





THE BRILLIANCE TRAP

How a misplaced emphasis on genius subtly discourages women and African-Americans from certain academic fields

BY ANDREI CIMPIAN AND SARAH-JANE LESLIE

IN THE 1980S PHILOSOPHERS WOULD SOMETIMES SPEAK OF “THE BEAM”—a metaphorical spotlight of intellectual brilliance that could illuminate even the most complex philosophical conundrums. Only some lucky philosophers were ever born with the Beam, and their work represented the gold standard of the field. Anyone who lacked the Beam was forever condemned to trail behind them intellectually.

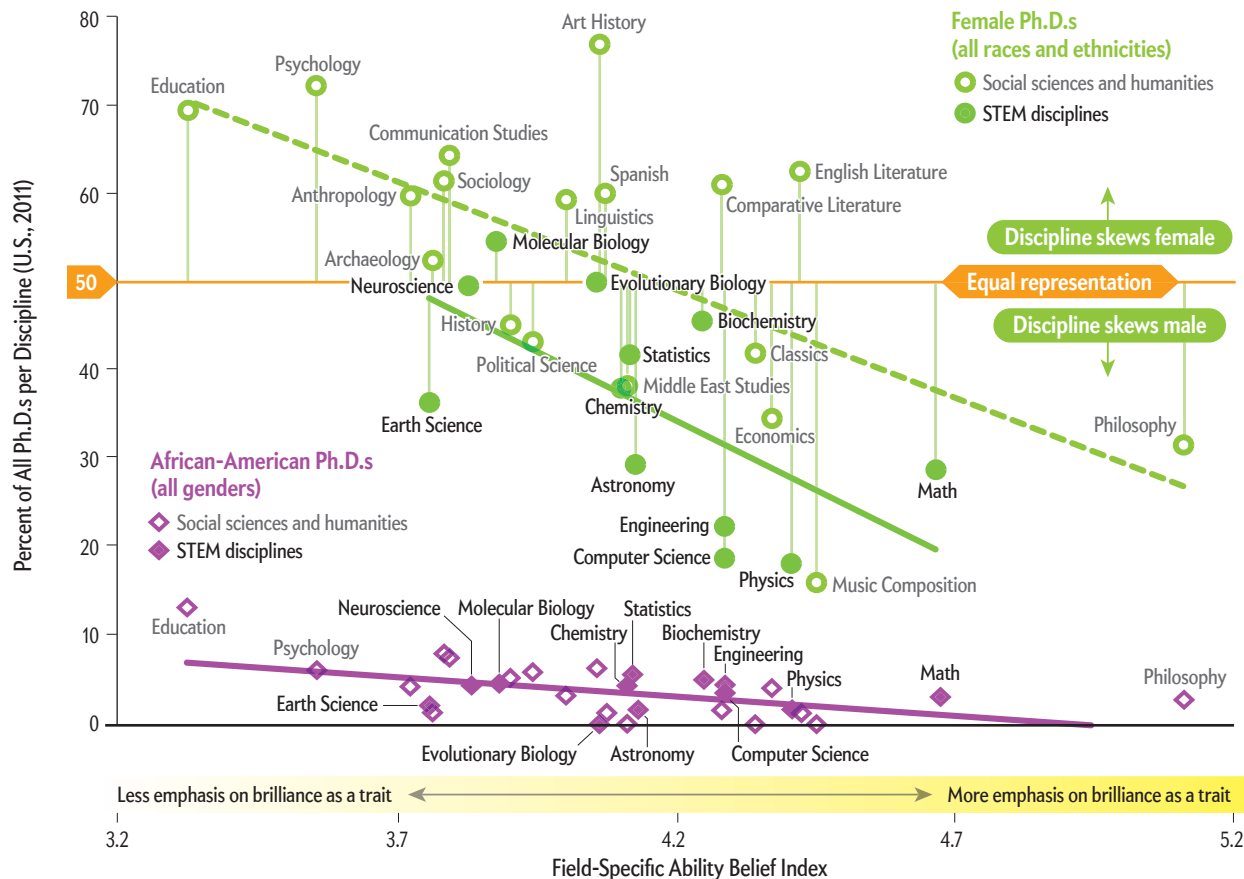
One of us (Leslie) would share this sort of story whenever we would see each other at conferences. The two of us were trained in different disciplines (Leslie in philosophy and Cimpian in psychology), but we studied similar topics, so we would get together regularly to catch up on research and talk about our experiences as members of our respective fields.

