Exploring the impact of formal work experience and term-time paid employment using longitudinal data from England (2003–2007)

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Selected Conclusions

→ Work experience provides a wake-up call to initially optimistic young people, leading them to question how effectively their education is preparing them for the job market.

→ Work experience varies in quality and its aggregate impact on attainment and participation in 2005/06 was statistically negligible.

→ Part-time paid-employment tends to reduce unemployment after compulsory education; fewer than three hours per week can also result in slightly better academic outcomes.

→ Part-time paid-employment over ten hours a week appears to lead young people to be more appreciative of their education, but results in significantly lower academic success even after controlling for prior attainment, a finding that matches pre-existing research.

Paper Summary

In recent years, England has seen considerable and growing motivation, from the state and non-state bodies (both for-profit and not-for-profit entities), to enhance and expand the mutually beneficial ways in which local economic and educational communities can work together.[1] These include careers education, improved work experience, mentoring schemes and school governance, and build on a rich heritage of similar activity.[2] Many such activities are aimed directly at young people, to improve their educational and life outcomes, and are built on a strong base of detailed case studies and firm convictions.

This paper marks an introductory exploration of a pre-existing longitudinal dataset on the impact of two types of activity, formal work experience placements and part-time paid employment during term-time. It exploits the Longitudinal Study of Young People in England (LSYPE), a government-funded survey tracking the opinions, activities and outcomes of initially around 15,500 of the same young people each year, all of whom turned 14 during academic year 2003/04.[3] At the time of writing data is available over five years, until the young people were 18 or 19, providing a rich data source on their short-term outcomes.

The detail of the study and its scale enable us to control for factors that likely influence an individual's engagement with the world of work and their initial outcomes, the absence of which would otherwise confuse interpretations, such as prior attainment and family background.[4] The study only allows us to track the one cohort through time,

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[1] The recent state context is broad, encompassing curriculum initiatives and the creation of a national infrastructure. Work-related learning became a requirement across the curriculum from 2004, and is currently being integrated into the mainstream of educational provision with the introduction of the 14-19 Diplomas. The launch of IEBE and the Education and Employers Taskforce in 2009 brings in national level bodies to professionalise and support the organisations fostering education-employer partnerships.

[2] See Huddleston (2000) for an account of work placements for young people. It's important to be clear that these activities are not new, but nonetheless that the level of state attention and institutional support for them has grown significantly in recent years.

[3] Not all young people answered all questions or were successfully re-interviewed each year. The sample size available for many questions in this paper was 10,162. Full details in the appendices.

[4] These control variables are key-stage 3 fine-graded APS and the 5-step derived variable, NS-

limiting the extent to which we can explore the impact of policy changes. Nonetheless, it provides a valuable means to explore these issues focusing on outcomes, and supplements the existing array of case study and opinion-requesting surveys.

Formal work experience describes the provision, supported by the school, of a one or two week work placement, which normally takes place at the end of year 10 or during year 11. We know that 37% of the young people in the LSYPE had engaged in such a week by the end of year 11.[5] We do not know anything about the quality, industry or length of the work placement. The survey also asks young people to record whether or not they worked part-time during term-time in each of years 9, 10 and 11. 45% of the young people worked in at least one of those years.[6] We know how much they earn, on average, per week and hour many hours they work per week. We do not know how much of the school year was worked for, nor do we know the sector in which they worked, their holiday employment, how the job was found, why they sought it or how they were treated.

Formal work experience and part-time paid employment are different activities. Each may or may not be optional for different young people in different situations. Analysing these differences in quantitative detail lies outside the scope of the LSYPE and would merit focus group and observational study. Nonetheless, it is probable that most employers are, at least in part, motivated to provide a learning experience in the former, but are focused on running a profitable business or efficient service in the latter. Similarly, a young person's motivations are likely to vary across these activities, although not necessarily in ways that are predictable or open to generalization.

Acknowledging these differences allows us to explore the different impacts of these activities in greater detail. This is because, despite the differences, both begin to afford a young person an insight into what it is like to be employed, what it might be like to exchange your time for someone else's money five days a week. They can also begin to build a young person's networks and understanding of a particular job or industry.

We find that young people who have worked intensively part-time, for instance over ten hours a week[7], are more likely to see the benefit of education and how it will help them

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SEC. See Appendix A for more details.

[5] Given the presence of both soft and statutory measures to increase the number of work experience placements, this may seem low and dissimilar to the number of schools reporting that they offered work experience placements in 2005/06. Although the LSYPE does not directly provide answers to these questions, the difference is perhaps due to the time lag between the introduction of new measures and their full implementation, as well as the inexact cross-over between a school making work experience placements available and all students being willing and able to take them up. It is also possible that young people were unaware of work experience placements, or were taking them after year 11, which introduces an unavoidable distortion into the analysis.

[6] We exclude the 246 young people with their own children in this study, since such a cohort is likely to have a different relationship with the world of work and would benefit from separate and individual analysis.

[7] The intensity of part-time employment is based on the number of years spent working, the wage earned and the hours per week. Interpreting 'high intensity' as over ten hours per work is a convenient short-hand for the concept. For full details see Appendix A.

find a job in the future.[8] However, young people working fewer hours per week are more likely to be critical of the value of education than they were before. Similarly, the cohort that was sceptical in year 10 was little moved in that opinion by going on work experience, whereas young people who felt that school was helping them in year 10 were more likely to have changed their mind after work experience, and determined that school was not preparing them very well. In all cases, we benchmark these groups against a cohort measured over a similar period of time but lacking that identifying characteristic. This means we control for any tendency that the view of young people generally turns, for instance, more negative towards school over that two to three year period in the early teenage years.[9]

This paper finds that working part-time during school years tends to reduce the time spent not in education, employment or training (NEET) after compulsory education, even after controlling for prior attainment. On average, for each extra hour per week a young person has spent working over a given year, they will spend one less day NEET. If a young person works for ten hours a week from year 9 to year 11, we might expect them to spend one month less NEET over the next two years than they might otherwise have done. We are unable to unpack the reasons for this in detail, but it may be linked to the development of work-related skills, improved CVs, the development of informal employment networks or to an unobserved influence, such as an innate quality generally shared by young people that seek term-time work not present in those that do not.

These positive findings only carry across weakly to attainment. Although fewer than four hours term-time employment per week are correlated with a small positive impact on key-stage four attainment, more hours than this quickly begin to have an adverse effect on grades.[10] This general effect carries through to whether or not a young person had attained a level three qualification by 2007.

In general, these are small effect sizes. This should not surprise us. A few hours paid employment per week is, on average, a small input into the complex equation of a life, when weighed up against dozens of teaching hours, after-school activities, peer influences and home life. Even a small 'effect size' might indicate a disproportionately large influence for similarly-scaled activities. Importantly, they are small but statistically significant, in that it is unlikely that they are driven by chance variance in the underlying dataset.

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[8] They are, on average, 8% more likely to disagree in year 12 with the statement 'School has done little to prepare me for when I leave school' than the inverted cohort. This is valid controlling for their prior opinion, as indexed on their agreement in year 10 with the statement 'Even if I do well at school, I will struggle to get the right job.' The timing of such questions and their phrasing makes quantitative interpretations unreliable, and are placed here to provide a sense of their direction and scale, rather than exact impact.

[9] 5% answered differently to expectations.

[10] On average, having controlled for prior attainment, the first three hours working part-time during year 11 are correlated with an extra three points at Key Stage 4, but by the time a young person is working ten hours a week, they can expect almost 20 fewer points (out of around 500 on the *Capped GCSE and equivalents total points score* index).

The statistical methods employed in this paper enable us to identify another reason for the small effect sizes. As well as isolating the overall impact of a particular activity, spread over some ten thousand respondents, the data also highlight the considerable variation in how those activities influence outcomes for particular respondents. In aggregate, we might see a small negative effect, but this disguises variation that includes positive effects for many respondents. This suggests there is something we are not taking into account – and this paper contends that it is the quality of these activities. For instance, insight from young people in the 14-19 Learner Panel informs us that work experience poorly managed has a negative impact, even where it is well intended.

Taken together, these findings suggest that work experience is providing a wake-up call to young people that their education has not provided all the answers they will need in later life and in the job market.[11] It also suggests that, although interviews and case studies indicate that effective work experience can have a motivational and positive effect on young people, enough work experience placements were not effective in 2005/06 that the aggregate effect of this activity over the country was negligible.

Some engagement with the world of work, such as a few hours paid employment a week, is correlated with slightly higher attainment, and term-time working reduces the risk of unemployment after compulsory education. Interestingly, we observe that young people who work a lot while at school are appreciative of the value of school – but nonetheless struggle to achieve academically, even controlling for prior attainment, a result perhaps of their reduced free time during the week.

This paper takes heart in the timing of the LSYPE and the initiatives that have taken place since the survey data were generated to develop and improve the ways that the worlds of education and employment coincide. It might be too early to judge the success of the newer initiatives in this space, such as Diplomas, but the early signs from Ofsted and other independent reviews is positive on the impact of integrating work-related learning into the curriculum. Nonetheless, this study supports the need for action, the need to focus on quality not quantity of employer engagement, and to develop ways of measuring quality that allow future research to pinpoint these effects more accurately.

Although we cannot add questions retrospectively to a survey, over time we hope the study continues and we have data on the progression of young people to higher education, their courses studied, and their initial entry wage in the job market, which will enable us to track these outcomes back to their earliest experiences of the world of work.

This paper begins with an introduction to the dataset and a summary of the debate around part-time employment. A brief discussion of the statistical methods employed in the study is followed by an analysis of six outcomes of interest: Key Stage 4 outcomes, NEET outcomes, level 3 attainment, likelihood of voting[12], and attitudes towards school. Finally, the most significant findings are summarized and interpreted in the context of pre-existing research.

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[11] The extent to which education should provide this is divisive and not explored in detail here.
[12] No significant findings relate to this variable.

Introduction to the Longitudinal Study

The Longitudinal Study of Young People in England (LSYPE) tracks the outcomes and activities of a single cohort of young people each year as they grow up, offering a rich dataset for understanding early influences on later life outcomes. It is a large, representative and rigorously sampled study, with data from around ten thousand individual young people available for many analytical questions of interest. These young people were in academic year 9 in 2003/04, when most were aged 13-14.[13]

We link the data to administrative data from the National Pupil Database, a pupil-level database which matches pupil and school characteristic data to pupil-level attainment. Thus we have GCSE results and Key Stage test scores for pupils. The questionnaire is extensive, and at the relevant ages includes the main parent and other parental influences as available. This enables us to construct proxies for socio-economic status and explore the inter-relation of this with a young person's engagement with work.

The LSYPE is funded by the Department for Children, Schools and Families (DCSF) and undertaken by professional and independent research institutions.[14] Data and details are publicly available at http://www.esds.ac.uk/findingData/lsypeTitles.asp.[15] At the time of writing, data for waves 1-4 are publicly available, with wave 5 available to the author and others on signing a confidentiality agreement with the DCSF. Wave 5, covering the year in which the young people would be in Year 13, aged 17-18 in 2007/08, is expected to be made available through the same web portal later in 2010.

