



## Schooling Effects in a Difficult Environment: the Case of the Palestinian West Bank

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### Abstract

*Schooling is considered the major factor underlying the development of cognitive abilities. However, the possible variability of schooling effects between educational systems has been ignored. The aim of this study was to estimate, for the first time, the combined effect of poor schooling quality, students' low ABS level and unfavorable contextual variables on the magnitude of the schooling effect on children's cognitive development. For this purpose, the study was conducted in the difficult environment of the Palestinian West Bank, where people face sociopolitical and economic adversities, unresolved conflict, mass violence and uncertainty regarding the future of the region. Specifically, the study was conducted in the two subsystems comprising the public Palestinian educational system of the West Bank: UNRWA and Government. Both subsystems suffer from low quality of schooling (poor infrastructure, over crowdedness and teachers' lack of motivation, etc.) and serve students with low ability to benefit from schooling (students' ability to benefit from schooling is negatively affected by poverty, parental depression and traditional beliefs about children's role in the family, as well as by the violent political conflict surrounding them).*

*The study was conducted in 2013 in a sample of 100 schools (33 male schools and 67 female schools) and 6000 grade 5 – 9 students (1980 males and 4020 females). Cognitive ability was measured by three major tests (verbal, numerical, and figural). The findings presented here are restricted to girls' schools. For each participant, three subtotal scores, one for each test type, and a total score were computed. Each of the three test scores, as well as the total scores, had high internal consistency reliability, high within-grade inter-correlations and increased systematically with age, thereby satisfying the basic validity requirements. The effects of schooling on the cross-sectional increase in mean subtest (verbal, numerical, figural) and total scores were estimated by means of the quasi-experimental between-grade regression discontinuity design.*

*The results indicate that difficult contextual conditions, such as poverty, political oppression, and military restrictions, are likely to attenuate to a considerable extent the effects of both schooling and out-of-school experiences on children's cognitive development, thereby slowing down this developmental process.*

### 1. Introduction: Variability of Schooling Effects

All the studies on the effect of schooling on cognitive development conducted during the last 25 years support the conclusion that schooling is a major factor underlying children's cognitive development [e.g., 1; 2]. Most of these studies have been conducted in stable, free, and generally supportive Western environments. Yet, the effect of schooling on cognitive development cannot be fully understood outside its cultural, social, political, and economic context. Differences in the characteristics of schooling, the characteristics of students and the dissimilarity between the cultural, social, political, and economic context in which the school systems operate may result in differential educational effectiveness and in differential effects of schooling on cognitive development [3;4]. According to the suggested conceptual model, this variability reflects differences between systems in either or both of two critical factors: (1) the quality of schooling; and (2) the student population's ability to benefit from the schooling (ABS) provided to them. The diagram in Figure 1 illustrates the hypothesized causal relations between the factors assumed to affect, either directly or indirectly, the magnitude of the effect of schooling on cognitive development. For further explanation of these factors see [4].

This theoretical model leads to the expectation that educational systems characterized by unfavorable individual, family, and contextual life conditions – and, therefore, also by low quality schooling and low mean ABS – will have weaker effects on children's cognitive development than educational systems characterized by more favorable conditions and, therefore, also by higher quality schooling and higher mean ABS. The purpose of this study is to empirically examine this hypothesis.

