is instead measured on the basis of the highest level of qualification ultimately completed and is thus a fixed value for each individual across the waves. These results suggest that, over the ages from 16 to 25, those who would go on to gain a certificate I/II or a diploma are the happiest. Those who were to gain a university degree now appear to be slightly happier than those who completed only Year 12, although the estimated effect is significant only at the 10% level, and have a similar level of happiness as those who were to complete a trade or certificate III/IV. The important implication of the contrast between models (2) and (4) is that it confirms that people who pursue a university education are not initially relatively less happy people but rather they *become* relatively less happy upon gaining a university degree. The panel-modelling approach accounts for unobservable individual specific effects to some degree, and the included variables explicitly control for a range of observable individual specific effects. Importantly, these include three characteristics likely to be strongly associated with the likelihood of going on to university: the 'wealth' of the family, Year 9 achievement scores and self-assessed performance in school subjects in Year 9.

The sample available for estimation falls from 52 705 observations on 7620 individuals in model (2) to 36 805 observations on 3777 individuals for the model that includes eventual educational attainment (model 4). This is because eventual educational attainment is only defined if the individual's highest level of education can be observed in wave 10 or later. All individuals who stop responding prior to wave 10 must be omitted. The change in results is not due to differences in sample composition, because the same findings hold if model (2) is estimated using the same sample available for model (4). The findings are also insensitive to the exclusion of achievement quartile and self-assessed school performance. Given this, the results provide quite strong evidence of a 'causal' decline in happiness associated with gaining a university degree.

[8] Recall this includes those who finished Year 11 and a certificate I or II.

Table 9 Odds ratio estimates of probability of being 'very happy': Panel logit models with random effects, 1997–2006

Educational attainment measured	Contemporaneously						Ultimately	
	Model 1		Model 2		Model 3		Model 4	
Independent variable	*Coeff.*	*Prob.*	*Coeff.*	*Prob.*	*Coeff.*	*Prob.*	*Coeff.*	*Prob.*
Male	0.83	0.00	0.83	0.00	0.80	0.00	0.77	0.00
NESB (1996)	0.84	0.04	0.84	0.04	0.85	0.06	0.77	0.03
Living status in 1997:								
At home with both parents	—		—		—		—	
At home, sole parent	0.74	0.00	0.74	0.00	0.76	0.00	0.74	0.00
Not living with parents	0.81	0.02	0.82	0.02	0.83	0.03	0.76	0.03
Wealth index (1996)	1.07	0.00	1.06	0.00	1.06	0.00	1.06	0.00
Personality traits (1997):								
Extrovert	1.62	0.00	1.62	0.00	1.61	0.00	1.62	0.00
Calm	1.44	0.00	1.45	0.00	1.44	0.00	1.42	0.00
Test score quartiles (1995)	0.91	0.00	0.91	0.00	0.91	0.00	0.88	0.00
School performance (1995)	1.17	0.00	1.17	0.00	1.17	0.00	1.13	0.00
Marital status:								
Single (never married)	—		—		—		—	
Married	1.80	0.00	1.80	0.00	1.78	0.00	1.78	0.00
De facto	1.51	0.00	1.52	0.00	1.47	0.00	1.50	0.00
Divorced/widowed	0.83	0.43	0.85	0.49	0.88	0.59	0.83	0.43
Highest ed. attainment:								
Year 11 or less			0.87	0.01	0.84	0.01	0.99	0.93
Year 12 or Yr 11 + cert. I/II			—		—		—	
Year 12 + cert. I/II			1.20	0.00	1.17	0.02	1.32	0.02
Apprenticeship or cert. III/IV			1.07	0.29	1.05	0.50	1.14	0.20
Diploma			1.14	0.12	1.09	0.32	1.29	0.03
Uni/postgrad. degree			0.98	0.75	0.92	0.10	1.15	0.06
Main activity:								
At school					1.15	0.06		
Apprenticeship					1.73	0.00		
Traineeship					1.19	0.04		
University					1.13	0.01		
Other study					1.01	0.82		
Working					—			
Working PT and studying PT					1.03	0.72		
Looking for work					0.75	0.00		
Not in the labour force					1.17	0.06		
Working and in 'career' job					1.61	0.00		
Observations	52 705		52 705		52 408		36 805	
Individuals	7 620		7 620		7 619		3 777	
Obs per individual:								
Minimum	1		1		1		7	
Average	6.9		6.9		6.9		9.7	
Maximum	10		10		10		10	
Wald chi^2	1 409	0.00	1 427	0.00	1 651	0.00	844	0.00
Log likelihood	-31 045		-31 035		-30 757		-21 223	
Likelihood ratio test of $\rho = 0$ (χ^2)	7 318	0.00	7 298	0.00	7 013	0.00	5 949	0.00

