Empirical Education

Introduction/Purpose.

This study's purpose is to understand the nature and extent of teacher collaboration in elementary and middle schools in order to inform decisions about experimental randomization schemes. While randomized designs can provide unbiased estimates of the impact of interventions, they must be sensitive to the way a program is implemented and the modes of teacher collaboration that may be in place in school settings. While teacher-level randomization is more efficient in terms of the overall size of the experiment than schoollevel randomization, the design may interfere with the common practice of teacher collaboration, which may be important for the success of the intervention. This study investigated whether randomization at the level of the grade-level team might provide greater efficiency than school-level randomization while minimizing the negative impact on teacher collaboration by having teachers within the same school in different experimental conditions.

Research Questions.

- . What is the nature and extent of teacher collaboration in these schools?
- a. How do elementary and middle school teachers compare in the frequency of mathematics and science collaboration meetings?
- b. Is there a difference between the numbers of organized group activities and/or meetings teachers attend for instructional versus administrative purposes?
- c. What is the nature and extent of elementary teachers "swapping" students for mathematics and/or science instruction?
- 2. Is there a difference in the amount of teacher collaboration within grade-level teams compared to collaboration involving teachers from other grade levels?

Data Source/Survey Questions.

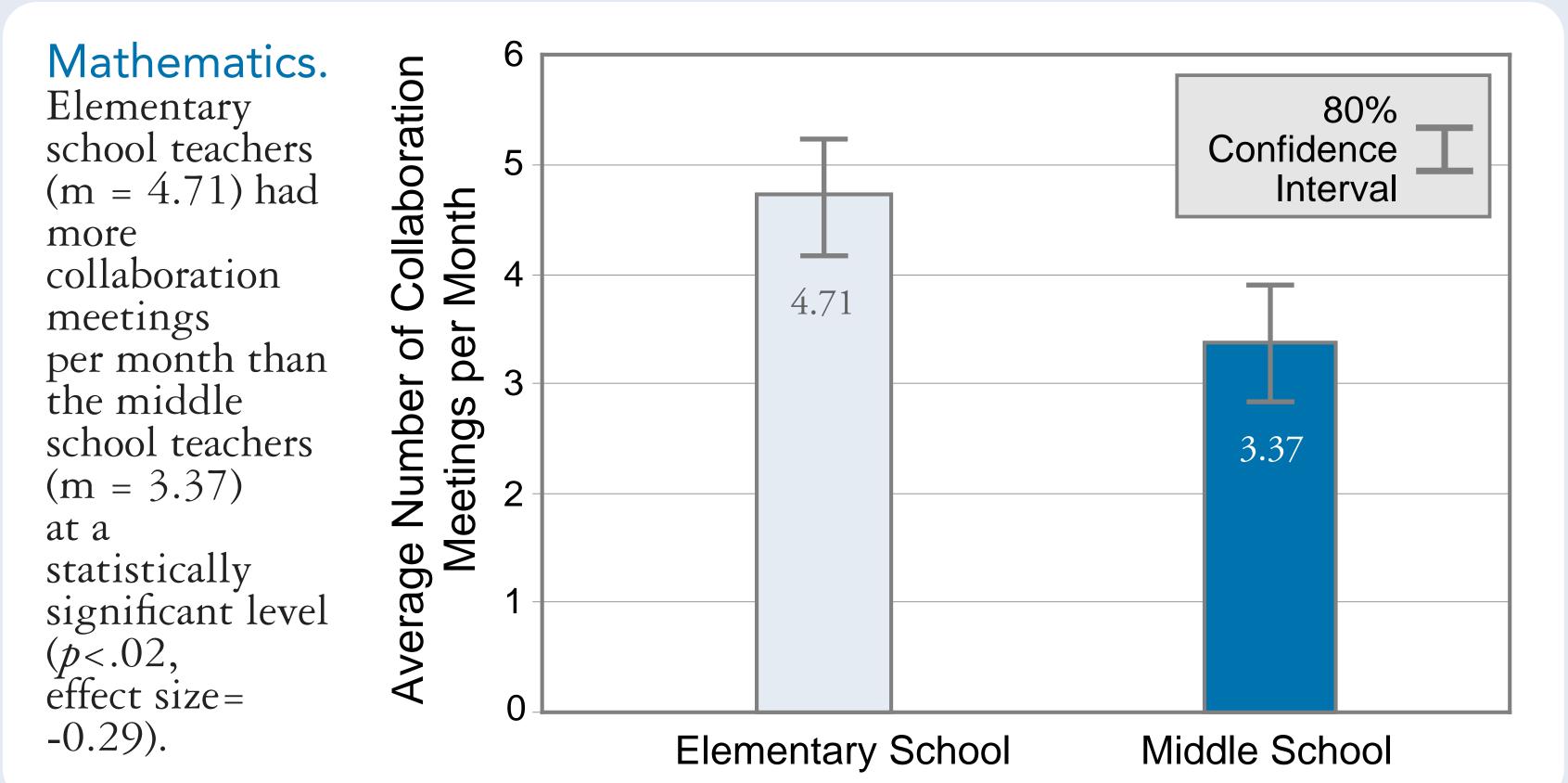
Five monthly surveys were deployed between January and May 2008 to approximately 600 elementary and middle school mathematics and science teachers. Survey questions addressed:

- o Surveys 2-4: Frequency of collaboration meetings per month for mathematics and science
- o Survey 5: Number of organized group activities or meetings focusing on administrative and instructional purposes
- o Surveys 1 and 3: Extent and nature of teachers teaching students not on their official rosters (i.e. "swapping")
- o Survey 5: Percent of teacher collaboration (as defined as receiving/providing input or advice from other teachers; participating in organized group activities or meetings involving other teachers) within grade-level teams and percent involving teachers from other grade levels.

The first four web-based surveys had an overall response rate of 94%. The fifth survey obtained a response rate of 64%. Comparisons were tested using HLM analysis, with school at level 2.

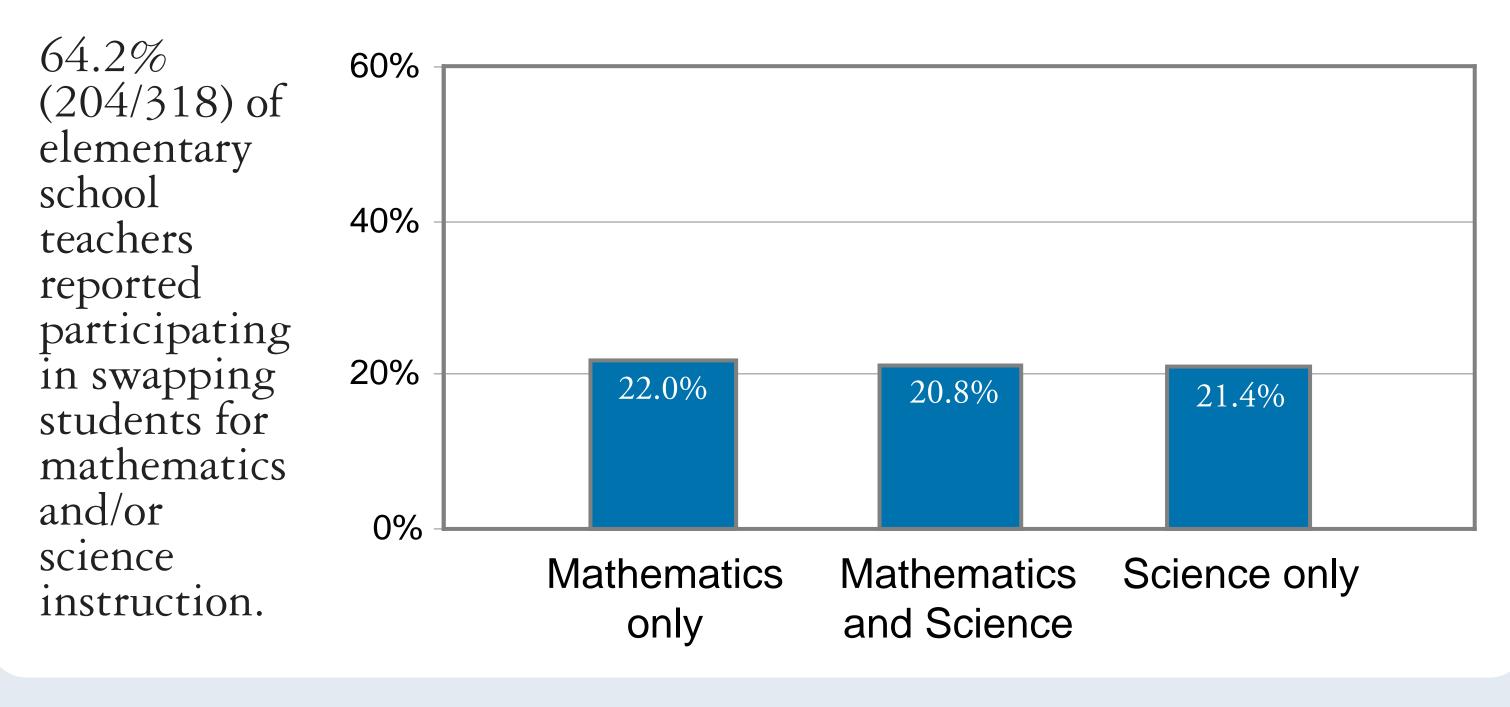
Addressing Challenges of Within-School Randomization Margit Zsolnay, Jenna Zacamy, Akiko Lipton, Boya Ma, Denis Newman **Empirical Education Inc.**

Findings for Question 1. What is the nature and extent of teacher collaboration in these schools?



1c. What is the nature and extent of **elementary** teachers "swapping" students for mathematics and/or science instruction? Of the teachers who "swapped" and reported the teacher with whom they swapped, 95.8% swapped with teachers within their grade level for mathematics instruction and 100% swapped with teachers within their grade level for science instruction.