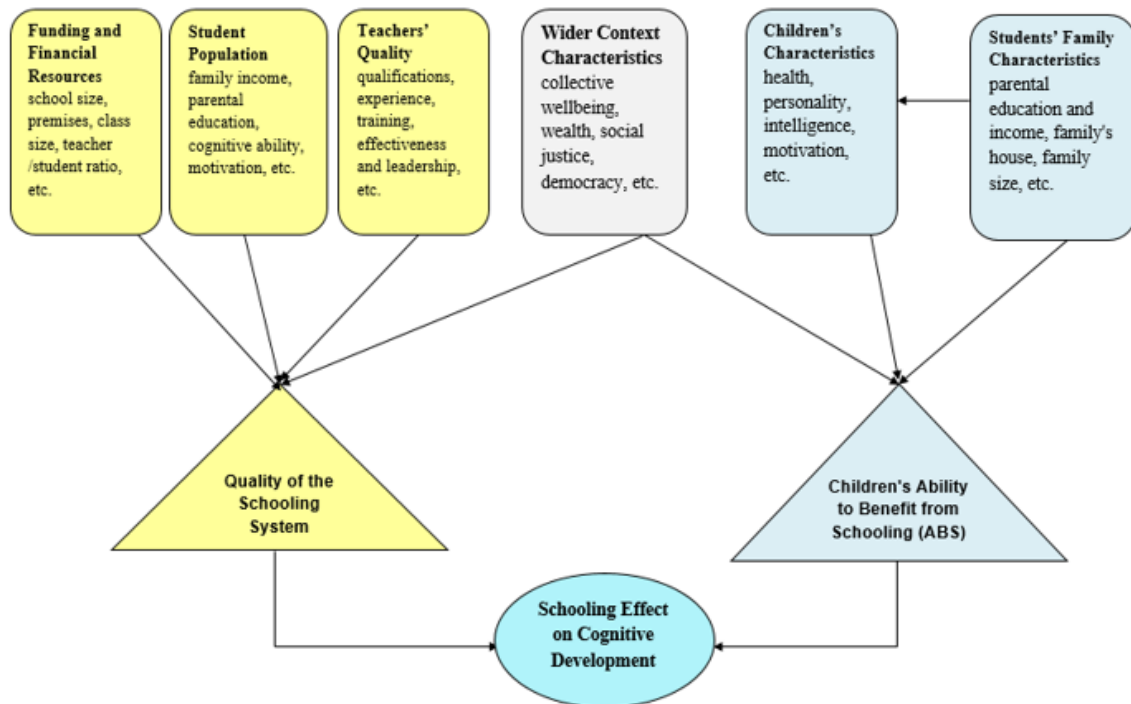


Figure 1. The factors affecting the effect of schooling on children's cognitive development according to the study's theoretical model.

For this purpose, the study focuses on the educational system of the Palestinian West Bank, an illustrative case of under-resourced schools in a disadvantaged community.

## 2. The Palestinian School System in the West Bank

The Palestinian school system in the West Bank is divided into three subsystems differing in their individual and school characteristics: (1) The Government (public) subsystem, operated by the Ministry of Education (79% of the schools); (2) the UNRWA subsystem, operated by the United Nations Relief and Works Agency for Palestinian Refugees (5% of the schools); and (3) private schools, operated by various charities, Islamic organizations or Christian churches (16% of the schools) [7]. This study focuses on two of the three educational subsystems in the West Bank: the UNRWA and Government subsystems.

**Quality of schooling.** Both UNRWA and Government schools lack resources, infrastructure, adequate classroom space, recreational areas and sanitation facilities. Teachers in both school systems struggle with increasing challenges: overcrowded classes, lack of discipline and low salaries. They lack motivation and professional commitment and many of them have second jobs [8]. This results in higher teacher burnout, which harmfully affects the quality of schooling. The quality of West Bank schooling is also negatively affected by the conservative patterns of teaching [8]. The schools' environment is stressful and corporal punishment, humiliation and collective punishment are common [6].

**Students' ability to benefit from schooling.** Palestinians in the West Bank face sociopolitical and economic adversities, unresolved conflict, mass violence and uncertainty regarding the future of the region. Many Palestinian parents and adults suffer from high rates of traumatic stress disorders comorbid with major depression. Nearly all (97%) Palestinian students in refugee camps and 48% of Palestinian children have reported experiencing and witnessing varying levels of violence. Therefore, children show several symptomatic traumatic behaviors, such as withdrawal from social life, aggressiveness, hyperactivity, sleeping difficulties, and low school achievements.

In conclusion, the quality of schooling and the student population's ABS is low in both UNRWA and Government schools.



### 3. Method

#### 3.1 Target Population and Sample

The target population of the study consisted of all fifth to ninth graders attending gender-segregated Government and UNRWA schools in the West Bank which included all of these grades in the 2012-13 school year. A stratified random sample of 100 schools (out of the total population of 463 schools) was selected from the three educational regions of the West Bank.

#### 3.2 The Cognitive Test

Cognitive development was measured by three major cognitive ability tests (verbal, numerical, and figural) used in [1], each consisting of several subtests covering a wide range of content (e.g., analogies, series, sentence completion, vocabulary).

**Test administration.** School counselors administered the entire test battery to the students as a group, in school during May 2013. The tests were given in a fixed order in a single, two-hour session with a 15-minute break.

**Cognitive test scores.** For each participant, three subtotals, one for each test type (verbal, numerical, figural), and a total score were computed. In order to allow for between-test comparability, these scores were standardized using the 5<sup>th</sup> grade mean and the pooled within-grade standard deviation.

