

Protecting Students Against the Effects of Poverty: Libraries

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Despite the current interest in school "reform," and despite the current movement to radically change schools and teaching, there is no evidence that school itself needs to change dramatically. There is no evidence that teachers these days are worse than they were in the past, that parents these days are more irresponsible than they were in the past, or that students these days are lazier than they were in the past.

Can schools improve? Of course. Nearly all educators work for improvement all the time. But we do not need "reform." We do not need radical changes in the structure of school, in teacher evaluation, teacher education, etc.

The main evidence for the claim that our schools have failed is the fact that American students have not done especially well on international tests of math and science. Studies show, however, that American students from well-funded schools who come from high-income families outscore nearly all other countries on these kinds of tests (Payne and Biddle, 1999; Bracey, 2009; Martin, 2009). The mediocre overall scores are because the US has a very high percentage of children in poverty, over 20%, compared to Denmark's 3% (http://www.nationmaster.com/graph/eco_chi_pov-economy-child-poverty). (1)

Our educational system has been successful; the problem is poverty.

How Poverty Hurts Children

More poverty means lower scores on all measures of school achievement (White, 1982). There are also many studies that show us just how poverty negatively impacts school performance:

- Children of poverty are more likely to suffer from "food insecurity," which means slower language development as well as behavioral problems (Coles, 2008/2009).
- High-poverty families are more likely to lack medical insurance or have high co-payments, which means less medical care, and more childhood illness and absenteeism, which of course negatively impacts school achievement. School is not helping: Poor schools are more likely to have no school nurse or have a high ratio of nurses to students (Berliner, 2009).
- Children of poverty are more likely to live in high-pollution areas, with more exposure to mercury, lead, PCB's (polychlorinated biphenyls) and smog, all of which influence health and learning, and often impact behavior as well (Berliner, 2009, p. 23; Martin, 2004).
- Children of poverty have very little access to books at home and in their communities, with less access to good public libraries and bookstores (Neuman and Celano, 2001).

Once again, school is not helping: Children of poverty attend schools with poorly supported classroom libraries and school libraries (Smith, Constantino, and Krashen, 1996; De Loreto and Tse, 1999; Duke, 2000; Neuman and Celano, 2001). Studies confirm that increased access to books is related to increased reading achievement (Lance, 1994; McQuillan, 1997; Krashen, 2004, Lindsay, 2010), which makes sense in view of findings that show that self-selected reading is a powerful predictor of reading achievement (McQuillan, 1998, Krashen, 2004).

Poverty is clearly the most serious problem. In fact, it may be the only serious problem in American education. What this brief review suggests is that when the problem of poverty is solved, when all children have the advantages that right now only middle-class children have, the "achievement gap" between children from high and low-income families will be closed.

What School Can Do

Until poverty is drastically reduced or eliminated, school needs to defend children against the effects of poverty. This means providing nutrition, health care, a clean environment, and books. For policy, this means continued and expanded support for free/reduced meal programs, increased school nursing care, and, of course, improved school and classroom libraries.

The dramatic impact of providing access to books

There is recent evidence suggesting that increasing access to books can not only help students enormously – it can even mitigate the effects of poverty on school achievement and literacy development. Four recent studies come to this conclusion.

Evans, Kelley, Sikora and Treiman (2010)

In a study of about 70,000 15-year olds in 27 countries, Evans, Kelley, Sikora and Treiman (2010) reported that controlling for parental education, fathers' occupation, and social class, young people in homes with 500 books stay in school three years longer than children in bookless homes.

Of great interest is the finding that the effect of books in the home was about the same as the effect of parental education, twice as strong as the effect of father's occupation, and stronger than the effect of standard of living, as measured by the GDP, or gross domestic product. In other words, the impact of access to books on school success is as strong as or is stronger than economic factors.

Schubert and Becker (2010)

Schubert and Becker (2010) studied 2810 children in Germany with similar backgrounds and examined their performance on the 2001 PIRLS test (given at age 9 or 10), the 2000 PISA test (given age 15) and on their parents' estimation of their literacy level before starting school.

The home print environment (number of books in the home) was a strong predictor of reading achievement, even when income, parental education, aspects of schooling, language used at home, and other aspects of the home environment were controlled. This was the case at age 10 and also at age 15. Again, of great interest to us: The home print environment was about as strong a predictor as SES.

