From the one-room school to high school: the provision of education in British Columbia, 1900-1920[1]

Mary MacKinnon (McGill)

Chris Minns (LSE)

PRELIMINARY: please do not quote.

1 We thank SSHRC for financial support, and Tim Leunig for comments on this paper.

Introduction

In 1900, primary school attendance in Canada was often irregular, with few pupils pursuing secondary education. Many parts of the country were only recently settled, with schools being built, and teachers imported from Britain or more established parts of Canada, to educate a growing local population. By 1950, virtually all children completed primary school, and in most of the country, high school attendance was the norm. Provinces had established programs to train and certify teachers (except Quebec), and while the population grew rapidly in the coming decades, the structure of primary and secondary schooling saw relatively little change.

This paper examines the transition to mass participation in education in the early 20th century. Abundant school-level data from British Columbia is used to explore the determinants of educational outcomes between 1900 and 1920. The paper aims to contributes to several aspects of recent research in economic history and the economics of education. First, work on education in the United States for this period has stressed the importance of the "high school revolution." Goldin (1998; 2001) argues that rising high school graduation rates were driven by demand at the grass roots for more schooling. Developments in Canada are argued to be similar to those in the United States, with slower progress in Canadian education reflecting lower incomes per capita north of the border (Goldin, 2001, footnote 32). We suspect that complementary developments at the primary level contributed to the rise of the modern high schools. Children who did not attend primary school consistently were unlikely to continue on into high school. British Columba, and other Canadian provinces, required that prospective students pass an examination to enroll in a provincial high school. In British Columbia, pass rates for this exam are only about 65 percent between 1900 and 1915, and many children left school without attempting the entrance exam. To what extent did primary school conditions impact on potential high school entrance? One of the valuable features of the data we use is that it contains information about school-level attendance rates (actual days of attendance versus the number of students enrolled and the length of the school year), and the

number of students per school who pass the high school entrance examination in every year. Was the high school revolution underpinned by changes in the provision of primary education? Historical work with Canadian or US Census data can provide valuable information about the relationship between school attendance and individual and family characteristics (see Moehling, 2004; MacKinnon and Minns, 2006), but it cannot match education outcomes to the volume or quality of the supply of schooling In this paper, we focus on factors associated with the availability and quality of the supply of schooling.

The paper also contributes to the growing literature of the importance of school conditions for educational output. A large literature debates whether measures of school quality (better paid teachers, better qualified teachers, class size) have an impact on educational outcomes (usually measured in the form of test scores) in contemporary economies. Much of this research focuses on developed Western economies such as Britain and the United States (Hanushek 1995; 1997; 2007), but an additional strand considers outcomes in developing economies. Conditions there are more likely to resemble what faced students and teachers in early 20th century North America. British Columbia was the frontier; the population was only 55 thousand in 1881. By 1901, the population had risen to about 180 thousand, with much of the recent settlement in remote areas, in close proximity to natural resources (mines, forests, arable land) or transportation networks (ports and railway lines). Schools were remote for many parents, students, and teachers, who would have virtually no access to public transportation. Outside of established urban areas, there would be little ability for parents to exercise school choice. The development literature stresses the difficulty of ensuring that poorly paid teachers turn up and deliver their classes; low pay was less of an issue in early 20th century British Columbia, but teacher turnover was substantial, and replacing rural teachers on short notice may have lead to lower quality curricula and the cancellation of part of the prescribed school year.

To the best of our knowledge, there are no other studies that draw the link between measures

of school quality and educational outcomes prior to the 1920s, and few (if any) for any period that track the evolution of schools and outcomes over an extended time period. Our outcome measures (attendance and high school entrance exam outcomes) differ from the test scores used in contemporary studies, but they are arguably more relevant to understanding the evolution of primary and secondary education in the early 20th century – the increase in human capital has been argued to be the key factor behind 20th century economic growth in North America. Children's performance on standardized tests may not affect whether they graduate from high school or continue on to university. All teachers and pupils in British Columbia understood the importance of the entrance exam. A child who failed the high school entrance exam in British Columbia could not attend a public high school, and left school without any tangible evidence of having acquired a good standard of literacy and numeracy. The measures of teacher and school quality available for BC do not differ greatly from those used in the contemporary literature. The data illustrate a range of characteristics on schools and teachers (more than we have been able to put together so far), and we are able to observe how these characteristics change over time.

