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A Brain-Imaging Perspective on Teacher Evaluation

By Karen Hunter Quartz, Kenneth T. Kishida, Dongni Yang, Steven R. Quartz, and P. Read Montague

Jane takes off her jewelry and prepares to have her brain scanned by a very strong magnet in the Human Neuroimaging Lab at the Baylor College of Medicine in Houston. Inside the scanner, gazing at a screen above her head, Jane uses a hand-held controller to solve the first set of standardized-test items. Then the experiment in social neuroscience begins. Today, Jane is taking an IQ test with five others, all connected in an online environment. Alongside the test questions, Jane and the other group members start to see how their performance on the last 10 items compares—where they rank in the group. What do you think happens to Jane's performance as the experiment continues?

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Social neuroscience is an emerging discipline that is discovering how extraordinarily tuned our brain is for social life. The feedback about social rank in our experiment was intended to mimic the real-life status cues we consciously and unconsciously infer from everyday social settings. Is our cognitive brain an island unto itself, as traditionally conceived, or can social cues influence something as impermeable-seeming as IQ? Our study of Jane and 69 other subjects was designed to probe these questions. Its findings reveal the profound role status cues play in shaping our cognitive performance and suggest that the sharp distinction between the social and cognitive brain is artificial.

These findings have implications for how and why rankings matter in all human social endeavors and provide a new empirical perspective to inform the current debate about whether and how to rank teachers.

Our study identified the brain regions involved in processing reputation or social status and watched how these processes shape cognitive performance. Two people in each small group of five were randomly selected to take the test while undergoing a technique called functional magnetic resonance imaging, or fMRI, so we could watch how their brains responded to this ranking feedback.

For Jane and all the other subjects, the "how do I rank?" feedback mattered. It caused stress and anxiety and depressed their performance. In the scanned subjects, we saw a significant effect in the amygdala, a brain region associated with fear, anxiety, and emotional arousal, which was associated with a reduction of activity in areas involved in problem-solving. What

happened after the initial round of feedback, however, was fascinating. One group of subjects regained their footing, while the performance of another group that included Jane continued to spiral downward—an average of 17 points on the IQ test, more than a standard deviation. The take-away message is that ranking feedback can affect performance on cognitive tasks, with negative consequences for particular groups.

Other researchers, such as the social psychologist Claude Steele, have conducted experiments showing that stereotypes—society-level signals about social status—can also be harmful to individuals' intellectual performance. Significant research has demonstrated that we are very sensitive and responsive to information, whether objective rankings or social stereotypes, about how we stack up in a group. In our brains, a positive change in social rank or status is comparable to other motivators of animal and human behavior such as food and money. On the flip side, negative rankings, stereotypes, and low status can derail our learning and potential. So, in the context of schools as workplaces, what exactly will we be selecting for if we measure teachers using ranked results based on standardized tests? And how might this ranking feedback interact with teachers' performance in the classroom?

Ranking teachers according to the value they add to their students' standardized-test scores is a practice that seems to be gaining steam. A **recent study** for the National Bureau of Economic Research by Harvard's Raj Chetty and his colleagues found that there are far-reaching benefits for students of having high "value added" teachers, such as higher college-going rates and future incomes. These findings almost sound like the promises of the early IQ-test developers. Although the researchers caution that this study was conducted in a low-stakes environment, their findings provide fodder for the growing policy community that seeks to evaluate, promote, and fire teachers based on competitive value-added rankings. How much these rankings should count or be weighted is the subject of much debate, but how are the debaters accounting for the effects of the rankings themselves?

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Two summers ago, when hundreds of teachers logged on to the *Los Angeles Times*' **public database** to view their rankings, how did they experience the feedback? From the public accounts and conversations with teachers, shame and humiliation for the lowest-ranking teachers seemed to eclipse any potential benefits and further crippled morale in a district plagued by financial woes and layoffs. As a result, the term "value added" seemed to recede in the district's lexicon, replaced by a new, branded value-added model called "academic growth over time," or AGT. Last fall, teachers received confidential "AGT Reports" about their relative rankings. The district intends to use these reports as one of several measures to evaluate teachers, but more importantly, to advance their development as professionals. In Los Angeles, as in many districts throughout the nation, educators are struggling to figure out how to make value-added-ranking feedback educational.

Well-designed studies are now needed to figure out how teachers will experience the ranking feedback that districts and think tanks are preparing for them. Highly polished output and graphs of where teachers stand on a number of measures are in production. How will schools and districts ensure that this

ranking feedback doesn't depress teacher performance and reward only those individuals predisposed to bounce back from "how do I stack up" feedback? In our IQ study, we found that women's cognitive performance was more likely to be derailed by ranking feedback than men's. Although this finding is limited by our small sample size, it does support the commonly held view that women are more sensitive than men to social feedback.

In a profession where women outnumber men three to one, school systems must ensure that teacher rankings are used responsibly and communicated in sensitive, professional ways that lead to growth—not shame, fear, and humiliation.

Karen Hunter Quartz is the director of research for Center X, the home of the University of California, Los Angeles' professional credentialing and advancement programs for K-12 educators, and for the UCLA Community School, a small K-12 public school that opened in 2009 within the Los Angeles Unified School District. Kenneth T. Kishida is a research scientist in the Computational Psychiatry Unit and Human Neuroimaging Laboratory at the Virginia Tech Carilion Research Institute in Roanoke, Va. Dongni Yang is a medical resident in the diagnostics and interventional radiology department at the University of Texas Health Science Center in Houston. Steven R. Quartz is a professor and the principal investigator of a National Science Foundation grant integrating graduate education and research training, which is part of the social science and computation and neural systems Ph.D. programs at the California Institute of Technology, in Pasadena, Calif. P. Read Montague is a professor at the Virginia Tech Carilion Research Institute and in Virginia Tech's department of physics, in Blacksburg, Va. He also holds a principal research fellowship from the Wellcome Trust and is a professor in the Wellcome Trust Centre for Neuroimaging at University College London.

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