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The Decline in Intergenerational Mobility in Post-Socialist Bulgaria

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The Decline in Intergenerational Mobility in Post-Socialist Bulgaria
[Running Title: Intergenerational Mobility in Bulgaria]

Abstract

Economists studying developing and transition economies have recently drawn attention to the problem of intergenerational immobility, or the high rate of transmission of inequality from parent to child (World Bank 2005). One readily estimable measure of this intergenerational persistence of economic status is the degree of association between the educational attainment of parents and children. This paper documents that the strength of this association has doubled in Bulgaria since the end of socialism, particularly between 1995 and 2001. For children of lesswell-educated parents, this has corresponded to an absolute decline in average educational attainment. These changes, which imply a steep decline in intergenerational social mobility, relate to children educated during a period of economic depression and of significant reductions in public spending on education, which led to school closures and shortages of materials, along with increases in out-of-pocket costs and distances to school. On the demand side, interview evidence suggests that the rise in unemployment among those with secondary education has lowered the expected benefits of schooling. We conclude that changing educational policies and priorities, along with depressed economic conditions, have had an important negative effect on equality of educational opportunity.

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I. Introduction

The correlation between the socioeconomic positions of parents and their adult offspring is positive and significant in every society for which estimates are available. These correlations are of interest because they serve as omnibus measures of a society's ability to provide equality of opportunity to children of differing family backgrounds, and, as such, they have drawn increasing attention from economists concerned with social equity in both rich and poor nations.[1] The issue is particularly salient for the transition economies, many of which formerly pursued egalitarian educational policies with great zeal. One plausible hypothesis, which, to our knowledge, has not yet been tested, is that their dramatic political and economic reforms since 1989 might have led to an increased importance of family background in the determination of economic status.

This paper documents that the degree of association between the educational attainment of parents and children has doubled in Bulgaria since the end of socialism, in particular between 1995 and 2001. This increased correlation, which implies a steep decline in intergenerational social mobility, relates to a cohort of children and young adults surveyed in 2001, who, unlike an earlier cohort surveyed in 1995, were educated primarily during a period of economic depression, and of significant reductions in public spending on education. These led to school closures and shortages of materials, along with increases in out-of-pocket costs and distances to school. On the demand side, interview evidence suggests that the rise in unemployment among those with secondary education has lowered the expected benefits of schooling. We show that

[1] Note, for example, the prominent place given to this topic in the *2006 World Development Report* (World Bank 2005).

these coincided with a reduction in the educational attainment of students born to poorly-educated parents, and we conclude that changes in educational policies and priorities that accompanied the political transition, together with the economic downturn of the 1990s, have had an important negative effect on equality of opportunity.

Most estimates of intergenerational mobility in the industrialized nations are based on regressions of the long-run average incomes of children against those of their parents (see surveys by Solon 1999; and Corak 2006). The resulting regression coefficients are not intended to serve as estimates of the true causal impact of parental income, but rather as descriptive measures of the persistence of long-run status across the generations, with higher coefficients indicating lower intergenerational mobility. However, the construction of these long-run income averages requires long-running panel datasets, which are not available for less-developed and transition economies.[2] Moreover, because income varies considerably from year to year, regressions based on *annual* income provide a poor measure of the persistence of *long-run* economic status (Solon 1992; Zimmerman 1992; Mazumder 2005). By contrast, for adults, education is a more or less permanent characteristic, and one which is readily observed in cross-sectional surveys. Intergenerational education regressions thus present a feasible and

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[2] The only panel dataset of which we are aware that will span a full generation in a developing country is the proposed re-interview of the original 1975 ICRISAT cohorts from Andhra Pradesh and Maharashtra, India. The RAND corporation's Malaysian Family Life Survey bridged this data gap by collecting retrospective information on parental earnings, but this approach has been criticized as unreliable. More complex methods have also been used to make up for the unobservability of long-run income; see, for example, the work of Grawe (2004).

informative alternative to income-based measures of the transmission of socioeconomic status from parent to child.[3] Estimates of this kind exist for a number of countries and epochs, including South Africa (Thomas 1996; Hertz 2001), a handful of Latin American nations (Behrman, Gaviria, and Székely 2001), and a half-dozen socialist economies (Ganzeboom and Nieuwbeerta 1999). A recent survey of more than 30 developing and transition economies has shown that average rates of intergenerational educational mobility over the past 50 years have been particularly low in Latin America, somewhat higher in a sample of ten Asian economies, and higher still in the formerly socialist economies (Hertz*, et al.* 2007).

To see how these intergenerational educational correlations may be affected by the economic and policy environment requires a framework for understanding the determinants of educational attainment. Government policy in large measure defines the educational choices available to parents and children, including the legal and practical access to, and costs of, schooling, as well as school quality; it may also influence the economic returns to schooling and to other competing household investments. Parents then make decisions regarding their

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[3] Hertz *et al.* (2007) provide an analysis of the relation between intergenerational regression estimates for education and income, which demonstrates that the two are related, but that the relationship will depend on many factors that may vary over space and time, such as the returns to education, the share of the variance of income that is explained by education, and the connection between parental income and children's education. Thus intergenerational education regression coefficients are not viewed as close proxies for income-based estimates, but rather as measures of the intergenerational transmission of a different but highly relevant index of status, namely, educational attainment.

investments of time and money in their children's education; income constraints and credit market conditions will play a role in this decision (Becker and Tomes 1979), particularly at higher levels of education. Finally, children make choices about educational effort, and these should depend on the perceived costs and benefits of schooling, which will in turn depend in part on perceptions of labor market conditions.

Consistent with these theoretical considerations, a small but growing number of studies have identified effects of both government policy and economic conditions on intergenerational educational mobility. For example, Lillard and Willis (1994) show that governmental interventions in Malaysia significantly reduced the effect of parents' education over the period 1950-1980. Similarly, in Indonesia, a massive school construction program has been shown to have had a positive effect on both attainment and mobility (Hertz and Jayasundera 2006; Duflo 2001). Hannum (1999) shows that in China the urban/rural attainment gap mirrors the trend in the number of teachers assigned to work in urban versus rural areas. While she notes that this correlation is not conclusive, she also points out that China explicitly prioritized rural education during the Cultural Revolution, and it was at this time that the urban/rural schooling gap narrowed. Later, in the 1980s, China adopted a more liberal approach, which had the effect of favoring urban areas, whereupon the urban/rural gap re-emerged.

Behrman, Birdsall, and Székely (2000) look at a panel of 16 Latin American nations and demonstrate that government expenditures on primary schooling (per student of primary age), as well as the average level of education of their teachers, have had positive effects on educational mobility. Macroeconomic factors are also shown to play a role; in particular, financial depth (M2 over GDP), which they take as an indication of the degree to which the economy is "marketized," proves a positive predictor of mobility.

Prior to their devolution, the socialist countries pursued the goal of increasing intergenerational mobility very energetically, not only promoting education among the children of less-educated parents (which simultaneously promotes mobility, attainment, and equality of opportunity), but also, in the early years of the experiment, discriminating actively against children of more educated parents (which also promotes mobility *per se*, but by repressive means which reduce average educational attainment). Ganzeboom and Nieuwbeerta (1999: 352) show that the strength of the association between parents' and children's schooling was reduced by about one-third in Bulgaria over the period 1940-1985, slightly less than in some other socialist countries, such as Hungary and Czechoslovakia, where the association fell by half or more.

We show that in Bulgaria this trend has lately been reversed, and that the transmission of socioeconomic status from parents to young adults observed in 2001 stood at levels not seen since the 1940s. For the children of less-educated parents, the rising impact of their family background has resulted in an *absolute decline* in educational attainment over time. We argue that these outcomes are likely to have resulted from the deterioration in economic and fiscal conditions, particularly over the period 1994 to 2001, described in the next section.

