

Reading 1: Why Psychology Isn't Science

July 13, 2012 | By Alex B. Berezow

Psychologist Timothy D. Wilson, a professor at the University of Virginia, expressed resentment in his Times Op-Ed article on Thursday over the fact that most scientists don't consider his field a real science. He casts scientists as condescending bullies: "Once, during a meeting at my university, a biologist mentioned that he was the only faculty member present from a science department. When I corrected him, noting that I was from the Department of Psychology, he waved his hand dismissively, as if I were a Little Leaguer telling a member of the New York Yankees that I too played baseball.

"There has long been snobbery in the sciences, with the 'hard' ones (physics, chemistry, biology) considering themselves to be more legitimate than the 'soft' ones (psychology, sociology)."

The dismissive attitude scientists have toward psychologists isn't rooted in snobbery; it's rooted in intellectual frustration. It's rooted in the failure of psychologists to acknowledge that they don't have the same claim on secular truth that the hard sciences do. It's rooted in the tired exasperation that scientists feel when non-scientists try to pretend they are scientists.

That's right. Psychology isn't science.

Why can we definitively say that? Because psychology often does not meet the five basic requirements for a field to be considered scientifically rigorous: clearly defined terminology, quantifiability, highly controlled experimental conditions, reproducibility and, finally, predictability and testability.

Happiness research is a great example of why psychology isn't science. How exactly should "happiness" be defined? The meaning of that word differs from person to person and especially between cultures. What makes Americans happy doesn't necessarily make Chinese people happy. How does one measure happiness? Psychologists can't use a ruler or a microscope, so they invent an arbitrary scale. Today, personally, I'm feeling about a 3.7 out of 5. How about you?

The failure to meet the first two requirements of scientific rigor (clear terminology and quantifiability) makes it almost impossible for happiness research to meet the other three. How can an experiment be consistently reproducible or provide any useful predictions if the basic terms are vague and unquantifiable? And when exactly has there ever been a reliable prediction made about human behavior? Making useful predictions is a vital part of the scientific process, but psychology has a dismal record in this regard. Just ask a foreign policy or intelligence analyst.

To be fair, not all psychology research is equally wishy-washy. Some research is far more scientifically rigorous. And the field often yields interesting and important insights.

But to claim it is "science" is inaccurate. Actually, it's worse than that. It's an attempt to redefine science. Science, redefined, is no longer the empirical analysis of the natural world; instead, it is any topic that sprinkles a few numbers around. This is dangerous because, under such a loose definition, anything can qualify as science. And when anything qualifies as science, science can no longer claim to have a unique grasp on secular truth.

That's why scientists dismiss psychologists. They're rightfully defending their intellectual turf

Reading 2: Don't panic, but Psychology isn't always a science.

Mindhacks

August 20, 2013

Every so often, the 'is psychology a science?' debate sparks up again, at which point, I start to weep. It's one of the most misplaced, misfiring scientific discussions you can have and probably not for the reasons you think. To understand why it keeps coming around you need to understand something about the politics of studying things.

Science has higher status in academia and industry than the humanities so suggesting to a practitioner that "they're not a scientist" can be the equivalent of suggesting "you're not as valuable as you make out".

This plays in out in two ways: less scientific disciplines get less funding and people start being knobs at parties.

The second is clearly more serious.

Probably every psychologist has had the experience of someone coming up to them and drunkenly suggesting that psychology is 'all made up'. Psychiatrists get the same sort of crap but in the 'you're not a real doctor' vein from other medics.

This makes people who work in psychological disciplines a bit insecure, so they'll swear blind that 'psychology is a science'.

Psychology, however, is not a science. It's a subject area. And you can either study it scientifically or non-scientifically.

I'm going to leave aside the debate of what defines science, which has been better covered elsewhere. No, there isn't a strict definition of science, but the "you know it when you see it" approach is sufficient if we want to see if something can be widely considered scientific.

I'm also going to leave aside the debate about whether you can study mind and behaviour scientifically. It's clear that you can, even if some areas are harder to measure than others. This is what is usually meant by the "is psychology a science?" debate. I consider this to be a settled issue but it is also where the debate usually misfires.

In other words, psychology can be a science, but it isn't only a science.

There are many folks who do legitimate psychology research who are not doing science. It's not that they think they are but really aren't (pseudoscience) or that they're doing it so poorly it barely merits the name (bad science). It's that they don't want to do science in the first place.