Psychology and philosophy are quite similar in their substance (in fact, psychology was a branch of philosophy until the mid-1800s), but the stories we told painted a picture of two fields with vastly different views on what is important for success. Much more so than psychologists, philosophers value a certain *kind of person*—the brilliant superstar with an exceptional

How Stereotypes about Genius Affect Women and Minorities in Academia

A survey of almost 2,000 professionals in 30 academic fields determined how strongly they believed that the trait of brilliance, as measured by a so-called field-specific ability belief index, mattered for success in their discipline. Fields with higher scores, such as

physics, math and philosophy, awarded fewer advanced degrees to women and African-Americans, compared with neuroscience and psychology, which scored lower. The results suggest that many fields implicitly equate brilliance with white males.



mind. Psychologists, in contrast, are relatively more likely to believe that the leading lights in their field grew to achieve their positions through hard work and experience.

At first, we viewed philosophy's obsession with brilliance as a quirk—a little strange but innocuous. Other things seemed like bigger problems in Leslie's field, such as its inability to attract women and minorities. Despite sustained attention to issues of underrepresentation in recent years and some efforts to alleviate it, women still accounted for less than 30 percent of the doctoral degrees granted in philosophy in 2015; African-Americans made up only 1 percent of philosophy Ph.D.s. The field of psychology, on the other hand, has been quite successful in attracting and retaining women (72 percent of newly minted Ph.D.s), and Afri-

can-Americans held 6 percent of its 2015 doctoral degrees, which admittedly still falls short of their share of the general population but is nonetheless six times the ratio in philosophy.

We could not wrap our minds around the discrepancy. Our fields have so much in common—both philosophers and psychologists ask questions about how people perceive and understand the world, how they decide between right and wrong, how they learn and use language, and so on. Even the few salient differences—such as psychologists' greater use of statistics and randomized experiments—are becoming blurred nowadays with the huge increase in the popularity of experimental philosophy, in which philosophers conduct surveys and experiments to explore different perspectives on morality, for example. How could

two such closely related fields be so vastly different in membership?

A BRILLIANT IDEA

THE CLOSEST THING either of us has ever had to a eureka moment came several years ago when we connected two threads running through the anecdotes we had been sharing. We were having dinner with a group of philosophers and psychologists at a conference, and the conversation happened to turn, in quick succession, from philosophers' infatuation with brilliance to the gender gap in their field. This chance juxtaposition brought to mind for us a connection we had never considered before: maybe the premium philosophers place on brilliance is actually the reason why so few of their colleagues are women or minorities. We did not discount the benefits of brilliance. Rather we wondered whether genius was more easily overlooked in women and African-Americans. Could it be that insistence on the need for a keen intellect in a particular field was tantamount to hanging a "Keep Out" sign to discourage any newcomers who did not resemble that field's current members?

On the surface, an emphasis on brilliance does not favor one group over another; as far as scientists can tell, cognitive ability is not intrinsically tied to gender or race. Philosophers seek a certain quality of mind—regardless of whose mind it is. This seemingly logical preference quickly becomes problematic, however, in light of certain shared societal notions that incorrectly associate superior intellect with some groups—for example, white males—more than others.