Note: Dummy variables for each wave (year) of the survey were included as control variables in each model. The results for these variables are presented in table A1.

As argued in the literature review, people who gain higher levels of educational attainment should achieve better labour market outcomes, which in turn should contribute positively to their happiness. The inclusion of variables relating to labour market outcomes should therefore result in the estimated effect of higher educational attainment on happiness being less positive (or more negative). A range of variables capturing individuals' main activity in each wave of the survey is added in model (3). These encompass being at school, studying at university, undertaking an apprenticeship or traineeship, in other study, working (other than as part of a traineeship or apprenticeship), looking for work and not in the labour force. Where the individual reports both working and undertaking post-school study, the activity that was undertaken on a full-time basis is taken as the main activity.[9] The category 'working and studying' covers those who were doing both activities on a part-time basis. For those whose main activity is working, a variable is also included to indicate whether or not their job is one that they would want as a career.

The inclusion of individuals' main activity at the time of the survey, as expected, leads to the coefficient on having completed a degree to be substantially more negative, and this effect is now weakly significant (at the 10% level) when compared with those who had completed only Year 12. The likelihood of a university graduate reporting being very happy, using this specification, is significantly lower than for those who completed any intermediate vocational qualification—a post-school certificate I/II, an apprenticeship or a diploma—and is not significantly different from early school leavers. This is consistent with labour market outcomes acting as mediators in the link between education and happiness. We also note that young people undertaking an apprenticeship or traineeship or in full-time university studies are relatively happy compared with young people in work. However, an important qualification to this statement relates to the quality of the jobs that young people have secured. If their job is one which they would like as a career, this has a greater positive impact on happiness than being at university or undertaking a traineeship, although not as large an effect as undertaking an apprenticeship. This seems to provide further evidence of a fall in happiness associated with completing a university degree: university students seem to be quite happy while they are at university, but not once they have completed their degree.

The results for having completed a university degree are sensitive to the inclusion of this variable: whether or not people whose main activity is working are in a job they would like to have as a career. When this variable is dropped, the odd ratio for having completed a university degree increases from 0.92 to 0.95 and the estimate is no longer significant. This shows that young people who have completed a university degree are more likely to be in a job they want as a career. For example in 2006, among those whose main activity was working, 74% of university graduates were in a job they would like as a career, compared with 61% of those without a university degree. So while this superior outcome in the world of employment does provide graduates with a source of greater happiness relative to those with other levels of educational attainment, overall they still remain less happy than all but early school leavers.

The findings with respect to contemporaneously measured educational attainment were subjected to a number of sensitivity tests. They are generally confirmed by estimation using the fixed-effects specification and with stronger evidence of a negative relationship between happiness and gaining a university qualification. They broadly apply when the models are estimated separately for males and females, although the deleterious effect of completing a university degree is most pronounced for males. Marital status has been included in all models on the assumption that it is relatively unrelated to educational attainment. It has been argued, however, that greater education allows people to develop more stable social relationships, and especially marriage (Ross & Van Willigen 1997), and hence marital status should also be treated as a mediating factor between education and happiness. The exclusion of the variables capturing marital status leaves the results essentially unchanged in model (2). In model (3) it results in university graduates being estimated to be 12% less likely to be 'very happy', and the estimate is statistically significant at the 5% level.

[9] In the handful of cases in which individuals reported both working full-time and studying full-time the main activity is taken to be studying, be that at university or in other study.

