

Literacy skills of Canadians across the ages: Fewer low achievers, fewer high achievers

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In a recent study, David Green and Craig Riddell, economists at the University of British Columbia, investigate the distribution of literacy skills in the Canadian-born population and how those skills are generated.¹ They also investigate the nature of literacy generation in the years after individuals have left formal schooling and are in the labour market, and the relationship between literacy and income. This article summarizes the results of their study.

They find, as have other studies, that literacy increases strongly (though at a decreasing rate) with years of schooling. Parental education levels also have a strong positive impact on literacy, with the mother's education being especially important.

More surprising is their finding that younger Canadians have lower levels of literacy than older Canadians had, at the same age and level of education. This was particularly true for more highly educated individuals. For example, using data from the [International Adult Literacy and Skills Survey 2003](#), Green and Riddell report that, in 2003, a 35 year-old had approximately the same average literacy score as a 25 year-old in the same survey. This was not because the 25 year-old could expect to be at the same literacy level in 10 years, but because the 35 year-old had started from a higher literacy level at age 25 (that is, came from a more literate cohort) but lost some of their initial literacy skills during the time since they left school. This finding that older age cohorts graduated with higher literacy skills than younger people today holds across the age distribution.

Green and Riddell report that literacy plays a substantial role in terms of earnings generation. They find that a 25-point increase in the average literacy score has an impact on earnings that is equivalent to an extra year of schooling. They also find that about one-fifth of the typically measured impact of schooling on earnings arises because schooling generates higher levels of literacy.

The generation of literacy skills

Citing the work of Sen (1999),² Green and Riddell note that literacy skills play a fundamental role in enabling individuals to function to their full capability in society and in the economy. Without literacy, individuals cannot take a full and equal role in social and political discourse: they become less than equal members of society without the basic tools required to pursue their goals. Thus, they argue, in any attempt to build a better society, the distribution and generation of literacy is of fundamental importance. An individual who improved his or her literacy might be expected to have better employment opportunities and command higher earnings leading to a higher level of well being. From a societal point of view, a more literate workforce may be better

positioned to adjust to change and to adopt new technologies. Thus, improving literacy for individuals may have spill-over effects on the productivity of the economy as a whole.

To help frame their research, Green and Riddell describe a model of literacy generation. They begin at birth, when individuals start out endowed with two key characteristics: their ability and parental resources. By parental resources, they mean something quite broad, incorporating both parental income and parental willingness and ability to support their children's education and literacy acquisition. Pre-school children begin to acquire literacy based on these fundamental characteristics (ability and parental resources).

Once they enter school, those characteristics interact with characteristics of the school such as teacher quality, class size and the attitudes and abilities of peers. New additions to literacy with each year of schooling are then functions of ability, parental resources, school characteristics and the literacy level at the beginning of the period, with these influences interacting in complicated ways. These additions continue until the legal school-leaving age. After that point until the end of high school, students make a decision each year on whether to continue in school. That decision will be a function of ability, parental resources and school characteristics, again, but it is also likely to be a function of literacy acquired to that point. The more literate a student is, the less onerous they are likely to find school and, thus, the more likely they are to choose to stay an extra year.

Finally, after high school, whether an individual continues to go to school will be determined by a combination of their own decision to apply to continue and the decision of the college or university on whether to admit them. The latter decision will likely be a function of the student's literacy as reflected in his or her grades. Thus, schooling and literacy are jointly determined with extra years of schooling leading to increased literacy but increased literacy also leading to more years of schooling, especially after the legal school-leaving age. Individuals who do not expect to continue with school past the legal minimum may rationally under-invest in acquiring literacy skills while they are in school.

Once individuals leave school, literacy acquisition is likely to be more difficult. Literacy skills may be acquired on the job if they are needed for carrying out tasks at work but otherwise further acquisition would require active investment in non-work hours. Indeed, it seems quite possible that individuals could lose literacy skills after they leave formal schooling if those skills depreciate when they are not used.

The distribution of literacy skills

Green and Riddell find that literacy is considerably more equally distributed than income and further, that the level of literacy inequality in the Canadian-born population decreased between the time of the [IALS 1994](#) and the [2003 IALSS](#) survey (see [Box 1](#) for a description of the data). However, while there have been improvements in literacy at the low end of the literacy distribution, there has been a deterioration in those skills at the top end. The improvements appear mainly to result from an increase in the overall education level of the population. They also reflect improved literacy among high school dropouts. The authors observe that one possible explanation for their results is that schools are doing a poorer job of imparting literacy, but that

this is counteracted by the fact that successive generations have acquired more years of schooling. Other potential explanations would involve reduced literacy acquisition and/or use outside of school – in the home, in the workplace, and in daily activities.

Box 1: The data

The [International Adult Literacy Survey \(IALS 1994\)](#) sample contains observations on 5,660 individuals, while the [International Adult Literacy and Skills Survey \(IALSS 2003\)](#) is considerably larger, at 23,038 individuals. The focus of the research is on literacy generation in the Canadian economy. As a result, anyone born outside of Canada is excluded from both samples in order to focus attention on the Canadian educational system. Information on Aboriginal people was also excluded from this analysis, being reserved for a separate report. The surveys include individuals over age 16; students are excluded from the analysis reported here, since the focus is on the effect of completed schooling and what happens to literacy afterwards.