Even among the academics present that night, one of the views expressed was that men and women just thought differently. Women were alleged to be more practical and anchored in reality, whereas men were more willing to engage in the kind of counterfactual, abstract reasoning that is viewed as a sign of philosophical brilliance. We started to wonder whether such stereotypes, which amount to equating brilliance with men, might well dissuade women from entering a field that holds this quality in high esteem. Moreover, current members of such a field might themselves hold different expectations about the prospects of men and women and might evaluate and encourage them differently as a result. The same logic extends to race: our country has a long history of portraying African-Americans as intellectually inferior, which is particularly likely to affect their participation in a field that focuses so single-mindedly on the quality of one's intellect. Considering these stereotyped attitudes, which are unsupported by science, philosophy's fascination with brilliance may have a real impact on its diversity.

Later that night the two of us talked about our insight. We speculated whether its implications extend beyond our home disciplines. Talk of brilliance is common in academia and—it seemed to us—quite common in fields that have similar issues with diversity such as science, technology, engineering or mathemat-



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IN BRIEF

Academic fields that prize the brilliance of their members, the authors found, are likely to be less diverse in gender and racial makeup.

Although innate cognitive ability is not, as far as scientists can tell, tied to gender or race, it is psychologically easier to ascribe this trait to people from groups stereotypically assumed to be intelligent.

Women and African-Americans may subconsciously interpret a field's emphasis on brilliance as a subtle "Keep Out" sign that dissuades them from entering certain disciplines in the sciences and humanities.

ics. Might our anecdotal comparison of philosophy and psychology have something new to say about the underrepresentation of women and minorities in these disciplines?

The more we thought about it, the more we realized that our brilliance hypothesis might also explain some of the variability in gender and race gaps *among* different scientific fields. For example, women make up nearly 50 percent of doctoral degrees in biochemistry but just more than 30 percent of Ph.D.s in organic chemistry. The difference cannot easily be explained by the content of the fields, in which there is considerable overlap, or by their history—biochemistry emerged from organic chemistry at about the same time psychology separated out of philosophy as an independent discipline. We wondered whether the demographic differences between such sibling subjects, as well as more generally among scientific fields, could be explained in part by the extent to which they emphasize exceptional intellectual talent as the key to success.

SUCCESSFUL MINDSETS

OUR EARLY CONJECTURES quickly reminded us of the rich body of work developed by psychologist Carol Dweck of Stanford University. Dweck and her colleagues have shown that one's beliefs about ability matter greatly for one's ultimate success. A person who sees talent as a stable trait (a "fixed mindset" in Dweck's terminology) is motivated to show off this aptitude and avoid mistakes, which presumably reflect the limits of that gift. In contrast, a person who adopts a "growth mindset" sees his or her current capacity as a work in progress. In other words, ability is a malleable quantity that can usually be increased with more effort and better strategies. For a person with a growth mindset, mistakes are not an indictment but rather a valuable signal highlighting which of their skills need work.

Although Dweck initially studied mindsets in individuals, she and Mary Murphy, now at Indiana University Bloomington, recently suggested that organized groups of people, such as companies and clubs, may also hold these sorts of views. We took that idea a step further and considered whether they might permeate entire disciplines as well. The fascination with brilliance in philosophy and other areas could conceivably create an atmosphere in which displays of intellectual prowess are rewarded, and imperfections are to be avoided at all costs. In combination with the stereotypes suggesting that genius is unevenly distributed across groups, such a field-wide perspective could easily turn toxic for members of stereotyped groups, such as women or African-Americans. After all, it is easy to "see" imperfections and inadequacies in those people whom you expect to have them.

Several long phone conversations later, we had a tentative plan for putting our ideas to the test. We would contact academic professionals from across a wide range of disciplines and ask them whether they thought that some form of exceptional intellectual tal-

ent was necessary for success in their field. We would then look up statistics on the gender and racial/ethnic composition of the people obtaining Ph.D.s in these disciplines, which the National Science Foundation freely supplies on its Web site. If our hunch was correct, we should see that those disciplines that place more value on brilliance would tend to have fewer female and African-American Ph.D.s. This pattern should hold not just at the macro level—when comparing the hard sciences, for example, with the social sciences and the humanities—but also *within* these broad domains—for disciplines as similar as philosophy and psychology.