Data on British Columbia Schools, 1900-1920

We draw school-level data from the Sessional Papers of the Province of British Columbia. The Report from the Ministry of Education provides the enrollment (for both sexes), actual attendance, teacher name, and the salary of the teacher for every classroom in every public school in the province.[2] This is the core of our data, and we have currently put records from 1900/01, 1905/06, 1910/11, 1914/15, and 1920/21 into digital form.[3] A second series in the reports lists the number of students (and for earlier years, student names) who pass the high school entrance exam by school.[4] We have so far converted the records from all years from 1898/99 to 1914/15, and use

2 The enrollment totals are for all children enrolled in a particular class at any time during the academic year. This some pupils are counted twice if they change classes or schools. Attendance figures show the total number of pupil-days in the academic year. The total number of school days is also reported.

3 We chose the academic year 1914-1915 due to the poor condition of the 1915-16 copy of the BC Sessional Papers in the British Library of Political and Economic Science.

4 Private schools are included in this part of the report, though we do not use this information in this paper.

data from 1900/1901 onwards in the analysis that follows. The reports also include detail on teacher qualifications. For all years between 1900 and 1920, a separate list in the Report gives the names of all teachers with academic, first class, second class, third class, or temporary teaching certificates. For some years we also know something about how long they have held their current certificate, and for university-trained teachers, we know what institution provided their highest degree. We currently have merged the teacher qualification register to school data for 1900, 1910, and 1920.

The provision of education in British Columbia, 1900-1920

In this section, we use the data we have assembled to illustrate how the schools system in British Columbia evolved during a period of rapid expansion between 1900 and 1920. We are interested in changes in the structure of schooling, and how these changes spread across the province over time. One of the trends we observe in the data is the spread of "graded" multi-room schools. These often replace or result from the expansion of "common" one-room schools in urban areas in the province.[5] Graded schools were more common in larger urban areas, but by 1920 they are found in a wide range of locations across the province.[6]. Graded had the potential to provide more age-appropriate education than a one-room school with a single class combining children between the ages of 6 to 12, with a possible impact on attendance rates, particularly among for older children. Graded schools and common schools may also have differed in other important characteristics. Head teachers in graded schools had administrative responsibilities beyond what was required in a common school.[7] Higher salaries for at least some teachers in graded schools

Unfortunately, there is a gap in the entrance exam results around 1920: in this period some pupils were promoted on recommendation of the principal. Total passes (including recommendations) are again listed in the mid-1920s.

5 The Education Reports distinguish between two types of one-room schools: common or public schools, and "assisted" schools. We have combined these categories for our analysis.

6 Population statistics in the census tables suggest that graded and high schools were found in some small places. Cumberland and Ladysmith have graded schools in 1900, despite total populations of less than 1000 in 1901. Kaslo has a population of 722 in 1911, and does not appear in the Census tabulations for 1900 – but a graded school is already in place in 1900.

7 Margo and Perlmann (2001) find that in early 20th century US elementary schools that were mainly staffed with female teachers often had a male principal. This is also the case in the British Columiba data used in the paper. We have yet to explore whether the presence of a principal, and the sex of the principal, had any impact

could serve to attract more qualified teachers, and to reduce teacher turnover within the school. There may also have been an important relationship between class size and school type. On the one hand, if over-subscribed common schools "upgrade" to graded school status by taking on additional teachers, the decline in class sizes may improve schooling outcomes. On the other hand, any loss of educational quality associated with large classes may be smaller in graded than one-room schools; it may be easier to provide a given standard of education to 30 children aged 6 to 8 than to 30 children aged 6 to 12.

Table 1 documents changes in the set of schools in the province between 1900 and 1920. High schools and graded schools are classified by 1903 provincial electoral district. The province was divided in to 35 such districts, and the Education reports list all schools and school boards by electoral district.[8] In 1900, only 5 high schools were open, and students away from major and semi-major urban areas (Vancouver, Victoria, Nanaimo, New Westminster, and Nelson) would have to travel a substantial distance to pursue a secondary education. Common schools were five times as numerous as graded schools, but taught only just over a third of primary school students. Over the twenty years, high schools spread across the province, with almost all districts containing a high school in 1920. However, many children within an electoral district still lived a long way from the nearest high school.