### 4. Estimation of the Schooling Effect on Cognitive Development

**The between-grades paradigm.** If schooling were the only causative factor affecting cognitive development, then the magnitude of its effect would be identical to the extent of development and would obtain directly (in a cross-sectional study) from the mean difference between adjacent ages in mean cognitive test scores. However, the causal model underlying cognitive development is more complex: schooling is not the only factor fostering cognitive development. Cognitive development during childhood and adolescence, like development in other domains, is primarily due to physical, physiological and psychological maturation. In addition, *cognitive* development is strongly affected by daily experience, interaction with others and informal learning, jointly represented by chronological age. Thus, the causal model underlying cognitive development includes two factors: chronological age (and the associated psycho-physiological development, life experience, and out-of-school learning) and schooling. Furthermore, these two factors are inexorably interrelated due to the compulsory nature of schooling (at least at the elementary level) in modern societies: older children are typically enrolled in higher grades and vice versa. This inextricable interdependence precludes straightforward disentangling of the unique contributions of chronological age and schooling to cognitive development. The quasi-experimental between-grade regression discontinuity approach [1] provided a satisfactory solution to this problem and has been repeatedly used for this purpose since its suggestion. This approach was also adopted in this study to disentangle the independent effects of schooling and age on the overall cross-sectional increase in mean subtest (verbal, numerical, figural) and total scores. This approach relies on the assumption that grade level is solely a function of chronological age; that is, admission to school is based on chronological age only, according to some arbitrary cut-off point, and progression through grades is automatic (i.e., there are no drop-outs and children are neither kept back nor advanced a grade). If this assumption holds true, then the net effects of age and schooling are estimated by means of a between-grade regression discontinuity design [1], in which test scores are regressed on chronological age within grades. In this design, the effect of age is reflected in the slope of the within-grade regression of test scores on chronological age, and the effect of schooling is reflected in the discontinuity between these regressions (see Figure 2).

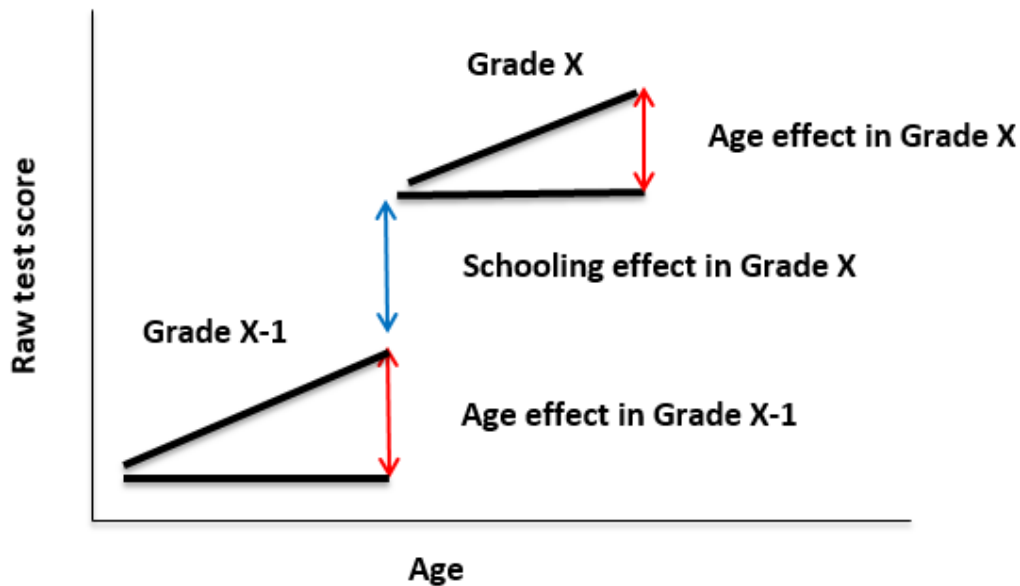


Figure 2. The effects of age and schooling in the between-grades regression discontinuity design.

Specifically, the estimated effect of a one-year difference in chronological age in a given grade equals the difference between the oldest and youngest students in that grade in mean scores, and the estimated effect of one year of schooling equals the differences in mean scores between the youngest children in any given grade (X) and the oldest children in the lower adjacent grade (X-1).

**The truth of the assumption.**

The assumption that grade level is solely a function of chronological age is only partially true. First, because of the official rule for admission to 1<sup>st</sup> grade in the West Bank school system, which allows for some flexibility regarding the January-born<sup>1</sup> children. Secondly, because the implementation of the admission rule in the West Bank school system, like in other school systems, is not universal, resulting in grade misplacement. In order to cope with this problem, three groups of subjects were excluded from the computation of the within-grade regressions: (a) all children born in January (b) students who were under- or over-aged; and (c) students born in February, where the proportion of missing students is highest.

**5. Results**

The results presented here are restricted to girl’s data. . The estimated effects of one year of age and one year of schooling for girls are presented in Table 1.