The LSYPE was not designed specifically to explore the outcomes of engaging with the world of work. Significantly, the LSYPE does not enable us to examine changing government policy in detail nor trends between generations of young people – it only covers one cohort of young people as they grow up.

The ESDS (Economic and Social Data Service) explains that "the main role of the study is to identify, and enable analysis and understanding of, the key factors affecting young people's progress in transition from the later years of compulsory education, through any subsequent education or training, to entry into the labour market or other outcomes." This generality is both a weakness of the LSYPE for addressing the topic of this study, and its greatest strength.

The survey asks young people to record whether or not someone worked part-time during term-time in each of years 9, 10 and 11. 45% of relevant young people worked in at least

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[13] Respondents were born between 1st September 1989 and 31st August 1990. Boarders, those solely educated at home and those only in England for the purpose of education are excluded from the study. Young people are interviewed in the Spring/Summer about the most recent academic year.

[14] The survey was commissioned with BMRB Social Research as lead contractor, working alongside GfK NOP and Ipsos MORI. The Joint Centre for Longitudinal Research (JCLR) partners - the Centre for Longitudinal Studies (CLS) and the National Centre for Social Research (NatCen) - were commissioned by the DCSF to develop the research design.

[15] The data can also be accessed through i-LSYPE - https://ilsype.gide.net/.

one of those years.[16] We know how much they earn, on average, per week and hour many hours they work per week. We do not know how much of the school year was worked for, nor do we know the industry in which they worked, nor their holiday working, nor how the job was sourced, why they sought it or how they were treated.

Formal work experience describes the provision, supported by the school, of a one or two week work placement, which normally takes place at the end of year 10 or during year 11. We know that 36% of the young people in the LSYPE had engaged in such a week by the end of year 11. We do not know anything about the quality, industry or length of the work placement. We do not know about speakers from industry, mentoring schemes, work-place visits, their engagement with work at home or the many other ways in which the local economic community and education can coincide to their mutual benefit.[17]

Despite this lack of detail on individual topics, the scale of the dataset and its generality are critical to the relevance of this study. We acknowledge that a young person's education and life outcomes are the result of many variables.[18] The young person's innate qualities, the support available and circumstances prevailing at home, and quality of the school are significant drivers of future outcomes.

It is meaningless, even misleading, to examine the influence of a work experience placement on a young person's positive participation outcomes without allowing for the impact of a person's prior attainment, their socio-economic background or other relevant variables. Children with well-connected parents may have access to better work experience opportunities; they may be more able to work unpaid over summer holidays and thereby become marketable to high quality employers. Young people with worse academic grades may be driven into working extensively during term-time – analysis of their outcomes against an inverted cohort would misleadingly denigrate this influence on outcomes.

The LSYPE allows us to control for these situations. In controlling for these powerful drivers of outcomes, we might expect the influence of additional variables to be small. For this reason, we need a large scale survey to be confident that the considerable individual variation in circumstances does not disguise or distort smaller influences on a person's life outcomes. A representative study of over 10,000 young people, mapped over five years, provides exactly the leverage needed to identify small influences.

When we discuss the benefits of engaging with the world of work, we have in mind a wide variety of outcomes. Driven by the limits of this longitudinal study, we consider the following set of outcomes from the end of year 11 onwards:

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[16] We exclude the 246 young people with their own children in this study, since such a cohort is likely to have a different relationship with the world of work and would benefit from separate and individual analysis.

[17] Consider www.the-guides.org for a description of the different types of engagement available.

[18] Feinstein at al (2008) discuss the range of capital to which a young person might have access.

- Attitude to the value of school in year 12. This variable allows us to explore whether engaging with employers outside school leads young people to evaluate school differently.

- Self-reported likelihood of voting in elections. This variable can be used as a weak proxy for engagement in socio-political issues.

- Key Stage 4 attainment, fine-graded points score.[19] Skills and qualifications are strongly associated with positive outcomes in the future, including higher wages and increased employment prospects (Schoon et al 2002). We also examine, where analytically appropriate, the dichotomous variable of attaining 5 GCSEs or equivalent at A*-C (including English and Maths).

- Number of months NEET after compulsory education (from September 2006 to May 2008). Participation is widely found to be correlated with positive life outcomes.[20] Similarly, Hammond & Feinstein (2006) used the National Child Development Study to demonstrate that continuing participation and good grades led to better adult outcomes.

- Whether or not a level 3 qualification has been attained by 2007.

In analysing how engagement inputs might lead to positive outcomes, we should be aware of the complex set of influences that generate positive outcomes. Feinstein at al (2008) state that there are four main forms of capital available to a child that can influence their outcomes – financial capital, human capital (linked to educational attainment), social capital (e.g. access to social institutions and networks) and individual capital (including resilience, communication and leadership skills).

The LSYPE allows us to control for many of these influences, isolating the impact of engagement with the world of work. However, over-controlling for variables can reduce the variance in the original dataset. Instead we want to find effective variables that allow us to proxy for many of the key background factors.

- Prior attainment. Since the factors we wish to control for are fairly fixed from childhood, their impact on academic outcomes should already be largely reflected in Key Stage three outcomes.[21]

- Family background and socio-economic status. There are many measures available for this, and this study will use a derived NS-SEC variable generated specifically for the LSYPE.

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[19] We use capped GCSE results to exclude the minority of young people who take a very large number of GCSEs and equivalents, and skew the normality of the distribution. This set of young people would be best analysed separately, and lies outside the scope of this study.
[20] CBI (2008)
[21] There are, nonetheless, important differences. KS3 results do not have the lasting individual significance of KS4 results, altering the incentives for exam participants and there is scope for life-changing events and performance in secondary schooling. Nonetheless, this measure remains a strong proxy.

These two controls proxy fairly closely for each other both statistically[22] and theoretically[23], meaning it is not always necessary to use both. Where possible, we apply Key Stage 3 outcomes, because they are more granular that the coarse NS-SEC categories.

In considering a young person's view of the value of school in year 12, we control instead for their view of school in year 10. Any socio-economic, prior attainment, gender, health or ethnicity-driven factors in their view would likely have already been incorporated by year 10.

Technical Appendix A provides the frequency distribution of these variables and a description of their derivation.

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[22] NS-SEC & fine-grained KS3 results has a PMCC of -0.373 (n=8866, p-value of null hypothesis (zero-correlation) 0.000).

[23] Poorer children have been documented as faring less well than richer children in a wide variety of studies. Relevant examples in this context include Blanden and Gregg (2002) who used the British Household Panel Survey and the British Cohort Study to quantify the negative effect on grades from a reduction in income. See also Gregg and Machin (2000) and Hobcraft (1998).

The debate surrounding part-time employment

The benefits and disadvantages of engaging with employment and employers during compulsory education are disputed. Although few would argue against a rounded education that includes engagement with the world of work, it is the form in which this engagement might take place, its extent and purpose which generate controversy. Working part-time is perhaps the most raw experience of work – trading one's time for money – and is also the most controversial.

The benefits broadly revolve around the notion of a 'pro-active learner' – a young person who engages in work will learn more about how the structures in our society fit together, will understand a little more about a particular industry, they will see the benefits of proactive labour and see more clearly the benefits of school and education, perhaps to get a better job than they realize they are currently able to. They will develop a set of attitudes and skills that generate employability. This, at least, is the attitude of many large employers with regard to work experience in the broader sense. A 2007 CBI survey of 101 member companies saw 50% of respondents "definitely agreeing" that "work experience plays a role in developing employability skills."[24]

Anecdotally, there is strong evidence in favour of the benefit of engagement.[25] The '14-19 Learner Panel' brought together 21 young people in April 2009 to debate work experience. Although the panel felt that work experience quality was patchy, when done well it was a powerful driver of outcomes. One member explained how work experience in year 10 had transformed his life, made him recognize the value of education and had since gained the grades to qualify for a local apprenticeship position.[26] A teacher of the *Diploma in Construction and the Built Environment* in a Northern college reported in December 2008 that site visits and experience under a foreman in understanding the relevance of formulae for managing money in construction decisions had helped stop a 14-year old truanting in maths.[27] Such anecdotes help to identify possible trends but do little to quantify them or establish their prevalence or significance.

The US literature on post-16 learners is divisive but some scholars have found that working part-time can support cognitive and affective development (Schill, McCartin and Meyer, 1985).[28] Helen Wood (2009) studied the attributes of part-time workers using the LSYPE, and found that workers tended to be more active generally, higher attainers that were socially engaged – although the lack of pocket money was found to be the single

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[24] CBI (2007:24). The CBI represents a disproportionate number of large employers and the exact percentage should not be considered reflective of all employers that offer work experience, but is nonetheless indicative of the underlying opinions.

[25] This is reflected in various policy and research documents. See DfES (2005), Leitch (2006), The Prince's Trust (2007) and CBI (2008).

[26] 14-19 Learner Panel (2009).

[27] Interview material (4 December) for the PMDU review into Diploma demand (2009) [unpublished].

[28] See also Hamilton and Crouter, (1980); Meyer and Wise, (1980); Steinberg et al, (1981). The following authors identify negative impacts from part-time work: Marsh, (1991); D'Amico, (1984); Steinberg et al (1982); Wirtz et al (1987); Eckstein and Wolpin, (1999); Singh (2001).

strongest positive predictor of part-time working. Quoting Wood (2009), she summarises the argument in favour concisely:

"Part-time work can provide a valuable insight into the world of work which can allow young people to develop skills and types of capital not open to them in school such as team work, communication skills and leadership."

Those supporting the argument against might criticise the kinds of jobs to which young people have access. These are not learning opportunities but monotonous distractions from study, which might tempt young people to sacrifice skills acquisition for temporary reward. Jethwa (2001) found that over a quarter of those working during compulsory education reported being too tired to concentrate on their education and 6% admitted playing truant to go to work. Although we cannot be certain of a causal link between the activities in Jethwa's survey, the finding is suggestive.

Using the British Cohort Study Dustmann et al (1996) found that young people who worked part-time aged 16 (in 1974) gained fewer qualifications than those who did not work, after controlling for individual ability and other key factors. Dustmann and van Soest (2007), using the National Child Development Study, also found that those who engaged in more part-time work were less likely to participate in further education.

These writers might argue that whatever engagement with work is appropriate should be done through structured work experience and work-related learning, rather than through direct part-time working. The data available in the LSYPE allow us to test whether formal work experience placements have different impacts to working part-time, and therefore to contrast these two points of view.

However, we should emphasise that there is a synthesis available between these points of view. For instance, Payne (2003) used the ninth cohort of the Youth Cohort Study (YCS) and found that while working excessive hours part-time damages academic prospects, a certain amount of work builds links to the adult world and fosters self-reliance.

A positive synthesis might link to the quality of engagement, a time-balanced approach and the integration of work experience and employer involvement into the curriculum. The research base driving the possibility of such a synthesis is returned to in 'Interpretation and Discussion.'

Analysis

Generating the data

At the centre of this study is the principle that its results should be replicable via publicly available data and commonly used software (SPSS v15 in this instance). Appendices to this study explain the raw LSYPE variables used in the analysis and the SPSS syntax is available on request from the author.

