

# NUMEROLOGY OVER NUMBERS? THE EFFECTS OF RELIGIOUS EDUCATION ON EDUCATIONAL ATTAINMENT

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## INTRODUCTION

One of the longest-running debates in education policy is between public vs. private schools. While private-schooling advocates are a diverse group, the primary advocate of private schooling tends to be concerned about the quality of religious education they want their child to attain. Advocates of religious education claim that religious education actually results in better educational outcomes for their children. While religious schools typically outperform their secular brethren, there is ample evidence that such is an illusion and the opposite effect is present. For example, Elder and Jepsen (2014) finds that American Catholic schools do not provide an educational boost, and in fact provide a malus to some areas, explaining the perceived effect by selection effects. However, the truth any claim about this topic is difficult to verify, as private schooling tends to outperform public schooling regardless of affiliation, and religious schooling tends to be private.

One country that differs in this regard is Israel. As a country with a state religion, Israel operates both secular and religious public schools, which have been criticized in the past for neglecting rigorous education for religious (“As religious schools in Israel grow, maths is neglected” 2022). Measuring the difference in educational attainment of children enrolled in Israeli religious public schools compared to their secular peers could provide a better estimate of the effect of religious education than studies that focus on private systems, which replaces math and science with biblical studies and prayer classes.

## METHODOLOGY

The core question is the effect of the student being in a religious public school on their examination scores. We will seek to find two values, one, the average treatment effect (ATE) of the student being in a religious public school on their score, and two, change in probability that the student will have a dramatically low or dramatically high score. We will employ ordinary least-squares (OLS) regression to answer the first question, as OLS should provide a good assessment of the ATE (Huntington-Klein 2021). For the second question, we will employ logistic regression, as it is robust to outliers and is directly interpretable for a binary dependent variable. We will employ robust standard errors, but non-clustered as the treatment is at the clustered level.

Some alternative variables that might explain test scores of students are socioeconomic status, the size of their class, their school only having a single class, and their sex (Krueger 1999). The first and third of those are weakly positively correlated with religious schooling, but also completely uncorrelated with test scores. The second is weakly negatively correlated with test scores. I will introduce two alternate specifications of covariates: one controlling

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for demographics and the other for demographics and school/class sizes. Additionally, I will look at the components of total test scores to see if there is a divergence in the effect on language versus mathematics skills.

## RESULTS

Regressing on total test scores, it becomes apparent that the specification of covariates determines the sign of the regression coefficient of our indicator for the religiosity of the school. A regression with no covariates finds a statistically-significant ATE of  $\sim -1.0$  to the total test score, whilst controlling for demographic factors and for demographic factors and class size factors finds a statistically-significant ATE of  $\sim -0.4$ . The full results are in table 1. It became apparent to me that coefficients for the treatment effect while regressing on the component scores merely added up to the total coefficient of the ATE, and so I decided against presenting those alternative regressions.

TABLE 1. Total test scores

	(1)	(2)	(3)
Religious public school	-1.022*** (0.0890)	0.362*** (0.0978)	0.406*** (0.0991)
Socioeconomic status of school		-0.0946*** (0.00342)	-0.0936*** (0.00344)
Male		-0.350*** (0.0695)	-0.349*** (0.0695)
Small class			0.390 (0.263)
Single-class school			-0.383** (0.133)
Constant	51.53*** (0.0384)	52.68*** (0.0590)	52.68*** (0.0592)
Observations	50726	49417	49417

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

For the logistic regression of bottom-decile scores, similar results were apparent. We find a statistically-significant increase in the odds ratio by  $\sim 1.4$  for the uncontrolled regression, whilst introducing our various control schemes reduces the odds ratio by  $\sim 0.5$ . For the logistic regression of top-decile scores, coefficients were smaller but still significant. Regression results for both are available in table 2 and table 3, respectively. These results do not contradict the previous regression.

My results essentially show that the religious affiliation of an Israeli public school is a small but negative factor in student performance. The reversal and shrinkage of the coefficient of

TABLE 2. Bottom-decile scores

	(1)	(2)	(3)
Religious public school	0.340*** (0.0318)	-0.0740 (0.0396)	-0.0859* (0.0403)
Socioeconomic status of school		0.0252*** (0.00115)	0.0249*** (0.00116)
Male		0.160*** (0.0292)	0.160*** (0.0292)
Small class			-0.0191 (0.0974)
Single-class school			0.0906 (0.0476)
Constant	-2.183*** (0.0166)	-2.550*** (0.0263)	-2.551*** (0.0263)
Observations	51250	49895	49895

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ 

TABLE 3. Top-decile scores

	(1)	(2)	(3)
Religious public school	-0.0914 (0.0498)	0.0957 (0.0541)	0.0753 (0.0548)
Socioeconomic status of school		-0.0143*** (0.00208)	-0.0147*** (0.00207)
Male		0.0154 (0.0410)	0.0148 (0.0411)
Small class			0.0774 (0.144)
Single-class school			0.141* (0.0697)
Constant	-2.926*** (0.0228)	-2.794*** (0.0369)	-2.801*** (0.0369)
Observations	51250	49895	49895

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

our treatment upon control suggests to me that it makes up a very small part of the data-generating process for the ATE, which is almost equal to the uncontrolled ATE. However, the odds ratio found by logistic regression on low scores suggests to me that religious participation is a factor in landing in the lowest percentile. However, in general, the results found suggest that the model used is very much incomplete.

Interestingly, in none of my regressions were class and school size significant. This effect suggests to me that religious schooling already captures the same causal pathway in the regression.

## CONCLUSION

My results suggest that the wrong model is being used to examine the problem. Although there is a small and significant effect, it reverses under covariate controls, which suggests to me that the variable setup cannot explain the variation.

However, this small difference in the third grade could be compounding. The Israeli government should setup studies on pupils to generate cross-sectional data to measure both the educational and economic effects of this schooling type. As the Haredi population of Israel grows, the proportion receiving a worse education will grow, which could have disastrous effects if, for example, the curriculum neglects advanced studies that matter in a modern economy like Israel's.

This study leaves several areas open for research in general. First, the study was conducted on third-grade pupils. It is possible that any effect of religious education has not taken hold by then, and thus a study on later pupils (hopefully with cross-sectional data, as mentioned) could better understand the effects. Additionally, more can be done to understand the proper control scheme, especially for demographics. This unique division in Israeli public schooling also seems ripe for some sort of difference-in-difference study, if an occasion occurs were such a selection can be found. As the Haredim gain more influence over policy in Israel, the differences between the schools will grow, and perhaps so too the observable effects.

## REFERENCES

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