Bad times at a tender age – how education dampens the impact of graduating in a recession¹

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Summary:

We study the effect of entering the labor market in good times as opposed to bad times: to what degree may education dampen short- and long term negative labor markets effects of finishing school in a recession? We focus on vocational training, which has been underdeveloped in many countries with high youth unemployment, but also assess the outcomes for those without a completed high school degree, those with only an academic high school degree, and those with college. We measure how these four educational groups fare in terms of labor market outcomes. Across most outcomes such as earnings, probability of a full time job and tenure length, those with vocational training are the closest to the college educated in terms of early career experiences.
In the OECD there are 26 million 15 to 24 year olds are not in work, education or training and seeking a job (OECD 2013). This is an increase of 30 percent from 1997, and many countries in Southern Europe have youth unemployment rates of 50 percent or more (The Economist, April 2013). A worry among policy makers is that the joblessness at the start of the working careers will have long lasting effects on job opportunities and lifetime earnings. Indeed, increasing evidence suggest that the condition of labor market at the time of entering the labor market may have negative short and long term effects on labor market outcomes. For high skilled workers with a college degree, long term negative effects have been documented for many countries such as the US, Canada, Germany, and also the Nordic countries (Oyer 2006; Oreopoulos, von Wachter, and Heisz 2012; Kahn 2010; Liu, Salvanes, and Sørensen 2012). For low skilled workers, the focus has been more on the direct short and long term effects on long term employment of being unemployed early on in the career (Burgess et al. 2003; Raaum and Røed 2006; Gardecki and Neumark 1998).

In this paper we ask the question to what degree education is insulating against negative short and long term effects of entering the labor market in a recession as opposed to in a boom. We are interested in the degree to which education length per se is important: high school drop outs vs high school graduates vs. those with college education. But we are also interested in to what degree the type of education is important. Recently there has been a lot of attention on vocational education since in many countries with high youth unemployment rates, this track in high school has been underdeveloped (The Economist, 2013), and we focus especially to what degree those starting out with vocational skills fare better than those with an academic high school degree and how they compare to the college educated. We analyze the short and long term effect of initial labor market conditions for high school drop outs, high school graduates with a vocational degree, high school graduates with an academic degree, and the college educated. We use Norwegian employer-employee data and assess the direct impact and persistence on earnings and unemployment, as well as on certain aspects of the quality of the jobs, such as proportion of full time jobs and job tenure of entering the labor market in recessions. In addition, we also provide some descriptive evidence of job mobility to get a better understanding of why differences across skill groups exist.

We are mainly using the largest downturn in the Norwegian economy after World War II, the early 1990s recession, when the youth unemployment tripled over a period of a couple of years and stayed high for almost 15 years before it dropped to a lower level (but not back to pre-1990 levels). The development of unemployment rates for youth and core labor force can be seen from Figure 1. The level of youth unemployment throughout this period is lower than
what is currently experienced in Southern Europe, but it is the steep increase in the youth unemployment rate that we are exploiting in this paper. Note also that official numbers are slightly misleading, since they do not count those in active labor market programs. In 1993, the year when the number of people on programs peaked, on average 8 percent of youth aged 16-24 and 2 percent of those aged 25-55 were enrolled in programs in addition to those counted as seeking work in Figure 1.

Different mechanisms may explain why the immediate negative effect of entering the labor market when it is thin may persist, and why the impact and persistence may differ across different parts of the distribution of education. Bad labor market at the time of entry will increase the probability of being unemployed and will affect labor market experience and hence human capital accumulation (Gibbons and Waldman 2006). A special version of this reasoning has been used in the empirical literature focusing on the fact that low skilled workers have a much higher probability of experiencing unemployment. In the “scarring” literature, the effect of being unemployment has a negative effect in itself through mechanisms such as loss of human capital while unemployed, or just the negative experience of being unemployed (Burgess et al. 2003; Nilsen and Reiso 2011). Search theory provides another perspective that predicts differences in catching up after a negative shock in the availability of well paid jobs, job quality, or good matches (Topel and Ward 1992; Manning 2000). Since it is well known that search activity and job-to-job mobility is an important part of early lifecycle careers, one would expect that the degree of search activity may explain persistence of a negative business cycle shock when starting out. It is also well documented that more skilled workers move more across labor markets for instance since their skills are more fit for a national labor market, and this search activity may explain potential differences in persistence.