The dataset was generated by linking the first four waves to the fifth wave (by cserial) and then reduced to relevant variables, weighted by the fifth wave factor (c2ScaledWeightLSYPE). We define the negative values of all variables as user-defined missing, excluding them from statistical analysis.[29] We also exclude those respondents that have their own child, who are likely to have a more complex relationship with the world of work than their peers and should be separately analysed.[30]

Statistical techniques used in the analysis

It is rare for surveys or natural experiments to generate data in forms that perfectly match the mathematical assumptions behind particular statistical techniques, and this is no exception. In this case we are dealing with different types of data and different techniques are called for. Where we examine dichotomous variables, contingency table analysis will be used; interval or quasi-interval variables will be analysed with OLS regression.

Contingency table analysis allows us to test independence between variables.[31] This is a technique fairly robust to the underlying distributions, helpful given the presence of ordinal and dichotomous data among the variables of interest. With a large sample, as with the LSYPE, we do not need to apply Yates Correction or the Fisher Exact Test, meaning hypothesis testing can be conducted with the Pearson's chi-square statistic (with a null of zero correlation) and the effect size explored via Cramer's Phi or V.[32]

The disadvantage of contingency tables is that we need to combine data into a small number of categories, both to reduce the number of low-valued cells in the table and to permit reasonable interpretation. This means we sacrifice information content in our interval variables. For this reason, we limit this technique to particular pairs of data only. It is also possible to control for variables with a contingency table, by carrying out the cross-tabulation for each individual value of the control variable. This procedure is analytically-intensive, and is best limited to one control variable with no more than three values.[33]

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[29] Negative values were used for responses like 'not-applicable', 'unknown' and 'not answered'.
[30] Wave 5: c2ownchi <> 1. Wave 4 child ownership was insignificant.
[31] Sirkin (2006) and Black (1999) for contingency tables, and Rodgers and Nicewander (1988) for linear correlation analysis.
[32] Cramer's Phi is only employed in this analysis where the difference between the number of rows and columns in the contingency table is below two, preventing the spurious inflation of Phi towards 1.
[33] Discriminant and Hiloglinear techniques are methods for sifting large multi-layered contingency

Regression analysis is a powerful set of methods for determining the effects of multiple predictor variables on a single dependent variable, controlling simultaneously for the effects of other variables.[34] The ability to unpack the individual effects makes it a desirable technique in this context. Under a rigorous set of assumptions, regression estimates are unbiased and efficient.[35] Even where these assumptions cannot be rigorously upheld, as is partly the case here, regression analysis can be used to indicate the nature of underlying relationships, even though the exact mechanics of them cannot be fairly evaluated.[36]

Different types of regression are available for different types of dependent variables. Here we will apply ordinary least squares regression to interval or quasi-interval data.[37] Since some of the regression models generated in this study have low levels of prediction, we must be cautious in interpreting the coefficients. The inclusion of an omitted variable could not only weaken the apparent relationships but reverse them. In partial mitigation of this, we look for normally-distributed, zero-mean residuals, low levels of collinearity and use the results to interpret the direction of underlying relationships and get a sense of their scale, rather than attempt to quantify them rigorously.

tables, however the problems with zero-valued cells remain. Moreover, logistic regression is generally preferred to discriminant analysis because it generates stronger results and does not rely on the assumption of multivariate normality (see Press and Wilson, 1978). In this instance, we prefer contingency table analysis to logistic regression despite the necessary loss of granularity because it enables us to identify relationships which are only significant for particular values of the control variable. The other competitor to contingency analysis in this instance is PMCC/PBCC. Contingency analysis is chosen because assumptions over linear dependence are hard to justify for few-valued variables and to better specify the underlying relationships.

[34] See Kennedy (1998), Wooldridge (2002) and Greene (2008) for regression techniques.

[35] Key assumptions are correct model specification, well-behaved residuals (e.g. mean zero, homoskedastic), no exact multicollinearity and fixed observations in repeated samples. The most serious violation in these applications is model specification. We assume linearity to give a general sense of underlying relationships, even where linearity cannot be theoretically justified, and we attempt to find effective proxies for omitted variables in general.

[36] Similarly, although some of our variables are censored (such as the number of months NEET, which cannot go below zero), this should not unduly affect the quality of the relationships.

[37] Some of these data are better described as ordinal. Despite this, measures of ordinality such as Spearman's Rank or Kendell's Tau are avoided because they sacrifice the quasi-interval information content in the data and the number of discordant pairs or rank differences lacks interpretability in this context, particularly considering the different numbers of categories between variables. Furthermore, Joreskog and Sorbom (1998) in a set of Monte Carlo studies found that ordinal scales with 15 or more orderings may be considered continuous, with reasonable tolerance at lower levels of quasi-interval data. Nonetheless, where OLS regression generates unacceptably poorly specified models, contingency analysis is here preferred to ordinal regression (available in SPSS via the McCullagh 1998 methodology). This is because taking advantage of the capacity of ordinal regression algorithms to better handle multi-valued variables results in so many zero-valued cells (typically 30%+ in this study) that the loss of information is as severe as the categorisation required for interpretable cross-tabulations.

Capped Key Stage 4 results

Plotting Key Stage 4 results against hours worked part-time during term, we observe that in all years, some part-time working improves average Key Stage 4 performance, peaking between 7 and 12 hours per week.[38] These effects are strongest in years 10 and 11, when each extra hour adds around 5 or 6 points for those first few hours. After this, the tail-off in performance is significant and additional hours worked begin to have a significant and negative impact on academic attainment.

However, in this analysis, we have not controlled for the prior attainment of the young person and it is possible that higher attaining young people are more likely to work part-time work, rather than the other way round. The regression analysis which incorporates prior attainment demonstrates, as expected, that Key Stage 3 results are by far the strongest predictor of Key Stage 4 results. The strength of this result gives us confidence that we have chosen an effective control and that the significance and scale of other inputs can be sensibly evaluated.

The beneficial impact of working part-time remains valid for the first few hours per week, but the effect size is reduced - the hunch about prior attainment is validated. On average the first three hours working part-time during year 11 are correlated with an extra three points at Key Stage 4, but by the time a young person is working ten hours a week, they can expect almost 20 fewer points. For context, the measure of KS4 performance is the capped new-style points score, a scale which runs for practical purposes from 0 to 500.

Capped Key Stage 4 results – technical comment

The variable for capped KS4 results is fine-grained interval data and broadly normally distributed, meaning that ordinary least squares regression is an appropriate technique.[39] Since we are looking at an academic result, prior attainment at KS3 is a sufficient control, both logically and statistically. With 8863 degrees of freedom, well-behaved residuals and an effective specification (with an adjusted R-squared of 0.70), we can have confidence in these conclusions.

In exploring the effect of working during term time, we cap the number of hours worked per week in any year at 50 hours. This excludes the few values in excess of this, which otherwise have a disproportionate effect on the analysis. Such values are either inaccurate or reflect a very small cohort that are likely to have a different set of experiences and influences to the rest, hence they are correctly excluded at this stage and would need separate and individual examination.[40]

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[38] See Appendix 1 for the graphs. We acknowledge that some noise will be generated by not knowing for how much of the year respondents were working, we will assume that this absent variable is pragmatically orthogonal to the residuals.

[39] Normal distributions are not necessary for the Gauss-Markov result to apply to OLS regression, but variables with a good and consistent spread of values are useful for generating more robust results and a normal distribution is a convenient short-hand for this.

[40] Consider for instance one respondent whose answers suggest they are earning 150 pounds an hour in year 10.

The raw relationship between KS4 results and hours worked demonstrates that a quadratic relationship is a significantly better fit than a linear relationship. Running the regression on variables and their squares reveals collinearity issues and low levels of significance for working part-time in years 9 and 10. Since we want to retain interpretability, we tolerate some loss to model performance by focusing on only year 11 part-time working, rather than generating an aggregate index in this instance.[41]

Number of months NEET

The only input variable found to be statistically significant controlling for prior attainment and other work engagement variables is the number of hours a young person has spent working part-time during term-time. On average, for each extra hour per week a young person has spent working over a given year, they will spend one less day NEET. For instance, if a young person works for ten hours a week in each year from year 9 to year 11, we might expect them to spend one month less NEET over the next two years than had they not worked at all.[42]

Surprisingly, higher earnings do not drive this relationship. We might have argued that more highly paid work should generate more learning opportunities, better evidence of skills or better networks, all of which should lead to better future employment outcomes In fact, since hours worked are negatively related to earnings/week, it seems likely that hours in higher paid roles do not have a disproportionately beneficial impact.[43] Perhaps this reflects the fact that those working only a few hours per week for high sums of money might be in sinecure or nepotistic positions that convey little experiential benefit, although they may still contribute to the building of professional and informal networks.

Number of months NEET – technical comment

The dependent variable is multi-valued interval data with a large positive skew, making OLS regression a reasonable technique. With NEET statistics, fitting quadratic curves for hours worked worsened the fit or improved it very little. We also found that each extra piece of experience working part-time has some impact on the variable in question and suggesting an aggregate index of each year. The model does not work well for a few dozen cases which were NEET for almost the full period (20 months or more). This

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[41] If we consider only that cohort of young people who work at all, we find that the more hours a young person works the more negative their outcome. These linear models are, unsurprisingly, better specified than when we include the full cohort because they do not have a large number of cases valued zero. However, excluding some three quarters of the dataset weakens the relevance and the interpretability of the graph and the strong F-statistics for a quadratic fit for the full cohort support the analysis as described in this section.

[42] Although this is a small effect overall, it does include the vast majority of young people who do not spend any time NEET during sixth form, and the fact that we are unable to measure probability of spending time NEET below zero months (we are dealing with a 'censored' sample) argues that this is a minimum bound on the impact of working part-time. Further research could develop a maximum likelihood estimator to correct for this.

[43] E.g. PMCC for year 11 of -0.25 on 2983 respondents (p-value 0.000).

results in a fairly low adjusted R-squared statistic (0.1) and the tail in the regression histogram. Nonetheless, the strong t-statistics suggest that the underlying trend is accurately identified. See Appendix 2 for more detail.

Level 3 attainment

With contingency table analysis, we control for prior attainment by splitting the cohort into those that achieved level 2, including English and Maths, and those that did not. We find that working part-time only has a significant effect on those who did achieve well in the past, and that a few hours working part-time per week had no strong effect. However, intense working, for instance over fifteen hours a week, suggested the young person was just over 5% less likely to attain level 3.[44] Due to the limitations of contingency analysis in handling fine-grained data, quantifying these effects can be misleading, but the effect is a seventh the size of the gender effect, with women more likely to attain level 3.

Meanwhile, engaging in work experience only had a significant effect on low attainers, but similarly decreased their chances of attaining level 3, with just under 5% of young people attaining differently from expectations after work experience, where our initial expectation is that it does not affect outcomes.[45]

Level 3 attainment – technical comment

To analyse the contingency tables efficiently, I use two-valued variables where possible and categorise a person's intensity of part-time working during term-time into three values, did not work in any years (54%), some engagement (22%) and high engagement (24%). High engagement means, for instance, that the person was working over fifteen hours a week most of years 9, 10 and 11. Higher-wage earners are more likely to be described as high engagers. This categorization allows for robust data analysis, with no cells containing fewer than 100 respondents. See appendix 3 for the cross-tabs.