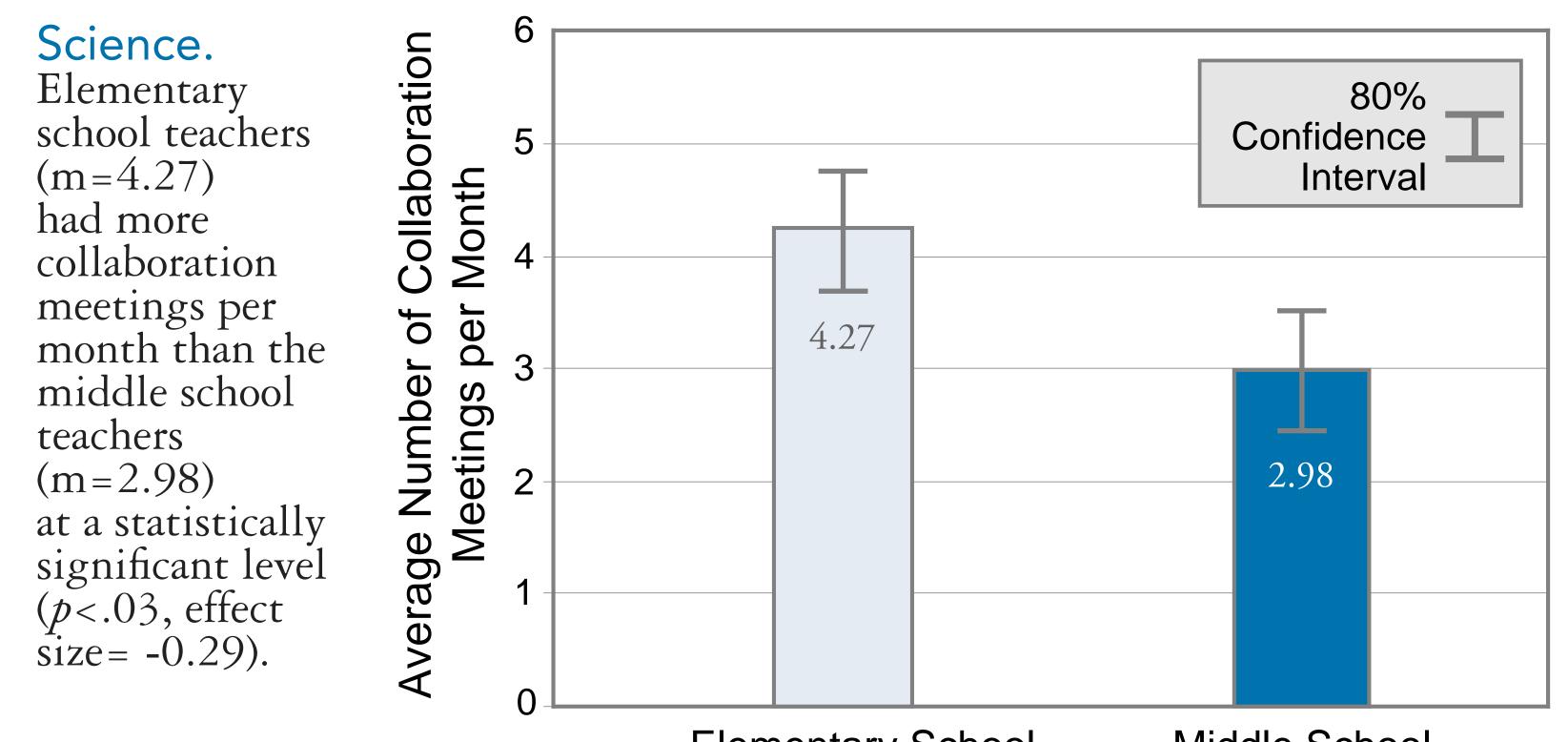
Percent of teachers who "swapped" students for instruction.



Findings for Question 2. Is there a difference between the percent of teacher collaboration within grade-level teams versus the percent involving teachers from other grade levels?