The Bulgarian data examined here were chosen in part because they are a particularly suitable source for studying the impact of the post-socialist economic downturn on intergenerational mobility. This is because the two surveys neatly bracket the worst years of economic crisis, creating different levels of "exposure" in the two surveys to the period of low educational funding and poor employment prospects, as quantified in Section III. Moreover, Bulgaria experienced economic problems at transition that were more severe than those of Poland, Hungary and the Czech Republic, but less severe than many of the post-Soviet cases; it thus may serve as a representative middle ground.

II. Bulgarian Background

Universal education was a central pillar of socialist development policy. New schools and classes were rapidly expanded after 1946, aimed at spreading literacy to all adults and providing universal secondary education. In Bulgaria, mean educational attainment among those born between 1937 and 1948 rose by about two years over those born in the two previous decades – from about 10 years to about 12 years (Ganzeboom and Nieuwbeerta 1999: 347). In 1990, Bulgaria had a (gross) secondary enrollment rate of around 75 per cent, putting it above Portugal and Argentina, on a par with Luxembourg, and just below Hungary (World Bank EdStats 2006).

The end of socialism brought significant changes to the education sector, as financial responsibility was partially shifted from the central government to the municipalities. The most important change in the educational environment, however, was the steep decline in available resources during the 1990s. The post-socialist economic collapse resulted in a decline in real GDP to 72 per cent of its 1990 level by 1997, the economic low point (UNICEF IRC 2006). The country managed to achieve sustained economic growth following the economic reforms of 1997, but by 2001 real GDP was still at no more than 84 per cent of its 1990 level (see Table 1, first column). Educational expenditures as a share of GDP (column 2) also fell dramatically, from 5.0 per cent in 1990 to 3.2 per cent in 1996; they have since partially rebounded, to just over four per cent. As a result, *total* educational expenditures fell by half between 1990 and 1996 (column 3). This decline in educational spending was partially offset by a steady, and ongoing, decline in the number of children of school age (column 4). Yet real educational expenditures per child aged 5 to 17 nonetheless fell by 45 per cent between 1990 and 1996; in

2001 they were still 12 per cent below their 1990 levels; but by 2004 they had risen to 26 per cent above the 1990 value (column 5).

The fall in spending was associated with both school closures and a decline in the quality of education provided. Despite a shift in emphasis from technical and vocational to general schools at the secondary level, the total number of general schools (primary and secondary) fell from 3458 in 1990/1991, to 3289 in 1995/1996, and to 3011 in 1999/2000, a 13 per cent decline. The number of general schools available in rural areas declined by 15 per cent over the same period, from 2125 to 2078 to 1799 (Bulgarian National Institute of Statistics 1995: 355; 2000b: 366). Although these closures in part reflect the decline in the school-age population, they nonetheless resulted in increases in the average distance to school.[4] The first line of Table 2 shows that the distance to school increased by 0.9 kilometers between 1995 and 2001 for enrolled students aged 7 to 20. Because distances to colleges and universities are generally higher than distances to primary and secondary schools, a small change in the share of students at this level could distort the comparison. Thus we also present the results for students aged 7-18 only, for whom the increased averaged 0.6 kilometers, a figure which was still statistically significant at the five per cent level. Moreover, in schools that remained open, the quality of education generally fell, and interviews in Bulgaria emphasize the impact of declining availability of food and materials in school on enrollment (Kabakchieva and Iliev 2002).

Financial responsibility was also shifted to parents, with the result that the real monthly out-of-pocket costs of schooling almost doubled between 1995 and 2001 for enrolled students in

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[4] Distance to school will generally increase even if the number of students falls at approximately the same rate as the number of schools, since population density falls as well.

our 7 to 20 year age group, or in the 7 to 18 age group, as shown in the second panel of Table 2. Figure 1 shows that school fees rose for all age groups between the two survey years.[5] These results support the proposition that the financial and time costs of education have risen, especially for older children, including those in post-secondary schooling. Still, it is important to remember that these are snapshots at two particular points in time, and do not reflect the cumulative costs borne by the students in the two surveys. Nor do they capture the decline in the quality of education that was cited in the interviews.

At the same time, expected returns to education have also been changing. Liberalization of labor markets has generally resulted in increased returns to education in post-socialist countries (Orazem and Vodopivec 2000; Newell and Reilly 1999). Still, returns in many post-socialist countries remain low by international standards and particularly for countries at a similar level of development (Orazem and Vodopivec 2000; Trostell, Walker, and Woolley 2002; Psacharopoulos 1994). Based on a small sample from 1992-1993, Trostel, Walker and Woolley (2002) found returns in Bulgaria to be among the lowest of the post-socialist cases examined, below those in Russia, Poland, Hungary, Slovenia and the Slovak Republic, and above only those in E. Germany and the Czech Republic. The rise in unemployment further depressed expected returns, especially in the rural areas and small towns worst hit by employment declines. The final column of Table 1 shows that employment as a percentage of the population of working age fell steadily, from 78 per cent in 1990 to 55 per cent in 2001, before rebounding somewhat to 59 per cent in 2004. The interview data mentioned above

[5] The data points for age 20 are omitted because the 1995 sample size at that age was just seven students, and one large outlier distorted the comparison.

reveals that children "don't expect [education] to help them find work" (Kabakchieva and Iliev 2002). The official youth unemployment rate was almost 14 per cent in 2001 and the vast majority of those were long-term unemployed. Moreover, people with mid-level education were more likely than either those with low or high education to be unemployed (Nenova 2002). This creates little incentive to finish secondary school if one does not expect to be able to afford to continue on to higher education, and these incentives are likely to have declined over time as unemployment rates rose.

III. Data and Methods

The 1995 and 2001 Living Standards Measurement Surveys (LSMS) for Bulgaria were conducted by BBSS Gallup International, under World Bank supervision, and with the cooperation of the Bulgarian National Statistical Institute; the 2001 survey is the most recent to be made available to the public at the time of this writing.[6] Both surveys were designed to be

[6] All data and documentation are available at http://www.worldbank.org/LSMS/guide/select.html. The LSMS program has provided nationally representative surveys for a wide range of developing and post-socialist economies, and the quality of the data has generally been evaluated positively. For further discussion of these surveys and their uses, see Deaton (1997: 35-40).

self-weighting random samples of 2500 households, in 500 survey clusters.[7] Households that refused to participate were replaced with other households randomly selected from the same cluster. The survey instruments were very similar in the two years, with only a few pertinent differences, noted below. Non-household-members present at time of interview, and those with missing data for age, education, parents' education, location, or ethnicity were dropped from the sample.

The outcome under study is the highest grade completed, measured as the modal number of years taken to achieve it. This was derived from two questions, which the primary respondent answered for all household members. The first asked the highest level of education completed, with some 34 possible answers, including various different secondary school tracks, which start at various ages and are of various durations. This complicated the task of assigning a corresponding number of years to each category, but this was resolved by means of the second question, asked only of those not currently enrolled, which recorded the total number of years spent in school, including repetitions. The modal reply to this second question for all respondents in a given category of the first question was taken to be relevant number of years associated with that level of education.[8] Educational coding was the same for parents, and the

[7] The 2001 survey included a deliberate oversample of 133 Roma households, which were dropped from our sample. The remaining Roma households were retained, so that the sample is demographically representative.

