Are school counselors an effective education input?

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HIGHLIGHTS

- This paper examines the impact of school counselors on academic achievement.
- Results suggest that counselors significantly improve boys' academic achievement.
- The increases are equivalent to increasing teacher quality by 0.3 sd.
- The effects are large compared relative to hiring teachers to reduce class size.

ARTICLE INFO

ABSTRACT

We exploit within-school variation in counselors and find that one additional counselor reduces student misbehavior and increases boys' academic achievement by over one percentile point. These effects compare favorably with those of increased teacher quality and smaller class sizes.

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1. Introduction

One of the central questions in education is how schools can allocate resources most efficiently to produce education. Recent work has focused on factors of production such as teacher quality (e.g., Chetty et al., forthcoming; Rivkin et al., 2005) and smaller class size (e.g., Angrist and Lavy, 1999; Hoxby, 2000; Krueger, 1999; Urquiola, 2006). However, in addition to hiring more or better teachers, schools can also increase the number of school support personnel, such as counselors, to deal with student problems that may impact academic achievement either directly or through peer interactions. Indeed, recent evidence indicates that even one "bad apple" in the classroom can have serious

negative consequences for others (e.g., Carrell and Hoekstra, 2009, 2012; Lavy et al., 2012). This means that by helping even a few children in the classroom, school counselors could potentially induce widespread academic gains.

To date, however, there is limited evidence on the effectiveness of school counselors. Reback (2010a) examines the impact of student-to-staff ratios by cleverly exploiting discontinuities in Alabama's financing system and finds that counselors reduce disciplinary incidents. Reback (2010b) shows descriptive evidence that states with more aggressive elementary counseling policies make greater test score gains and have fewer student behavioral problems than otherwise-comparable states. Finally, in a study perhaps most similar to this one, Carrell and Carrell (2006) use within-school variation in counselors and find that lower student-to-counselor ratios reduce disciplinary recidivism.

This paper complements this existing research by examining the impact of school counselors on academic achievement. The key contribution of our paper is that we are able to combine individual-level administrative data with a compelling research design that

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uses plausibly exogenous within-school variation in the number of counselors.

2. Identification strategy and methodology

To identify the effect of school counselors, we utilize a school fixed effects framework that exploits the within-school variation in counselors from the placement of graduate counselor interns from the University of Florida (UF). Formally, we estimate the following equation using ordinary least squares:

$$y_{isgt} = \varphi_0 + \varphi_1 Counselors_{st} + \beta_1 X_{isgt} + \beta_2 W_{sgt} + \lambda_s + \sigma_{gt}$$
$$+ \phi_{sg} t + \varepsilon_{isgt}$$

where y_{isgt} is the outcome variable for individual i in school s, grade g, and in year t, $Counselors_{st}$ is the number of counselors in school s in year t, and X_{isgt} is a vector of individual characteristics including own family violence (reported and unreported), race, gender, subsidized lunch, and median zip code income, and W_{sgt} is a vector measuring average cohort-level race, gender, subsidized lunch and size. λ_s is a set of school fixed effects, σ_{gt} is a set of grade–year fixed effects, and $\varphi_{sg} t$ is a set of school-by-grade specific linear time trends. Standard errors are clustered at both the school-by-year level and the individual level using multi-way clustering (Cameron et al., 2011).

The identifying assumption is that even though some schools may receive more counselor interns than others (perhaps due to proximity to the university), the timing of the placements is uncorrelated with other time-varying determinants of achievement within the school. This assumption would be violated if, for example, students or families were to select into or out of schools in years that receive an additional counselor. This seems unlikely since counselor placements are made only weeks before the start of the semester and because families would have to move to a new catchment area to switch schools.

Nevertheless, in results shown and discussed in Appendix A, we show that the within-school counselor variation is uncorrelated with lagged student outcomes and demographics, as well as with current student demographics and test taking. Along similar lines, we also show that current year test scores and disciplinary outcomes are uncorrelated with follow-on year counselors.

3. Background and data

3.1. The role of elementary school counselors

The primary role of counselors is to provide classroom guidance by giving lessons on social and emotional development, peer relations, drug use, and academic skills. In addition, counselors consult with teachers and provide individual and small group counseling. Thus, counselors may affect student achievement in several ways. First, counselors may help students directly by enabling them to better deal with the personal pressures and issues in their lives. Second, counselors may reduce negative peer effects by either working directly in classrooms with disruptive students or by sharing techniques with teachers. Finally, counselors may also reduce the disruptions caused by troubled students through individual counseling.

3.2. School records

We use a confidential student-level dataset containing a panel of annual test scores provided by the School Board of Alachua County in Florida. The data cover every 3rd through 5th grader

Table 1
Summary statistics.

Variable	Boys	Girls
Number of school counselor interns	0.28	0.29
	(0.38)	(0.38)
Reading and mathematics score	50.95	54.80
	(29.40)	(28.51)
Number of disciplinary incidents	0.84	0.29
	(2.39)	(1.26)
Black	0.37	0.39
	(0.48)	(0.49)
Free/reduced lunch	0.52	0.54
	(0.50)	(0.50)
Median neighborhood family income	44,394	44,091
	(13,537)	(13,470)
School size	289.25	288.84
	(104.83)	(104.83)

Notes: figures come from 44,482 observations, of which 42,278 were observed with test scores.

in the twenty-two elementary schools in the county from the 1995–1996 academic year through 2002–2003.

The test scores reflect percentile rankings on the math and reading sections of the Iowa Test of Basic Skills and Stanford 9 exams, which are given in the spring. The other outcome of interest is the number of disciplinary infractions committed by each student in each academic year, which are "incidents that are very serious or require intervention from the principal or other designated administrator".