More than a year and thousands of e-mailed surveys later, we and our collaborators Meredith Meyer of Otterbein University in Ohio and Edward Freeland of Princeton University finally had an answer to some of our questions. Equal parts relieved and exhilarated, we saw that the answers received from almost 2,000 academics across 30 fields matched the distribution of Ph.D.s in the way we had expected. Fields that placed more value on brilliance also conferred fewer Ph.D.s on women and African-Americans. The greater the emphasis on this single fixed trait, the fewer doctoral degrees were awarded to either of these groups. The proportion of female and African-American Ph.D.s in psychology, for example, was higher than the parallel proportions for philosophy, math or physics.

Next, we separated the responses in the physical and biological sciences from those in the humanities and social sciences. Analyses of these subgroups indicated that a stronger emphasis on brilliance correlated with fewer female and African-American Ph.D.s regardless of whether we compared physics with biology or philosophy with sociology. It seemed that we had stumbled onto an explanation that was general enough to describe the representation of multiple stereotyped groups in fields across the entire academic spectrum.

ALTERNATIVE IDEAS

OUR EXCITEMENT ABOUT THESE DATA ASIDE, all we had really shown at this point was a correlation between the presumed desirability of a fixed trait—brilliance—with a dearth of women or African-Americans in a given field. We had not yet demonstrated cause and effect. Certainly many other plausible explanations for the gender imbalances have been proffered over the years—from a heavier workload that favored single men and those with wives who did not work outside the home to a supposed female preference for working with living organisms, as opposed to inanimate objects. We needed to determine whether we were bringing something new to the table—perhaps our explanation reduced to one that had been previously offered.

We carefully examined the most common alternatives. For instance, did our brilliance measure simply track differences between fields in their reliance on



math? We looked at the math portion of incoming students' Graduate Record Examinations (GREs) as a proxy. Beliefs about brilliance still predicted women's representation above and beyond those scores. Similarly, we found no support for the common view that women are underrepresented in "high-powered fields" because they prefer a better work-family balance. We asked the academics in our sample how many hours they worked per week—both on- and off-campus. Taking into account these differences in workload did not, however, reduce the explanatory power of beliefs about brilliance; this single variable still predicted the magnitude of gender gaps across the 30 disciplines. We also considered the prevalent thought that women might be more interested in working with (and have a better intuitive understanding of) people, whereas men prefer inanimate systems. But an analysis of the many branches of philosophy, for example, that do in fact consider people—and are still dominated by men—basically blew that idea out of contention.

As often happens in research, this initial study made it clear to us how much we did *not* yet know about the phenomenon we were investigating. For example, we realized it would be important to know if academics' beliefs about brilliance predict gender and race gaps

at earlier points in students' educational trajectories. We were very interested in testing our idea at the bachelor's level, which is the gateway to students' later careers. Do field-level messages about the importance of brilliance relate to the majors that young women and African-Americans ultimately pursue?

The answer to this question is yes, as we reported in *PLOS ONE* in 2016 when we analyzed anonymous student evaluations of their college instructors on RateMyProfessors.com. We found that undergraduates were nearly twice as likely to describe male professors as "brilliant" or a "genius" compared with female professors. In contrast, they used such terms as "excellent" or "amazing" equally often for men and women on the popular Web site. We determined that the overall amount of talk about brilliance and genius in the student reviews (which is a proxy for a field's emphasis on these qualities) correlated closely with a lack of diversity in completed majors.

ORIGINS OF STEREOTYPES

FURTHER INVESTIGATION SHOWED that nonacademics share similar notions of which fields require brilliance. Exposure to these ideas at home or school could discourage young members of stereotyped groups from pursuing certain careers (such as those in science or engineering) before they even set foot on a college campus.

