Study Finds Spatial Skill Is Early Sign of Creativity

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Published: July 15, 2013

A gift for spatial reasoning — the kind that may inspire an imaginative child to dismantle a clock or the family refrigerator — may be a greater predictor of future creativity or innovation than math or verbal skills, particularly in math, science and related fields, according to a study published Monday in the journal <u>Science Reporters and Editors on Twitter</u>

The study looked at the professional success of people who, as 13-year-olds, had taken both the SAT, because they had been flagged as particularly gifted, as well as the Differential Aptitude Test. That exam measures spatial relations skills, the ability to visualize and manipulate two-and three-dimensional objects. While math and verbal scores proved to be an accurate predictor of the students' later accomplishments, adding spatial ability scores significantly increased the accuracy.

The researchers, from Vanderbilt University in Nashville, said their findings make a strong case for rewriting standardized tests like the SAT and ACT to focus more on spatial ability, to help identify children who excel in this area and foster their talents.

"Evidence has been mounting over several decades that spatial ability gives us something that we don't capture with traditional measures used in educational selection," said David Lubinski, the lead author of the study and a psychologist at Vanderbilt. "We could be losing some modern-day Edisons and Fords."

Following up on a study from the 1970s, Dr. Lubinski and his colleagues tracked the professional progress of 563 students who had scored in the top 0.5 percent on the SAT 30 years ago, when they were 13. At the time, the students had also taken the Differential Aptitude Test.

Years later, the children who had scored exceptionally high on the SAT also tended to be high achievers — not surprisingly — measured in terms of the scholarly papers they had published and patents that they held. But there was an even higher correlation with success among those who had also scored highest on the spatial relations test, which the researchers judged to be a critical diagnostic for achievement in technology, engineering, math and science. Cognitive psychologists have long suspected that spatial ability — sometimes referred to as the "orphan ability" for its tendency to go undetected — is key to success in technical fields. Earlier studies have shown that students with a high spatial aptitude are not only overrepresented in those fields, but may receive little guidance in high school and underachieve as a result. (Note to parents: Legos and chemistry sets are considered good gifts for the spatial relations set.)

The correlation has "been suspected, but not as well researched" as the predictive power of math skills, said David Geary, a psychologist at the University of Missouri, who was not involved in the study, which was funded by the John Templeton Foundation. The new research is significant, he said, for showing that "high levels of performance in STEM fields" — science, technology, engineering and math — "are not simply related to math abilities."

Testing spatial aptitude is not particularly difficult, Dr. Geary added, but is simply not part of standardized testing because it is considered a cognitive function — the realm of I.Q. and intelligence tests — and is not typically a skill taught in school.

"It's not like math or English, it's not part of an academic curriculum," he said. "It's more of a basic competence. For that reason it just wasn't on people's minds when developing these tests."

It is also a competence more associated with men than women. In the current study, boys greatly outnumbered girls, 393 to 170, reflecting the original scores of the students in the '70s. But the study found no difference in the levels of adult achievement, said Dr. Lubinski, though the women were more likely than the men to work in medicine and the social sciences.