Probability of voting

We use the individual's self-reported probability of voting, on a scale from 1-10, as a proxy for general engagement and positive involvement with social issues. Since it is a very imperfect proxy, we use this analysis to get a sense of the direction of a relationship rather than its strength. We learn that pupils who have more experience of part-time work, higher attaining pupils and pupils from privileged backgrounds are more likely to see the benefit of voting. However, when we combine socio-economic background and involvement in term-time working, the effect of part-time employment disappears.

Probability of voting – technical comment

Since we are looking at a ten-point quasi-interval scale, we employ OLS regression. This is broadly supported by the performance of residuals, although they are skewed by the

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[44] Cramer's V 0.045, Pearson's Chi-Square 10.1 with p-value 0.006.
[45] Cramer's V 0.06, Pearson's Chi Square 15.9, with p-value 0.00.

underlying distribution (biased towards 10). To minimize interaction effects and remove insignificant variables, we regress the intensity of part-time working against likelihood of voting, controlling for socio-economic background. This regression performed poorly (adjusted R-squared of 0.03) and should be cautiously interpreted. There are no conclusions from this section which we rely on elsewhere. See Appendix 4.

Attitude towards school

We examine whether or not a young person in year 12 agrees or disagrees with the statement 'School has done little to prepare me for when I leave school' (overall 23.3% of 10,162 respondents agreed or strongly agreed). Initial analysis indicates that those who have more experience of working part-time are less likely to agree, whereas those who have done work-experience are more likely to agree.

It is possible that only those with more positive attitudes on the value of school tend be proactive individuals who get involved in part-time work during term-time. To control for this possibility, we repeat the analysis controlling on the young person's agreement in year 10 to the statement 'Even if I do well at school, I will struggle to get the right job' (overall 64.8% of 10,162 respondents disagreed). This is an inexact control, but averaged over thousands of respondents gives a flavour of the underlying tendencies.

We find that those that were sceptical about school in year 10 were slightly more likely to be worried about the preparation they get from school if they have done no or only a little part-time work.[46] Those who have worked intensively during term-time were generally more appreciative of the impact of schooling - 8% of respondents answered differently from expected as a result of working part-time. Meanwhile, the same cohort that was sceptical in year 10 was little moved from that opinion by going on work experience.[47]

Interestingly, young people who felt that school was helping them in year 10 were more likely to have changed their mind after work experience, and determined that school was not preparing them very well (5% answered differently from expected).[48] For comparison, the effect sizes of the two significant influences described are both similar to the effect size of being ethnically white vs. non-white, where white respondents in year 12 were the more sceptical about the value of education for the job-market.

Attitude towards school – technical comment

Since we are examining four-valued opinions, we apply contingency table analysis and collapse the opinions to 'agree' or 'disagree.' The categorization of part-time working follows the methodology applied in level 3 attainment. This has the required effect and no cell has fewer than 50 respondents. For cross-tabs see Appendix 5.

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[46] Cramer's V 0.053, Pearson's Chi-Square 9.94 with p-value 0.007.
[47] The observed effect is 46% likely to have occurred by chance variation alone.
[48] Cramer's V 0.045, Pearson's Chi-Square 13.2 with p-value 0.000.

Interpretation and Discussion

This study set out to explore two questions, framed by the debate around the impact of working part-time during term-time and the wider engagement of young people in the world of work.

Firstly, we want to explore the notion that experiencing the world of work might encourage young people to integrate more positively and proactively with society, engage more critically with their education and see the benefits of engagement.

Secondly, we want to examine whether part-time working has a qualitatively different set of impacts to work experience.

Part-time working

Working part-time during term-time has a statistically significant effect on a key priority for government education policy, whether or not young people spend time not in education, employment or training (NEET). If a young person works during term-time for ten hours a week from year 9 to year 11, we might expect them to spend one month less NEET than they otherwise would have done, although the data do not allow us to be specific about why this correlation should exist.

One concern in the literature is whether working part-time during term time worsens someone's ability to concentrate on their studies. The analysis here supports Payne (2003) in identifying a beneficial impact from a small amount of part-time working and a negative one from intensive part-time employment on Key Stage 4 attainment, controlling for Key Stage 3 results. These findings on part-time working have been separately identified by US and Australian longitudinal studies.[49]

This effect persists, weakly, into sixth form academic performance. We find that working part-time only has a significant effect on those who achieved highly in the past[50], and that a few hours work per week has no strong effect. Intense employment, however, for instance over fifteen hours a week, suggested the young person was 5% less likely to attain level 3.

We might hypothesise that effects on attainment from working part-time are driven by experience outside the classroom influencing a young person's view on the value and effectiveness of working during school hours. Attitudinal questions in the LSYPE demonstrate that those who had worked intensively during term-time were 8% more likely to appreciate the value of schooling, although they subsequently performed less well in their academic grades than expected.

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[49] Lucas and Lammont (1998), Robinson (1999).
[50] Defined as achieving at least level 2 including English and Maths.

Work experience placements in year 10

Work experience does not have a significant effect on Key Stage four attainment, but it is possible that going on work experience in year 10 or 11 might come too late to impact on Key Stage four outcomes, but may still influence their likelihood of attaining a level three qualification.[51]

We find that engaging in work experience only had a significant effect on an initially low attaining cohort which did not achieve level 2, including English and maths at Key Stage four. In these instances, work experience decreased a typical respondent's likelihood of attaining level 3, by just under 5%.

Interpreting this finding is not straightforward. It perhaps sheds light on the demotivating effect of work experience, if it leads young people to question the usefulness of school qualifications in the workplace. Indeed, the cohort of young people who were sceptical of the usefulness of school for the job market in year 10 were little moved in that opinion by going on work experience, but some of those who had previously thought school would help their prospects changed their mind after a week of work experience (5% answered differently from expectations).

Throughout the analysis so far, the 'reliability' of each possible predictor of a possible outcome has only been incorporated in the sense that it partially determines whether or not that predictor is 'statistically significant', with results only reported if they are only 5% likely or less to have occurred by random variation alone. However, this could be down either to a relatively large effect size or a relatively low variance. Examining the statistical output from this study, we observe that the impacts of engagement with the world of work are typically characterized by high variances.

The high variance likely reflects the coarseness of our measures of engagement with the world of work. We do not know whether young people found the work experience placement useful, nor do we know its quality or length. We do not know about speakers from industry, mentoring schemes, work-place visits, their engagement with work at home or the many other ways in which the local economic community and education can coincide to their mutual benefit.

To support our ability to interpret this high variance, we turn to qualitative evidence and pre-existing studies. We have already discussed the strong support from the 14-19 Learner Panel for the value of work experience despite its patchy implementation.

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[51] It is reasonable to ask whether young people going on work experience are high performers simply adding another string to their well-stocked bow. In fact, the data suggest the opposite conclusion, albeit weakly. There is a PBCC of -0.1 between a dummy for taking work experience and the KS3 fine-graded points score (N=8897, p-value 0.000). We might speculate that this is institution- rather than individual-driven. Schools in 2004-5 with lower attaining cohorts might be more likely to explore diverse ways of engaging them, including work experience opportunities, but testing these ideas lies outside the scope of this study.

The Education and Employers Taskforce argues for the mutual benefit of school-business partnerships.[52] The research base of the Taskforce emphasises an IEBE survey of 15,025 learners[53] who had recently completed work experience. After work experience, 90% of learners felt it helped them understand why it is important to do well in school and 89% reported they would work harder as a result. These positive findings were broadly replicated in the 2007 CBI survey of 1,034 young people aged 14-16 who had recently a completed work placements.[54]

One table from the Taskforce research base is particularly relevant to this study and worth replicating in full. In 2004, 2007 and 2009, Ipsos MORI polled several thousand young people aged 11-16 to gauge their involvement in educational activities engaging employers and their experience of them.[55] The studies show strong support for the relevance of such provision:

	% having participated			% finding helpful	
Activity	2009	2007	2004	2009	2007
Been on a work placement for one week or more	83	88	80	84	87
Visited a work place, such as a factory or a shop	58	60	54	69	76
Listened to, or spoken with, a visitor from business	46	59	46	72	75
Taken part in a mini-enterprise or other enterprise project	34	48	17	64	68

These case studies, surveys and studies clearly indicate that work experience and closer links to employers are valued by a considerable number of young people and are able to have a positive impact.

It seems likely that there is a balance between working 20 hours a week during term-time and a productive level of work that builds self-esteem and maturity. A positive synthesis might also revolve around the quality of engagement and the integration of work experience and employer involvement into the curriculum. Links might be made between the experience across a class of different part-time jobs and relevance to, for instance, personal finance, mathematics, business structures and understanding different sectors.

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[52] The Education and Employers Taskforce (2010).
[53] National Support Group for Work Experience (2008).
[54] CBI (2007).
[55] QCA (2007, 2009). Ipsos MORI (2009).

Situating the findings of this study, in particular the high variance of predicted relationships, in the broader context of research on work-related learning and employer engagement leads to the compelling suggestion that it is the quality of engagement that matters and not its quantity. Although interviews and case studies indicate that effective work experience can have a motivational and positive effect on young people, enough work experience placements were not effective in 2005/06 that the aggregate effect of this activity over the country was neutral and statistically insignificant. This result would not be surprising to focus groups, such as the 14-19 Learner Panel, but it is helpful to identify its possible persistence into large-scale quantitative analysis.

Despite the small but generally negative effects on attainment, we observe some evidence that working part-time, on the average, improves a young person's chance of spending time actively participating during their sixth form years. Working part-time only appears to have a negative effect on the likelihood of attaining level three qualifications for those working a large number of hours, echoing Payne (2003) and similar findings in the FE sector (such as Martinez and Munday, 1998).

There is evidence that experience outside the classroom allows young people to critically reflect on the value of education. A low-level engagement with work, for instance through a small amount of part-time working or a short work experience placement, has a small effect, perhaps demotivating people who begin to realize how different the workplace is to the classroom. However, once we have controlled for prior opinion, young people that work a much larger number of part-time hours see the benefit of school, perhaps realizing the kind of grades and skills they will need to get higher skilled jobs. Combined with the IEBE survey indicating that young people are generally more motivated for study after work experience, these results are positive, if permitting of multiple and contested interpretations.

This study takes heart in the timing of the LSYPE and the significant government and local initiatives that have taken place since the survey data were generated to develop and improve the ways that the worlds of education and employment can coincide.

