

Edited by

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Editor of *This Idea Must Die*

"A lavish cerebral feast."

-*The Atlantic*

# Know This



Today's Most Interesting and Important  
Scientific Ideas, Discoveries, and Developments

EDGE.ORG Presents Original Ideas from "the World's Finest Minds"\*

Jared Diamond, Steven Pinker, Carlo Rovelli, Frank Wilczek,  
Alison Gopnik, Freeman Dyson, Martin Rees, Jonathan Haidt,  
Rebecca Newberger Goldstein, and more "Very, VERY smart people"†

\**The Guardian* †*Times Online*

## PSYCHOLOGY'S CRISIS

ELLEN WINNER

Professor of psychology, Boston College

The field of psychology is experiencing a crisis. Our studies do not replicate. When *Science* recently published the results of attempts to replicate 100 studies, those results were not confidence-inspiring, to say the least.\* The average-effect sizes declined substantially, and while 97 percent of the original papers reported significant  $p$  values, only 36 percent of the replications did.

The same difficulty in reproducing findings is found in other scientific fields. Psychology is not alone. We know why so many studies that don't replicate were published in the first place: because of the intense pressure to publish in order to get tenure and grants and teach fewer courses—and because of journals' preference for publishing counterintuitive findings over less surprising ones. But it is worth noting that one-shot priming studies are far more likely to be flukes than longitudinal descriptive studies (e.g., studies examining changes in language in the second year of life) and qualitative studies (e.g., studies in which people are asked to reflect on and explain their responses and those of others).

In reaction to these jarring findings, journals are now changing their policies. No longer will they accept single studies with

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\* "Estimating the reproducibility of psychological science," 349: 6251, 28 Aug. 2015.

small sample sizes and  $p$  values hovering just below .05. But this is only the first step. Because new policies will result in fewer publications per researcher, universities will have to change their hiring, tenure, and reward systems, and so will granting and award-giving agencies. We need to stop the lazy practice of counting publications and citations, and instead read critically for quality. That takes time.

Good will come of this. Psychology will report findings that are more likely to be true, less likely to lead to urban myths. This will enhance the field's reputation and, more important, our understanding of human nature.

## OUR CHANGING CONCEPTIONS OF WHAT IT MEANS TO BE HUMAN

HOWARD GARDNER

Hobbs Professor of Cognition and Education, Harvard Graduate School of Education; author, *Truth, Beauty, and Goodness Reframed*

We live at a time of great, perhaps unprecedented, advances in digital technology (hardware/software) and biological (genetic/brain) research and applications. It's easy to see these changes as wholly or largely positive, although as a card-carrying member of the pessimists' society I can easily point to problematic aspects as well. But irrespective of how full (or empty) you believe the glass to be, a powerful question emerges: To what extent will our conceptions of what it means to be human change?

History records huge changes in our species over the last 5,000 years or so—and presumably prehistory would fill in the picture. But scholars have generally held the view that the fundamental nature of our species—the human genome, so to speak—has remained largely the same for at least 10,000 years and possibly much longer. As Marshall McLuhan argued, technology extends our senses, it does not fundamentally change them. Once one begins to alter human DNA (for example, through CRISPR) or the human nervous system (by inserting mechanical or digital devices), we are challenging the very definition of what it means to be human. And once one cedes high-level decisions to digital creations, or these artificially intelligent entities cease to follow the instructions programmed into them

and rewrite their own processes, our species will no longer be dominant on this planet.

In a happy scenario, such changes will take place gradually, even imperceptibly, and they may lead to a more peaceful and even happier planet. But as I read the news of the day, and of the last quarter century, I discern little preparedness on the part of human beings to accept a lesser niche, let alone to follow Neanderthals into obscurity. And so I expect tomorrow's news to highlight human resistance to fundamental alterations in our makeup, and quite possibly feature open warfare between old and newly emerging creatures. But there will be one difference from times past: Rather than looking for insights in the writings of novelists like Aldous Huxley or George Orwell or Anthony Burgess, we'll be eavesdropping on the conversations among members of the third culture.