Missing from both these informative studies is this: What about access to books from sources outside the home? What about libraries? Two current studies suggest that access to books in school libraries can also mitigate the effects of low SES (Achterman, 2008; Krashen, Lee and McQuillen, 2010).

Achterman (2008)

Achterman's analysis is based on scores on the California Standards Tests given in 2006-2007 provided by the State of California, the California Department of Education Library Survey, and other data provided by California schools. Tables 1 and 2 present the results of multiple regression analyses, which allows us to determine the impact of each predictor independent of the others, that is, with the others held constant (also used in the two studies reviewed just above). In tables 1 and 2, the impact of community, school and library factors on English language arts and social studies tests is presented. Examination of the beta's in the table shows the relative impact of each predictor on the test scores.

Table 1: English Language Arts: Betas

predictors	grade 4	grade 8	grade 11
community	0.8	0.76	0.51
school	0.23	0.17	0.14
library	0.04	0.13	0.46
r2	0.69	0.64	0.57

From Achterman, 2008, tables 51, 54, 60

Table 2: Social Studies (4)/US History (11): Betas

predictors	grade 8	grade 11
community	0.7	0.47
school	0.24	0.16
library	0.17	0.48
r2	0.6	0.56

From Achterman, 2008, tables 57, 63

Community factor = parent education, free and reduced lunch, ethnicity, percentage English learners
 School factor = average teacher salary; correlated with percentage of teachers credentialed
 Library factor = hours open, collection size, budget, total staff hours, total services, total technology

According to table 1, the strongest predictor of English language arts test scores in grade 4 is the community factor (beta = .8), which represents, to a great extent, the impact of social class. School makes a positive but more modest contribution (beta = .23) and the

library, while a statistically significant contributor, is much weaker ($\beta = .04$). The overall r^2 is .69, which means that if we know about community, school and library factors, this provides 69% of the information we need to predict the language arts test score. Of that 69%, the library provided less than one percent (.2%).

But the contribution of the library is stronger with older students, contributing 2% of the total effect in grade 8 and 19% in grade 11. By grade 11, the library is nearly as strong a predictor as the community factor for language arts, and is a slightly stronger predictor than the community factor for the 11th grade US History test.

Tables 3 and 4 present data highly relevant to this discussion – the correlations between the access variables "collection size" and "hours open" and performance on tests.

Table 3: correlations between access and English language arts test scores

	grade 4	grade 8	grade 11
collection size	.08 (.07)	.05 (.20)	.44 (.47)
hours open	.08 (.08)	.16 (.20)	.52 (.52)

From: Achterman, tables 44, 45, 47

Parentheses: controlling for SES (free & reduced price lunch)

Table 4: correlations between access and social studies test scores

	grade 4	grade 8	grade 11
collection size	.08 (.07)	.05 (.20)	.44 (.47)
hours open	.08 (.08)	.16 (.20)	.52 (.52)

From: Achterman tables 46, 48

Parentheses: controlling for SES (free & reduced price lunch)

The weaker correlations found for younger students could be due to lack of library services in lower grades in California, which results in limited variability and therefore lower correlations. Achterman notes that only 1.2% of California elementary schools have a full-time clerk and full-time librarian. This improves to 8.5% at the middle school and 30.3% at the high school level.

The PIRLS Study

The PIRLS organization (Progress in International Reading Literacy Study) administers a reading test to fourth graders in many countries every few years. Students are tested in the language of the country, and all tests are of equal difficulty. We (Krashen, Lee and McQuillan, 2010) analyzed the 2006 results for 40 countries, examining the impact of factors considered to be related to reading achievement.

Our analysis included countries for which complete data was available for all factors. Most countries tested about 4000 students from about 150 schools.

Table 5 presents the results. As in Achterman's study (see above), we used multiple

regression, which allowed us to determine the impact of each predictor uninfluenced by the other predictors.

Table 5: Multiple Regression Analysis: predictors of achievement on the PIRLS reading test

predictor	Beta	p
SES	0.42	0.003
SSR	0.19	0.09
Library	0.34	0.005
Instruction	-0.19	0.07
r2 = .63		

According to table 5, the strongest predictor of reading achievement among ten-year olds is SES, socio-economic class, defined here as a combination of education, life expectancy and wealth in each country (beta = .42). In agreement with many other studies, we found that higher SES meant better performance.