[8] The 2001 survey included a category called "Post-graduate" which did not appear on the 1995 survey. For consistency, these were combined with the next lowest category, "University more than 5 years," and assigned a value of 18 years of education.

average number of years of schooling of the two parents, if both were present in the household, was used as the measure of parental education in all analyses.[9]

Our identification strategy rests on the fact, noted above, that children who were in school during the period 1994 to 2001, when public education spending per child was 12 to 45 per cent below its 1990 value, experienced reduced access to schools, higher costs, and deteriorating conditions, compared to students educated before the funding crisis. In this regard, the timing of the two surveys is fortuitous, as it generates large differences in exposure to these crisis conditions between the two surveys. In particular, for children aged 16 to 20 in 1995, who will be the focus of our intergenerational regressions, exposure ranges between zero out of their first twelve potential years of observable education (for 20 year olds) to two out of ten (for 16 year olds).[10] The average number of years of exposure for this group is 1.5, representing just 14

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[9] Our goal is to describe the association between parents' and children's schooling, as indicators of socioeconomic status, not to estimate a structural model of the causal determinants of children's education. Thus we may abstract from the often-asked question of whether the father's or mother's education exerts a greater influence on the child. We adopt the average of the parents' education levels as our measure of parental status, as have authors like Ganzeboom and Nieuwbeerta (1999); other authors have used the education level of the better-educated parent. This definitional choice makes very little quantitative difference, and no qualitative difference, for our results.

[10] For example, a 16 year old in 1995 was born in 1979 and should have started first grade at age 7, in 1986. Only grades nine and ten, in 1994 and 1995, would fall during the period of low funding; the maximum number of years of schooling observable in 1995 for that student is 10.

per cent of their potential years of primary and secondary education at the time of the survey. Thus the educational attainment of those surveyed in 1995 should not have been greatly affected by the poor economic and fiscal conditions of the period 1994 to 2001.

By contrast, 16-20 year olds surveyed in 2001 would have been exposed to as many as eight years of the depressed conditions that characterized the 1994 to 2001 period, with an average exposure of 7.4 years, or 66 per cent of their potential years of primary and secondary schooling observable to date.[11] The 16 to 20 year olds in 2001 would also have faced a much worse job market than the 16 to 20 year olds in 1995, since employment fell steadily from 1990 to 2001. While this reduces the opportunity cost of schooling, the interview evidence suggests that it nonetheless reduced the demand for education.

Together, these supply and demand-side factors suggest that average educational attainment for 16 to 20 year olds should have worsened between the 1995 and 2001 surveys. However, if this negative impact had been felt equally by the children of better and less-well educated parents, it would have no effect on our estimates of intergenerational mobility, since these regression coefficients are insensitive to changes in means over time, and only reflect changes in the strength of the association (the slope) between parental and child education. Our

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[11] A 16-year-old in 2001 was born in 1985 and should have started first grade at age 7, in 1992. Grades 3 through 10 would then correspond to the crisis period, 1994 to 2001, accounting for eight out of ten of their potential years of schooling observable by 2001. A 20 year old, born in 1981, would have spent 7th through 12th grade in the 1994-2001 period, or six of their first 12 potential years of education. Similar calculations are used to estimate exposure for younger students, discussed below.

specific question, then, is whether this difference in exposure was associated with a decline in intergenerational educational mobility, i.e. a rise in the intergenerational regression coefficient. To address this question we present the results of the following bivariate intergenerational regressions, one for 16-20 year olds surveyed in 1995, and another for those surveyed in 2001:

$$S_1 = \alpha + \beta S_0 + e \qquad [1]$$

where S_1 is the schooling of the child, and S_0 is the average of their parents' schooling, e is the regression error term, and β is the parameter of interest.

These regression coefficients, which measure the "effect" of a one-year difference in parental education, may also be standardized into correlation coefficients, which express the relation between a one-standard-deviation difference in parental education and the corresponding difference in children's education, also measured in standard deviations. This adjusts for changes in the variance of schooling from one generation to the next, and produces a unit-free measure of intergenerational persistence which may then meaningfully be compared to intergenerational correlations in other status measures, such as income.

Both the regression coefficients and the correlation coefficients measure the degree of persistence of educational outcomes across generations (not the causal effect of parental education) with higher persistence corresponding to lower intergenerational mobility. As already noted, mobility may rise or fall independently of whether mean attainment of the parents and/or children is rising or falling over time, although, as an historical matter, improvements in the average level of schooling tend to coincide with improvements in intergenerational educational mobility (Behrman*, et al.* 2001).

The choice of the 16-20 age group is dictated by the desire to observe children who are old enough to have completed most if not all of their education, but still young enough to be observed in their parents households. Clearly, however, many of these children will still be in school, meaning that our data are censored. This might bias the intergenerational coefficient in a downward direction: if the children of better-educated parents have not yet had time to achieve their terminal levels of education, the covariance between (high) parental education and children's education would be lessened. On the other hand, it may be that children born to poorly educated parents will take longer than usual to achieve their final level of education, due to grade repetition, which would tend to impart an offsetting bias in the other direction.

To address these issues we also present results for the subset of children who were not currently enrolled, and show that these yield qualitatively similar conclusions regarding the 1995-2001 comparison. This solution, however, is also imperfect, since finishing one's education, or going on to higher education, may cause students to leave their parents' household, and so become unobservable in our survey. The direction of this selection bias is likewise unclear *a priori*. However, what counts for our analysis is whether these biases have changed over time, and we can think of no good reason that they should have changed so dramatically as to explain the large differences we see between surveys.

A second stage of the analysis allows us to extend our scope to include younger cohorts as well, namely, all those between the ages of 7 and 20, in order to ask at what age the children of poorly educated parents start to fall behind academically, compared to those born to better educated parents. To answer this question, and to see how that answer has changed over time, we calculate grade-for-age trajectories as a function of parental education, in each survey year, controlling for a number of other covariates which are needed to ensure descriptive consistency between the two surveys, as detailed below. The results are then used to plot the grade-for-age profiles of the children of poorly-educated parents, as compared to children of better-educated parents, for both survey years. As we move from the 1995 to the 2001 survey we will observe an increasing attainment gap between the children of high and low-education parents. This provides a clear illustration of the increased association between parent and child schooling, and one that allows us to express this in terms of changes in actual attainment over time for children from various backgrounds, and at particular ages, something that the intergenerational mobility regressions of equation [1] do not convey.

As with the 16 to 20 year olds, the increase in the importance of parental education between the two surveys coincides with an increase in students' exposure to the 1994-2001 period. Those aged 7 to 20 in 1995 had an average of 1.8 years of exposure, representing 39 per cent of their potential years of primary and secondary education, while those of the same age group in the 2001 survey had an average exposure of 5.9 years, which represented 88 per cent of their potentially observable years of primary and secondary schooling.

The regression equation used to predict attainment, which was run separately for each survey year, was as follows; full results are reported in the Appendix.

$$S_1 = \sum_{t=7}^{20} \delta_t D_t + \sum_{t=7}^{20} \beta_t (D_t \times S_0) + \alpha(Months) + \tau(IntDate) + \gamma(Female) + \rho(Rural) \qquad [2]$$

$$+ EthnicityDummies + DistrictDummies + u$$

Here the child's education (S_1) is estimated as a function of, first, a full set of age dummies, $\sum_{t=7}^{20} \delta_t D_t$, where t indexes age in years, the D_t are the age dummies, and the δ_t are their associated coefficients; because all age dummies are included, the intercept is suppressed. Next, each age dummy is interacted with S_0, or average parental schooling: $\sum_{t=7}^{20} \beta_t (D_t \times S_0)$. This allows the effect of parental education to differ with full flexibility by age. The next variable, *Months*, is the number of months of age within the year (from 0 to 11), which is included to capture the fact that children with slightly earlier birthdays may be able to enroll a full year earlier. This effect turns out to be strongly significant (at the 0.1 per cent level), with each extra month of age adding about 0.07 years to average attainment (see Appendix).