For our interest in how education might dampen the impact of graduating in a recession, we divide the population into four skill categories: drop-outs from high school, high school

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2The labor force survey did not have questions covering various employment and training programs before a redesign of the questionnaire in 1996. Bø (1999) explains that before 1996, such program participants would typically be counted as employed (if in employment programs) or out of the labor force (if they were in training or qualification programs).

3Own calculations based on numbers from Norwegian Labor and Welfare Organization (NAV), http://www.nav.no/Om+NAV/Tall+og+analyse/Arbeidsmarked/Annen+arbeidsmarkedsstatistikk/Historisk+statistikk.
graduates from academic and vocational track, as well as workers with at least some college (but not advanced post graduate degrees). Instead of assessing the effect of being unemployed, we estimate how these four groups fare in terms of earnings, the probability of being unemployed, the probability of a full time job. We then assess two other aspects of job outcomes which have been focused on in a complementary literature – job tenure and job mobility (see Neumark, Polsky, and Hansen 1999; Jaeger and Stevens 1999; Burgess and Rees 1998; Bratberg, Salvanes, and Vaage 2010). Although the previous literature on this has focused on whether there has been a trend in these outcomes over time, we focus also on the cyclical pattern and persistence.

Our empirical approach does not account for compositional changes in final education caused by the business cycle. There are reasons to suspect that such compositional changes would not have large impacts on the composition of our groups given the business cycle variations in our period. Betts and McFarland (1995) found that an increase in unemployment led to increased enrollment at community colleges. However, their estimates taken together with Norwegian business cycle fluctuations would not radically impact the composition of our groups; they estimate 4 percent increase in enrollment (not percentage points) per percentage point of adult unemployment. Duncan (1965) suggested that dropping out of high school would be more tempting in good times when alternatives to school are good. Rees and Mocan (1997) found this effect to be quantitatively small (about half the effect size that Betts and McFarland (1995) found on college enrollment). As to the choice between academic and vocational high school, not a lot is known about how economic circumstances affect this choice. But at the college level, it is known that choice of major is not very sensitive to economic circumstances (Arcidiacono 2004; Beffy, Fougère, and Arnaud 2012). We conjecture that the effect on the analogous choice between academic and vocational high school also is small.

The rest of the paper proceeds as follows: In the next section we present data and variable definitions. The results follow, first in Section 2 where we look at experience profiles of our outcomes, and then in Section 3 where we quantify the relation between initial labor market conditions and the experience profiles. In Section 4 we make some concluding remarks.

1. Data and Sample Selection
The data on workers used in our study are derived from administrative registers and prepared for research by Statistics Norway. The data covers all Norwegian residents 16-74 years old in
the years 1986-2010. We have information about employment relationships, labor income, educational attainment, field of education and date of completion, labor market status, and a set of demographic variables such as gender, age, experience and marital status. A unique person identifier allows us to follow workers over time. Likewise, each worker is matched to a firm allowing us to identify each worker’s employer.

The sample used in our main analysis is constructed by first identifying the cohorts graduating between 1986 and 2002. We use data from 1986 to 2008 such that we can follow them for some years after graduation and confirm that we see the end of their educational career in the data. For the remainder of the paper, education will be taken as the maximum level of education within these years. We focus on the first ten years following graduation from college.

The main focus of the study is to compare four groups of workers 1) those who enter the labor market from mandatory school only (we call these “dropouts”), 2) those entering the labor market with a high school degree from the academic track and 3) entering the labor market with a completed vocational high school and 4) those with at least some college (not necessarily a completed academic degree, but excluding those that take advanced post graduate educations). We know the date of graduation, and for the first three groups, we restrict the sample to be 16-24 years old when they enter the labor market. This excludes mature students who return to school either for finishing degrees or starting a new career. For the college group, we require that the age at the year of graduation is between 20 and 29. Table 1 report the relative sizes of the education groups over the period. We note that the share of the high school dropout group is decreasing over time, and as expected, the share of the cohorts taking some college is increasing. The most striking gender difference is how the women are distributed more intensely on academic rather than on vocational high school. This is not because fewer women go on to higher education: In Norway, as in many other countries, there are more women earning at least some college education, by a margin that has been increasing for some time.