To investigate whether happiness is shaped by different factors for those who ultimately gain different levels of qualifications, table 10 reports the results of models run separately for three groups based on their eventual educational attainment. The groups are those with no post-school qualifications, including early school leavers who gained a certificate level I/II (model 5); those who completed Year 12 with a certificate I/II or completed an apprenticeship or diploma (model 6); and those who completed a university degree (model 7). It can be seen that the estimated effects of the explanatory variables on happiness are mostly consistent across these three groups. Among those who would go on and gain a university degree, the negative effect associated with having higher achievement scores on the Year 9 tests is less pronounced, and school is a relatively happier place compared with those who do not gain university qualifications. The positive effect of being married or in a de facto relationship seems stronger for those with lower levels of education. Young people are generally happier in a traineeship or apprenticeship than in other work, irrespective of their eventual qualifications. The exception is people who were in traineeships without having completed Year 12 (model 5), although these will include Year 12 finishers who were then in a traineeship that they did not complete. And, although university graduates are the most likely to be in a job they would like as a career, the effect of this on happiness is in fact smaller than for people with lower levels of education.[10]

Cross-section models

The random-effects panel models indicate that those who gain a university degree are generally happy in school and while at university, but their happiness falls upon completing their degree. The timing of this change in happiness can be further investigated by estimating cross-section models of happiness for each wave of the survey, along with changes in the influence of other factors on young people's happiness as they progress from adolescence to adulthood. The eventual educational attainment variables are used, and the models are estimated without the variables capturing current activities. This is because the main interest here is in the gross effect of educational attainment; mediating factors such as labour market outcomes are ignored.

The estimated models, reported in table 11, are therefore the ten (waves 3–12) cross-sectional equivalents of model (4) above. As it is now possible to use the full range of the happiness ratings, ordered probit models of the form given in equation (1) are estimated. These are cross-sectional in the sense that only one observation on each individual's happiness rating is used in each model. However, the longitudinal nature of the data is still exploited in the sense that 'historical' variables capturing background characteristics from ages 14 to 16 years are included, along with the 'future' variables capturing the highest level of education the individual attains. The results demonstrate the persistence over time of the negative impact of having lived in a sole-parent family at age 16 years and, oddly, of achieving higher scores on the standardised maths and reading tests. The factor scores for personality traits are also highly significant in each year, although their positive association with happiness does appear to decay somewhat with time.

[10] Estimation using the fixed-effects model yields broadly consistent results. The positive effect associated with being at school is reduced for the university sample in magnitude and significance, but remains larger than for the other two groups. The effect of being married is also substantially reduced for all three groups (but remains large and positive), suggesting that part of the association between marital status and happiness arises because happier people are more likely to marry.

Table 10 Odds ratio estimates of probability of being 'very happy' by highest level of education eventually attained: Panel logit models with random effects, 1997–2006

	Yr 12 or lower Model 5		Post-school vocational Model 6		University or higher degree Model 7	
Independent variable	Coeff.	P>|z|	Coeff.	P>|z|	Coeff.	P>|z|
Male	0.77	0.012	0.78	0.023	0.73	0.000
NESB (1996)	0.70	0.153	0.74	0.244	0.91	0.570
Living status in 1997:						
At home with both parents	—		—		—	
At home, sole parent	0.74	0.055	0.75	0.073	0.78	0.076
Not living with parents	0.76	0.181	0.67	0.071	0.87	0.517
Wealth index (1996)	1.06	0.092	1.02	0.599	1.09	0.003
Personality traits (1997):						
Extrovert	1.55	0.000	1.43	0.000	1.78	0.000
Calm	1.53	0.000	1.34	0.000	1.38	0.000
Test score quartiles (1995)	0.88	0.009	0.85	0.001	0.94	0.198
School performance (1995)	1.05	0.505	1.30	0.000	1.10	0.130
Marital status:						
Single (never married)	—		—		—	
Married	1.96	0.000	1.68	0.000	1.58	0.001
De facto	1.52	0.000	1.59	0.000	1.28	0.007
Divorced/widowed	0.63	0.155	1.34	0.520	0.93	0.904
Highest ed. attainment:						
Year 11 or less	0.91	0.447				
Year 12 or Year 11 + cert. I/II	—					
Year 12 + cert. I/II			1.18	0.200		
Apprent'ship or cert. III/IV			—			
Diploma			1.18	0.181		
Main activity:						
At school	1.23	0.122	1.00	0.999	1.70	0.091
Apprenticeship	1.66	0.000	1.89	0.000	1.51	0.591
Traineeship	0.90	0.532	1.46	0.014	1.58	0.149
University	1.04	0.744	0.92	0.596	1.20	0.015
Other study	1.04	0.775	1.00	0.973	1.05	0.798
Working	—		—		—	
Working PT and studying PT	1.46	0.056	0.91	0.631	0.90	0.490
Looking for work	0.90	0.457	0.67	0.013	0.97	0.883
Not in the labour force	1.35	0.032	1.19	0.352	1.26	0.254
Working and in 'career' job	1.64	0.000	1.77	0.000	1.56	0.000
Observations	11 716		9 205		15 699	
Individuals	1 214		952		1 611	
Obs per individual:						
Minimum	5		7		7	
Average	9.7		9.7		9.7	
Maximum	10		10		10	
Wald chi2	347	0.000	340	0.000	385	0.000
Log likelihood	-6 681		-5 349		-8 984	
LR test =0 (χ^2)	1 936	0.000	1 187	0.000	2 529	0.000