The variable *IntDate* measures the month and day on which the household was interviewed. This is needed because the 2001 interviews were conducted in April and early May, when school was still in session, whereas the 1995 interviews were conducted in late May through the end of July, when the school year had ended for most students.[12] If currently-attending respondents took the phrase "highest level completed" at face value, then those who were interviewed in April of 2001 should have responded with last year's grade level, whereas had they been interviewed in late June or early July they should have reported that they had just completed another grade. This would bias reported educational attainment in 2001 downwards in relation to 1995. As may be seen in the Appendix, this interview date effect is statistically significant at the five per cent level, and amounts to 0.18 additional grades completed for those interviewed one month later. Uncorrected estimates of the change in educational attainment between 1995 and 2001 are thus biased in a negative direction. Note that the interview date is excluded from the 2001 equation, since all were still in school.[13] (It is likewise omitted from

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[12] School ends on May 24 for grades 1 and 12, on May 31 for grades 2 through 4, on June 15 for grades 5 through 8, and on June 30 for grades 9 through 11 (Marlow-Ferguson 2002).

[13] The difference in mean month of interview between the two surveys is 1.74, which spuriously reduces observed attainment in 2001 by about 0.31 years. To correct for this, the variable *IntDate* is included, and expressed as a deviation from the 2001 sample mean, implying that the

equation [1] upon which it had no effect). Note also that both years and months of age are calculated as of December of the previous calendar year (the current school year) so that they are consistently defined for children interviewed at different times.

The final control variables include indicators for women, for those living in rural areas and in each of the country's ten major districts, and for the four principal ethnic groups (Bulgarian, Turkish, Roma, and Russian/Other) which are defined by reference to one's mother tongue. These are included to prevent changes in the sample's composition over time (whether due to sampling variability or to actual changes in the population) from biasing our comparison of the 1995 and 2001 grade-for-age profiles. In this regard, the question of emigration merits special consideration, as migrant flows have historically been large, and have recently been biased towards the better-educated (Rangelova and Vladimirova 2004). However, a calculation of the numbers involved suggests that the impact of emigration on our estimates is very likely to be negligible. Between 1991 and 1994, the rate of net emigration averaged 0.6 per cent per year (World Bank 2004), but since then it has slowed , standing at 0.3 per cent per year over the period 1995-2002. This represents a loss of about 1.8 per cent of the population over the six year period between our two surveys. An upper-bound estimate of the impact of this change on the number of young adults between the ages of 16 and 20 may be generated by supposing that their propensity to migrate is the same as those in the 18-29 age category, for whom data are available. According to a survey of adults aged 18 and over, conducted in 1996, some 24 per

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predicted values for 1995, plotted in Figures 2 and 3, are estimates of what would have been observed had those interviews been conducted in mid-April, while students were still in school, as they were in 2001.

cent of those who declared an intention to emigrate were in the 18-29 age category (Rangelova and Vladimirova 2004), whereas about 21 per cent of the adult population fall in this age bracket (Bulgarian National Institute of Statistics 2000a). Hence members of this age group were only about 14 per cent more likely to declare an intention to emigrate than was the average Bulgarian adult. If this were true for our 16-20 year olds as well, the change in their numbers due to migration would stand at just 2.1 per cent, which is too small to have any real impact on our estimates. Moreover, this figure is surely a maximal estimate given that 16 to 20 year-olds are obviously much younger, on average, than 18 to 29 year-olds, and that the propensity to migrate falls off rapidly at younger ages. Finally, and just as importantly, in order for this 2.1 per cent change to bias our estimated grade-for-age profiles, it would have to be the case not simply that migrants are better educated than average, but that they are better educated than average even after controlling for gender, rural location, geographic region, and ethnicity.[14]

A final potential source of bias lies in the possibility that parents' education might have been measured with differing degrees of reliability in the two surveys. Variation in the amount of measurement error could create spurious variation in the coefficients associated with parental education. We correct for this by examining the correlation between two independent measurements of parental education: one that is based on grade level (which we convert to a number of years using a set formula) and one which counts years directly. Changes in the

[14] The intergenerational regressions lack these control variables making selection bias somewhat more likely. Yet even discarding the best-educated *five* per cent of the observed sample had no impact whatsoever on the estimated intergenerational regression coefficient or correlation, suggesting that changes in the population of this order of magnitude are likewise unimportant.

correlation between these two measures should reflect changes in the accuracy with which the two questions were answered, recorded and key-punched.[15] We use this correlation as an estimate of the reliability of parents' measured education, and present both raw and measurement-error-corrected estimates of intergenerational educational mobility.

IV. Results

Table 3 reports the means and standard deviations for all variables used to estimate equations [1] (for 16 to 20 year olds) and [2] (for 7 to 20 year olds), and the corresponding sample sizes. Note that a portion of the observed decline in children's average education is spurious, as explained above and in the notes to the table.

Table 4 reports the results of estimating equation [1], for both years, for children between the ages of 16 and 20. The first row in the upper panel reports the intergenerational educational correlation, for both enrolled and not-enrolled students, and the second row reports the corresponding regression coefficient. We see that the correlation nearly doubles, rising from 0.331 to 0.606 between 1995 and 2001, while the regression coefficient more than doubles, from 0.215 to 0.488. Both changes are statistically significant at the 0.01 per cent level or better, as

[15] The frequency of grade repetition (which is picked up by one measure but not the other) might also have changed. While a uniform increase in the rate of grade repetition would not alter the simple correlation between the measures, an increase in the *variance* in the repetition rate across students could have an effect on that correlation.

indicated by the t-statistics in the final column. The regression coefficients imply that an extra year of parental education was associated with an additional 0.2 years of education for their children in 1995, but 0.5 years in 2001. The fact that the correlations do not increase by as great a proportion as the regression coefficients is simply a reflection of the fact that the standard deviation of children's education increased more rapidly between 1995 and 2001 than did that of their parents, as documented in Table 3. By either measure, the persistence of educational status across generations increased dramatically.

The next row reports the estimated reliability of measured parental education, based on the correlation between repeated measures of their schooling, as described above. This is somewhat higher in 2001 than in 1995. Correcting the regression coefficients for this fact very slightly reduces the difference between the 1995 and 2001 estimates, but produces no qualitative change in our findings.[16] The same conclusions obtain in the lower panel, which drops those who are still enrolled in school. Now the correlation coefficient rises from 0.493 to 0.723 over the six-year time span; the regression coefficient again more than doubles, from 0.323 to 0.706; and correcting for changes in the reliability in the measurement of schooling has little effect.[17]

To put these changes in perspective, we may compare them to estimates for other countries reported by Hertz *et al.* (2007), based on surveys conducted between mostly between 1994 and 2004. The youngest cohort considered there was 20 to 24 years old, included both

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[16] In a bivariate regression, the measurement-error correction amounts to simply dividing the reported regression coefficient by the estimated reliability.

[17] Trends for sons and daughters were fairly similar: both displayed large increases in both regression coefficients and correlations from 1995 to 2001.

enrolled and unenrolled children, but was not subject to the restriction that they be observed in their parents' household. The difference in age and residency requirements renders the comparison with the Bulgarian results imperfect, but it remains informative. Of the 30 developing and former Soviet Bloc countries included in that survey, 22 had intergenerational educational correlations that were higher than Bulgaria's 1995 value of 0.33, but only one (Indonesia) had a higher correlation than Bulgaria's 2001 value of 0.61. If we compare the (not-measurement-error-corrected) regression coefficients instead, we find that 29 of 30 countries had higher coefficients than did Bulgaria in 1995, but only seven exceeded its 2001 result. Thus, by either measure, Bulgaria has moved down in rank by 21 or 22 out of 30 positions on the global scale of intergenerational educational mobility.

Figure 2 uses the results of regression equation [2], reported in the Appendix, to more concretely illustrate the changing relation between parents' and children's educational attainment, and to allow us to see the age at which the effects of parental education start to become significant. The upper graph plots the estimated number of years of schooling completed, by age and at various levels of parents' education, for 1995; and the lower plots the same results for 2001. It is immediately clear from the fanning-out of the 2001 trajectories in relation to the 1995 results that the gap between the attainment of the children of better and less-well educated parents has grown substantially. In 1995, parents' education has no statistically or practically significant effect through age 13. (The relevant t-tests, reported in the Appendix, are those associated with the parental education variables for each age). Thereafter it is significant at the five per cent level or better at ages 14, and 17 through 20. In 2001, the gaps are much larger, and uniformly significant at the one per cent level or better, from age 14 through 20. (For example, in the Appendix we see that the effect of an extra year of parental education at age 14 rises from 0.17 years in 1995 to 0.24 years in 2001; at age 20 it rises from 0.27 to 0.57 years).