There has been a gradual increase in the enthusiasm, commitment and variety from employers for supporting education, seen in the ambitious programmes of work both locally and in national organizations, such as BITC. The growth of specialist schools has provided incentives and funding for schools to build links with the local economic community in support of their specialism. The founding of the Education and Employers Taskforce, the professionalisation of Education Business Partnerships and IEBE, and the success of the 'Big Conversation - *turning work experience into work inspiration*' in 2009 are simultaneously examples of and drivers of this trend.[56]

There has been increased funding from central government and regularly improved guidance since 2004 (and the timing of the relevant LSYPE questionnaires) for employer engagement in schools. There has also been considerable investment in and excitement around new ideas that elevate the status of applied learning and improve the available

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[56] BITC (2009). DCSF (2009) (i). IEBE, (2009).

suite of applied qualifications, in particular the 14-19 Diplomas and the Young Apprenticeship Programme.[57]

Early signs of the impact of these new and revived qualification pathways are encouraging. The independent schools inspectorate, Ofsted, interviewed employers supporting the Young Apprenticeship programme, providing evidence that work experience enables young people develop interpersonal skills and employability.[58] In its August 2009 review of Diploma provision, Ofsted drew on interviews with employers, young people and teaching staff from 66 different Diploma-teaching schools and colleges. The review found young people responding positively to the involvement of employers in classroom activities and visits to employer premises.[59]

It might be too early to judge the success of these initiatives or their cumulative impact, even if early signs are encouraging. Nonetheless, this study gives strong support to the need for action, the need to focus on quality not quantity of employer engagement, and to develop ways of measuring quality that allow future research to pinpoint these effects more accurately.

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[57] DCSF (2009) (ii) and DCSF (2008).
[58] Ofsted (2007:13). Quoted in Education and Employers Taskforce (2010).
[59] Ofsted (2009). See also NFER (2005) (i) and NFER (2005) (ii). Quoted in Education and Employers Taskforce (2010).

Limitations and further work

Statistical inference at best identifies controlled correlations between variables of interest. The impossibility of fully knowing the operational relationships and interacting variables means causal interpretations are necessarily suggestive rather than conclusive. We mitigate this in part within the paper by identifying appropriate controls and by using temporally separated relationships. Nonetheless, we have discussed at length the inability of the LSYPE to exactly measure the employer engagement that theory describes.

Although large and rigorously developed, the LSYPE remains victim to the biases that afflict studies of its type. We do not know how differently people might interpret the same questions; attitudinal questions are sensitive to language and the peculiar time of asking. There is also a self-selection bias. Those willing to be interviewed may not be a fair reflection of the population or might themselves develop different attitudes after five years answering searching questions about their lifestyles. We rely on the likelihood that anonymity permits honesty and accurate data recording.

Of more concern, there are many ways of slicing, categorizing and aggregating the data – some options will generate weaker and some stronger relationships than those identified here, and we may even find some reverse relationships if we look hard enough. The index of part-time working and the dichotomous control variables are most likely to be sensitive to this aggregation. Different indices explored by the author do not dispute the qualitative interpretations of this study, and these underlying trends are considered fairly robust. Further work might contrast different indices in more detail and apply other statistical techniques discussed throughout the text, for instance a maximum likelihood analysis of such censored variables as number of months NEET.

This is an overview study trying to identify the broad qualitative trends that are taking place and it is possible to focus further on particular relationships of interest. More focused work would examine a greater variety of background factors and develop model performance within regression analysis, for instance by transforming variables, removing insignificant ones and developing more reliable quantitative conclusions.

Another approach would be to identify, within the cohort that worked part-time during school, sub-cohorts which had very different outcomes and then examine in what other ways they differed. For instance, we could explore whether more advantaged young people are able to work for longer periods of time before it has a negative impact on their educational outcomes. Similarly, this approach could be applied to only those young people who spent time NEET to back-track to some of the key indicators.

With more time, we will hopefully have more data about the LSYPE cohort, including their higher education and initial employment outcomes. We could also examine whether relationships are affected by the local community, for instance its overall unemployment, school quality, rural vs. urban and so on. We might find clustering significant, for instance at the school level through such channels as peer and personality influence.

Appendix A

Input variables

1. Whether or not the young person did at least one week of work experience in years 10/11. (*'W3outschbYP'* dichotomous variable)

YP: Whether YP has a short term work experience placement

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	3679	36.2	37.0	37.0
	No	6267	61.7	63.0	100.0
	Total	9945	97.9	100.0	
Missing	YP not interviewed	92	.9		
	Refused	0	.0		
	Don't know	5	.0		
	System	119	1.2		
	Total	217	2.1		
Total		10162	100.0		

2. The extent to which a young person engaged in part-time paid employment during term-time in years 9/10/11. A person's engagement is considered more intense for each additional year worked (+1), the hours worked per week (+ weekly_hours/20) (and the higher the wage earned for each year a young person is working (+ hourly_wage/5). (*'PWTint'* ordinal data, subjectively indexed, with weak interval qualities).

Mean = 1.74
Std. Dev. = 2.393
N = 10,1612

Cases weighted by LSYPE weight
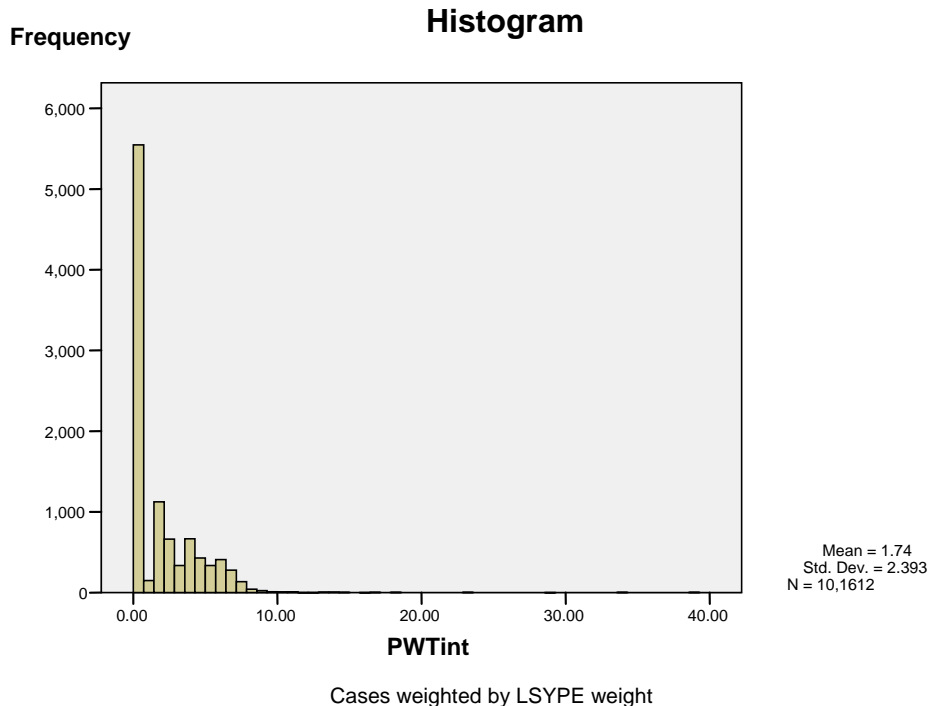
3. Whether or not someone worked at all in years 9, 10 and 11. (*'worker'* dummy variable; '0' indicates the respondent did not work part-time during term-time in any year)

worker

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	5548	54.6	54.6	54.6
	1.00	4614	45.4	45.4	100.0
	Total	10162	100.0	100.0	

4. The highest weekly wage someone earned while working part-time. (*'High_Wage'* interval data, valued zero if not applicable)

Histogram

Mean = 1.51
Std. Dev. = 3.11
N =10,162

Cases weighted by LSYPE weight
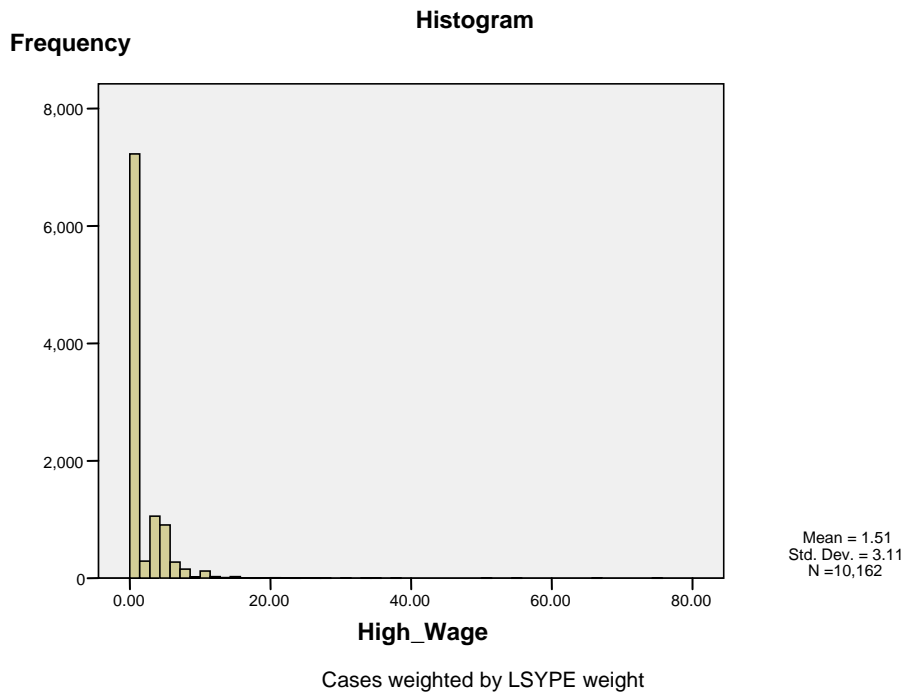
5. Total_Hours is a simple sum of the hours worked per week over year of the three years.

Output variables

1. Attitude to the value of school in year 12 (ordinal data)

YP: YP Agreement with statement : School has done little to prepare me for when I leave school

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	425	4.2	4.3	4.3
	Agree	1939	19.1	19.7	24.0
	Disagree	5467	53.8	55.6	79.6
	Strongly disagree	2005	19.7	20.4	100.0
	Total	9836	96.8	100.0	
Missing	YP not interviewed	160	1.6		
	Don't know	136	1.3		
	System	31	.3		
	Total	326	3.2		
Total		10162	100.0		

2. Self-reported likelihood of voting in elections:

Frequency   **Histogram**

Mean = 5.86
Std. Dev. = 3.545
N =10,1612

Liklihood of voting in next general election (on scale of 0 - 10)

Cases weighted by LSYPE weight
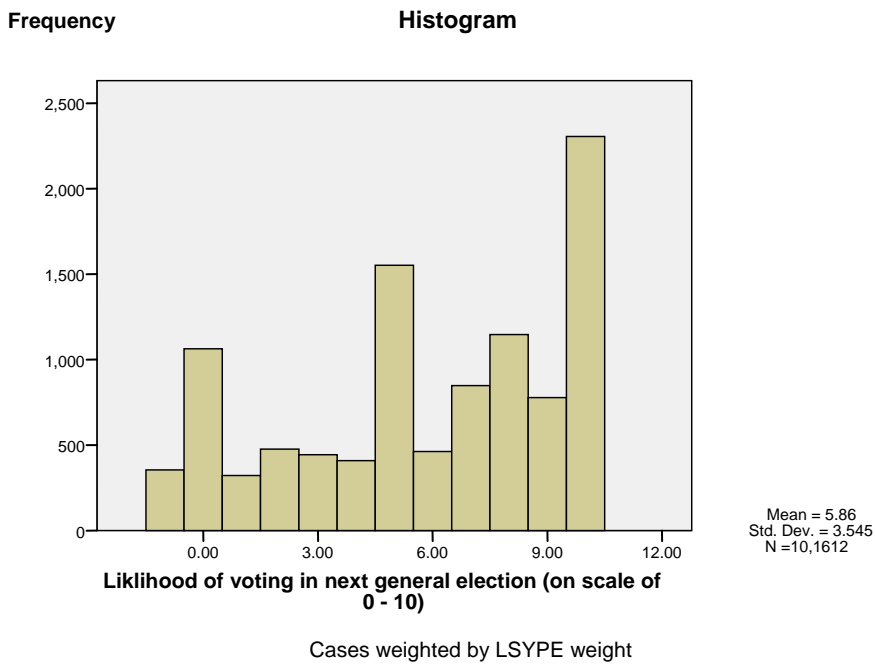
3. Key Stage 4 attainment (*'ptscnewe'* interval data, fine-graded).[60]

