Strictly speaking: Examining teacher use of punishment and student outcomes

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March 18, 2022

Motivation

- Extant research has identified a variety of negative academic and long-run effects from exclusionary discipline (Chu & Ready, 2018; Lacoe & Steinberg 2018; Novak, 2019; Bacher-Hicks et al., 2019).
- Exclusionary discipline leads students to disengage with school (Pyne, 2019) and, troublingly, exhibits racial bias in its use (Skiba et al., 2011; Barrett et al., 2021; Shi & Zhu, 2021).
- Scholars have begun to examine school-related factors that shape the use of discipline.
    - Teacher diversity reduces Black-White gap in referrals (Lindsey & Hart, 2017)
    - Principal variation in use of punishment (Sorensen et al., 2021)
    - Policies on use of exclusionary punishments (Craig & Martin, 2019; Eden, 2017; Lacoe & Steinberg, 2018)
- Teachers' contribution to the production of discipline and impacts on student achievement remains an open question.

Research Question

1. How does teacher use of referrals affect students' academic outcomes?
2. How does racial bias in teachers' use of referrals impact student outcomes?

North Carolina Data

- Data from North Carolina Education Research Data Center (NCERDC)
- Contains full universe of traditional public school students
  - Provides student test scores in 3rd-8th grade
  - Provides matched teacher and student identifiers
  - Provides rich information about teachers
- Restrict sample to self-contained classrooms in grades 3-5 from 2008-2013
- Analytic sample: 155,287 students, 10,856 teachers, 28,408 classrooms, 1,200 schools

Measuring Teacher Contribution

$$P_{ijct} = \alpha_{jt} + \gamma_1 P_{i,t-1} + \gamma_2 A_{i,t-1} + \varepsilon_{ijct} \tag{1}$$

- P_{ijct} represents student-level counts of referrals for subjective infractions
- γ_1 and γ_2 capture the contribution of prior year referrals and achievement
- α_{jt} is a teacher-year fixed effect

$$P_{ijct} = \rho_{1jt} black_i + \gamma_{1jt} P_{i,t-1} + \gamma_{2jt} A_{i,t-1} + \varepsilon_{ijct}, \forall t \in \{j\} \tag{2}$$

- rho_1 captures the conditional difference in Black-White referrals assigned within teacher-year

Effect of Referral Use

$$Y_{ijcgst} = \beta_1 \widehat{\alpha}_{jt} + \beta_2 Z_j + \beta_3 X_i + \gamma_1 Y_{i,t-1} + \omega M_c + \varphi_s + \psi_g + \tau_t + \varepsilon_{ijcgst} \quad (3)$$

- Y_{ijcgst} represents student-level measures of academic outcome (absences, math scores, ELS scores)
- $\widehat{\alpha}_{jt}$ represents our estimated teacher contribution to use of referrals (measure of punitiveness, measure of bias)
- Controls for lagged outcomes; student and teacher observables; class-level observables; school, grade, and year FE.
- Bootstrapped standard errors with 500 replications.

Effect of teacher punitiveness on academic outcomes

	(1) Absences	(2) Chronically	(3) ELA	(4) Math
Punitiveness	0.494***	0.011***	-0.041***	-0.068***
	(0.06)	(0.00)	(0.01)	(0.01)
Observations	313,326	313,326	313,326	313,326
R-squared	0.363	0.139	0.645	0.671
All teacher controls	✓	✓	✓	✓
All student controls	✓	✓	✓	✓
Lagged Absences	✓	✓		
Lagged test Scores	✓	✓	✓	✓
School, grade, and year FE	✓	✓	✓	✓

Note: *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

Spillover effect of teacher punitiveness

	(1) Absences	(2) Chronically	(3) ELA	(4) Math
Punitiveness	0.122	0.004	-0.099***	-0.123***
	(0.09)	(0.00)	(0.01)	(0.01)
Observations	266,190	266,190	266,190	266,190
R-squared	0.366	0.135	0.654	0.692
All teacher controls	✓	✓	✓	✓
All student controls	✓	✓	✓	✓
Lagged Absences	✓	✓		
Lagged test Scores	✓	✓	✓	✓
School, grade, and year FE	✓	✓	✓	✓

Note: *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

Effect of teacher bias

	(1) Absences	(2) ELA	(3) Math
Panel A. White S			
Bias	-0.064**	-0.003	-0.006*
	(0.03)	(0.00)	(0.00)
Observations	118,746	118,746	118,746
R-squared	0.364	0.609	0.646
Panel B. Black S			
Bias	0.385***	-0.015**	-0.034***
	(0.06)	(0.01)	(0.01)
Observations	51,152	51,152	51,152
R-squared	0.327	0.590	0.612
All controls	✓	✓	✓

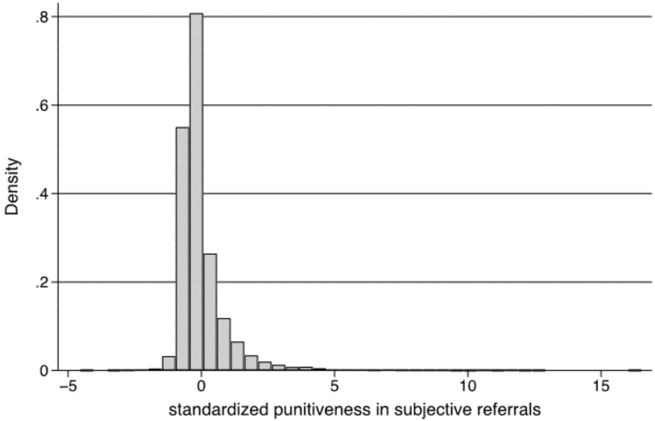
Note: *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

Conclusions

- Teachers play an important role in the disciplinary pipeline and their behaviors in this area have consequential impacts on students
- Teachers who respond more harshly to minor infractions have less productive classrooms in general
  - Student absenteeism increases
  - Student achievement decreases in both ELA and math
  - The impact on student achievement spills over to students who did not receive referrals
- Racial bias in teachers' use of referrals has negative impacts concentrated on the recipients of the bias
- Overall effects of bias seem quite modest and independent from measures of teacher effectiveness

Thank You! Comments welcome. Contact: sbholt@albany.edu

Distribution of Punitiveness



Distribution of Bias