



# A large-scale field experiment shows giving advice improves academic outcomes for the advisor

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**Common sense suggests that people struggling to achieve their goals benefit from receiving motivational advice. What if the reverse is true? In a preregistered field experiment, we tested whether giving motivational advice raises academic achievement for the advisor. We randomly assigned  $n = 1,982$  high school students to a treatment condition, in which they gave motivational advice (e.g., how to stop procrastinating) to younger students, or to a control condition. Advice givers earned higher report card grades in both math and a self-selected target class over an academic quarter. This psychologically wise advice-giving nudge, which has relevance for policy and practice, suggests a valuable approach to improving achievement: one that puts people in a position to give.**

advice | motivation | achievement | education | nudge

People often fall short of achieving their goals, which undermines policy-relevant outcomes and incurs societal costs (1–3). Standard economic theory suggests 2 solutions: increase incentives or give people more information. For instance, 2 prominent approaches to improving academic achievement are to pay students for better performance or provide tutoring (4, 5). Both approaches assume that, to improve achievement, people need to receive something they lack.

One problem with providing incentives and information at scale is that doing so can be expensive. Even worse, offers of help can inadvertently imply to recipients that they cannot help themselves (6).

In the current investigation, we examined the benefits of asking individuals to give advice to others. Several findings in the social psychology literature suggest that giving advice may benefit the advisor. First, people who advocate for specific opinions or beliefs come to believe what they advocate, to mitigate cognitive dissonance (7). Second, the reflection entailed in generating advice may prompt advisors to formulate concrete plans for enacting the recommended behaviors in their own lives (8). Third, giving advice, unlike receiving advice, can increase confidence. Indeed, in a recent series of laboratory studies, giving advice raised self-reported confidence and motivation more than receiving advice (9). In sum, advice giving is a “psychologically wise” intervention (10) insofar as it aims to change key psychological processes underlying a target behavior.

We conducted a large-scale field test of advice giving as a zero-cost nudge to improve a policy-relevant outcome: high school grades. Raising academic achievement has been called the “best investment” a government can make (11). High school grades predict future earnings, employment, and even physical health (12, 13). However, straightforward attempts to improve achievement (e.g., paying students to do better in school) often fail (4). Our approach, which positions students as advice givers, may be particularly effective for adolescents, who are highly sensitive to infringements on autonomy and status (14, 15).

We preregistered our hypothesis, study design, and analytic plan (<https://osf.io/9yvd4/>, ref. 16), and worked with the Character Lab Research Network to recruit a large sample ( $n = 1,982$ )

of students attending 7 diverse public high schools in the United States. For full details on our participant sample, see the web appendix (<https://osf.io/b73td/>, ref. 17). Using a longitudinal experimental design, we randomized students to give academic advice to younger students ( $n_{\text{treatment}} = 985$ ) or to a control condition ( $n_{\text{control}} = 997$ ). We hypothesized that giving advice would improve advisors’ grades in 2 courses—first, in a target academic course in which the student most “want[ed] to improve.” Since advice giving is a motivational intervention, we expected it to be effective in the course in which the student was most motivated. The second course was math. Math is anxiety-provoking for many students (18). In other words, it is a subject in which many students lack confidence. Since we expected advice giving to motivate achievement by raising confidence, we anticipated the intervention would also be especially beneficial in this subject. We examined the effect of advice giving on grades because grades, more than other outcomes (e.g., standardized achievement test scores), are influenced by student effort (19, 20).

Teachers brought students to a school computer laboratory at the start of the third academic quarter (January 2018) and explained that they would be participating in online activities “as part of a special project to help improve educational practices.” Students identified a target class in which they most hoped to improve their performance. Next, they were randomly assigned to an advice-giving condition or a control condition.\*

The advice-giving activity, which took an average of 8 min to complete, prompted participants to advise younger students. Specifically, participants completed 14 open-ended and multiple-choice questions in which they gave advice on optimal study locations and study strategies. Finally, participants wrote a motivational letter to an anonymous younger student who was “hoping to do better in school.” At the conclusion of this activity, students completed a battery of self-report measures and a behavioral task. Control participants also completed this battery of measures and the behavioral task, but did not give advice. (See web appendix for complete materials for both conditions.) At the end of the school year, grades and demographic information were collected from official school records.

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The authors declare no conflict of interest.

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Data deposition: The preregistration plan of the project can be found on Open Science Framework at <https://osf.io/9yvd4/>. The data and web appendix can be found on Open Science Framework at <https://osf.io/b73td/>.

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\*This study was 1 of 5 independent studies aimed at increasing academic achievement conducted in parallel with different subsets of this high school student population via the Character Lab Research Network. See the web appendix for additional information.