Histogram

Frequency

Mean = 307.10
Std. Dev. = 104.288
N =9,9712

Capped GCSE and equivalents - new style point score

Cases weighted by LSYPE weight
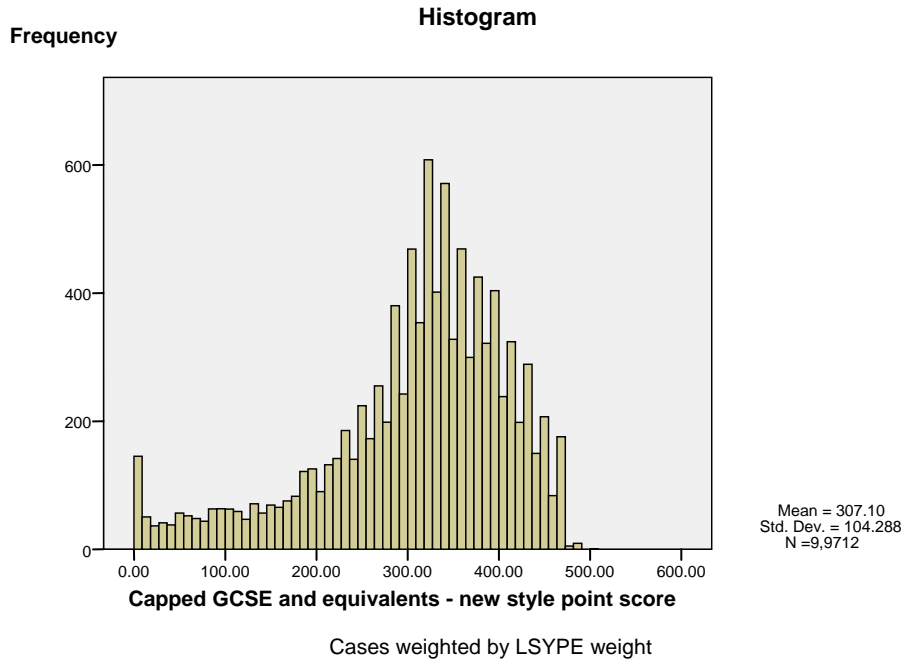
4. Number of months NEET (Not in Education, Employment or Training) after compulsory education (from September 2006 to May 2008) (interval data).

Histogram

Frequency

Mean = 1.37
Std. Dev. = 3.909
N =10,162

Number of months NEET - Sep 06 to May 08

Cases weighted by LSYPE weight

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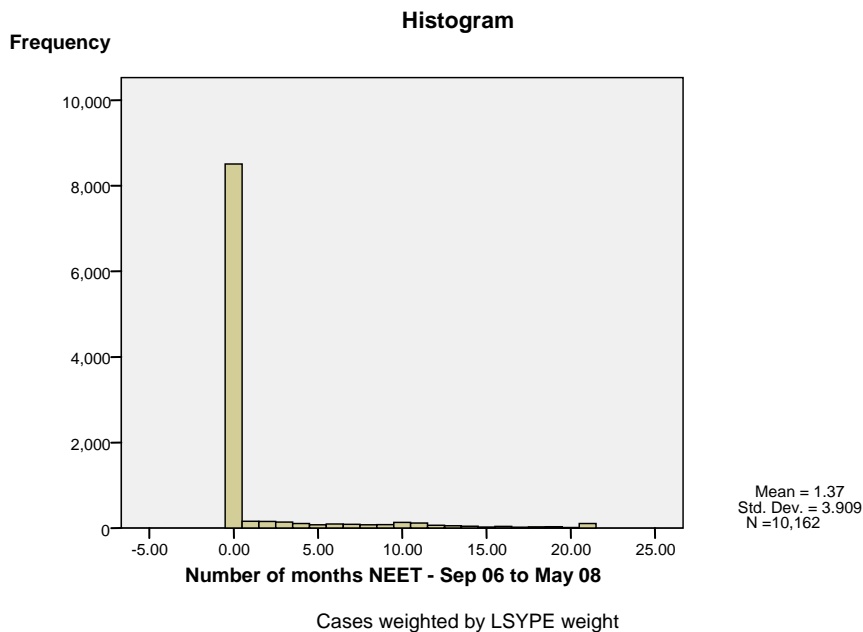
[60] We use capped GCSE results to exclude the minority of young people who take a very large number of GCSEs and equivalents, and skew the normality of the distribution. This set of young people would be best analysed separately, and lies outside the scope of this study.

5. Whether or not a level 3 qualification has been attained by 2007 (dummy variable).

Attained Level 3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	5139	50.6	51.4	51.4
	1	4855	47.8	48.6	100.0
	Total	9994	98.3	100.0	
Missing	System	168	1.7		
Total		10162	100.0		

6. Key Stage four attainment (dummy variable):

Achieved 5 or more GCSE and equivalents at grades A*-C including GCSE and equivalents in English and Maths (Functional English and Maths)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	4918	48.4	49.3	49.3
	Yes	5054	49.7	50.7	100.0
	Total	9972	98.1	100.0	
Missing	No data available for pupil at this key stage	89	.9		
	System	101	1.0		
	Total	190	1.9		
Total		10162	100.0		

Control variables

1. Opinion on school work in year 9:
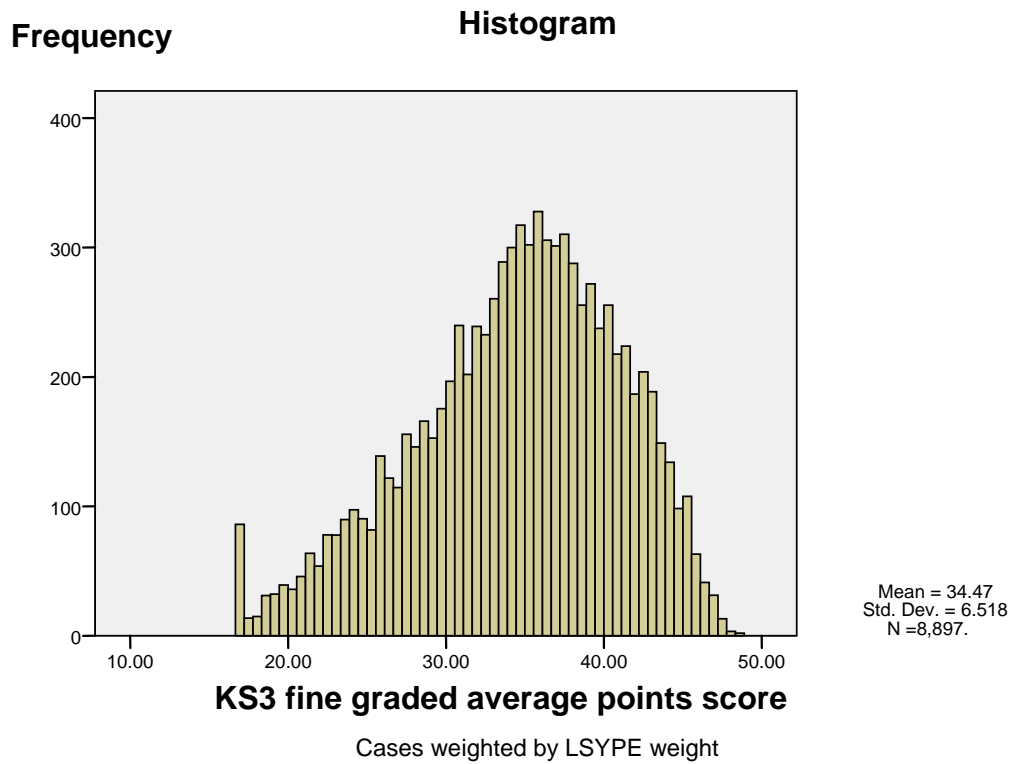
YP: Feelings about school: School work is worth doing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	4473	44.0	46.1	46.1
	Agree	4236	41.7	43.7	89.8
	Disagree	527	5.2	5.4	95.2
	Strongly disagree	466	4.6	4.8	100.0
	Total	9702	95.5	100.0	
Missing	YP not interviewed	92	.9		
	YP refused self completion	32	.3		
	YP using interpreter	40	.4		
	Don't know	176	1.7		
	System	119	1.2		
	Total	460	4.5		
Total		10162	100.0		

2. Opinion about school in year 10 (W2Fat2YP)

YP: Statements about success: Even if I do well at school, I'll have a hard time getting the right kind of job

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	572	5.6	6.7	6.7
	Agree	3001	29.5	35.3	42.0
	Disagree	4149	40.8	48.8	90.7
	Strongly disagree	789	7.8	9.3	100.0
	Total	8511	83.7	100.0	
Missing	Interviewer missed question	3	.0		
	YP not interviewed	128	1.3		
	YP refused self completion	57	.6		
	YP using interpreter	69	.7		
	Refused	42	.4		
	Don't Know	1252	12.3		
	System	102	1.0		
	Total	1651	16.3		
Total		10162	100.0		

3. Prior attainment (cva3aps)

Frequency

Histogram

Mean = 34.47
Std. Dev. = 6.518
N =8,897.