On average, for students aged 16-20 (who appear in the intergenerational regression estimates of Table 4), the difference in predicted attainment between the child of college-educated parents (coded as 16 years of schooling) and the child whose parents have no schooling at all stood at 3.2 years in 1995, but rose to 6.8 years in 2001.[18] Note, however, that only about three percent of parents had college degrees, and only about one-half of one percent had zero education; thus the comparison just described is one of extremes. A more representative comparison is between parental education levels 12 and 8, which represent the 74th and 22nd percentiles of the parental education distribution, or roughly the interquartile range. For 16 to 20 year-olds at these two points in the distribution, the attainment gap likewise doubled, from 0.8 years in 1995 to 1.7 years in 2001.

Figure 3 plots the same results, but this time pairing the 1995 and 2001 estimates at each level of parental education. This allows us more readily to determine if the average levels of educational attainment have risen or fallen between the two surveys for children from a given parental background. In the upper left panel, we observed that the children of college-educated

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[18] An interesting result visible in the lower panel of Figure 2 (for 2001) is the fact that children of less-educated parents actually had somewhat *higher* attainment at ages below 13 years; at ages 7 and 9, this negative effect of parental education was statistically significant while at other ages it was not. This would appear to mean that better-educated parents start their children's educations later, but that by age 14 these children have caught up with, and surpassed, the average for children of less-well-educated parents.

parents had somewhat less education at young ages in 2001 than in 1995; these differences are significant at the ten per cent level or better for ages 9 and 11,as indicated by the minus signs amongst the horizontal axis labels. For ages 16 and above, however, they gained ground between the two surveys, with significant differences emerging at ages 16 and 19. In the next panel, which pertains to parents with 12 years of schooling, we see that the 2001 results lie below the 1995 figures at all but two age levels, and at ages 9, 14, and 17 these differences are significant at the 10 per cent level or better.[19] As we move to parental education levels 8, 4 and 0, we see that absolute attainment for those aged 14 to 20 has indeed fallen over time, and has fallen the most (in both absolute and proportional terms) for the children of the least-well educated parents.

To summarize, the increase from 1995 to 2001 in the association between the educational levels of parents and children has manifested itself in the form of *educational gains* for the children of college-educated parents, and *educational losses* for the children of non-college-educated parents, with the largest (negative) changes occurring for those whose parents had the least schooling. Recall that this result obtains after controlling for demographic and geographic differences, as well as age in both years and months, and the spurious effect of the month of interview.

[19] These tests of significance do not appear in the Appendix, but are straightforward tests of differences between the estimated coefficients, given their standard errors, and given that the two surveys are independent cross-sections.

V. Discussion

Ganzeboom and Nieuwbeerta's 1999 analysis reaches the conclusion that the intergenerational educational regression coefficient has fallen by about 0.035 per decade from 1940 to 1985. While their estimates are not directly comparable to ours[20], it nonetheless would appear that the trend they identify has since reversed direction with a vengeance. After falling by not quite 20 points in 45 years, this measure of the intergenerational transmission of social status has since increased by more than 35 points in just six years. Moreover, educational attainment appears to be declining in *absolute* terms for those whose parents are less well educated, even as it has risen for the children of college educated parents.

While we cannot rule out other explanations, the coincidence of this change with the collapse in public spending on education in Bulgaria and the concomitant decline in its quality, the increase in its out-of-pocket costs, the fall in the number of schools, the greater physical distances from home to school, and the especially rapid rise in unemployment among those with secondary education, strongly suggests that this represents an economically-driven structural change, brought about by the turmoil associated with the transition away from socialism, as well as the shift in political priorities that permitted a reduction in state support for education.

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[20] The pertinent differences are that their "children" were between ages 21 and 69, as opposed to 16-20; that their information on parents' education was based on the children's recollection, not the results of parental interviews; that the parents and children did not have to be living in the same household; and that they include regional controls, which we omit from our estimates of equation [1].

It is important to emphasize, however, that these intergenerational correlations serve as imperfect indices of the equality of educational opportunity. There are many reasons why the children of less well-educated parents get less education themselves, not all of which can, or arguably should, be addressed by public policy, a point made clear by Jencks and Tach (2005). Yet it seems equally clear that public policy, and economic conditions, have played an important role in the deterioration of educational outcomes in post-socialist Bulgaria. Given that this has had the most impact on the children of less-well-educated parents, it is hard to avoid the conclusion that this represents an erosion of equality of educational opportunities.

A further important qualification is that we do not know whether this deterioration is a temporary result of the fiscal crisis or part of a longer-run trend. Institutional change and improving economic conditions after 2002 may contribute to future improvements in mobility. Further exploration of this question should be possible once the data from the 2003 and subsequent rounds of the household survey are made public. Yet even if conditions have improved, this will have come too late to help the cohort of 16-20 year olds from the 2001 survey, whose educational attainment is largely determined by this point. Moreover, to the extent that the association between parental and child education is a causal link, some portion of this educational deficit will be passed on to their children, some of whom are just beginning to enter school as of this writing.

On the other hand, it is also entirely possible that the fundamental change in political orientation and educational policy since 1989, with greater educational cost-shifting to parents, and related educational reforms, may have a permanent negative effect on intergenerational mobility. Our contribution has been to document that institutional and economic changes in Bulgaria coincided with a sharp reduction in educational mobility. It does not seem unreasonable to speculate not only that similar changes may have attended the economic crises of transition in other former Soviet Bloc nations, but also that the policies they now embrace may be less conducive to intergenerational mobility than were past policies. In particular, as demonstrated by Solon (2004), a reduction in the progressivity of state expenditures on education has the dual effect of increasing cross-sectional income inequality and reducing intergenerational mobility. In other words, the same changes that have lead to seemingly permanent increases in cross-sectional income inequality in many transition economies since 1989 (Milanovic 1999) are also likely to contribute to reductions in intergenerational mobility, and equality of opportunity.

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Table 1
GDP, Education Spending, and Employment: 1990-2004

	[1]	[2]	[3]	[4]	[5]	[6]
Year	**Real GDP (Index)**	**Education Spending as % of GDP**	**Real Education Spending (Index)**	**Population Aged 5-17 (Index)**	**Education Spending Per Child (Index)**	**Employment as % of Population Aged 15-59**
1990	100	5.0	100	100	100	78
1991	88	5.1	91	99	92	68
1992	82	6.1	99	97	103	63
1993	81	5.7	93	94	99	63
1994	82	4.8	79	92	**85**	57
1995	84	4.0	68	90	**75**	58
1996	77	3.2	49	89	**55**	60
1997	72	3.9	56	87	**65**	60
1998	75	3.9	58	84	**69**	59
1999	77	4.2	64	82	**78**	56
2000	81	4.2	68	80	**86**	55
2001	84	4.0	68	77	**88**	55
2002	88	4.2	74	73	102	57
2003	92	4.4	81	70	116	57
2004	97	4.3	85	67	126	59

Note: Years in boldface are those for which spending per child was 10% or more below its 1990 value.

Source: Authors' calculations from UNICEF IRC (2006).