Table 1  
Estimated Effects of 1 Year of Age and 1 Year of Schooling in Grades 5-9 (Girls only)  
(SD units)\*

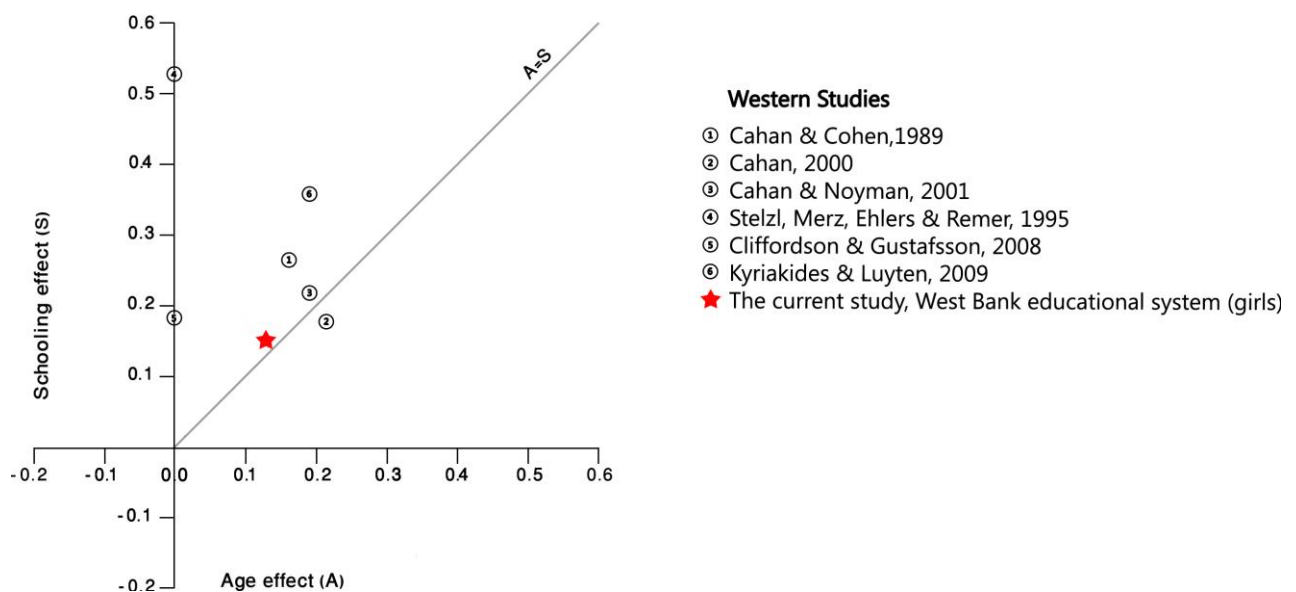
Test	Age Effect	Schooling Effect
<b>Verbal</b>	0.12	0.15
<b>Figural</b>	0.08	0.14
<b>Numerical</b>	0.13	0.09
<b>Total</b>	<b>0.12</b>	<b>0.15</b>

As evident in Table 1, schooling has a positive effect on girls’ cognitive development in the West Bank. All measures of cognitive ability are positively affected by schooling, by comparable amounts. These findings are in agreement with previous studies with a similar methodological design. However, the average magnitude of the effect of one year of schooling, which in this study ranges from 0.09 SD to

<sup>1</sup> According to the official rule, the range of normative birth dates for admission to first grade in any given school year Y (e.g., 2008) is 13 (rather than the customary 12) months, from January 1st of the year Y-6 (i.e., 2002) to January 31st of the following year (i.e., Y-5 = 2003).

0.15 SD across subtests with a median of 0.14 SD, is considerably smaller than the effect found in most of the previous studies, which were conducted in developed, stable, and generally supportive contexts. (see Figure 3).

Furthermore, the schooling effects obtained in this study are lower than the corresponding estimates obtained in previous studies also in terms of relative magnitude (i.e., relative to the corresponding effect of age). Unlike most of the previous studies, where the effect of schooling is considerably larger than the effect of age (see Figure 3), the schooling effect obtained in this study roughly equals the effect of age. This finding is particularly noteworthy in view of the fact that the median effect of age in this study (0.12 SD) is lower than the age effects typically found in previous studies (see Table 1 and Figure 3). Thus, the lower absolute effect of schooling found in this study is not compensated for by a higher effect of age. On the contrary, our findings suggest that harsh realities in a difficult environment are not only detrimental to the effect of schooling on cognitive development, but also weaken the contribution of chronological age (and the associated maturation and everyday out-of-school experience and learning) to children's cognitive development, thereby slowing down the developmental process.



## 6. Conclusion

The findings of this study support the conclusion that living in substandard conditions is highly consequential for the effects of both schooling and out-of-school experiences on children's cognitive development. It attenuates both effects and, therefore, impairs the developmental process.

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