The declines in literacy levels at the top end of the distribution are especially evident among high school graduates, university graduates and graduates of non-university postsecondary education institutions. In fact, the research finds that successive birth cohorts have had poorer literacy outcomes at the top of the distribution. Green and Riddell suggest that this may point to an education system that is doing better for those at the low end but a poorer job of generating literacy for those at the top.

There is a general tendency for literacy skills to decrease with age. But, this effect differs for individuals with different levels of schooling. For individuals with a high school education or less, there was no ageing effect for those at the lowest literacy level, suggesting there is little loss with age of very basic literacy skills. For the university educated, the declines with age are evident across all literacy levels.

Parental education is strongly related to literacy, but in an interesting way: having parents who were high school dropouts had a strong negative impact on literacy but there was almost no contribution from parental education above high school graduation.

Post-school, work-related literacy acquisition

Green and Riddell also investigate a "use it or lose it" model of literacy, asking whether individuals who use literacy skills on their jobs maintain higher literacy levels. In the 2003 IALSS, the literacy-use-at-work questions asked about the frequency of performing reading, writing and mathematical tasks. For reading, questions were asked about five tasks. There were also questions on five writing tasks and five math tasks. For their analysis, Green and Riddell constructed measures indicating whether an individual responded that he or she performed four or five of the reading-related tasks at least once a week; similar measures were constructed for the writing and math tasks. Similarly, measures were constructed to indicate whether an

individual performed one to three of the tasks at least once a week for each of reading, writing and math and whether an individual reported performing all of the tasks only rarely.

The literacy-at-work variables indicated that those who used literacy intensively at work (who report performing four or more literacy tasks in a group at least once a week) had higher literacy. Performance of reading tasks and of writing tasks at work were highly correlated. The analysis found that a person who performed four or more reading and four or more writing tasks per week had approximately 3.7% higher literacy on average. At the other end, a person who rarely wrote or read at work had approximately 2% lower average literacy.

The study's authors observe that these effects are large enough to be noteworthy, but that they are not huge. They also note that their findings do not indicate the direction of causality – that is, it may be that more literate individuals are more likely to be employed in high literacy jobs or that high literacy jobs may help individuals maintain their literacy, or some combination of the two.

Math use is not as correlated with reading and writing literacy at work as the latter are with each other - of the people classified as reading rarely at work, only 43% say they also use math rarely. The analysis does not find a positive effect on literacy from using math often at work, but those who use math rarely have over 3% lower literacy.

Finally, the authors examine the relationship between literacy and occupation. They find that, compared to managers and related occupations, those in the professions, clerical and technical jobs all had similar literacy levels. Interestingly, so did skilled agricultural workers and craftsmen and trades workers. On the other hand, service workers, machine operators and labourers all had significantly lower literacy levels. Again, these effects are not huge. For example, the difference in average literacy between a manager and a labourer was 5%. This compares to a difference of over 30% between a person with 12 years of education and one with 16 years of education.

Overall, the authors conclude that while there are clear correlations between literacy use at work and average literacy levels, these are not large compared to the impact of years of schooling. They also find that being in a high literacy occupation does not seem to forestall the decline in literacy that comes with increasing age.

Conclusion

The research summarized here adds considerably to our understanding of the complex relationships that exist between schooling, literacy skills, ageing and the labour market. The research points to the important role that schooling plays in literacy acquisition, but only to a certain point. Education has played a particularly important role in raising literacy levels at the bottom end of the literacy distribution. However, there is evidence that recent postsecondary graduates do not achieve the same level of literacy at the upper end of the literacy distribution as did postsecondary graduates of previous generations.

Literacy skills tend to deteriorate with age. However, because older generations began at higher literacy levels initially, the deterioration they experience in those skills brings them closer to the literacy levels of younger generations. This finding, together with the powerful influence of education on literacy, leads Green and Riddell to conclude that schools may be doing a poorer job of imparting literacy at any given level but that this has been compensated by the fact that successive generations have attained higher levels of schooling.

Another interpretation of these results is possible. High school dropout rates have fallen considerably over the generations. Not only are much larger percentages of Canadians graduating from high school, much larger proportions are graduating with college diplomas and university degrees. This implies that the educational system has become more inclusive over time. Indeed, other studies have found that, compared to other countries, the gap in academic achievement between students from different socioeconomic backgrounds is comparatively low in Canada. Therefore it could be argued that the educational system has been serving a larger and more diverse student population. Further, it is argued that in order to be able to participate fully in society, individuals should function at least at a minimum acceptable level. Ensuring that the majority, if not all, Canadians meet this standard is an important goal of education.

At the same time, there are tradeoffs involved in achieving these goals. Meeting the skill needs of a larger and more diverse population is likely to imply less educational effort being devoted to those whose initial skills clearly exceed the minimum level, which could result in a deterioration of literacy skills at the top of the distribution. The tension between the twin goals of equity and excellence in academic achievement is one of long standing. The challenge is to work to achieve both, while not sacrificing one for the other.

References and notes

1. Green, David A. and W. Craig Riddell (2007). [Literacy and the Labour Market: The Generation of Literacy and Its Impact on Earnings for Native-born Canadians](#). International Adult Literacy Series. Statistics Canada Catalogue no. 89-552-XIE, no. 18.
2. Sen, A. (1999). *Development as Freedom*. New York: Anchor Books.