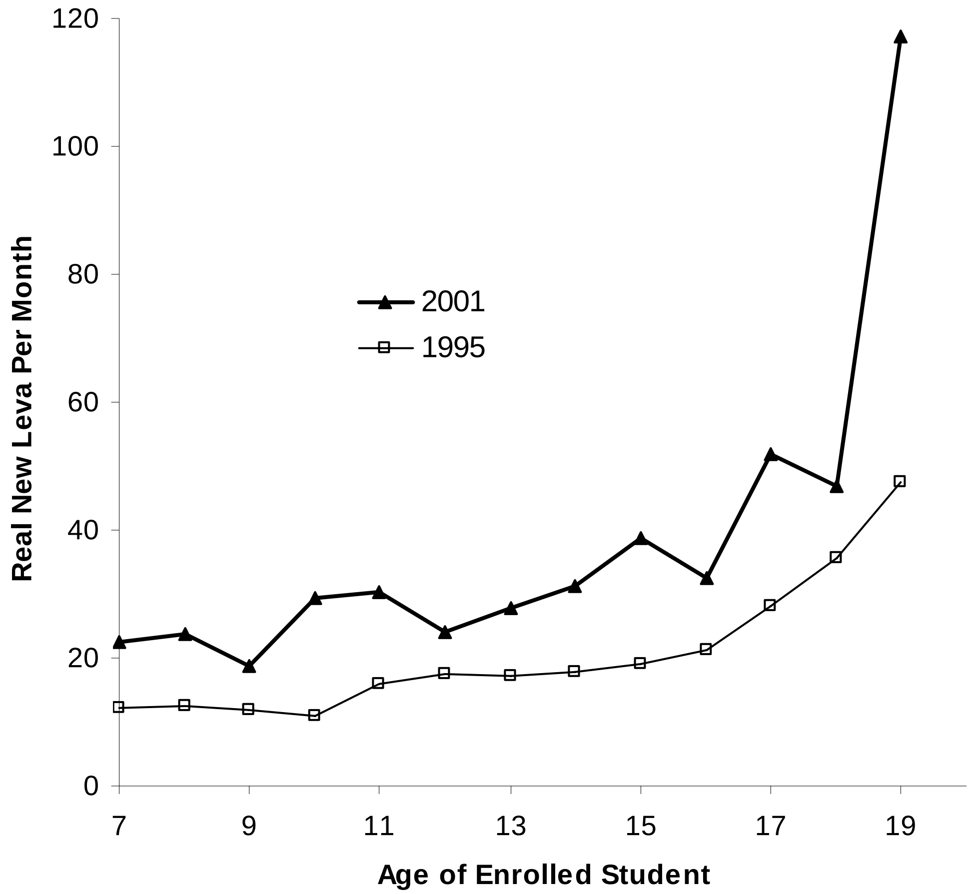
Table 2
Cost and Distance to Schools

	1995		2001				
	Means	(StdErr)	Means	(StdErr)	**Difference**	(StdErr)	
Distance to School (km)							
Age 7-20	2.55	(0.24)	3.43	(0.34)	0.88	(0.43)	†
Age 7-18	2.19	(0.16)	2.79	(0.18)	0.60	(0.27)	†
School Fees							
Age 7-20	17.9	(0.91)	33.5	(1.37)	15.7	(1.86)	‡
Age 7-18	16.6	(0.74)	30.3	(1.11)	13.7	(1.53)	‡

Note: Fees are in 2001 Leva per month. Distances are in kilometers. Sample is limited to enrolled students from 1995 and 2001 household surveys, described in text. † indicates a statistically significant difference at the 5% level; ‡ at the 1% level.

Source: Authors' calculations from 1995 and 2001 household surveys.

Figure 1
Real Out-of-Pocket Costs of School Attendance
1995 Versus 2001



Notes: Figures represent the sum of monthly expenditures reported for transportation to/from school, extra-curricular activities, school meals, lodging, and supplies, as well as one-twelfth of the annual expenses reported for school tuition, uniforms and text-books. Figures are adjusted for inflation to 2001 prices using the National Statistical Institutes' published Consumer Price Index series, and take account of the 1000-fold redenomination of the leva in 1999.

Source: Authors' calculations from 1995 and 2001 household surveys.

Table 3
Descriptive Statistics

	1995		2001	
	Mean	StdDev	Mean	StdDev
Ages 16-20				
Years of Schooling*	10.25	2.00	9.62	2.70
Parents' Average Years of Schooling	10.92	3.09	10.70	3.35
Sample Size	369		396	
Ages 7-20				
Years of Schooling*	6.71	3.47	6.21	3.59
Parents' Average Years of Schooling	11.02	3.11	10.89	3.29
Age (Years) in Previous December	13.24	3.81	13.44	3.90
Age (Months) in Previous December	5.81	3.47	5.51	3.53
Interview Date (Month)	6.51	0.66	4.77	0.26
Share Female	0.49		0.50	
Shares in Districts				
Sophia City	0.12		0.14	
Sofia Region	0.16		0.14	
Bourgass	0.11		0.13	
Varna	0.12		0.11	
Lovetch	0.09		0.08	
Montana	0.05		0.07	
Plovdiv	0.14		0.17	
Rousse	0.07		0.08	
Haskovo	0.14		0.08	
Share Rural	0.27		0.30	
Shares by Mother Tongue				
Bulgarian	0.82		0.79	
Turkish	0.11		0.10	
Roma**	0.06		0.10	
Russian and Other	0.01		0.00	
Sample Size	1172		1205	

Notes:

* Average children's education is downwardly biased in 2001, for all age groups, for reasons described in the text. For the full 7 to 20 year-old sample, the true overall decline in mean schooling is on the order of 0.2 years, not 0.5 years.

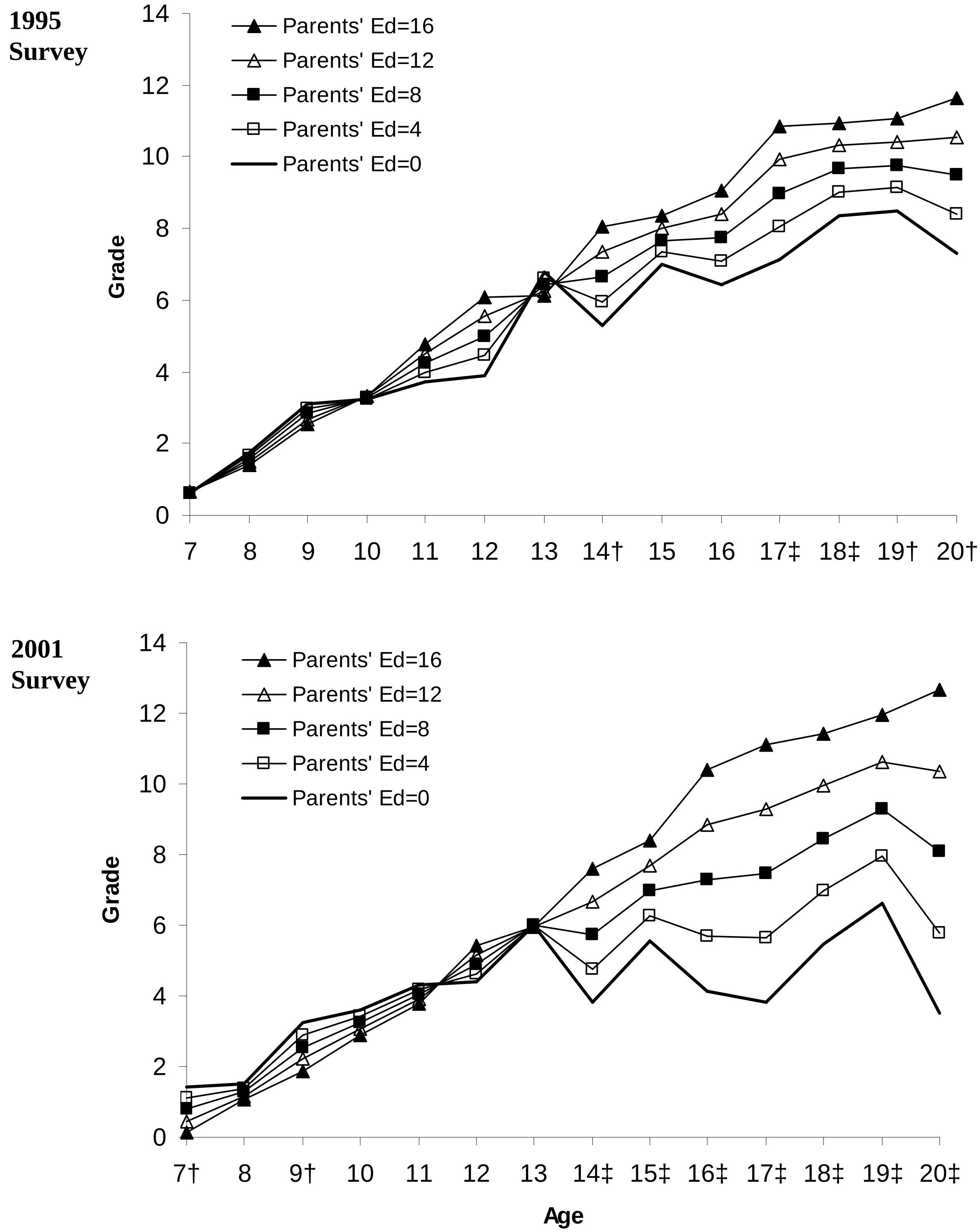
** The 2001 survey oversampled Roma households, and these excess households were dropped to maintain demographic representativity at the national level; the observed increase in the share of Roma is thus not an artifact of the oversampling.