KS3 fine graded average points score

Cases weighted by LSYPE weight

4. Family background and socio-economic status.

DV: Family NS-SEC Class Bulletin

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Higher professional	680	6.7	6.7	6.7
	Lower professional	3847	37.9	38.0	44.7
	Intermediate	1705	16.8	16.8	61.5
	Lower supervisory	787	7.7	7.8	69.3
	Routine	1664	16.4	16.4	85.7
	Other/not classified	1449	14.3	14.3	100.0
	Total	10131	99.7	100.0	
Missing	System	31	.3		
Total		10162	100.0		

Appendix 1 – Capped KS4 analysis
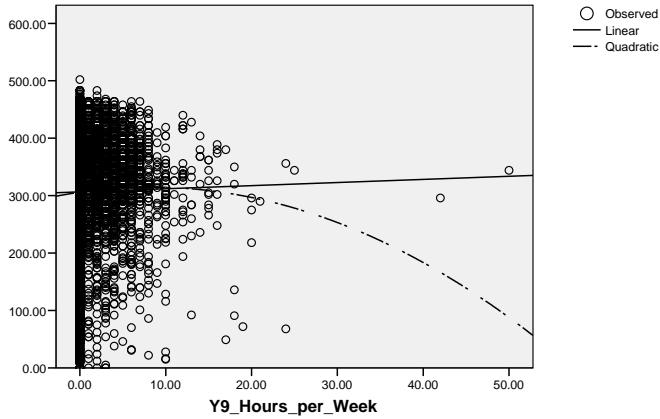(data and more detailed diagnostics available on request from the author)

Model Summary and Parameter Estimates

Dependent Variable: Capped GCSE and equivalents new style point score

Equation	Model Summary					Parameter Estimates		
	R Square	F	df1	df2	Sig.	Constant	b1	b2
Linear	.000	1.441	1.00	9969.64	.230	306.606	.541	
Quadratic	.001	5.616	2.00	9968.64	.004	305.942	2.151	-.130

The independent variable is Y9_Hours_per_Week.
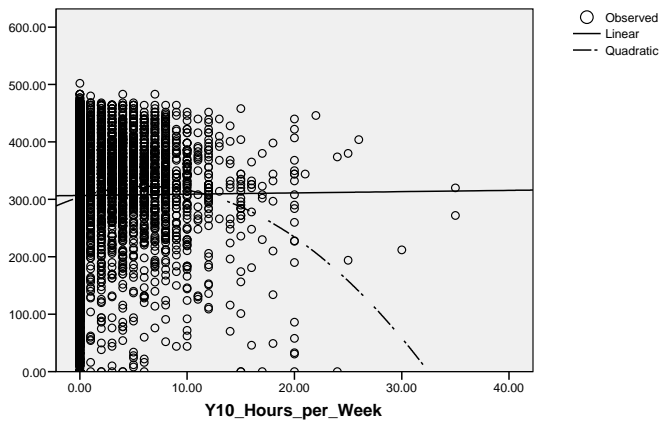
Capped GCSE and equivalents new style point score

Model Summary and Parameter Estimates

Dependent Variable: Capped GCSE and equivalents new style point score

Equation	Model Summary					Parameter Estimates		
	R Square	F	df1	df2	Sig.	Constant	b1	b2
Linear	.000	.424	1.00	9969.64	.515	306.781	.222	
Quadratic	.009	45.577	2.00	9968.64	.000	303.973	5.911	-.470

The independent variable is Y10_Hours_per_Week.
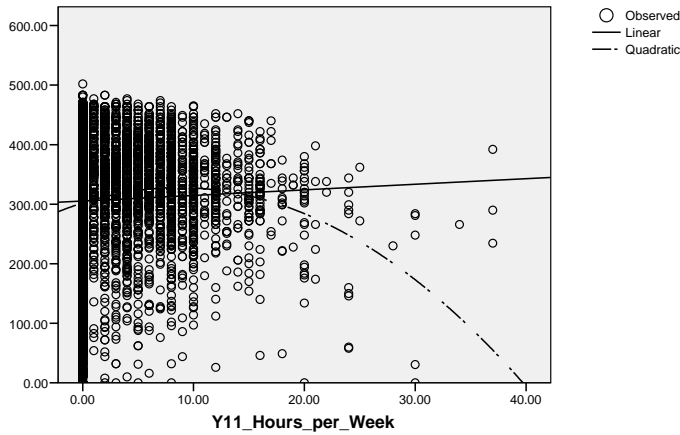
Capped GCSE and equivalents new style point score

Model Summary and Parameter Estimates

Dependent Variable: Capped GCSE and equivalents new style point score

Equation	Model Summary					Parameter Estimates		
	R Square	F	df1	df2	Sig.	Constant	b1	b2
Linear	.001	12.388	1.00	9969.64	.000	305.274	.940	
Quadratic	.012	61.663	2.00	9968.64	.000	302.106	5.905	-.340

The independent variable is Y11_Hours_per_Week.
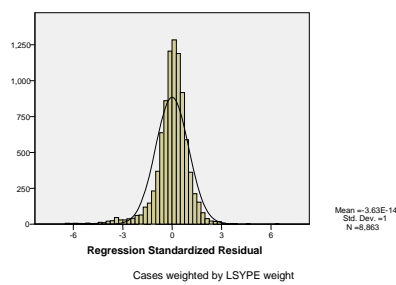
Capped GCSE and equivalents new style point score

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-122.852	3.256		-37.735	.000	-129.234	-116.470		
	Vocational_Learning	-7.000	1.549	-.026	-4.519	.000	-10.037	-3.964	.975	1.026
	Employers_Premises	-5.048	1.636	-.018	-3.085	.002	-8.255	-1.840	.971	1.030
	Work_Experience	-.276	1.189	-.001	-.232	.816	-2.606	2.054	.974	1.027
	highwage	.056	.230	.002	.245	.806	-.394	.506	.647	1.545
	KS3 fine graded average points score	12.519	.090	.829	139.733	.000	12.344	12.695	.948	1.055
	Y11_HPWsq	-.101	.019	-.067	-5.296	.000	-.139	-.064	.210	4.755
	Y11_Hours_per_Week	1.415	.350	.057	4.042	.000	.729	2.101	.171	5.855

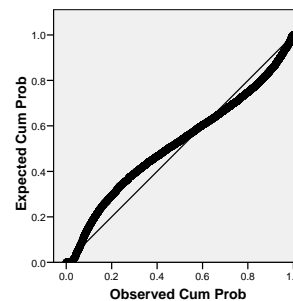a. Dependent Variable: Capped GCSE and equivalents new style point score

Histogram

Dependent Variable: Capped GCSE and equivalents new style point score

Cases weighted by LSYPE weight

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: Capped GCSE and equivalents new style point score

Appendix 2 – Months NEET analysis

(data and more detailed diagnostics available on request from the author)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	7.166	.216		33.204	.000	6.743	7.590		
	Vocational_Learning	-.155	.103	-.015	-1.503	.133	-.357	.047	.976	1.025
	Employers_Premises	.190	.109	.018	1.744	.081	-.024	.403	.973	1.028
	Work_Experience	.038	.079	.005	.483	.629	-.117	.193	.974	1.027
	highwage	-.010	.014	-.008	-.686	.493	-.037	.018	.776	1.289
	KS3 fine graded average points score	-.167	.006	-.292	-28.157	.000	-.179	-.156	.951	1.051
	Total_Hours	-.030	.006	-.056	-4.889	.000	-.042	-.018	.778	1.286

a. Dependent Variable: Number of months NEET -Sep 06 to May 08

Histogram
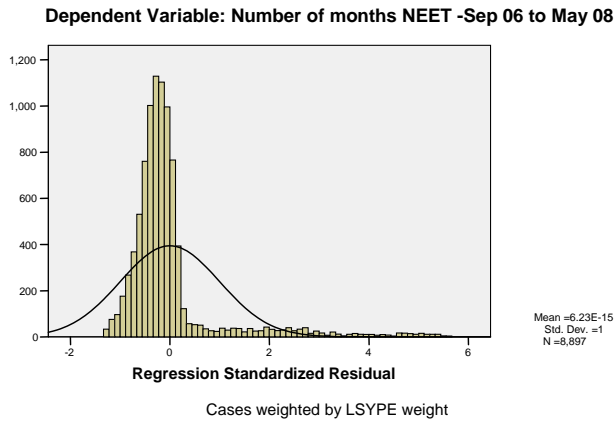
Dependent Variable: Number of months NEET -Sep 06 to May 08

Mean =6.23E-15
Std. Dev. =1
N =8,897

Cases weighted by LSYPE weight

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: Number of months NEET -Sep 06 to May 08
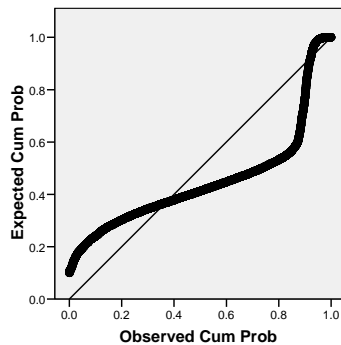
Appendix 3 – Level 3 Attainment

(data and more detailed diagnostics available on request from the author)

Attained Level 3 * pwtint (Binned) * Achieved 5 or more GCSE and equivalents at grades A*-C including GCSE and equivalents in English and Maths (Functional English and Maths) Crosstabulation

Achieved 5 or more GCSE and equivalents at grades A*-C				pwtint (Binned)			
				No part-time work	Low part-time work intensity	High part-time work intensity	Total
No	Attained Level 3	0	Count	2302	955	842	4099
			Expected Count	2303.0	944.3	851.7	4099.0
			% within Attained Level 3	56.2%	23.3%	20.5%	100.0%
			% within pwtint (Binned)	84.9%	85.9%	83.9%	84.9%
			% of Total	47.7%	19.8%	17.4%	84.9%
			Residual	-1.0	10.7	-9.7	
		1	Count	410	157	161	728
			Expected Count	409.0	167.7	151.3	728.0
			% within Attained Level 3	56.3%	21.6%	22.1%	100.0%
			% within pwtint (Binned)	15.1%	14.1%	16.1%	15.1%
			% of Total	8.5%	3.3%	3.3%	15.1%
			Residual	1.0	-10.7	9.7	
	Total		Count	2712	1112	1003	4827
			Expected Count	2712.0	1112.0	1003.0	4827.0
			% within Attained Level 3	56.2%	23.0%	20.8%	100.0%
			% within pwtint (Binned)	100.0%	100.0%	100.0%	100.0%
			% of Total	56.2%	23.0%	20.8%	100.0%
Yes	Attained Level 3	0	Count	448	199	290	937
			Expected Count	485.4	198.5	253.1	937.0
			% within Attained Level 3	47.8%	21.2%	30.9%	100.0%
			% within pwtint (Binned)	17.2%	18.7%	21.4%	18.6%
			% of Total	8.9%	4.0%	5.8%	18.6%
			Residual	-37.4	.5	36.9	
		1	Count	2156	866	1068	4090
			Expected Count	2118.6	866.5	1104.9	4090.0
			% within Attained Level 3	52.7%	21.2%	26.1%	100.0%
			% within pwtint (Binned)	82.8%	81.3%	78.6%	81.4%
			% of Total	42.9%	17.2%	21.2%	81.4%
			Residual	37.4	-.5	-36.9	
	Total		Count	2604	1065	1358	5027
			Expected Count	2604.0	1065.0	1358.0	5027.0
			% within Attained Level 3	51.8%	21.2%	27.0%	100.0%
			% within pwtint (Binned)	100.0%	100.0%	100.0%	100.0%
			% of Total	51.8%	21.2%	27.0%	100.0%

Chi-Square Tests

Achieved 5 or more GCSE and equivalents		Value	df	Asymp. Sig. (2-sided)
No	Pearson Chi-Square	1.545[a]	2	.462
	Likelihood Ratio	1.547	2	.461
	Linear-by-Linear Association	.192	1	.661
	N of Valid Cases	4827		
Yes	Pearson Chi-Square	10.141[b]	2	.006
	Likelihood Ratio	9.985	2	.007
	Linear-by-Linear Association	9.948	1	.002
	N of Valid Cases	5027		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 151.27.

b. 0 cells (.0%) have expected count less than 5. The minimum expected count is 198.51.