The outcome variables we look at are (the log of) real earnings deflated by the Consumer Price Index. The probability of unemployment is defined as having had registered unemployment spell during the year or belonging to one of the types of labor market

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4Our measure of earnings is the sum of pre-tax market income (from wages and self-employment) and work-related cash transfers, such as unemployment benefits, sickness benefits, and parental leave benefits.
programs (employment programs, qualification programs, and back to work programs). This measure is not the same as the one in Figure 1, since it cumulates events over the year, whereas those in Figure 1 records the stock at a point in time. A full time job is defined as a job requiring more than 30 hours of work per week. Job tenure is defined as the maximum length (in years) of employment spells at the same plant with start date at or before the year of observation. We focus on job tenures up to 2000, since there would be right-censoring of job spells toward the last few years of the sample. Job mobility is defined as a transition between jobs or between employment and unemployment.

We exploit one major and one smaller downturn plus two upturns taking place in Norway in the observational window. Returning to the national unemployment, as reported in Figure 1, for this analysis the severe bust that took place in Norway in the beginning of the observational window, starting in 1988/89 is particularly interesting. The downturn lasted until 1993 when unemployment started to decrease. This is the deepest and longest lasting downturn in Norway since the WWII. The national unemployment rose from 1.5 percent to 5.5 percent which is a historically large unemployment rate in Norway. Following this recession, growth and employed picked up, and a boom took place around 1998 where the unemployment rate was down to 2.4 percent of the labor force. The recovery flattened out in 1998, but lasted until 2001. In 2001-2003 there was a mild recession before a new and strong expansion started.

2. Results: The effects of graduating in a recession across gender and skill groups

We look at the experience profiles of our outcome measures over the early career for those graduating between 1986 and 2002, where by “experience” we mean potential years of work experience after leaving the final education. For each cohort of graduates we draw how outcomes change over time. We add drawn through the first, the second, and the fifth year after graduation. We do so separately for skill groups and genders.

2.1 Effects on earnings of entering the labor market in recession

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5The national unemployment rates from the Norwegian Labor and Welfare Organization (NAV).
In Figure 2 we plot the experience profiles of log annual real earnings by cohorts for the four skill groups from dropouts to those with some college, for men and women respectively. Focusing on men first, we notice that there are large variations in the earnings across cohorts for all skill groups and strongly correlated with the business cycle. We see that in first year earnings there are clear differences in the impact of the business cycle across skill groups, where the drop-outs and those with an academic high school have a much stronger variation over the business cycle than men with vocational training or some college. In fact, those with academic high school looks much more similar to the dropouts than to those with vocational training. In order to better visualize the persistence of starting out in good and bad times, we indicate persistence of the pattern by connecting the earnings profiles for cohorts one, two and five years after graduation. After two years of experience we see that the patterns persist for all groups. However, after five years there is very little left of the negative income shock for starting to work in a recession for all education groups, even though the drop-outs and the academic high school cohorts seem to have a larger boost of the late 1990s boom. The initial differences gradually fade out and earnings across cohorts converge in a little over five years for all groups.

For women we see a very similar pattern on earnings for graduating in a recession, however with some interesting differences as compared to men. The levels are lower, not so much because the starting levels are lower, but because the experience profiles are not as steep as for men. Another interesting difference is that women who dropped out from high school appears to have a quite strong negative trend in start earnings in the whole period we are looking at. And whereas the male dropouts seems to have benefited from the late 1990s boom, this does not seem the case for women. After five years of experience, earnings levels are smoother, similar to those for males, but at a lower level – and with five years of experience, dropouts and those with academic high school of both genders seem to have very little increase in real earnings, unlike those with vocational high school and those with some college, who have increasing real earnings over the period.