Table 1 also breaks the distribution of high schools into named "places". British Columiba is rugged, and much of the province was remote, with many settlements accessible primarily by water. One reason for sporadic attendance in much of the province may the unavailability of a local high school; the parents of children residing more than a couple of miles from a high school may have been unwilling or unable to relocate or to pay to relocate their children for further education. In Vancouver and Victoria, choice was more extensive, and graded schools and high schools were

on attendance or other outcomes.

8 In 1900 there were only 28 electoral districts. In 1920 the province was carved into 43 (?) electoral districts. Wherever possible, we have classified schools in 1900 and 1920 into the districts that existed in the intervening years.

more widespread. Here parents may have had some choice between common and graded schools with an eye on further education in the high school, and we may be able to document this substitution if it takes place.

By 1920, more developed places, even outside of the major cities of Vancouver and Victoria, had several schools – North Vancouver, South Vancouver, Burnaby, Chilliwack, Langley, Kelowna, and so on. There is a twenty percent increase in the proportion of places that contain a high school over the 20 year period. We do not know at this point whether some schools within a "place" were truly accessible to all children within a place, or to what extent children from rural places lived close by to an urban high school. Ideally we would locate schools on a map and determine the proximity of primary schools to the nearest secondary school – this is something we intend to do in future work.

Table 2 summarises attendance and school and teacher characteristics from the Reports for the three classes of schools over time. The set of school and teacher features that we consider are quite similar to the main determinants of education outcomes in contemporary studies of education. School characteristics include the number of separate classes (for high and graded schools), total school enrollment, and average class size. Whether class size matters for schooling outcomes has been the subect of considerable debate. Hanushek finds that only a minority in either developed or developing economies find that class size is a significant determinant of achievement (Hanushek 1995; 1997; 2007). Recent evidence from experimental or quasi-experimental studies is similarly inconclusive. Michael Kremer (2003) reports that a randomized program in India to provide second teachers to one teacher schools did not improve test scores, but did improve attendance among girls (Kremer 2003).

The reports also give enrollment by sex, from which we draw the sex ratio, and the number of days the school was in session.[9] The first measure may be important if attitudes towards

9 From 1900 through 1914, the reports also list the prescribed number of days – some parts of the province had school years that were a few days longer or shorter than average.

education differ between boys and girls, or the parents of boys and girls. We are unable to relate this to sex-specific attendance, however. Variance in the number of session days was most likely caused by student or teacher absenteeism. This would reflect economic conditions (teachers leave for better paid white-collar occupations elsewhere, and may be difficult to replace on short notice), or by shocks that prevent either students or teachers from arriving at the school (for example, weather or disease).

The contemporary literature has examined whether there is an association between teaching quality and pay or paper qualifications. As with class size, the bulk of the literature has difficulties connection teacher pay and qualifications with educational outcomes. We have information on both pay and teacher qualification for early 20th century British Columbia, and these measures are included in Table 2. We have not yet entered data on qualifications for all years, and these measures are therefore not included in the regression analysis later in the paper.[10]

Table 2 indicates that high schools in 1920 are a bit larger in terms of student numbers than in earlier years, with student/staff ratios a bit lower than in 1900 and 1905. In all years, the majority of high school students (54-64 percent) were girls. Schools size for graded schools is fairly constant over the period – average enrollment in 1920 is about where it was in 1905, but student/staff ratios have fallen as the average school has more divisions. Common schools featured smaller classes after 1900.

Almost all high school teachers were university graduates, and the majority were men – though the proportion of women staff in high schools rose above 40 percent in 1920. Primary school teaching was mainly a female occupation, and the figures suggest increasing feminisation of teaching in both graded and common schools through the period. The best paid teachers were in high schools – a result that holds up if one controls for gender and qualifications (cite our Helsinki paper?). Graded school teachers held somewhat better qualifications on average than common

10 Preliminary regression for 1900, 1910, and 1920 suggested little relationship between teacher qualifications and attendance rates, after controlling for school type and school characteristics.

school teachers (they were considerably less likely to possess a third-class certificate in 1910 or 1920), and had modestly higher average wages.