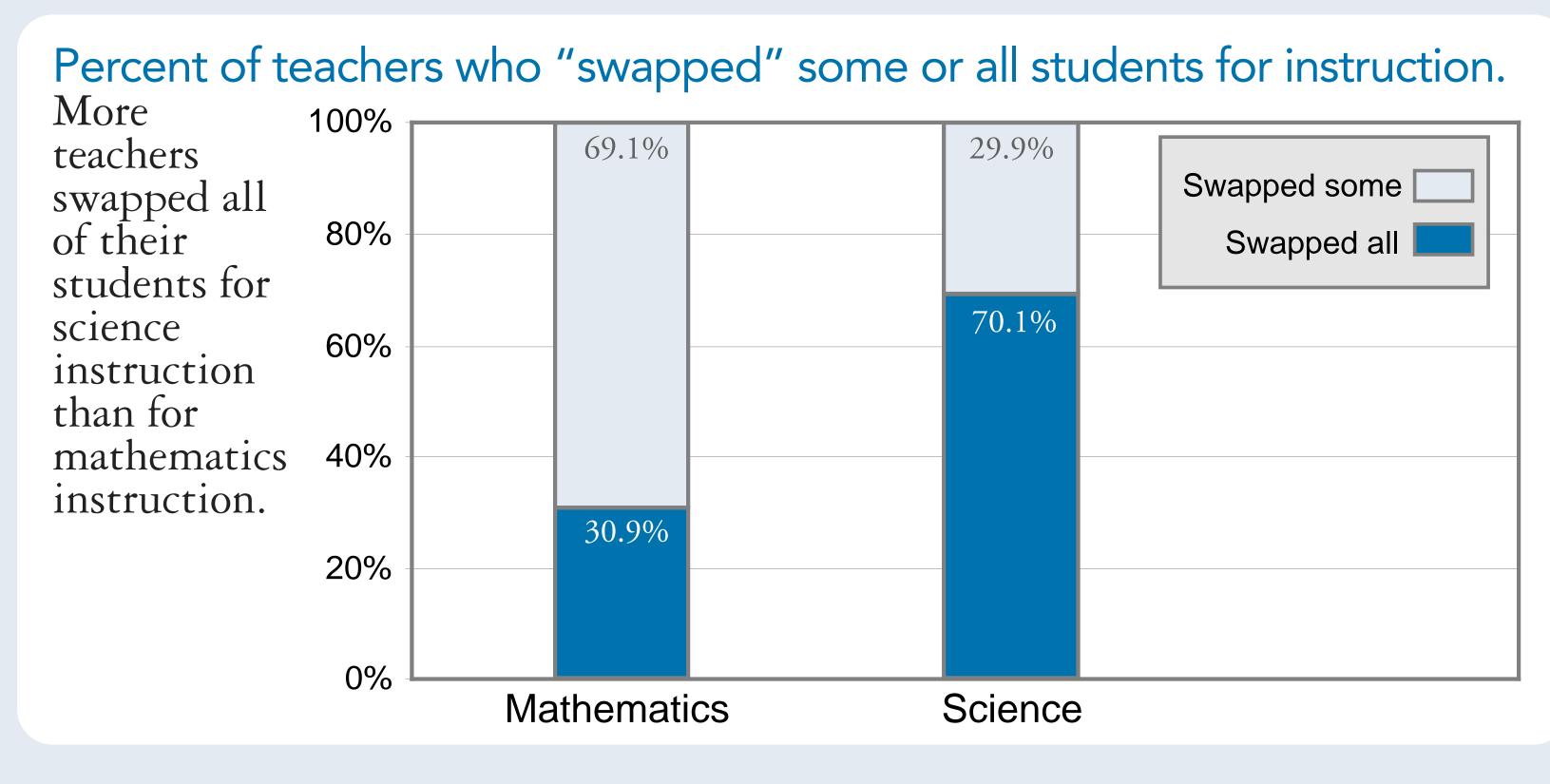
Receiving/Providing Input. Teachers reported that a higher 80% percentage of Confidence interactions in es of dvice 80% receiving/providing Interval input or advice was -I with teachers **b** 60% 64.4% within their grade-level team (64.4%) than with teachers from other grade levels (23.0%). This difference was statistically significant (p < .01,0% effect size = 1.60). Within-grade Between-grade