Note: Dummy variables for each wave (year) of the survey were included as control variables in each model. The results for these variables are presented in table A2.

With respect to the impact of highest educational attainment, the results mirror those of the descriptive statistics. In 1997, or at age 16 years, those who will not complete school are the least happy; indeed, they may leave school early because they are unhappy. However, after controlling for background characteristics, they are not significantly less happy than those who do complete school from age 17 onwards. For most of the period covering the final year of high school through to age 22 years, those who ultimately gain a university qualification are significantly happier than those who complete high school. By age 22, those who failed to complete Year 12 and those who completed Year 12 with no further qualifications report similarly low levels of happiness, with all people with post-school qualifications being happier. It is only in the final year of the survey, at around age 25 years, that the wellbeing 'premium' enjoyed by those who gain university qualifications vanishes. In this year none of the educational attainment groups has a statistically significant difference in reported happiness from those who completed only Year 12. In the intervening years, those with intermediate-level qualifications, notably those who completed apprenticeships or certificates III/IV and diplomas, appear as happy or happier than those who gained university degrees.

Happiness in individual life domains

The final set of models reports the results of random-effects panel models of happiness in individual life domains. This is to test whether the influence of education on happiness is most apparent within specific domains that contribute to overall happiness. The models are the equivalent of model (2), but now use binary dependent variables based on whether or not the individual reported being very happy with each of the 13 separate life domains, as opposed to fairly happy, fairly unhappy or very unhappy. Many of the results for the other explanatory variables are fascinating in themselves; for example, being married almost triples the likelihood of a young person indicating that they are very happy with their life at home, but leads to lower happiness with their social life. To maintain the focus, however, only the coefficients and significance levels for the educational attainment variables are reported and discussed (see table 12).[11] Note that the educational attainment variables are measured contemporaneously with the happiness rating, and hence capture the effect of changes in the highest level of education attained.

Compared with those who complete Year 12 but gain no further qualifications, early school leavers are significantly less happy with seven of the 13 life domains. Early school leavers tend to be most unhappy, in relative terms, with their career prospects. They are also markedly less happy with their independence, their social life, their future, the way the country is run, where they live and how they get on with people. However, they are significantly happier with the money they get each week. Completing an apprenticeship or certificate is associated with greater happiness with the work people do, the money they get each week, how they get on with people and their life at home. Completing a diploma does not appear to lead to increased happiness in any of these life domains relative to those who complete Year 12.

Completing a university degree leads to greater happiness in a number of domains. In decreasing order of the odds ratios, these are: the state of the economy (1.34), your independence (1.23), the work one does (1.21), the money you get each week (1.20), your future (1.19), career prospects (1.15) and what you do in your spare time (1.11). No statistically significant negative associations are identified. On this basis it seems surprising that completing a university education does not increase, and perhaps even reduces, young people's reported happiness with their life as a whole. One of the domains with which they are relatively happiest—their future—is strongly correlated with overall happiness (see table 8). The hypothesis that more-educated people are less happy because they are more concerned with, and critical of, issues outside their personal domains is not supported by the fact that university graduates are significantly happier with the state of the

[11] Full results and associated model diagnostics are available from the author upon request.

economy and no less happy with the way the country is run. In any case, happiness in these domains has the lowest correlation with overall happiness, although it is true that the correlations are highest for university graduates (again see table 8). In short, there is no evidence of the overall happiness of university graduates being suppressed through a lower level of happiness within any of these life domains.