Data on student and staff numbers and salaries can be combined to give a sense of the per-student labour cost associated with teaching activity in the three types of school. The interesting comparison is between graded and common schools, especially when the attendance figures are considered. In most years the per student teaching cost in graded schools was about sixty percent of that in common schools – but attendance was 8 to 12 percent higher in graded insitutions.

Another difference across school types appears in the length of the school year. The table reports days in session – the number of days in which teaching was recorded as taking place. For graded schools, this is an average across division. The main point to note here is that the variance in the days schools were actually in session is larger in common schools than graded schools, particularly prior to 1914. This is consistent with the idea that weather and other disturbances were more likely to lead to school cancellations in remote one-room schools, and that the need to replace teachers on short notice may also have lead to lost teaching time.

The data in Table 2 suggest that graded primary schools were a cost-effective way to raise educational performance. Table 3 narrows the focus to consider schools that expand from one-room to multi-room in the four intervals observed in our data. The figures in the Table suggest that common schools that became graded schools had somewhat lower attendance rates, and substantially larger class sizes, than the typical common school. In each interval, attendance rates at the newly graded school rose substantially (only 8 percent 1900 to 1905, but 12 to 20 percent in the other three intervals). This increase was greater than the upward attendance trend within either common or graded schools, and put attendance at newly graded schools closer to the average of all graded schools than to the average of all common schools.

Attendance regressions

One of the most fundamental indicators that a school is doing something right is that pupils attend class. Barriers to attendance may take many forms: if children and maprents think that schools are provifing a useful service, they will put more effort into making sure that children go to school as often as possible.

We have estimated preliminary regression models of school-level attendance rates. These allow us to control estimate the impact of all school and teacher variables, and also to control (crudely) for school location and for attendance in earlier years. Table 4 presents regressions for primary school attendance rates (common and graded) for 1905, 1910, 1915 and 1920. The explanatory variables include school and teacher characteristics: the log of average pay in the school, the number of days school was in session, average class size, the fraction of student who were boys. A set of district dummies control for any district-specific effects in attendance – these can be thought of as crude controls for demand-side variables that might influence attendance and school leaving age. An additional geographic variable is an indicator of whether a high school is present in the same place as the primary school. As noted earlier, this is an imperfect proxy for whether elementary school students could feasibly take up a high school place without rural-urban or inter-urban migration on the part of themselves or their family. Two additional variables control for school type – a dummy variable indicating whether the school was a graded school in the earlier period, and a second dummy indicating if a school had upgraded from common to graded over the interval.[11] This means that in the regression for 1905 (first column), the first dummy is equal to one if a school in the study was graded in 1900. The second dummy is equal to one if a school in the study was common in 1900, but is graded in 1905. The final variable is a control for attendance rate in the school in the previous period. For the 1905 regression, this is equal to the attendance rate in 1900. The coefficient on this variable gives some sense of whether attendance patterns in schools are persistent over time. It also serves as an implict control for unobserved factors (school reputation, characteristics, occupation, and income of parents in the local area) that might cause school

11 There are a very small number of schools that shrink from common to graded over the period of the study.

attendance to be high in both the current and previous period. As the regressions include lagged values from the previous period, there is no regression for 1900, and the sample in each year is limited to schools that exist (and can be matched) in both the current and previous period.

Some strong results emerge in Table 4. The most consistent finding is that class size matters. An increase in class size of 22 students (the standard deviation of common school class size in 1900) is predicted to reduce attendance rates by between 5.5 and 7 percent. In three of the four regressions, teacher salary has a strong statistical relationship with attendance. A twenty log point increase in average pay (roughly twenty percent, a bit more than the difference between average salaries between common and graded schools in 1905 and 1910) would be predicted to raise attendance by 3 to 7.5 percent. The results confirm that graded schools enjoyed higher attendance rates after controlling for other characteristics, and that recently upgraded schools have a large attendance shift that is not attributable only to decreases in class size and changes in teacher compensation. The presence of a local high school has a positive impact on primary level attendance, but it is only substantial in the 1905 cross-section. Finally, attendance does appear to be correlated over time, with three of four regressions carrying significant positive coefficients on lagged attendance. We suspect that the magnitude of this coefficient would be substantially larger in year-on-year comparisons than when comparing schooling outcomes 5 years apart, as we found little evidence in earlier work that attendance was highly correlated over a ten year interval. This may well have something to do with the very rapid turnover of teachers, particularly in common schools. Preliminary estimates (in which we assume the same teacher is in the common school if teacher surname is unchanged in 2 consecutive cross sections) suggest that only 3 to 6 percent of common schools retained their teacher over the 5 or 6 year intervals that we consider. This fraction does not appear to increase over time. Turnover may be lower in graded schools, but we have not yet computed a turnover index for these schools.[12]