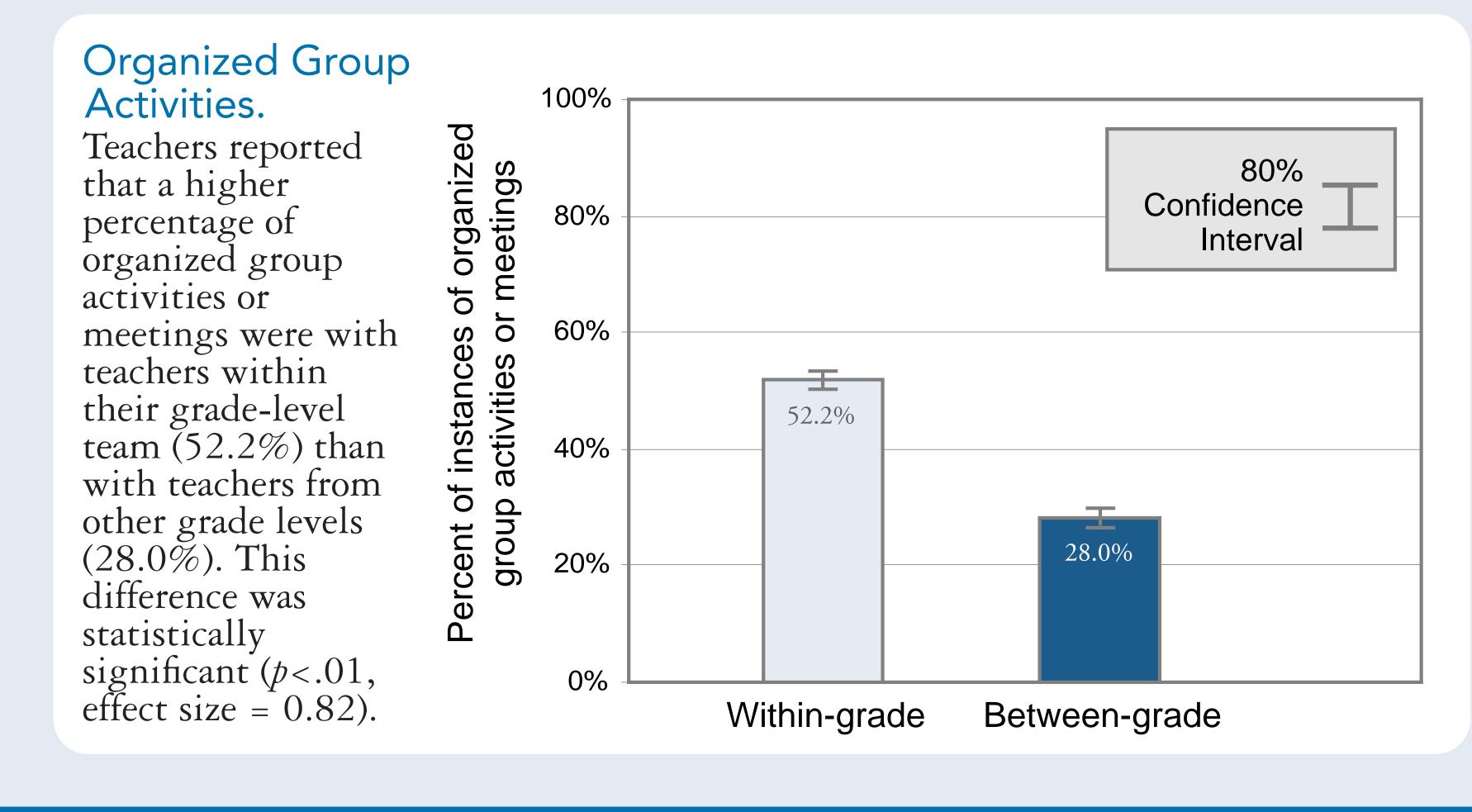
1a. Is there a difference in the frequency of mathematics and science collaboration meetings between elementary and middle school teachers?