2.2 Effects on Unemployment of entering the labor market in recession

The large fluctuations in earnings we saw in Figure 2 do not only (or even primarily) reflect differences in wages, but also differences in hours worked. Unemployment is an important reason for such differences in hours worked. Figure 3 provide the unemployment pattern and persistence across skill groups and gender. We see large differences both in the immediate effect on unemployment across skills, and in the impact for those who have reached five years
of experience. This fact is not particularly surprising since wage compression and the importance of unions in wage negotiations in Norway is very high, leaving less room for effects on wages and more adjustment on quantities such as unemployment (Kahn 1998).

The skill group with some college is almost insulated from being unemployed, except in the very early career, while the three other skill groups experience on average quite big differences in unemployment rates depending on the labor market conditions when entering. More remarkable is that the effects do not seem to dampen much with experience, and especially for the high school dropouts the effects even seem to become stronger over time, notice the large impact of the mid 2000s boom on high school drop-outs of both genders. The results resemble the results for low skill groups in the “scarring” literature (for Norwegian evidence along these lines, see Raaum and Roed (2006) and Nilsen and Reiso (2011)). For women we see in general lower effects on unemployment of starting out in a bad year which most likely has to do with the fact that a larger number of women have jobs in the public sector such as in education and health. Other than this, we see a very similar pattern as for men.

2.3 Effects on the fraction with a full time job of entering the labor market in recession

Figure 4 show the fraction with a full time job. If we think of this as in some sense an aspect of the quality of the job, we see that all skill groups of men have a very high probability of getting a full time job almost directly out of school. However, for all skill groups it varies over the business cycle, and dramatically much more so for dropouts and those with academic high school. Thin labor markets provide less of an opportunity for a full time job, and again it is very clear that the level of education insulates graduates from a bad shock.

For women we have as expected a lower probability of a full time job than for men since we know that women work more part time. Notice also what seems to be a secular downward trend for all women except for the group with some college education. Also for this outcome it seems that women are a little less affected than men and the persistence seem to disappear after five years, with the exception for those with a vocational training. However, there appears to be a noticeable secular trend in having a full time job for the three lowest skill groups, while there is no comparable trend among those with some college.

2.4 Effects on mean job tenure of entering the labor market in recession
Whether graduates are able to match to a good job is another aspect of labor market performance. We expect tenures at good jobs to be longer, but the business cycle can have two opposite effects on mean tenure: bad times might make it necessary to accept worse jobs with less of an opportunity for advancement, this would give an incentive to leave such jobs early such that tenures would be short. On the other hand, we would expect search on the job to be more effective in good times, which could mean that the tenures would go up in bad times.

In Figure 5 we see that the mean job tenure is around 4 years for the first jobs in Norway and this is in line with what was found in Bratberg, Salvanes, and Vaage (2010). We also see that for men there is an inverse U-shape when split by skill levels, those with vocational high school actually realize the longest tenures early in the career. This is not true for women where mean job tenure is much the same for everyone except for dropouts, which have a smaller mean tenure. We all see that for both men and women the pattern established for tenure in the first job is also very evident in the pattern at five years of experience.

2.5 Effects on job mobility of entering the labor market in recession

One possible explanation for why mean tenures are so stable could be that there was very little job mobility, such that tenure at the first job in effect corresponded to tenure over the whole period we look at. This is not the case, as can clearly be seen from Figure 6. Job mobility is high from the outset, and of course declining over the experience profile, as graduates settle into jobs that fit them.

It does not seem that job mobility is as sensitive to business cycle variations as some of our other measures, although it seems to increase for everyone in the good times of the late 1990’s, coming out of the early 1990’s recession. For both men and women, this effect seems most pronounced for the high school dropouts. But it is also clear that while experience lowers the level of job mobility, it does not seem to dampen the impact of what business cycle variation there is – the red dotted lines are at least as volatile as the green ones.

3. Measuring the short- and long-term effects of initial labor market conditions

In the introduction we looked at the aggregate business cycle patterns in Norway over the period (Figure 1), and in Section 2 we examined the experience profiles of five different outcomes. In this section we would like to connect these two parts of the picture, relating the
experience profile of outcomes to the state of the labor market at the time of graduation. We want to do so using the first-order patterns in the data we already have presented, since what we want to shed light on is the effect of national business cycles as youth outcomes. Previous work that use only within-region variation in business cycles (such as Oreopoulos, von Wachter, and Heisz (2012) and Liu, Salvanes, and Sørensen (2012)) restrict attention to variation in data that is arguably closer to true exogeneous variation. This comes at the cost of less directly addressing the issue of national business cycles such as those we see in Figure 1. For this study, we have chosen in favor of descriptive relevance.

