Siqi Wang

New York, NY | 646-318-8903 | sw5178@nyu.edu | Website

This writing sample is an individual assignment that I completed for the "Estimating Impacts in Policy Research" course in Spring 2023. The assignment required coding in STATA, conducting statistical analyses, creating tables and charts, and composing this report. The intended audience for the memo was policy analysts at the Department of Education.

Title

Estimating the Impact of the "Down with Punitive Discipline" Program on School Suspensions in New York City Public Schools (2009 - 2017)

Introduction

Punitive school discipline may prevent students from accessing adequate education and increase the risk of ending up in prison, disproportionately impacting children of color. This study evaluates the "Down with Punitive Discipline" (DPD) program, which offers training to school principals on conflict de-escalation and promoting restorative justice. The goal is to assess whether the DPD program had an impact on students' suspensions in the New York City (NYC) public school system.

Methods

This study conducts a longitudinal panel analysis to assess the impact of the DPD program on the average rate of student suspensions across 22 administrative districts in the NYC public school system from 2009 to 2017. Data are obtained from the NYC Board of Education, featuring annual district-level totals of student suspensions from 2009 to 2017. The study measures outcomes using the log-transformed probability of suspensions and determines the treatment effect based on the presence of the DPD program in a district from 2009 to 2017. It begins by presenting descriptive statistics to compare districts that adopted the DPD program with those that did not. This comparison involves using one-way ANOVA tests and plotting time trends. The study also employs simple bivariate regression for preliminary insights. To address potential district-specific and time-specific effects, it includes a district fixed-effect regression model, as well as a district and time fixed-effect regression model. The analysis uses STATA version 17, applies robust adjustments, and reports statistical significance at the .01, .05, and .1 levels.

Results

Descriptive Statistics

Table 1 presents a summary of the overall and annual average number of suspensions from 2009 to 2017. Among the 10 districts that ever had the DPD program at some point, the average number of suspensions was 1976.69. This figure is 261.14 suspensions lower than the average for the 12 districts that never implemented the DPD program. However, the difference is not statistically significant. This discrepancy may stem from the fact that schools participating in the program had different profiles compared to those that did not. Students in lower-income schools, often facing resource constraints and lacking support to navigate life challenges, are more likely to experience higher rates of school suspensions and may be more inclined to participate in the DPD program (Commonwealth Institute, 2017). Both Table 1 and Figure 1 illustrate a downward trend in average suspensions over time across both groups of districts, suggesting a broader trend influencing suspension rates.

Regression Analyses

To enhance interpretability, this study uses the natural log of suspensions as the dependent variable in all regression models, with the coefficients converted to percent change using the formula: percent change = $(e^{\beta_{DPD}} - 1) * 100$. According to Model 1 in Table 2, the implementation of the DPD program is, on average, associated with a 37.4% reduction in the likelihood of suspensions. This finding is statistically significant at the 0.01 level. However, this estimate is likely to be influenced by omitted variable bias. Incorporating some time-invariant omitted variables via fixed effects, Model 2 in Table 2 shows a more pronounced association: a 53.14% average decrease in suspension likelihood with statistical significance. This suggests a downward bias in Model 1, indicating that the relationship between the omitted variables and both the propensity to join the DPD program and the likelihood of suspension is positively correlated. For instance, lower-income schools, often experiencing higher suspension rates, are more frequently encouraged to participate in the DPD program. Model 3 in Table 2, which accounts for time-fixed effects, presents a different picture. Here, the impact of the DPD on suspension likelihood drops to an average decrease of 9.94%, losing its statistical significance. This shift implies an upward bias in Model 2's coefficient for DPD. Meanwhile, year coefficients from 2013 to 2017 are negative and statistically significant, suggesting that the time-fixed effect is inversely related to suspensions but positively correlated with DPD participation. This could capture variables that were constant across districts but changed over time, such as a city-wide law implemented by the NYC government to curb excessive suspensions or a general shift in attitudes towards reducing student suspensions.

Conclusions

There is not sufficient evidence to demonstrate that the DPD program itself directly influenced school suspension rates from 2013 to 2017. Rather, the data suggests a broader, city-wide trend impacting the suspension rates across NYC districts. It's important to note, however, that the effects of this trend may not be uniform across all districts.

Limitations

This study faces several limitations that affect the interpretation of its conclusion. First, the statistical power may be limited because only 22 districts over an 8-year period are included in the dataset. Second, omitted time-varying fixed effects within a district and district-varying time effects within a period might have biased the estimates of the analysis, thereby threatening the internal validity. For instance, as principals in a district gain experience, their improved strategies for fostering positive school environments could simultaneously reduce suspension rates and increase the likelihood of DPD program participation. Third, the focus on districts that participated in the DPD program limits the study's generalizability to other school regions, particularly since these districts are likely self-selected. Fourth, relying on suspension rates as the primary measure might not fully capture the DPD program's impact, given that suspensions can be influenced by a multitude of factors beyond the scope of a principal's conflict resolution skills. Lastly, this research did not investigate the specific events leading to the observed trend of decreasing school suspensions in NYC. Future research may investigate these events and their potential relationship with the DPD program's implementation.