12 The largest graded schools had 15 to 20 divisions, so the direct effect of having a stable subset of teachers, even on those pupils who stayed at the school for at least 5 years, may have been quite small.

Table 5 estimates similar regressions to those above, but with graded and common schools considered separately. One main message to take from this table is that the effects identified above when combining primary school types appear stronger for common schools than for graded, with teacher pay, class size, and lagged attendance having stronger marginal effects. We also think that the coefficients on class size for common schools suggest that difficulties in getting to school were not the largest problem in getting kids to attend. Schools in remote, less populated areas were likely smaller, with the median child having to travel further to attend school.

High School Entrance Examination Results

Our second, and more direct, measure of educational output are results from high school entry examinations. The Education Reports listed the number of candidates who passed the exam from each school in each academic year. Table 6 offers a statistical profile of high school entrance against student populations for graded and common schools.[13] The figures suggest that the growth of graded schools did play a role in facilitating high school entrance in British Columbia. Between 1900 and 1914, the number of common school students entering high school doubled; for graded schools, the figure increased ninefold. The proportion of students in graded schools also expanded in this period with about three times as many primary pupils in graded schools in 1914 as in 1900, while numbers in common schools were much the same at the beginning and end of the period.

Table 7 explores the determinants of success on the high school entrance examination. We have recorded the number of passing students per school in every year, and these figures fluctuate year on year, particularly for smaller graded and common schools. For this reason it is inappropriate to examine the high school entrance only in the years for which we have the full range of school and teacher characteristics. We have chosen to aggregate exam results over periods equal to the intervals between each cross section of school characteristics: 1900/01-1904/05, 1905/05-

13 Though we do not know what proportion of students passing the high school entrance exam took up places in high school the following year, we will refer to this outcome as high school entrance for ease of presentation.

1909/10, and 1910/11-1914/15. We then use enrollment figures at the beginning and end of each interval to calculate a crude proxy for the entrance rate into high school. This entrance rate is equal to the number of high school entrance exam passes over the five year interval divided by average enrollment at the beginning and end of the interval. This is far from ideal; one would really want to know the proportion of senior primary school children who pass the entrance exam. We know the number of children in each school only every five years, (some schools saw large increases in student numbers, or became graded schools over the interval) and we do not know the student age distribution. We do not claim that this is an accurate estimate of the "actual" proportion passing the entrance exam, but movements in this measure should be highly correlated with the ideal actual measure.

The findings in Table 7 are less consistent than in the attendance regressions, but some patterns worth noting emerge. The number of days schools were in session matter in all three regressions. One interpretation of this finding is that days lost due to teacher absence, climatic conditions, or other shocks had an adverse impact on preparations for high school entrance (but I think this is may be a small effect, and maybe not worth talking about...). Salaries matter in two of the three cross-sections, with teacher pay positively related to the proportion passing the entrance exam. Class size and the presence of a high school have little impact, but graded schools were more successful at getting students access to secondary education. Finally, attendance rates also seem to matter, with better attended schools sending more children to high school. Taken together with findings for attendance, this suggests that school structure and high school presence do some of the contribute to better continuation into high school partly through attendance, with a weaker additional direct impact on high school entry.

Table 8 presents high school examination regressions separately for graded and and common schools. The graded school model is much as what was estimated in Table 7; the common school regression is a linear probability model explaining whether any common school student

passed the entrance exam. The graded school results indicate that teacher compensation and attendance rates are important determinants of the proportion passing high school entrance exams. Class size and session days are significant only in one of three regressions. Findings for common schools are somewhat different. Teacher salaries appear less important, being significant (and of substantially smaller magnitude) in only one regression. Class size is consistently important, and has a positive sign. Larger classes might not have raised teaching quality, but larger numbers of students in the one-room school would increase the probability that at least one child present was able enough to get through to secondary school. Days in session have a small positive effect in all years. Attendance is significant only in regressions for 1905.