3.3. Counselor data

Data on counselor intern placements come from the Department of Counselor Education at UF, which is located in Alachua County. The department places each graduate student counselor into an Alachua County school to work alongside the full-time counselor for a semester-long practicum or internship. We convert these placements to full-time equivalent (FTE) positions to measure the marginal effect of adding a full-time counselor to the school.

Each elementary school in our data had one permanent school counselor on staff during each academic year. Thus, the only source of variation in the number of counselors was the placement of graduate student counselor interns. Prior to serving an internship, each graduate student submitted to the school district the names of the schools in which they would most like to intern. The school district coordinator then matched interns to schools using these preferences. (See Table 1.)

4. Results and discussion

Results are shown in Table 2. Estimates in column 1 control only for school and year fixed effects, while columns 2 through 5 additionally control for grade by year fixed effects, peer demographics, individual controls, and school-specific linear time trends. Columns 6 and 7 control for family and individual fixed effects, respectively.

Results for boys' test scores are shown in row 1 of Panel A and range from 0.83 to 1.43. All eight estimates are statistically significant at the 10% level, while four are significant at the 5% level. Importantly, estimates from specifications including family or individual fixed effects remain essentially unchanged, indicating that our results are not driven by families selecting into school-years with additional counselors. Overall, these results suggest that counselors significantly improve boys' academic achievement.

Estimates for disciplinary infractions for boys are shown in the second row of Panel A. Estimates range from −0.13 to −0.20 infractions, which represent relative declines of 15% and 29%,

Table 2
The effect of counselors on academic achievement and misbehavior.

Indep. variable: number of counselors	1	2	3	4	5	6	7
Panel A: Boys							
Reading and mathematics score	1.404[*]	1.370[*]	1.339[**]	1.214[**]	1.429[***]	1.123[*]	0.834[**]
	(0.79)	(0.79)	(0.64)	(0.58)	(0.49)	(0.59)	(0.42)
Observations	20,859	20,859	20,859	20,859	20,859	13,136	20,859
Disciplinary infractions	−0.159[*]	−0.157[*]	−0.154[*]	−0.164[*]	−0.128	−0.186[**]	−0.204[**]
	(0.09)	(0.10)	(0.09)	(0.09)	(0.08)	(0.08)	(0.09)
Observations	22,120	22,120	22,120	22,120	22,120	13,990	22,120
Panel B: Girls							
Reading and mathematics score	0.312	0.287	0.405	0.456	0.916[*]	0.623	0.188
	(0.66)	(0.65)	(0.62)	(0.53)	(0.47)	(0.59)	(0.43)
Observations	21,619	21,619	21,619	21,619	21,619	13,786	21,619
Disciplinary infractions	−0.089[**]	−0.090[**]	−0.083[**]	−0.085[**]	−0.051	−0.075[*]	−0.059
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Observations	22,762	22,762	22,762	22,762	22,762	14,067	22,762
Year fixed effects	Yes	–	–	–	–	–	–
School fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Grade by year fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Peer controls	No	No	Yes	Yes	Yes	Yes	Yes
Individual controls	No	No	No	Yes	Yes	Yes	–
School specific linear time trends	No	No	No	No	Yes	Yes	Yes
Sibling fixed effects	No	No	No	No	No	Yes	No
Individual fixed effects	No	No	No	No	No	No	Yes

Notes: each cell reports results from a separate regression. Standard errors in parentheses are two-way clustered at the school-by-year and individual level. Individual controls include gender, race, median family income, and subsidized lunch status.
[*] Significant at the 0.10 level.
[**] Significant at the 0.05 level.
[***] Significant at the 0.01 level.

respectively. Seven of eight estimates are statistically significant at the 10% level.

Results for girls are shown in Panel B of Table 2. While the results generally suggest that school counselors reduce misbehavior by girls, estimates on academic achievement are more modest than for boys and are generally indistinguishable from zero. We view this as consistent with counselors having a direct impact on boys, who are most likely to cause negative peer effects and are most likely to be affected by disruptive peers (Carrell and Hoekstra, 2009; Lavy and Schlosser, 2011).

One important question is how the effectiveness of counselors compares with that of other educational inputs. Results here indicate the aggregate effect of an additional counselor is to increase boys' and girls' achievement by 0.85 percentile points, or 3.4% of a standard deviation.[1] Given the finding in the literature that a one standard deviation increase in teacher quality increases achievement by one-tenth of a standard deviation, a back-of-the-envelope calculation indicates that hiring an additional counselor is approximately equivalent to increasing the quality of every teacher in the school by 0.3 standard deviations.

The estimated impact of counselors is also large compared to the impact of hiring an additional teacher to reduce class size. Given the result by Krueger (1999) that reducing class size by 7 increased test scores in the 1st year by 4 percentile points, a back-of-the-envelope calculation shown in Appendix B suggests that hiring a counselor is approximately twice as effective as hiring an additional teacher.

5. Conclusions

This paper uses within-school variation in elementary school to show that counselors cause an economically and statistically significant increase in achievement, particularly for boys. We also find evidence that counselors reduce the misbehavior of both boys and girls by roughly 20% and 29%, respectively. Moreover, results indicate that relative to other education inputs such as additional teachers to reduce class size, counselors appear to be an effective way of improving academic achievement. This suggests that hiring counselors may be an effective alternative to other education policies aimed at increasing academic achievement.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at http://dx.doi.org/10.1016/j.econlet.2014.07.020.

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[1] The estimate for boys and girls together that corresponds to Column 4 in Table 2 is 0.81 percentile points, which is statistically significant at the 10 percent level.

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