3.1 The framework

In line with much previous work, we approximate initial labor market conditions using the unemployment rate at the time of graduation. We follow Oreopoulos, von Wachter, and Heisz (2012) and Liu, Salvanes, and Sørensen (2012), and estimate the outcome for graduating cohort $c$ at time $t$ as

$$y_{ct} = \beta_1 + \beta_2 e U_c + \gamma_e + \delta_1 c + \delta_2 c^2 + \epsilon_{ct},$$

where $\gamma_e$ is a fixed effect for the year of potential labor market experience ($e = t - c$), and $\delta_1$ and $\delta_2$ make up a quadratic time trend. $U_c$, is the national unemployment rate measured at the time of graduation for each cohort. The coefficients on the initial unemployment rate, $\beta_2$, are allowed to vary with levels of potential experiences. If $U_c$ were to represent exogenous variation in labor demand, the $\beta_2$ estimated using ordinary least squares would capture the causal effect of initial labor market conditions. As Oreopoulos, von Wachter, and Heisz (2012) point out, $\beta_2$ estimate the average change by experience level, given the regular evolution of the unemployment rate faced in the future.

In order to estimate the model, we first cluster our panel data into cells defined by cohort and calendar year. By not including indicators for each region, we are only using between cohort-time variation in unemployment and outcomes, which wins us some precision and directly relates the variation in the experience-profiles in Section 2 to the unemployment history we saw in Figure 1. On the other hand, it might introduce some biases – see Liu, Salvanes, and Sørensen (2012) for an approach that restricts identification to within time and region variation.

3.2 Results on persistence

Unemployment at the time of graduation has a negative effect on earnings, not only in the first year (as we have looked at), but also for a number of periods, as seen in Figure 7, but with the
exception of for those with academic high school, most of the effect seems to have tapered off four years after graduation.

For unemployment, we also see dramatic effects (Figure 8). One percentage point in economy-wide unemployment rate at graduation is associated with a 4 to 5 percentage point increase in unemployment of graduates, although this effect also tapers off in five years.\(^6\)

The chance of getting a full time job is seriously damaged by graduating in a recession, as can be seen in Figure 9. For the high school drop-outs and those with academic high school only, the effect seems to persist a long time. This is very different for those with vocational high school and college, for whom the effects are smaller initially, and for whom they are very small four years later.

For job mobility, we see that the initial effects are negative, but they are also pretty small (Figure 11). The effects of one percentage point of unemployment have only marginal effects comparing to the large levels that can be seen in Figure 6. The effect turns positive after a few years, probably reflecting that workers tend to leave a job earlier when they have been matched to a worse job initially. This is confirmed by looking at the picture for mean maximum tenures (Figure 10). The effect of initial unemployment on maximum tenure is negative for a long time, indicating that some workers are able to find their way to other jobs.

Summarizing figures 7–11, we do not want to make too much out of different degrees of persistence for the educational groups we look at; in many of the cases, the estimated precision does not support this. But we do want to emphasize that many of these adverse effects of initial labor market experience seem quite persistent.

4. Concluding remarks

In this paper we study the effect on different skill groups entering the labor market in good times as opposed to in bad times. We are interested in to what degree education may insulate short- and long term negative labor markets effects of starting out in a recession. Our results address the intuition that education is not uni-dimensional, as The Economist puts it in a recent article assessing youth unemployment rates: “What matters is not the number of years of education people gets, but the content,” and they continue “But it is unwise to conclude

\(^6\)For the non-college groups it might even seem that after five years, the effect of initial employment seems to be a good thing. We believe this is an artifact of the relatively short time period in the data.
that governments should simply continue with the established policy of boosting the number of people who graduate from university” (The Economist, 2013). In this paper we have assessed the outcomes for those starting out in a job without a completed high school degree (dropouts), with (only) an academic high school degree, and those with college. We assess effects separately for men and women, and measure how these four groups fare in terms of earnings, the probability of being unemployed, the probability of a full time job, job tenure and the job mobility by graduation cohort. We also examine persistence of the shocks for the different groups, and show how education may insulate against business cycle shocks.