Table 11 Ordered probit models of happiness with your life as a whole: Waves 3 to 12

	1997 (age 16)		1998 (age 17)		1999 (age 18)		2000 (age 19)		2001 (age 20)		2002 (age 21)		2003 (age 22)		2004 (age 23)		2005 (age 24)		2006 (age 25)	
Intercept	-0.46	***	-0.14		-0.28	**	0.00		-0.17		0.07		-0.14		-0.11		-0.08		-0.04	
Intercept2	2.26	***	2.20	***	2.16	***	2.37	***	2.29	***	2.31	***	2.49	***	2.28	***	2.44	***	2.32	***
Intercept3	3.15	***	2.98	***	2.78	***	3.13	***	3.04	***	2.95	***	3.29	***	3.04	***	3.33	***	3.12	***
Male	0.03		0.00		-0.13	***	-0.12	***	-0.08	**	-0.03		-0.11	***	-0.16	***	-0.16	***	-0.11	**
NESB (1996)	-0.02		-0.17	**	-0.17	*	-0.08		-0.10		-0.20	**	-0.13		-0.11		-0.09		-0.17	*
Living status in 1997:																				
At home with both parents	—		—		—		—		—		—		—		—		—		—	
At home, sole parent	-0.14	**	-0.18	***	-0.21	***	-0.11	*	-0.04		-0.10		-0.17	***	-0.19	***	-0.11		-0.09	
Not living with parents	-0.02		-0.22	**	-0.22	**	-0.04		-0.16	*	-0.18	**	-0.21	**	-0.12		-0.03		-0.03	
Wealth index (1996)	0.03	*	0.01		0.03	**	0.02		0.02		0.03	**	0.03	**	0.04	***	0.05	***	0.02	
Personality traits (1997):																				
Extrovert	0.27	***	0.23	***	0.19	***	0.21	***	0.17	***	0.18	***	0.19	***	0.20	***	0.22	***	0.18	***
Calm	0.30	***	0.15	***	0.15	***	0.14	***	0.09	***	0.12	***	0.15	***	0.13	***	0.12	***	0.13	***
Test score quartiles (1995)	-0.05	**	-0.08	***	-0.03		-0.05	**	-0.04	*	-0.05	**	-0.06	***	-0.06	***	-0.09	***	-0.06	***
School performance (1995)	0.11	***	0.08	***	0.09	***	0.03		0.05	*	-0.03		0.04		0.05	*	0.01		0.00	
Marital status:																				
Single (never married)	—		—		—		—		—		—		—		—		—		—	
Married			5.64		0.91		0.55	**	0.41	***	0.40	***	0.49	***	0.45	***	0.41	***	0.31	***
De facto					0.21		0.35	***	0.27	***	0.27	***	0.15	**	0.17	***	0.24	***	0.25	***
Divorced/widowed					5.22		-0.93		-0.59		-0.20		0.40		-0.04		-0.25		-0.33	
Highest ed. attainment[a]																				
Year 11 or less	-0.22	***	-0.02		-0.07		-0.10		0.03		-0.04		0.02		-0.01		0.14		0.02	
Year 12 or Yr 11 + cert. I/II	—		—		—		—		—		—		—		—		—		—	
Year 12 + cert. I/II	-0.01		0.18	**	0.08		0.14		0.20	**	0.11		0.32	***	0.09		0.07		-0.06	
Apprent'ship or cert. III/IV	-0.08		0.12		0.08		0.19	***	0.07		0.10		0.14	*	0.05		0.08		0.03	
Diploma	-0.07		0.10		0.12		0.08		0.06		0.07		0.17	**	0.27	***	0.24	**	0.03	
Uni/postgrad degree	0.05		0.21	***	0.07		0.11	**	0.19	***	0.16	***	0.17	***	0.09		0.10	*	0.02	
Log-Likelihood	-2739		-2774		-2796		-2674		-2712		-2709		-2601		-2631		-2377		-2330	
Observations	3769		3773		3774		3773		3775		3774		3772		3775		3432		3188	