Conclusions and Future Work

Our study of schooling in British Columbia suggest that school characteristics were important determinants of the generation of human capital. Class size and teacher pay are significant determinants of school-level attendance rates. School structure also seems to matter, with graded schools promoting better attendance, conditional on location and the set of other school characteristics. One interpretation of this result is that more age appropriate education in a multi-room school increased the perceived return to school attendance. School and teacher characteristics also play a role in influencing who proceeded to high school. Teacher pay is positively correlated with high school entrance, as is the number of days school was in session. Better attendance schools sent more students on to secondary education. Graded schools appear somewhat more successful at getting children on the track to high school, even after conditioning for attendance (where these schools have a strong separate impact).

The research in this paper is preliminary. One of the things we still need to do is to fill in evidence on teacher qualifications from 1905/06 and 1914/15. We suspect that these will have little impact on attendance, but may be more important for high school entry. We also want to examine

teacher turnover more carefully. Research on primary school outcomes in Britain indicates that teacher turnover has an adverse effect of school outcomes, and high levels of turnover in British Columbia schools may have caused overall attendance to rise more slowly than with a more stable set of teachers. The best way to test this would be to draw data from consecutive years, where we are likely to have a much more mixed population of schools with the same teacher or a new teacher.

References

Goldin, Claudia (1998) "America's graduation from high school: the evolution and spread of secondary schooling in the twentieth century." *Journal of Economic History*, 58(2) pp. 345-374.

Goldin, Claudia (2001) "The human capital century and American leadership: virtues of the past." *Journal of Economic History*, 61(2), pp. 263-292.

Hanushek, Eric (1995) "Interpreting recent research on schooling in developing countries." *World Bank Research Observer*, 10(2), pp. 227-246.

Hanushek, Eric (1997) "Assessing the effects of school resources on student performance: an update." *Educational Evaluation and Policy Analysis* 19(2), pp. 141-164.

Hanushek, Eric, (2007) "School resources," in *Handbook on the Economics of Education*, eds. E. Hanushek and F. Welch. Amsterdam: Elsevier. (Forthcoming)

Kremer, Michael (2003) "Randomized evaluations of educational programs in developing countries: some lessons." *American Economic Review Papers and Proceedings*, 93(2), pp. 102-106.

Moehling, Carolyn (2004) "Family structure, school attendance, and child labor in the American South in 1900 and 1910." *Explorations in Economic History* 41(x) pp. xxx-xxx.

MacKinnon, Mary, and Chris Minns (2006) "Canadian school attendance in 1910: laws, costs, and family characteristics." Paper presented at 2006 CEA

Joel Perlmann and Robert Margo (2001), *Women's work? American schoolteachers, 1650-1920.* Chicago: U of Chicago Press.

Table 1: Public schools in British Columbia, 1900-1920

	1900	1905	1910	1914	1920
# High schools	5	13	23	36	53
# Graded schools	58	86	132	243	292
# Common schools	264	290	388	492	612
% districts with High School	10	31	43	85	96
% places with High School	10	13	17	22	30
% primary enrollment in Graded School	67	74	78	83	85

Table 2: School Characteristics, BC 1900-1920

	1900			**1905**			**1910**		
	High	Graded	Common	High	Graded	Common	High	Graded	Common
Mean # of divisions	3 (2)	4.9 (4)	1 (0)	2.9 (3.8)	4.6 (4.1)	1 (0)	3.2 (4.5)	5.6 (4.7)	1 (0)
Days in session	185 (45)	191 (29)	198 (34)	187 (16)	197 (17)	193 (30)	187 (16)	182 (23)	180 (32)
% teachers with academic certificate	97	9	9				96	12	7
% teachers with first class certificate		37	14					28	14
% second class certificate		41	51					37	17
% male teachers	92	32	43				78	24	29
Mean Enrollment	118 (88)	295 (247)	35 (22)	95 (138)	246 (244)	27 (13)	86 (133)	263 (242)	25 (13)
% boys	41	48	45	36	52	51	42	52	52
Average class size	36 (11)	60 (17)	35 (22)	30 (8)	50 (10)	27 (13)	22 (6)	44 (11)	25 (13)
Average monthly salary	100 (4)	55 (4)	51 (6)	104 (10)	60 (8)	52 (6)	118 (13)	73 (10)	63 (9)
Monthly salary/student	3.0 (1.2)	1.1 (0.3)	2.1 (1.1)	3.8 (1.1)	1.3 (0.3)	2.3 (1.1)	5.7 (1.4)	1.8 (.5)	3.1 (1.5)
% Attendance	62	66	58	73	69	61	74	72	62

