

The learning puzzle

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In a collaborative study, researchers found that incentives raised IQ scores by 10 points on average, with greater gains for lower-IQ participants.

Gone are the days of using careful pen strokes to change "Ds" to "Bs" on report cards. Students now have access to far more advanced technology—Photoshop for instance, can work wonders. But what if all the effort that went into dodging academic accountability could instead be channeled into a hunger for learning? Questions like this have long been driving Angela Lee Duckworth, Assistant Professor of Psychology, to investigate new ways to improve student outcomes.

One of Duckworth's main avenues of research involves motivation and its potential effect on IQ testing. Her collaborative study on the topic was recently published in the journal *Proceedings of the National Academy of Sciences*, and has received wide media attention. Duckworth and her team synthesized findings from prior studies that tested the effects of incentives on IQ scores. They found that incentives raised IQ scores by 10 points on average, with greater gains for lower-IQ [participants](#).

Duckworth's interest in self-control and motivation in young students began when she was an undergraduate at Harvard. She spent the majority of her free time volunteering as a tutor and Big Sister. Upon completion of her master's at Oxford, she worked a brief stint at a consulting firm but knew her true calling was back in education.

“I took a job as a math teacher,” she says. “These questions of motivation kept popping up, and it was like a puzzle for me: I knew if I could reach them, every single one of these kids had the potential to be an accomplished student—what I wanted to teach them was within their intellectual reach. And so I decided that in order to start solving this puzzle, I would need a background in psychology, which ultimately brought me to Penn.”

Duckworth sought out Martin Seligman, Penn faculty member and founder of positive psychology. She met with him in person, and he encouraged her to apply. As part of her Ph.D., she focused on trying to understand self-control in children. Qualities, like grit—the term Duckworth uses to describe individual perseverance—are distinct from talent or raw intelligence, she says. Self-control and grit are dispositions to put forth effort when the rewards for that effort are deferred—and such dispositions may in theory be improved through deliberate intervention.

“We have partnerships with Philadelphia and New York public schools that allow us to measure, and sometimes even intervene, in student lives,” Duckworth says. “These educators are open to any and all innovations—anything to help improve these kids’ education. What we’ve found, examining the way emotions play out in children, is that those who are able to take a step back from their situations and put it in perspective are much better at controlling themselves.”

Duckworth and her collaborator Gabriele Oettingen at New York University also developed an intervention program in which children are asked to articulate a wish related to their academic progress. Children are then prompted to elaborate, mentally and in writing, on why they chose that. Finally, children list an obstacle to their wish and create a short plan stating when where, and how they will get around it. This strategy, based upon years of prior research with adults, helps turn “high

expectations” into actual behavior change.

“Increasing self-control would not necessarily mean children working longer and longer hours. Such a picture would be grim indeed,” Duckworth says. “If you look at world-class performers—Olympic-level athletes, for instance—their most deliberate, strenuous training takes about a four-hour period daily. This suggests that if we can improve the quality of the work children do, improve their concentration and effort, we should vastly increase the efficiency of their studying and learning time. So, paradoxically, and wonderfully, we should free up more time for play, running around and just enjoying childhood.”

Provided by University of Pennsylvania

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