SSR in table 5 stands for the percentage of students in each country who participated in sustained silent reading programs in school: Students in countries that utilized more sustained silent reading tended to do better in reading (beta = .19). This result fell just short of the usual standard for statistical significance, but the positive relationship between SSR and reading proficiency is consistent with the results of in-school self-selected reading programs (Krashen, 2004).

Library, in table 5, means the percentage of school libraries in each country with over 500 books. This was a strong predictor of reading achievement (beta = .34). As was the case in Achterman's study, the library predictor was nearly as strong as social class (similar to Achterman's community factor).

The final predictor in table 5, instruction, means the average hours per week devoted to reading instruction in each country. According to our analysis, the effect of instruction was modest and negative, that is, more instruction tended to be related to lower performance on the reading test (beta = -.19). This predictor fell just short of statistical significance. It may be the case that a little reading instruction is beneficial, but after a point it is ineffective and counterproductive. (2)

Table 5 indicates that $r^2 = .63$: The four variables considered here account for 63% of the variability in reading test scores. In other words, if we know the SES level of a country, the percentage of children who do independent reading in school, the percentage of children who have access to a library of 500 books or more, and the amount of instruction, this is 63% of the information we need to predict their reading score. This r^2 is quite high, and is similar to the r^2 reported by Achterman.

The four studies reviewed here show that predictors related to access to reading material are strong and consistent predictors of reading test scores. This confirms a great deal of previous research, cited earlier. The four studies also strongly suggest that providing

access to books can, to at least some extent, make up for the effects of poverty on reading. As noted above, several studies confirm that children of poverty have little access to books at home or in their community; the school library may be the only source of books for these children.

A Proposal

It's never a good idea to make a proposal in education without talking about how to pay for it and I have a suggestion: Drop all standardized testing, with the exception of one test, an improved NAEP.

There is no strong empirical evidence to continue, let alone expand our testing program. The available evidence indicates that the massive amount of standardized testing currently done does not do any good and may be doing real harm (Kohn, 1999) and the expansion of testing currently planned by the US Department of Education promises to make things worse. Increased testing does not improve achievement (Nichols, Glass, and Berliner (2006) found no relationship between testing "pressure" in 25 states and achievement on NAEP math & reading) nor does standardized testing do a better job than grades alone in predicting later achievement: Two different studies found that high school grades were a good predictor of college success, and that adding SAT scores did not improve the predictive power of grades (Geiser, and Santelices, 2007; Bowen, Chingos, and McPherson, 2009).

These studies as well as common-sense tell us that teacher evaluation does a better job of evaluating students than standardized testing does: The repeated judgments of professionals who are with children every day is more valid than a test created by distant strangers. Moreover, teacher evaluations are "multiple measures," are closely aligned with the curriculum, cover a variety of subjects, and are "value-added," that is, they take improvement into consideration.

For those who argue that we need national standardized tests in order to analyze student achievement over time and to compare subgroups of students, we already have an instrument for this, the NAEP. The NAEP is administered to small groups who each take a portion of the test every few years. Results are extrapolated to estimate how the larger groups would score. No "test prep" is done, as the tests are zero stakes. Our efforts should be to improve the NAEP, not start all over again, and go through years of expensive d fine-tuning with new instruments.

If we are interested in a general picture of how children are doing, this is the way to do it. If we are interested in finding out about a patient's health, we only need to look at a small sample of their blood, not all of it.

The money saved by vastly reducing standardized testing can be invested in improving libraries in high-poverty areas: If we do this, we will be investing in solving the problem, not just measuring it.

Notes

1. Other reports arrive at similar figures using different methodologies, e.g. UNICEF, 2007. *An Overview of Child-Well Being in Rich Countries*. UNICEF Innocenti Research Centre, Report Card 7. The United Nations Children's Fund). Tienken (2010) cites studies showing that a myriad of additional factors operate that artificially depress American students' scores on international tests, including exclusion of high-poverty students by some countries (the US samples 98% of the student population) and test content (e.g. 23% of the 1999 TIMSS math test assumed knowledge of calculus).
2. The negative relationship between instruction and reading proficiency could be a result of schools offering more instruction to those who need it most. The result is, however, also consistent with reports showing little or no effect of intensive reading instruction on tests that require children to understand what they read (Garan, 2001; Krashen, 2009).

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