Notes: a. Educational attainment is measured as of 2004 for the 1997–2003 models, and contemporaneously for the 2004–06 models.
***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Table 12 Educational attainment and happiness in individual life domains: Odds ratio estimates from random effects logit models, 1997–2006

Happiness with:	The work you do		What you do in your spare time		How you get on with people		The money you get each week		Your social life		Your independence		Your career prospects	
	Coeff.	P>|z|	Coeff.	P>|z|	Coeff.	P>|z|	Coeff.	P>|z|	Coeff.	P>|z|	Coeff.	P>|z|	Coeff.	P>|z|
Highest ed. attainment														
Year 11 or less	1.07		0.95		0.87	***	1.10	*	0.74	***	0.73	***	0.69	***
Year 12 or Yr 11+ cert. I/II	—		—		—		—		—		—		—	
Year 12 + cert. I/II	1.24	***	1.16	***	1.12	*	1.20	***	0.87	**	1.10		1.02	
Apprent'ship or cert. III/IV	1.18	***	1.07		1.15	**	1.16	**	1.02		1.00		1.02	
Diploma	1.01		1.10		1.05		0.88		0.93		1.08		0.91	
Uni/postgrad. degree	1.21	***	1.11	**	1.07		1.20	***	0.96		1.23	***	1.15	***

Table 12 (continued)

Happiness with:	Your future		Your standard of living		The way the country is run		The state of the economy		Where you live		Your life at home	
	Coeff.	P>|z|	Coeff.	P>|z|	Coeff.	P>|z|	Coeff.	P>|z|	Coeff.	P>|z|	Coeff.	P>|z|
Highest ed. attainment												
Year 11 or less	0.82	***	0.92		0.82	*	0.87		0.85	***	0.92	
Year 12 or Yr 11+ cert. I/II	—		—		—		—		—		—	
Year 12 + cert. I/II	1.14	**	1.13	**	1.14		1.14		1.00		1.13	**
Apprent'ship or cert. III/IV	1.09		1.18	***	0.67	***	0.83		1.01		1.14	**
Diploma	1.12		1.12		0.70	**	0.79		1.04		1.05	
Uni/postgrad degree	1.19	***	1.04		0.99		1.34	***	0.94		0.97	

Notes: ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Conclusion and discussion

This paper has sought to cast light on a puzzling phenomenon observed in Australia and other developed countries, whereby people with higher levels of educational attainment report lower levels of wellbeing. There remains no convincing theoretical or empirical explanation for why this should be so. It must be said also that this study has failed to unearth the underlying cause of such a relationship, if indeed it exists. However, it reveals some critical insights into the relationship between education and subjective wellbeing, provides some potential avenues for further investigation and offers one explanation in particular that warrants testing where other data permit.

It is clear from the data that those who do achieve university-level qualifications have personal characteristics and family backgrounds which are generally more conducive to happiness. They are less likely to have come from sole-parent families or to have left home early, and their parents have greater 'wealth'. These characteristics are shown to have a lasting, positive impact on happiness. Partially offsetting this, they are in fact more likely to have come from a non-English speaking background. As expected, university graduates also achieve significantly better labour market outcomes. Post-education, they are more likely to be participating in the labour force, to be employed and, importantly, to be working in the sort of job they would like as a career. Despite all of this, at around age 25 years, university graduates are among the least happy of the cohort in terms of their self-reported happiness. In fact, at this age, no significant differences in happiness by level of educational attainment are apparent for the cohort analysed.