Attained Level 3 * YP: Whether YP has a short term work experience placement * Achieved 5 or more GCSE and equivalents at grades A*-C including GCSE and equivalents in English and Maths (Functional English and Maths) Crosstabulation

Achieved 5 or more GCSE and equivalents at grades A*-C including GCSE and equivalents				YP: Whether YP has a short term work experience placement		
				Yes	No	Total
No	Attained Level 3	0	Count	1743	2291	4034
			Expected Count	1694.3	2339.7	4034.0
			% within Attained Level 3	43.2%	56.8%	100.0%
			% within YP: Whether YP has a short term work experience placement	87.2%	83.0%	84.8%
			% of Total	36.6%	48.2%	84.8%
			Residual	48.7	-48.7	
		1	Count	255	468	723
			Expected Count	303.7	419.3	723.0
			% within Attained Level 3	35.3%	64.7%	100.0%
			% within YP: Whether YP has a short term work experience placement	12.8%	17.0%	15.2%
			% of Total	5.4%	9.8%	15.2%
			Residual	-48.7	48.7	
	Total		Count	1998	2759	4757
			Expected Count	1998.0	2759.0	4757.0
			% within Attained Level 3	42.0%	58.0%	100.0%
			% within YP: Whether YP has a short term work experience placement	100.0%	100.0%	100.0%
			% of Total	42.0%	58.0%	100.0%
Yes	Attained Level 3	0	Count	321	608	929
			Expected Count	302.7	626.3	929.0
			% within Attained Level 3	34.6%	65.4%	100.0%
			% within YP: Whether YP has a short term work experience placement	19.7%	18.0%	18.6%
			% of Total	6.4%	12.2%	18.6%
			Residual	18.3	-18.3	
		1	Count	1307	2761	4068
			Expected Count	1325.3	2742.7	4068.0
			% within Attained Level 3	32.1%	67.9%	100.0%
			% within YP: Whether YP has a short term work experience placement	80.3%	82.0%	81.4%
			% of Total	26.2%	55.3%	81.4%
			Residual	-18.3	18.3	
	Total		Count	1628	3369	4997
			Expected Count	1628.0	3369.0	4997.0
			% within Attained Level 3	32.6%	67.4%	100.0%
			% within YP: Whether YP has a short term work experience placement	100.0%	100.0%	100.0%
			% of Total	32.6%	67.4%	100.0%

Chi-Square Tests

Achieved 5 or more GCSE and equivalents		Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
No	Pearson Chi-Square	15.859	1	.000		
	Continuity Correction	15.535	1	.000		
	Likelihood Ratio	16.100	1	.000		
	Fisher's Exact Test				.000	.000
	Linear-by-Linear Association	15.856	1	.000		
	N of Valid Cases	4757				
Yes	Pearson Chi-Square	2.024	1	.155		
	Continuity Correction	1.915	1	.166		
	Likelihood Ratio	2.008	1	.156		
	Fisher's Exact Test				.163	.084
	Linear-by-Linear Association	2.023	1	.155		
	N of Valid Cases	4997				

0 cells (.0%) have expected count less than 5. The minimum expected count is 303.67. (Top)

0 cells (.0%) have expected count less than 5. The minimum expected count is 302.66. (Bottom)
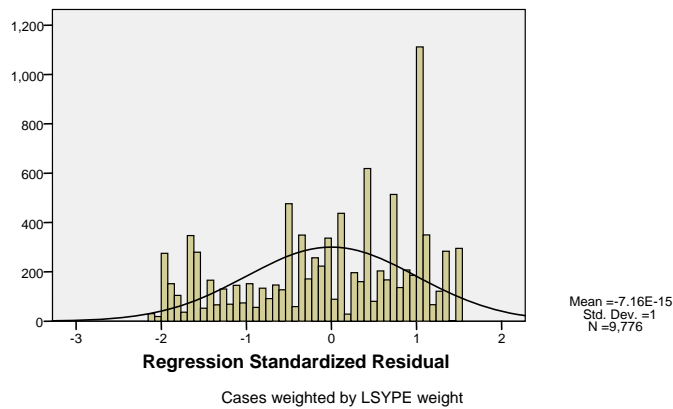
Appendix 4 – Likelihood of voting

(data and more detailed diagnostics available on request from the author)

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t-Statistic	Sig.	Tolerance	VIF
(Constant)	7.301	.083		87.454	.000		
PwtInt	.004	.014	-.003	-.288	.773	.985	1.015
Family NS-SEC	-.360	.021	-.172	-17.138	.000	.985	1.015

Histogram

Dependent Variable: Liklihood of voting in next general election (on scale of 0 - 10)

Mean =-7.16E-15
Std. Dev. =1
N =9,776

Cases weighted by LSYPE weight

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: Liklihood of voting in next general election (on scale of 0 - 10)
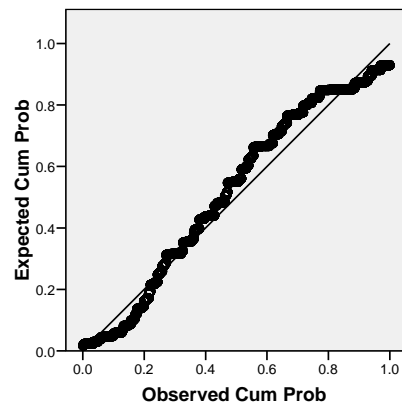
Appendix 5 – Attitudes to school
(data and more detailed diagnostics available on request from the author)

Y12_schoolview * pwtint (Binned) * Y10_schoolview Crosstabulation

Y10_schoolview				No part-time work	Low part-time work intensity	High part-time work intensity	Total
.00	Y12_schoolview	.00	Count	2816	1138	1245	5199
			Expected Count	2834.2	1140.2	1224.6	5199.0
			% within Y12_schoolview	54.2%	21.9%	23.9%	100.0%
			% within pwtint (Binned)	78.4%	78.8%	80.2%	78.9%
			% of Total	42.7%	17.3%	18.9%	78.9%
			Residual	-18.2	-2.2	20.4	
		1.00	Count	776	307	307	1390
			Expected Count	757.8	304.8	327.4	1390.0
			% within Y12_schoolview	55.8%	22.1%	22.1%	100.0%
			% within pwtint (Binned)	21.6%	21.2%	19.8%	21.1%
			% of Total	11.8%	4.7%	4.7%	21.1%
			Residual	18.2	2.2	-20.4	
	Total		Count	3592	1445	1552	6589
			Expected Count	3592.0	1445.0	1552.0	6589.0
			% within Y12_schoolview	54.5%	21.9%	23.6%	100.0%
			% within pwtint (Binned)	100.0%	100.0%	100.0%	100.0%
			% of Total	54.5%	21.9%	23.6%	100.0%
1.00	Y12_schoolview	.00	Count	1411	546	642	2599
			Expected Count	1422.8	567.4	608.8	2599.0
			% within Y12_schoolview	54.3%	21.0%	24.7%	100.0%
			% within pwtint (Binned)	72.1%	70.0%	76.7%	72.7%
			% of Total	39.5%	15.3%	18.0%	72.7%
			Residual	-11.8	-21.4	33.2	
		1.00	Count	545	234	195	974
			Expected Count	533.2	212.6	228.2	974.0
			% within Y12_schoolview	56.0%	24.0%	20.0%	100.0%
			% within pwtint (Binned)	27.9%	30.0%	23.3%	27.3%
			% of Total	15.3%	6.5%	5.5%	27.3%
			Residual	11.8	21.4	-33.2	
	Total		Count	1956	780	837	3573
			Expected Count	1956.0	780.0	837.0	3573.0
			% within Y12_schoolview	54.7%	21.8%	23.4%	100.0%
			% within pwtint (Binned)	100.0%	100.0%	100.0%	100.0%
			% of Total	54.7%	21.8%	23.4%	100.0%

Chi-Square Tests

Y10_schoolview		Value	df	Asymp. Sig. (2-sided)
.00	Pearson Chi-Square	2.188[a]	2	.335
	Likelihood Ratio	2.210	2	.331
	Linear-by-Linear Association	1.988	1	.159
	N of Valid Cases	6589		
1.00	Pearson Chi-Square	9.940[b]	2	.007
	Likelihood Ratio	10.100	2	.006
	Linear-by-Linear Association	4.173	1	.041
	N of Valid Cases	3573		

[a]. 0 cells (.0%) have expected count less than 5. The minimum expected count is 304.83.

[b]. 0 cells (.0%) have expected count less than 5. The minimum expected count is 212.63.

Y12_schoolview * YP: Whether YP has a short term work experience placement * Y10_schoolview
Crosstabulation

Y10_schoolview				YP: Whether YP has a short term work experience placement — Yes	No	Total
.00	Y12_schoolview	.00	Count	1792	3273	5065
			Expected Count	1848.9	3216.1	5065.0
			% within Y12_schoolview	35.4%	64.6%	100.0%
			% within YP: Whether YP has a short term work experience placement	76.6%	80.5%	79.1%
			% of Total	28.0%	51.1%	79.1%
			Residual	-56.9	56.9	
		1.00	Count	546	794	1340
			Expected Count	489.1	850.9	1340.0
			% within Y12_schoolview	40.7%	59.3%	100.0%
			% within YP: Whether YP has a short term work experience placement	23.4%	19.5%	20.9%
			% of Total	8.5%	12.4%	20.9%
			Residual	56.9	-56.9	
	Total		Count	2338	4067	6405
			Expected Count	2338.0	4067.0	6405.0
			% within Y12_schoolview	36.5%	63.5%	100.0%
			% within YP: Whether YP has a short term work experience placement	100.0%	100.0%	100.0%
			% of Total	36.5%	63.5%	100.0%
1.00	Y12_schoolview	.00	Count	967	1612	2579
			Expected Count	976.5	1602.5	2579.0
			% within Y12_schoolview	37.5%	62.5%	100.0%
			% within YP: Whether YP has a short term work experience placement	72.2%	73.3%	72.9%
			% of Total	27.3%	45.5%	72.9%
			Residual	-9.5	9.5	
		1.00	Count	373	587	960
			Expected Count	363.5	596.5	960.0
			% within Y12_schoolview	38.9%	61.1%	100.0%
			% within YP: Whether YP has a short term work experience placement	27.8%	26.7%	27.1%
			% of Total	10.5%	16.6%	27.1%
			Residual	9.5	-9.5	
	Total		Count	1340	2199	3539
			Expected Count	1340.0	2199.0	3539.0
			% within Y12_schoolview	37.9%	62.1%	100.0%
			% within YP: Whether YP has a short term work experience placement	100.0%	100.0%	100.0%
			% of Total	37.9%	62.1%	100.0%

Chi-Square Tests

Y10_schoolview		Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
.00	Pearson Chi-Square	13.165[b]	1	.000		
	Continuity Correction[a]	12.934	1	.000		
	Likelihood Ratio	13.023	1	.000		
	Fisher's Exact Test				.000	.000
	Linear-by-Linear Association	13.163	1	.000		
	N of Valid Cases	6405				
1.00	Pearson Chi-Square	.549[c]	1	.459		
	Continuity Correction[a]	.493	1	.483		
	Likelihood Ratio	.548	1	.459		
	Fisher's Exact Test				.459	.241
	Linear-by-Linear Association	.549	1	.459		
	N of Valid Cases	3539				

a. Computed only for a 2x2 table

b. 0 cells (.0%) have expected count less than 5. The minimum expected count is 489.14.

c. 0 cells (.0%) have expected count less than 5. The minimum expected count is 363.49.

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