

Dunning–Kruger effect

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The **Dunning–Kruger effect** is a cognitive bias in which relatively unskilled persons suffer illusory superiority, mistakenly assessing their ability to be much higher than it really is. Dunning and Kruger attributed this bias to a metacognitive inability of the unskilled to recognize their own ineptitude and evaluate their own ability accurately. Their research also suggests corollaries: highly skilled individuals may underestimate their relative competence and may erroneously assume that tasks which are easy for them are also easy for others.^[1]

The bias was first experimentally observed by David Dunning and Justin Kruger of Cornell University in 1999. They postulated that the effect is the result of internal illusion in the unskilled, and external misperception in the skilled: "The miscalibration of the incompetent stems from an error about the self, whereas the miscalibration of the highly competent stems from an error about others."^[1]

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Original study

The phenomenon was first experimentally observed in a series of experiments by David Dunning and Justin Kruger of the department of psychology at Cornell University in 1999.^{[1][2]} The study was inspired by the case of McArthur Wheeler, a man who robbed two banks after covering his face with lemon juice in the mistaken belief that, because lemon juice is usable as invisible ink, it would prevent his face from being recorded on surveillance cameras.^[3] The authors noted that earlier studies suggested that ignorance of standards of performance lies behind a great deal of incorrect self-assessment of competence.

This pattern of over-estimating competence was seen in studies of skills as diverse as reading comprehension, practicing medicine, operating a motor vehicle, and playing games such as chess or tennis. Dunning and Kruger proposed that, for a given skill, incompetent people will:^[4]

- fail to recognize their own lack of skill
- fail to recognize the extent of their inadequacy
- fail to accurately gauge skill in others
- recognize and acknowledge their own lack of skill only *after* they are exposed to training for that skill

Dunning has since drawn an analogy – "the anosognosia of everyday life"^{[5][6]} – with a condition in which a person who experiences a physical disability because of brain injury seems unaware of, or denies the existence of, the disability, even for dramatic impairments such as blindness or paralysis: "If you're incompetent, you can't know you're incompetent.... [T]he skills you need to produce a right answer are exactly the skills you need to recognize what a right answer is."^[5]

Supporting studies

Dunning and Kruger set out to test these hypotheses on Cornell undergraduates in psychology courses. In a series of studies, they examined student self-assessment of logical reasoning skills, grammatical skills, and humor. After being shown their test scores, the students were asked to estimate their own rank in the class. The competent group estimated their rank accurately, while the incompetent group overestimated theirs. In other words, students who were about to get Ds and Fs thought they had turned in B-or-better work. As Dunning and Kruger noted:

Across four studies, the authors found that participants scoring in the bottom quartile on tests of humor, grammar, and logic grossly overestimated their test performance and ability. Although test scores put them in the 12th percentile, they estimated themselves to be in the 62nd.^[1]

Meanwhile, students of high ability tended to underestimate their relative competence. Roughly, participants who found tasks to be easy erroneously presumed that the tasks also must be easy for others; in other words, they assumed others were as competent, if not more competent, than themselves.^[1]

A follow-up study, reported in the same paper, suggests that grossly incompetent students improved their ability to estimate their rank after minimal tutoring in the skills they had previously lacked, regardless of the improvement gained in skills.^[1]

In 2003, Dunning and Joyce Ehrlinger, also of Cornell University, published a study that detailed a shift in people's views of themselves when influenced by external cues. Participants in the study, Cornell University undergraduates, were given tests of their knowledge of geography. Some of the tests were intended to affect their self-views positively, some negatively. They were then asked to rate their performance. Those given the positive tests reported significantly better performance than those given the negative.^[7]

Daniel Ames and Lara Kammrath extended this work to sensitivity to others and subject perception of how sensitive they were.^[8]

Research conducted by Burson *et al.* (2006) set out to test one of the core hypotheses put forth by Kruger and Muller in their paper "Unskilled, unaware, or both? The better-than-average heuristic and statistical regression predict errors in estimates of own performance": "that people at all performance levels are equally poor at estimating their relative performance".^[9] To test this hypothesis, the authors investigated three different studies, which all manipulated the "perceived difficulty of the tasks and hence participants' beliefs about their relative standing".^[9] The authors found that when researchers presented subjects with moderately difficult tasks, the best and the worst performers varied little in their ability to accurately predict their performance. Additionally, they found that with more difficult tasks, the best performers were less accurate in predicting their performance than the worst performers. The authors concluded that these findings suggest that "judges at all skill levels are subject to similar degrees of error".^[9]

Ehrlinger *et al.* (2008) made an attempt to test alternative explanations, but came to conclusions that were qualitatively similar to the original work. The paper concludes that the root cause is that, in contrast to high performers, "poor performers do not learn from feedback suggesting a need to improve".^[10]

Studies on the Dunning–Kruger effect tend to focus on American test subjects. A number of studies on East Asian subjects suggest that different social forces are at play in different cultures. For example, East Asians tend to underestimate their abilities and see underachievement as a chance to improve themselves and to get along with others.^[11]

Historical antecedents

Although the Dunning–Kruger effect was formulated in 1999, Dunning and Kruger have noted earlier observations along similar lines by philosophers and scientists, including Confucius ("Real knowledge is to know the extent of one's ignorance"),^[2] Bertrand Russell ("One of the painful things about our time is that those who feel certainty are stupid, and those with any imagination and understanding are filled with doubt and indecision"),^[10] and Charles Darwin, whom they quoted in their original paper ("Ignorance more frequently begets confidence than does knowledge").^[1]

Geraint Fuller, commenting on the paper, noted that Shakespeare expressed a similar observation in *As You Like It* ("The Foole doth thinke he is wise, but the wiseman knowes himselfe to be a Foole" (V.i)).^[12]

Award

Dunning and Kruger were awarded the 2000 satirical Ig Nobel Prize in psychology "for their modest report, 'Unskilled and Unaware of It: How Difficulties in Recognizing One's Own Incompetence Lead to Inflated Self-Assessments' ".^[13]

See also

- Curse of knowledge
- Four stages of competence
- Grandiose delusions
- Hanlon's razor
- Hubris
- Impostor syndrome
- Narcissism
- Not even wrong
- Optimism bias
- Overconfidence effect
- Self-deception
- Self-efficacy
- Self-serving bias
- Superiority complex
- Ultracrepidarianism

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Further reading

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