Table 4
Estimates of the Intergenerational Correlations and Regression Coefficients
Children Aged 16 to 20
1995 Versus 2001

	1995	2001	Difference	T-statistic of Difference
All children	n=369	n=396		
Correlation between child's and parents education	0.331	0.606	0.274	4.32‡
(Standard error)	(0.049)	(0.040)	(0.064)	
Regression coefficient: "effect" of an extra year of parental education	0.215	0.488	0.273	3.63‡
(Standard error)*	(0.054)	(0.053)	(0.075)	
Estimated reliability of parental education**	0.939	0.980		
Measurement-error-corrected regression coefficient	0.229	0.498	0.269	5.71‡
(Standard error)	(0.034)	(0.033)	(0.047)	
Children not enrolled in school	n=221	n=201		
Correlation between child's and parents education	0.493	0.723	0.231	3.01‡
(Standard error)	(0.059)	(0.049)	(0.077)	
Regression coefficient: "effect" of an extra year of parental education	0.323	0.706	0.382	3.90‡
(Standard error)*	(0.067)	(0.071)	(0.098)	
Estimated reliability of parental education**	0.949	0.985		
Measurement-error-corrected regression coefficient	0.341	0.716	0.376	5.98‡
(Standard error)	(0.040)	(0.048)	(0.063)	

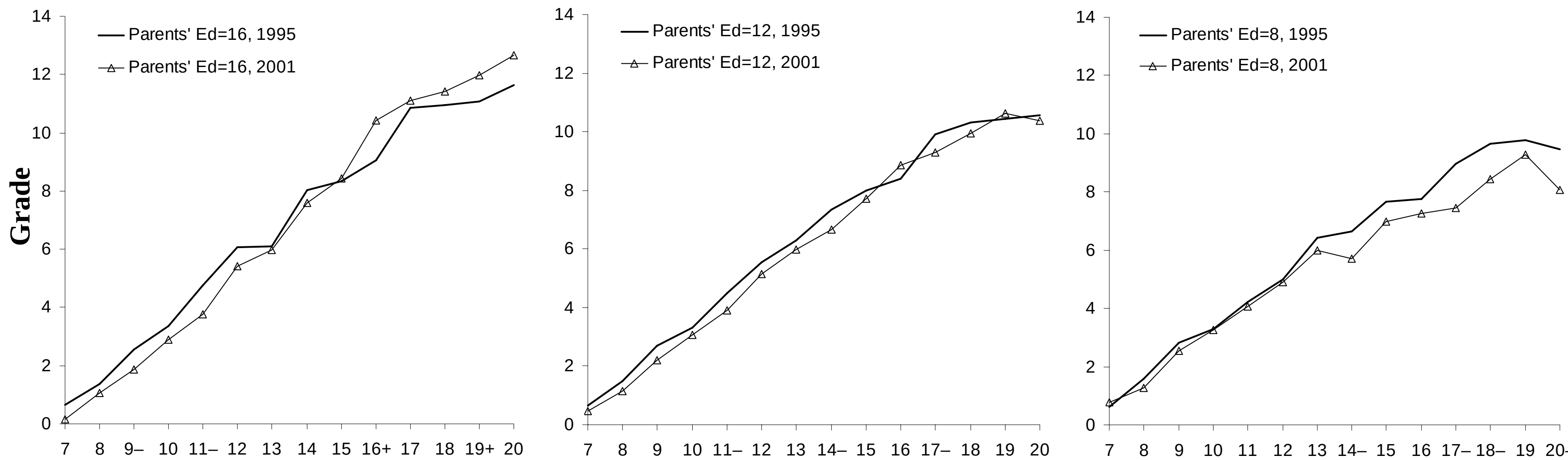
Notes:
* Reported standard errors are robust to heteroskedasticity and clustering at the level of the primary sampling unit. Other (non-starred) standard errors are conventional estimates.
** Reliability of parental education based on correlation between two measures thereof, as described in text.
‡ Statistically significant difference, at 1% level.

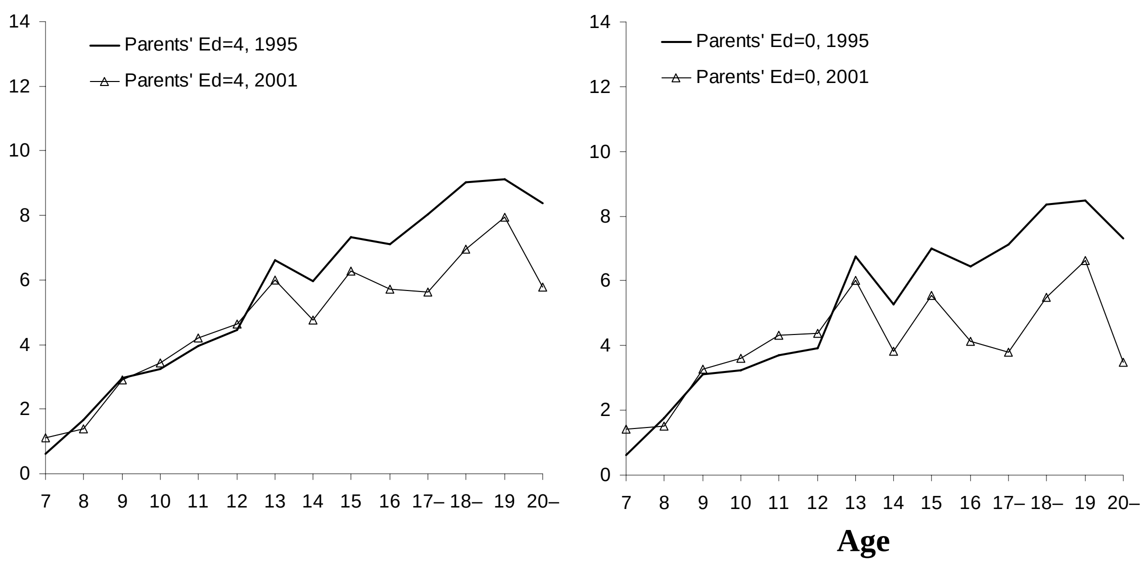
Figure 2
Grade-for-Age by Parents' Education: 1995 versus 2001



Notes: † indicates a significant effect of parents' education at 5% level; ‡ significant at 1% level. Underlying standard errors are robust to heteroskedasticity and clustering at the level of the 500 primary sampling units. The regressions that generate these estimates appear in the Appendix.