Table 2, continued

	1915			**1920**					
	High	Graded	Common	High	Graded	Common			
Mean # of divisions	3.6 (5.0)	5.7 (4.5)	1 (0)	4.7 (5.1)	6.3 (5.5)	1 (0)			
Days in session	194 (14)	190 (20)	189 (23)	183 (4)	179 (18)	179 (19)			
% academic				92	9	5			
% first class					20	14			
% second class					49	40			
% male				57	16	16			
Enrollment	81 (124)	208 (186)	23 (10)	137 (173)	245 (233)	21 (10)			
% boys	46	50	54	40	51	51			
Average class size	25 (9)	35 (10)	23 (10)	25 (7)	35 (7)	21 (10)			
Average salary	131 (24)	78 (11)	72 (10)	169 (34)	104 (17)	21 (10)			
salary/student	5.2 (1.1)	2.5 (1.1)	3.8 (2.0)	7.0 (1.5)	3.0 (0.7)	5.2 (2.8)			
% Attendance	82	84	71	84	83	74			

Notes: standard deviations in parentheses

Table 3: Transition schools – common to graded

	Attendance rate	Average monthly salary	Average class size	N
1900 to 1905				
Common in 1900	58	57 (11)	58 (21)	21
Graded in 1905	70	58 (5)	46 (9)	
1905 to 1910				
Common in 1905	57	57 (5)	47 (15)	25
Graded in 1910	69	68 (8)	39 (9)	
1910 to 1914				
Common in 1910	59	67 (12)	41 (12)	45
Graded in 1914	78	70 (19)	32 (8)	
1914 to 1920				
Common in 1914	69	66 (26)	37 (12)	39
Graded in 1920	81	96 (15)	28 (6)	

Table 4 – Explaining attendance rates

	1905	1910	1914	1920
Log average pay* 100	.374 (4.71)	.250 (3.41)	.032 (0.63)	.153 (3.09)
Class size*10	-.033 (-5.52)	-.028 (-4.10)	-.031 (-4.92)	-.025 (-4.19)
% boys	.003 (0.06)	-.017 (-0.29)	-.098 (-1.65)	-.135 (-3.13)
Session days	-.001 (-1.77)	-.001 (-4.67)	.0001 (0.13)	.0002 (0.56)
Upgrade in period	.071 (2.76)	.084 (3.33)	.105 (6.01)	.090 (4.64)
Graded in earlier period	.020 (0.83)	.103 (4.10)	.106 (5.78)	.047 (2.87)
High school in "place"	.064 (2.18)	.009 (0.31)	.033 (1.63)	.011 (0.58)
Attendance rate in earlier period	.236 (4.10)	.178 (2.64)	.010 (0.20)	.160 (3.49)
District dummies	yes	yes	yes	yes
N	266	288	306	526
R2	.48	.42	.48	.32

Notes: The dependant variable is calculated as total actual days/(enrollment * total session days). T-statistics are in parentheses.