Table 1. Descriptive Statistics for Districts that Ever Took and Never Took DPD Program:
New York City (2009 - 2017)

Variable		Districts that Ever Took DPD Program (n=10) Mean (SD)	Districts that Never Took DPD Program (n=12) Mean (SD)	P value
Number of Suspensions (2009 - 2017)		1976.69 (2176.47)	2237.83 (905.27)	0.36
Number of Suspensions (Yearly)	2009	2975.2 (1210.83)	3234.33(2848.15)	0.79
	2010	2186.2 (963.05)	2383 (2354.30)	0.81
	2011	3474.1 (1966.95)	3809.08 (3572.11)	0.79
	2012	2451.9 (1487.47)	2838 (3025.45)	0.72
	2013	1694.5 (719.20)	1827.67 (1924.31)	0.84
	2014	1581.5 (762.66)	1798.83 (1781.26)	0.72
	2015	1442.3 (616.71)	1813.67 (1682.20)	0.52
	2016	1140.1 (690.78)	1414.17 (1429.89)	0.59
	2017	844.4 (496.277)	1021.75 (1168.45)	0.66
Note. DPD = Down with Punitive Discipline program. Standard deviations are in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$ for ANOVA test of no difference between the mean of suspensions.				

Figure 1. Mean Suspensions for Districts that Ever Took and Never Took DPD Program (2009 - 2017)
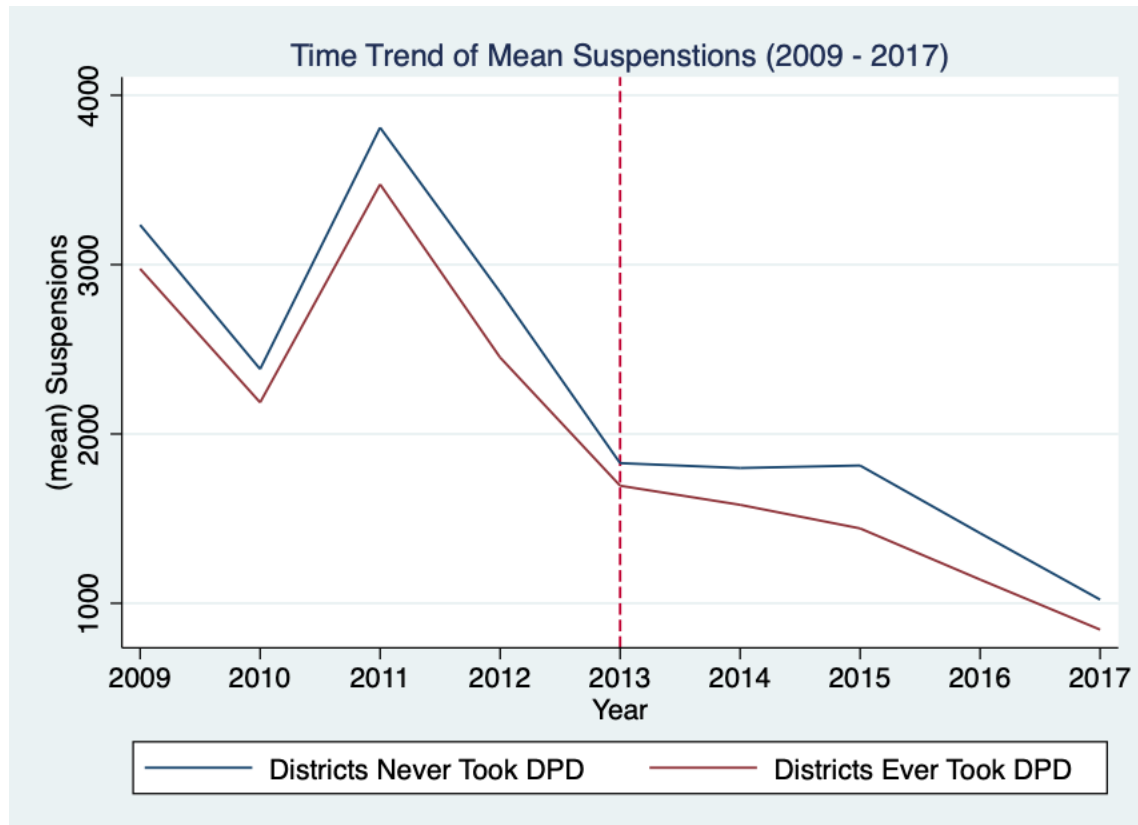
Table 2. Logged Suspension Rates: Ordinary Least Squares (OLS) and Fixed-Effects Regression Results for NYC School Systems (2009 - 2017)

Variable	Model 1 Simple Bivariable Regression	Model 2 Fixed Effects Regression	Model 3 Fixed Effects Regression
DPD	-0.468***	-0.758***	-0.104
	(0.106)	(0.051)	(0.072)
2010			-0.322***
			(0.047)
2011			0.136**
			(0.057)
2012			-0.219**
			(0.085)
2013			-0.589***
			(0.095)
2014			-0.592***
			(0.089)
2015			-0.622***
			(0.077)
2016			-0.889***
			(0.083)
2017			-1.228***
			(0.096)
Constant	7.488***	7.552***	7.888***
	(0.0575)	(0.011)	(0.059)
Observations	198	198	198
R-squared	0.075	0.301	0.842
Number of District	22	22	22
District FE		YES	YES
Year FE			YES
Note. DPD = Down with Punitive Discipline program. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1			

Reference

[1] The Commonwealth Institute. (2017, November 26). *Unequal opportunities: Fewer resources, worse outcomes for students in schools with concentrated poverty.*
https://thecommonwealthinstitute.org/research/unequal-opportunities-fewer-resources-worse-outcomes-for-students-in-schools-with-concentrated-poverty/