Figure 3
Grade-for-Age in 2001 versus 1995, By Parents' Education Level





Note: Figures plot the estimated attainment by age, for each parental education category, based on same regressions as previous figures (see Appendix). Plus signs (+) and minus signs (–) next to a given age indicate the sign of the difference between the 2001 and 1995 values, and are only shown for differences that are significant at the 10% level or better, based on standard errors that are robust to heteroskedasticity and clustering at the level of the 500 primary sampling units.

Appendix

1995: Results of regression equation [2]

Number of obs = 1172
R-squared = 0.85
Root MSE = 1.35

Number of clusters = 404

Children's Education	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
Age 7	.6041932	.4766979	1.27	0.206	-.3329321	1.541318
Age 8	1.764028	.6366315	2.77	0.006	.5124943	3.015561
Age 9	3.117393	.7485221	4.16	0.000	1.645898	4.588889
Age 10	3.22927	.5280742	6.12	0.000	2.191146	4.267394
Age 11	3.703348	.8954988	4.14	0.000	1.942916	5.463781
Age 12	3.913384	1.235918	3.17	0.002	1.483733	6.343036
Age 13	6.762588	.5970204	11.33	0.000	5.588925	7.936251
Age 14	5.278257	.9386164	5.62	0.000	3.433061	7.123453
Age 15	6.999258	.6387379	10.96	0.000	5.743583	8.254932
Age 16	6.446029	1.51309	4.26	0.000	3.471494	9.420564
Age 17	7.113171	.8234819	8.64	0.000	5.494314	8.732027
Age 18	8.363752	.7048351	11.87	0.000	6.97814	9.749365
Age 19	8.482848	.979992	8.66	0.000	6.556313	10.40938
Age 20	7.296374	1.346387	5.42	0.000	4.649555	9.943193
Months	.0669285	.0129447	5.17	0.000	.0414809	.0923761
IntDate	.1792053	.0780341	2.30	0.022	.0258005	.3326102
Female	.1552446	.0807396	1.92	0.055	-.0034788	.313968
District 2	-.040715	.1575743	-0.26	0.796	-.3504852	.2690552
District 3	.0993044	.1917825	0.52	0.605	-.2777148	.4763235
District 4	.1168858	.2172161	0.54	0.591	-.3101324	.543904
District 5	.1488236	.1745568	0.85	0.394	-.1943319	.4919792
District 6	.0784549	.1801914	0.44	0.664	-.2757775	.4326874
District 7	-.0728352	.2248816	-0.32	0.746	-.5149226	.3692523
District 8	.0414027	.1730919	0.24	0.811	-.2988731	.3816784
District 9	-.2380572	.1973088	-1.21	0.228	-.6259403	.1498259
Rural	-.1135734	.1747338	-0.65	0.516	-.4570769	.2299301
Turkish	-.7525459	.2769478	-2.72	0.007	-1.296989	-.2081031
Roma	-1.15026	.2693889	-4.27	0.000	-1.679843	-.6206773
Russian/Other	.1307124	.3048613	0.43	0.668	-.4686047	.7300294
Parents' education coefficient at age...						
7	.002679	.0308491	0.09	0.931	-.0579662	.0633243
8	-.0240476	.0423329	-0.57	0.570	-.1072685	.0591732
9	-.0359373	.0552332	-0.65	0.516	-.1445185	.0726439
10	.0072238	.0286587	0.25	0.801	-.0491155	.0635631
11	.0654398	.0630006	1.04	0.300	-.0584111	.1892906
12	.1352822	.0981618	1.38	0.169	-.0576909	.3282552
13	-.0406795	.0442358	-0.92	0.358	-.1276412	.0462823
14	.171872	.0770745	2.23	0.026	.0203537	.3233903
15	.0834487	.0459971	1.81	0.070	-.0069754	.1738729
16	.1624303	.1124101	1.44	0.149	-.058553	.3834137
17	.233156	.0622651	3.74	0.000	.1107509	.355561
18	.1622133	.0509459	3.18	0.002	.0620604	.2623661
19	.1616568	.0715102	2.26	0.024	.0210773	.3022364
20	.271942	.1206996	2.25	0.025	.0346626	.5092214

2001: Results of regression equation [2]

Number of obs = 1205
R-squared = 0.83
Root MSE = 1.50

Number of clusters = 430

Childrens' Education	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
Age 7	1.427329	.5042254	2.83	0.005	.4362697	2.418389
Age 8	1.498125	.5560785	2.69	0.007	.4051474	2.591102
Age 9	3.256457	.4919042	6.62	0.000	2.289614	4.223299
Age 10	3.603852	.7113367	5.07	0.000	2.205713	5.00199
Age 11	4.32946	.6065452	7.14	0.000	3.13729	5.52163
Age 12	4.386064	.5878671	7.46	0.000	3.230606	5.541522
Age 13	6.008633	.5887485	10.21	0.000	4.851442	7.165824
Age 14	3.830038	.9494398	4.03	0.000	1.963906	5.696171
Age 15	5.556573	.8189987	6.78	0.000	3.946824	7.166323
Age 16	4.136978	.9488902	4.36	0.000	2.271926	6.00203
Age 17	3.80079	1.050986	3.62	0.000	1.735067	5.866513
Age 18	5.483209	1.612994	3.40	0.001	2.312855	8.653564
Age 19	6.617145	.9892005	6.69	0.000	4.672862	8.561427
Age 20	3.497978	1.042664	3.35	0.001	1.448613	5.547343
Months	.071185	.0119584	5.95	0.000	.0476806	.0946893
Female	.0707288	.0898317	0.79	0.432	-.1058363	.2472938
District 2	.2314666	.2178876	1.06	0.289	-.1967935	.6597268
District 3	.0995834	.1950893	0.51	0.610	-.2838664	.4830332
District 4	.2634166	.1785848	1.48	0.141	-.0875934	.6144266
District 5	.3180456	.2182721	1.46	0.146	-.1109702	.7470614
District 6	.0706926	.1898176	0.37	0.710	-.3023956	.4437808
District 7	.131359	.1934003	0.68	0.497	-.2487709	.511489
District 8	.0470852	.2464173	0.19	0.849	-.4372503	.5314207
District 9	-.0349712	.295272	-0.12	0.906	-.6153309	.5453886
Rural	-.0447873	.1669393	-0.27	0.789	-.372908	.2833334
Turkish	-.3004241	.2735557	-1.10	0.273	-.8381003	.2372522
Roma	-1.384074	.3494198	-3.96	0.000	-2.070862	-.6972866
Russian/Other	-.3658482	.6041092	-0.61	0.545	-1.55323	.821534
<u>Parents' education coefficient at age...</u>						
7	-.0803524	.0363399	-2.21	0.028	-.1517789	-.0089259
8	-.0281909	.0410795	-0.69	0.493	-.1089331	.0525513
9	-.0876872	.0354837	-2.47	0.014	-.1574307	-.0179438
10	-.044014	.0548221	-0.80	0.423	-.1517673	.0637393
11	-.0347544	.0466921	-0.74	0.457	-.1265281	.0570193
12	.063801	.0440194	1.45	0.148	-.0227196	.1503217
13	-.0026031	.045381	-0.06	0.954	-.0917998	.0865936
14	.2359493	.0806678	2.92	0.004	.077396	.3945026
15	.1787371	.0652459	2.74	0.006	.0504956	.3069786
16	.3925092	.078986	4.97	0.000	.2372615	.547757
17	.457433	.0841902	5.43	0.000	.2919564	.6229095
18	.3713033	.1319792	2.81	0.005	.111897	.6307096
19	.3342267	.0808921	4.13	0.000	.1752324	.4932209
20	.5731688	.0802773	7.14	0.000	.415383	.7309547