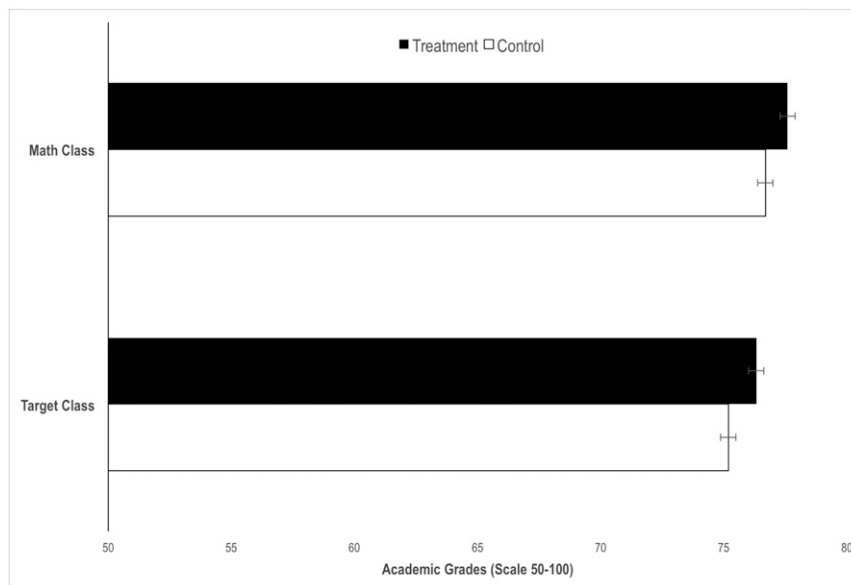


Fig. 1. Estimated effects of advice giving on third-quarter grades in a target class ( $n = 1,764$ ) and math class ( $n = 1,838$ ). Error bars represent 1 SE.

## Results and Discussion

All data and materials are available on Open Science Framework (<https://osf.io/b73td/>, ref. 17).

As described in our preregistered analysis plan, we analyzed third-quarter target and math class grades (obtained from school records) using ordinary least squares regressions and controlled for preintervention grades, ethnicity, grade level, gender, socioeconomic status, and school. Degrees of freedom varied slightly across analyses because some students had no target (11%) or math (7%) grade matches in official school records. Results were consistent when correcting for missing data in multiple ways (see web appendix).

Compared with those in the control group, students who gave advice earned higher third-quarter grades in their target class ( $B = 1.14$ ,  $SE = 0.43$ ,  $95\% \text{ CI} = 0.29$  to  $1.99$ ,  $n = 1,764$ ,  $t[1,745] = 2.62$ ,  $P = 0.009$ ,  $d = 0.12$ ) and math class ( $B = 0.91$ ,  $SE = 0.44$ ,  $95\% \text{ CI} = 0.05$  to  $1.76$ ,  $n = 1,838$ ,  $t[1,819] = 2.08$ ,  $P = 0.038$ ,  $d = 0.10$ ) (Fig. 1). Benchmarking against the effect of hundreds of independent, school-based interventions on standardized achievement test scores, the magnitude of this effect on student achievement ranks in the 50th to 70th percentile despite ranking in the lowest, first percentile, for per pupil marginal cost. Notably, the benefit of giving advice was consistent across student gender, ethnicity, socioeconomic status, grade level, and prior level of achievement.

As a secondary analysis, we tested for durability. In the fourth quarter, advice giving produced a marginally significant increase in math grades ( $B = 0.93$ ,  $SE = 0.51$ ,  $95\% \text{ CI} = -0.07$  to  $1.94$ ,  $n = 1,758$ ,  $t[1,739] = 1.82$ ,  $P = 0.069$ ,  $d = 0.09$ ) and a nonsignificant increase in target grades ( $B = 0.70$ ,  $SE = 0.53$ ,  $95\% \text{ CI} = -0.34$  to  $1.75$ ,  $n = 1,691$ ,  $t[1,672] = 1.32$ ,  $P = 0.187$ ,  $d = 0.06$ ).

While it may seem surprising that an 8-min intervention boosted achievement over an entire academic quarter, many simple, psychologically informed interventions and nudges produce lasting behavior change (10, 21–28). Interventions that are psychologically wise, like an advice-giving prompt, generate long-term effects by tapping into recursive psychological processes (23, 29). Although we are not certain of the exact mechanisms that accounted for the observed effect—a common limitation in field research (30)—past laboratory research suggests advice giving may have worked by boosting confidence (9). It would be valuable for future research to explore whether giving advice also

motivates achievement by prompting plan formation (8), leading people to believe their own advice (7), or via other mechanisms.

Although most of the processes through which advice giving could plausibly raise achievement are likely to be stronger when people give advice to others rather than to themselves, future research is needed to identify the active ingredients that raised motivation and achievement in the present study.

Our results highlight a key limitation of current economic theories, which focus on the value of incentives and information as drivers of behavior change. Typically, the kind of information presumed to change behavior couldn't arise from asking people to share knowledge they already possess. However, in the current investigation, giving advice motivated achievement.

These findings have practical implications. Most attempts to raise academic achievement in high school fail. Nearly 90% of the math and science programs reviewed in the What Works Clearinghouse (<https://ies.ed.gov/ncee/wwc/>) show no measurable benefits when tested. The handful of adolescent interventions that do demonstrably improve achievement are time-intensive and costly, and their effects are comparable to, or only slightly larger than, those of this 8-min, digitally delivered intervention (31).

Beyond school contexts, advice giving has the potential to improve a wide range of outcomes in any setting in which motivation is key to success. Most important, our findings highlight the underappreciated motivational power of placing people in a position to give, not just receive. In the words of Seneca, “when we teach, we learn.”

All study materials were reviewed and approved by the Institutional Review Board at the University of Pennsylvania. We obtained informed consent from the participants at the start of the study.

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