At this point, we realized we needed to investigate the acquisition of these stereotypes. When do young people in our culture start thinking that some groups have more brilliant people in them? On the one hand, it could be that this stereotype emerges late in development, after sustained exposure to relevant cultural input (for example, media portrayals of brilliance and gender-biased expectations from parents, teachers, professors and peers). On the other hand, evidence from developmental psychology suggests that children are cultural sponges—incredibly sensitive to signals in their social environments. In fact, youngsters in the early elementary grades seem to have already absorbed the stereotypes that associate math with boys and reading with girls. From this perspective, we might expect that stereotypes about brilliance would also be acquired early in life.

To explore this idea, we asked hundreds of five-, six- and seven-year-old boys and girls many questions that measured whether they associated being "really, really smart" (our child-friendly translation of "brilliant") with their gender. The results, which we published in January in *Science*, were consistent with the literature on the early acquisition of gender stereotypes yet were still shocking to us. Male and female five-year-olds showed no difference in their self-assessment. But by age six, girls were less likely than boys to think that members of their gender are "really, really smart."

Finding these stereotypes so early in childhood made us ask whether they might already begin to constrain boys' and girls' interests. We introduced another group of five-, six- and seven-year-olds to

unfamiliar gamelike activities that we described as being "for children who are really, really smart." We then compared boys' and girls' interest in these activities at each age. The results revealed no gender differences at age five but significantly greater interest from boys at six and seven years of age—which is exactly where we saw the stereotypes emerge. In addition, the children's own stereotypes directly predicted their interest in these novel activities. The more a child associated brilliance with the opposite gender, the less interested he or she was in playing our games for "really, really smart children." This evidence suggests an early link between stereotypes about brilliance and children's aspirations. Over the rest of childhood development, this link may funnel many capable girls away from disciplines that our society perceives as being primarily for brilliant people.

The hard work of figuring out how best to put all this information to use—how to intervene—lies ahead of us. But a few suggestions follow pretty directly from the evidence we have so far. Minimizing talk of genius or brilliance with students and protégés may be a relatively easy and effective way of making one's field more welcoming for members of groups that are negatively stereotyped in this respect. Given current societal stereotypes, messages that portray this trait as singularly necessary may needlessly discourage talented members of stereotyped groups. The changes may need to go a little deeper than talk, however, and tackle some of the entrenched, systemic issues that accompany a field's fascination with brilliance. Refraining from mentioning the Beam will not help young women in philosophy if the rest of the field's practices continue to be implicitly anchored in the idea that brilliance is all that matters.

Another key takeaway is that we may need to intervene earlier than conventional wisdom suggests. Our developmental data indicate that some of the psychological processes that work against diversity in fields that value brilliance can be traced all the way back to elementary school. Waiting until college to step in and ensure that all young people have a fair shot at finding the careers that might suit them no longer seems like the best-timed intervention—we as a society would be wise to encourage a growth perspective, as opposed to a fixed-trait mindset, in young children as well. ■

FRIENDLY FIELDS

Of the 17,505 doctorates awarded in science and engineering to women in the U.S. in 2015,

40%
were given
in the
life sciences.

Of the 1,307 of such doctorates granted to African-Americans, more than

40%
were in
psychology
and the social
sciences.

MORE TO EXPLORE

- On Being an "African American Scientist."** Raynard S. Kington in *Scientist*, Vol. 27, No. 5; May 2013. www.the-scientist.com/?articles.view/articleNo/35251/title/On-Being-an-African-American-Scientist-Expectations-of-Brilliance-Underlie-Gender-Distributions-across-Academic-Disciplines. Sarah-Jane Leslie et al. in *Science*, Vol. 347, pages. 262-265; January 16, 2015.
- The Frequency of "Brilliant" and "Genius" in Teaching Evaluations Predicts the Representation of Women and African Americans across Fields.** Daniel Storage et al. in *PLOS ONE*, Vol. 11, No. 3, Article No. e0150194; March 3, 2016.

FROM OUR ARCHIVES

How Diversity Works. Katherine W. Phillips; October 2014.

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