That the discussion has concentrated on university graduates highlights an important implication to arise from the empirical analysis. The relationship between education and happiness is not monotonic. That is to say, happiness does not decline as people gain higher qualifications. Instead the multivariate modelling suggests that people with very low levels of educational attainment, namely, early school leavers, are the least happy, followed by those with university-level qualifications, even after controlling for background circumstances. Although the modelling results vary with specification and by year, people with or who would later attain intermediate-level vocational qualifications, such as a traineeship, apprenticeship or diploma, appear to be happier than either the highly or lowly educated. It appears that, in these data, any negative relationship between educational attainment and subjective wellbeing is essentially limited to a negative impact of gaining university degrees and postgraduate qualifications relative to those who gain intermediate-level vocational qualifications. This also suggests that the many empirical studies of subjective wellbeing that have entered educational attainment as a continuous variable are likely to be specified incorrectly, and that such a relationship may be more widespread than currently acknowledged.

The most important finding is the clear rejection of the hypothesis that a negative relationship between gaining tertiary qualifications and subjective wellbeing arises because those who gain tertiary qualifications were always relatively less happy. Both the raw means and the ordered probit models calculated by wave of the survey show that those who would gain a university degree are the happiest of all at high school and tend to be happier than average for the cohort up until around age 22 years. More sophisticated panel models confirm that they are relatively happy at school and while attending university, and that it is in the years following completion of their university qualification that this relatively lower happiness sets in. Although this finding strictly

applies only to the 1995 Year 9 cohort of the LSAY, there seems no reason to suspect it does not apply to the wider Australian context.

The other major hypothesis investigated is that the happiness of more-educated people is shaped by factors different from those that apply to the less-educated, perhaps through a tendency for greater critical thought and evaluation or a more sophisticated social conscience—the 'better Socrates dissatisfied' argument. For this argument to hold, it would be necessary to show that this change in concerns occurs upon gaining a degree, which seems a somewhat dubious proposition, but there is some evidence in support of it. As discussed earlier, the strength of the correlation between educational attainment and happiness with the state of the economy and how the country is run falls, suggesting that more-educated people do become relatively less satisfied with these domains. However, this does not seem to be relevant to university graduates—the random-effects panel models reported in table 12 find that completing a university degree is associated with increased happiness with respect to the state of the economy and with no significant association with happiness with the way the country is run. University graduates do seem to place greater emphasis on their career prospects and their future, but again completing a university degree is estimated to be associated with greater happiness in both of these domains. Overall, the analysis of the links between educational attainment and happiness in individual life domains would not lead to the expectation of a decline in global happiness upon the gaining a degree.

A number of key variables are identified that shape happiness in the school-to-work transition. In terms of 'fixed' factors, these include family circumstances while at school and the personality traits of being an extrovert and of being calm or easygoing. In terms of experiences during the transition, getting married or entering into a de facto relationship is associated with a pronounced increase in reported happiness. Undertaking an apprenticeship stands out as a particularly rewarding experience, and this is also true of traineeships for people who have completed Year 12. Upon completion of studies or an apprenticeship or traineeship, securing a job that one would like as a career is a critical factor in people's subjective wellbeing. The lower level of happiness experienced by early school leavers has been given a lesser emphasis in the discussion, since it is consistent with the conventional wisdom about the effects of education on life outcomes. It is worth noting here that the evidence reveals that these young people do experience a difficult time in adolescence and young adulthood, and this is evident in career outcomes and a range of other life domains. Factors associated with leaving school early, such as being from a sole-parent or low-income family, are also shown to have a persistent negative effect on wellbeing. These considerations imply the potential for a greater level of early intervention and post-school assistance programs for early school leavers and youth at risk than were in place for the 1995 Year 9 cohorts' transition from school to work.

The age from 23 to 25 years seems to be a critical turning point, where those who gain university qualifications switch from being relatively happy members of their cohort to having relatively low levels of happiness. The panel models confirm that the timing of this fall in subjective wellbeing is associated with the completion of a degree. An important question is whether or not this trend continues beyond the age of 25 years, or whether perhaps it is just a temporary dip in happiness associated with the early career experiences of university graduates. It is unfortunate that the cohort is tracked only to age 25 years, but evidence cited from HILDA suggests the lower happiness of university graduates relative to those with intermediate vocational qualifications is a permanent phenomenon.