Elementary School

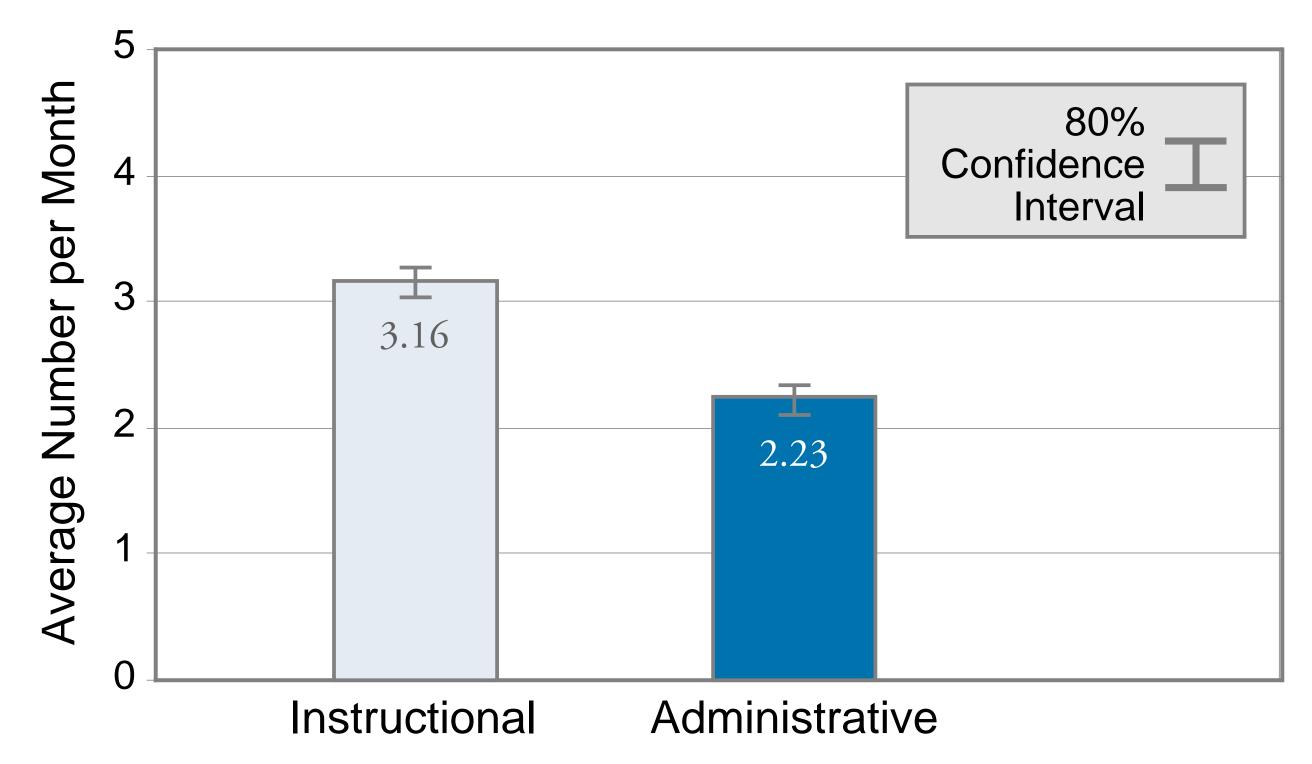
Middle School





1b. Is there a difference between the numbers of organized group activities and/or meetings teachers attend for instructional versus administrative purposes?

Teachers reported collaborating more for instructional purposes (m=3.16) than for administrative purposes (m=2.23) at a statistically significant level (p < .01, effect size = -0.29).



Definitions for administrative and instructional collaboration

o Instructional: Organized group activities or meetings involving other teachers that primarily focused on issues pertaining to student instruction/behavior. o Administrative: Organized group activities or meetings involving other teachers that primarily focused on administrative issues, such as schedules, upcoming events, and teacher's work assignments.

Summary of Findings.

- Elementary teachers had more collaboration meetings than middle school teachers.
- Instructional meetings outnumbered administrative meetings.
- In elementary schools, 66% of teachers swapped students for mathematics and/or science.
- Virtually all swapping was within grade
- Formal and informal teacher interactions occured more often within grade level teams than across grade levels.

Implications for Randomization Schemes.

For experiments on math or science programs, our observations suggest that within-school teacher-level randomization will interfere with teacher collaboration and potentially reduce the impact of the intervention. This was shown in the prevalence of meetings, informal advice/input, and in swapping students.

Findings from this study suggest that randomization of grade-level teams will interfere less with formal and informal communication and will have little effect on the practice of swapping students. Grade-level team randomization offers a relatively efficient alternative to school-level randomization and a intrusive alternative to teacher-level potentially less randomization.

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