We find that both the number of years of education and the type of education divide the cohorts into groups that fare very differently in times of recession. The high school drop outs perform worse along all dimensions, and the college educated outperform all other groups. It is probably reasonable to assume that a college education is not an alternative for the high school drop outs for different reasons, so a more reasonable comparison is the high school drop outs to those with vocational training and to those with an academic high school degree only when entering the labor market. The question is whether helping these workers to do a vocational training program, for instance by providing more and better vocational training programs, can be beneficial. Those with a vocational high school degree outperform both those with an academic high school degree and the dropouts. In fact, those with vocational training seem much more similar to the college educated in terms of outcomes with one important exception: they appear to be as little isolated from becoming unemployed (persistently so) as the other high school graduates, but they do better than the high school dropouts. In sum both the length and the type of education are important predictors of a good and smooth transition from school to work.

References


Figure 1. Proportion of workforce seeking work.

Note: Own calculations based on Labor Force Surveys (Statistics Norway 2003).
Figure 2. Annual (log) earnings by experience.

Note: For each group and cohort, mean (log) earnings are drawn starting the year after graduation. Our measure of earnings is the sum of pre-tax market income (from wages and self-employment) and work-related cash transfers, such as unemployment benefits, sickness benefits, and parental leave benefits, deflated by the Consumer Price Index. The black dashed lines indicate the means one year after graduation, the green line two years after graduation, and the red lines five years after graduation.
Figure 3. Unemployment by experience

Note: For each group and cohort, the fraction with at least one recorded spell in unemployment or labor market programs are drawn, starting the year after graduation. The black dashed lines indicate the means one year after graduation, the green line two years after graduation, and the red lines five years after graduation. Our unemployment data series is not available before 1988, which is why one cohort is first observed the second year after graduation, such that the black and green lines start the same year.
Figure 4. Proportion with full-time job by experience.

Note: For each group and cohort, the proportion with full-time jobs (meaning at least 30 hrs/week) are drawn, starting the year after graduation. The black dashed lines indicate the means one year after graduation, the green line two years after graduation, and the red lines five years after graduation.
Figure 5. Mean of maximum tenures by experience.

Note: For each group and cohort, the mean maximum tenures of the job that has been started at at a point in time are drawn, starting the year after graduation. The black dashed lines indicate the means one year after graduation, the green line two years after graduation, and the red lines five years after graduation.
Figure 6. Job mobility by experience.

Note: For each group and cohort, mean fraction of the population changing labor market status (between jobs or between employment and unemployment) are drawn starting two years after graduation. The green line connects the means two years after graduation, and the red lines five years after graduation.
Figure 7. Persistence of initial unemployment in annual (log) earnings.

Note: We plot point estimates and a 95 percent confidence interval for the $\beta_2^e$ coefficient in equation 1, where initial unemployment is measured in percentage points.
Figure 8. Persistence of initial unemployment on unemployment.

Note: We plot point estimates and a 95 percent confidence interval for the $\beta_2^e$ coefficient in equation 1, where initial unemployment is measured in percentage points.
Figure 9. Persistence of initial unemployment on proportion with full-time job.

*Note:* We plot point estimates and a 95 percent confidence interval for the $\beta_2^e$ coefficient in equation 1, where initial unemployment is measured in percentage points.
Figure 10. Persistence of initial unemployment on maximum tenure.

Note: We plot point estimates and a percent confidence interval for the \( \beta_2^e \) coefficient in equation 1, where initial unemployment is measured in percentage points.
Figure 11. Persistence of initial unemployment on job mobility.

*Note:* We plot point estimates and a 95 percent confidence interval for the $\beta_2^e$ coefficient in equation 1, where initial unemployment is measured in percentage points.
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<td>0.076</td>
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<td>0.126</td>
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<tr>
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<td>0.470</td>
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*Note:* Relative sizes of the cohort/education groups identified by the sample selection criteria outlined in Section 1.