It is difficult to see what more could be done with the existing Y95 LSAY data to explain this fall in relative happiness. More extensive controls for labour market outcomes could be incorporated, such as wage rates, but this is likely to reinforce the negative effect of having completed a degree, since university graduates already display superior outcomes. For example, university graduates are generally more satisfied with their jobs and see themselves as doing better financially. More extensive controls for initial circumstances are unlikely to alter the story either—we know that people who gain university qualifications generally have more favourable initial circumstances and they are initially happier. Possibly data with richer information on outcomes in other life domains than those covered in LSAY, such as work–life balance, may offer some further insights.

Being able to explicitly model the formation of aspirations or the groups with which young people compare themselves may provide the answer, but this may require a specifically designed survey. On the evidence presented here, university graduates might well attract Micholas's label of living in 'fool's hell': they seem to be relatively less happy, despite living in quite favourable circumstances. Perhaps the most likely explanation to arise from this study for university graduates' lower level of happiness was raised in the initial assessment of how happiness changes over time. On average, university graduates have favourable childhood circumstances, enjoy school and their university studies. Are these the best years of their lives with which later life experiences never quite compare? The panel models which capture the change in happiness as young people move from education to work would be most sensitive to such an effect, and indeed these show the most robust evidence of a negative impact of completing a university degree. Apprenticeships, which combine learning with on-the-job work experience, may provide a longer-lasting and positive appreciation of what is done in life, as well as more realistic expectations upon becoming a tradesperson.

While this explanation certainly accords with what has been observed in the data on these young Australians, it would need to be a very persistent effect to account also for such a relationship being observed for older generations. And even if it were correct, the question of whether or not there is a causal effect in which gaining a university education reduces happiness is still open to interpretation. Technically, it could be said that it does 'cause' lower subjective wellbeing in later life, but partly by 'raising the bar' and increasing wellbeing at an earlier stage of life.

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Appendix

Table A1 Results for dummy variables for each wave of the survey: Table 9 models

Educational attainment measured	Contemporaneously						Ultimately	
	Model 1		Model 2		Model 3		Model 4	
Independent variable	*Coeff.*	*Prob.*	*Coeff.*	*Prob.*	*Coeff.*	*Prob.*	*Coeff.*	*Prob.*
Wave 3 (1997)	—		—		—		—	
Wave 4 (1998)	1.30	0.00	1.30	0.00	1.30	0.00	1.25	0.00
Wave 5 (1999)	1.36	0.00	1.20	0.00	1.18	0.02	1.30	0.00
Wave 6 (2000)	1.41	0.00	1.23	0.00	1.19	0.02	1.39	0.00
Wave 7 (2001)	1.46	0.00	1.25	0.00	1.20	0.02	1.42	0.00
Wave 8 (2002)	1.38	0.00	1.19	0.01	1.14	0.11	1.32	0.00
Wave 9 (2003)	1.37	0.00	1.18	0.02	1.10	0.24	1.34	0.00
Wave 10 (2004)	1.56	0.00	1.34	0.00	1.22	0.02	1.51	0.00
Wave 11 (2005)	1.28	0.00	1.11	0.18	0.98	0.79	1.24	0.00
Wave 12 (2006)	0.94	0.26	0.81	0.01	0.71	0.00	0.91	0.13

Table A2 Results for dummy variables for each wave of the survey: Table 10 models

	Yr 12 or lower Model 5		Post-school vocational Model 6		University or higher degree Model 7	
Independent variable	Coeff.	P>|z|	Coeff.	P>|z|	Coeff.	P>|z|
Wave 3 (1997)	—		—		—	
Wave 4 (1998)	1.14	0.200	1.48	0.000	1.20	0.034
Wave 5 (1999)	1.36	0.032	1.39	0.100	1.69	0.090
Wave 6 (2000)	1.36	0.034	1.59	0.023	1.72	0.086
Wave 7 (2001)	1.27	0.099	1.33	0.170	2.08	0.021
Wave 8 (2002)	1.29	0.091	1.26	0.274	1.73	0.083
Wave 9 (2003)	1.10	0.543	1.39	0.118	1.76	0.076
Wave 10 (2004)	1.42	0.022	1.42	0.098	1.81	0.064
Wave 11 (2005)	1.21	0.224	1.22	0.358	1.35	0.358
Wave 12 (2006)	0.94	0.703	0.77	0.225	1.02	0.956

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