Table 5 – Explaining attendance rates: common versus graded schools

	1905		1910		1914		1920	
	common	graded	common	graded	common	graded	common	graded
Log average pay* 100	.490 (4.35)	.208 (1.85)	.348 (3.73)	.136 (1.19)	.139 (1.30)	.011 (0.21)	.215 (2.24)	.097 (2.29)
Class size*10	-.044 (-5.95)	-.001 (-0.08)	-.032 (-3.78)	-.004 (-3.28)	-.030 (-3.75)	-.034 (-3.04)	-.032 (-3.79)	-.021 (-2.53)
% boys	.018 (0.26)	-.057 (-0.97)	-.009 (-0.12)	-.062 (-0.92)	-.109 (-1.44)	.043 (0.32)	-.151 (-2.72)	-.200 (-2.55)
Session days	.0001 (0.22)	-.004 (-7.25)	-.001 (-3.41)	-.002 (-3.48)	-.0004 (-0.47)	.0004 (0.82)	.001 (1.23)	-.001 (-2.37)
High school in “place”	.092 (1.71)	.067 (2.06)	-.038 (-0.65)	.030 (1.04)	-.010 (-0.20)	.025 (1.36)	.031 (0.74)	.012 (0.89)
Attendance rate in earlier period	.217 (3.25)	-.128 (-1.05)	.157 (1.92)	.197 (1.61)	-.001 (-0.01)	.023 (0.35)	.173 (2.80)	.079 (1.36)
District dummies	yes	yes	yes	yes	yes	yes	yes	yes
N	195	71	201	87	181	126	311	214
R2	.28	.81	.32	.66	.35	.45	.24	.36

Notes: The dependant variable is calculated as total actual days/(enrollment * total session days). T-statistics are in parentheses.

Table 6: High school entrance, common and graded schools

Year	# passing entrance exam, common schools	# passing entrance exam, graded schools	# enrolled in common schools	# enrolled in graded schools
1900	69	162	9613	16674
1905	97	521	7693	21118
1910	76	953	10005	35131
1914	138	1483	9760	47217

Table 7 – High school entrance regressions

	1900-1905	1905-1910	1910-1914
Log average pay, earlier period	-.026 (-0.04)	3.85 (3.31)	2.75 (2.37)
Class size, earlier period	-.002 (-0.33)	.013 (1.13)	.0001 (0.06)
% boys, earlier period	-.391 (-0.54)	-.302 (-0.34)	-.374 (-0.42)
Session days, earlier period	.008 (3.39)	.009 (2.06)	.006 (1.59)
Upgrade in period	-.153 (-0.43)	-.568 (-1.33)	-.175 (-0.46)
Graded in earlier period	1.01 (3.09)	.325 (0.78)	.932 (2.26)
High school in "place"	.508 (1.25)	.009 (0.31)	.544 (1.31)
Attendance rate in earlier period	1.18 (1.42)	3.39 (3.15)	1.99 (1.97)
District dummies	yes	yes	yes
N	285	298	398
R2	.36	.40	.31

Notes: the dependant variable is the high school entrance "rate" described in the text:
exam passes over interval / ((enrollment at beginning of interval + enrollment at end of interval)/2).
T-statistics are reported in parentheses

Table 8: High School entrance regression, by primary school type

	Graded			Common		
	1900-1905	1905-1910	1910-1914	1900-1905	1905-1910	1910-1914
Log average pay, earlier period	5.67 (2.56)	6.72 (1.72)	12.6 (2.76)	-.042 (-0.32)	1.39 (3.05)	-.101 (-0.32)
Class size, earlier period	-.021 (-0.69)	.002 (0.03)	-.106 (-2.02)	.005 (2.46)	.005 (1.46)	.012 (4.48)
% boys, earlier period	-.480 (-0.31)	-.089 (-0.03)	-3.55 (-0.95)	.259 (0.88)	-.040 (-0.14)	-.097 (-0.42)
Session days, earlier period	.021 (1.98)	.033 (0.82)	-.006 (-0.34)	.003 (3.40)	.002 (1.56)	.002 (2.37)
High school in "place"	.250 (0.16)	.507 (0.33)	.885 (0.84)	.224 (1.04)	.037 (0.21)	-.061 (-0.41)
Attendance rate in earlier period	5.24 (1.47)	11.4 (1.84)	3.39 (0.58)	.615 (2.02)	-.087 (-0.27)	.310 (1.24)
District dummies	yes	yes	yes	yes	yes	yes
N	56	68	100	229	230	298
R2	.64	.45	.38	.38	.29	.23

Notes: the dependant variable is the high school entrance "rate" described in the text:
exam passes over interval / ((enrollment at beginning of interval + enrollment at end of interval)/2).
T-statistics are reported in parentheses