Instead, they are doing qualitative research, where they intend to uncover patterns in people's subjective impressions without imposing their own structure onto it.

Let me give you an example.

Perhaps I want to find out what leads victims of serious domestic violence to drop a prosecution despite the abuser already being safely in jail, pending trial.

I could come up with a list of motivations I think might be plausible and then find a way of testing whether they are present, but essentially, no matter how rigorous my methods, the study still depends on what I think is plausible to begin with.

This could be a problem because I may not know a whole lot about the area. Or worse, I may think I do, but might largely be basing my assumptions on prejudice and what passes for 'common sense'.

Qualitative methods get at how people understand the situation from their own perspective and it looks at common themes across what they say.

In this case, the study by Amy Bonomi and colleagues applied a kind of qualitative analysis called grounded theory to transcripts of jailhouse phone calls between victims of domestic violence and the abusers.

Here's what they found:

...a victim's recantation intention was foremost influenced by the perpetrator's appeals to the victim's sympathy through descriptions of his suffering from mental and physical problems, intolerable jail conditions, and life without her. The intention was solidified by the perpetrator's minimization of the abuse, and the couple invoking images of life without each other.

Once the victim arrived at her decision to recant, the couple constructed the recantation plan by redefining the abuse event to protect the perpetrator, blaming the State for the couple's separation, and exchanging specific instructions on what should be said or done.

There is no pretence that this study has discovered what happens in all cases, or even if these are common factors, but what it has done is shown how this works for the people being studied.

This is massively useful information. If you're a scientist, suddenly you have a whole bunch of hypotheses to test that are drawn from real-life situations. If you're not, you understand one instance of this situation in a lot more detail.

The reason that human psychology can be studied both scientifically and non-scientifically is that the object of study can be objectively observed and can describe their own subjective experience.

This doesn't happen with electrical impulses, enzymes or subatomic particles.

I'm a neuropsychologist by trade, perhaps the most clearly scientific of the psychological disciplines, but I'm not going to pretend that qualitative research psychologists aren't doing important work that makes psychology more valuable, not less.

So psychology is not just a science, and is better off for it.

Oh yeah, and the drunk guy at the party? He's like someone who thinks a screaming orgasm is only a drink. I'm laughing *at* you chump, not with you.

Reading 3: Psychology's brilliant, beautiful, scientific messiness

Scientific American

By Melanie Tannenbaum on August 13, 2013

Today, sitting down to my Twitter feed, I saw a new link to Dr. Alex Berezow's old piece on why psychology cannot call itself a science. The piece itself is over a year old, but seeing it linked again today brought up old, angry feelings that I never had the chance to publicly address when the editorial was first published. Others, like Dave Nussbaum, have already done a good job of dismantling the critiques in this article, but the fact that people are still linking to this piece (and that other pieces, even elsewhere on the SciAm Network, are still echoing these same criticisms) means that one thing apparently cannot be said enough:

Psychology is a science.

Shut up about how it's not, already.

I clearly cannot just say that without explaining *why* psychology is a science, although sometimes I wish I could just join the biologists, chemists, and physicists who are never faced with having to answer such questions. So I will start by quoting the main thrust of Dr. Berezow's argument, and then explaining why the 20-year-olds who take my Intro Social Psych class each semester could have told Berezow why he's wrong by the end of our first week of class.

From Berezow's piece:

Psychology isn't science.

Why can we definitively say that? Because psychology often does not meet the five basic requirements for a field to be considered scientifically rigorous: clearly defined terminology, quantifiability, highly controlled experimental conditions, reproducibility and, finally, predictability and testability.

[To claim that psychology] is "science" is inaccurate. Actually, it's worse than that. It's an attempt to redefine science. Science, redefined, is no longer the empirical analysis of the natural world; instead, it is any topic that sprinkles a few numbers around.

First of all, if anyone is attempting to "redefine" science here, it is Berezow himself, with his claim that science has *ever* been limited to an empirical analysis of the natural world. I am an expert on psychology, not physics or chemistry, so there are many things about these fields that I do not have the expertise to fully address, and as a result my examples are sadly limited. But even with my limited perspective into the "hard sciences," I know that there is no way anyone can claim that they all revolve around empirical analyses of observable facets of the natural world. From what I can gather, there are plenty of phenomena in the "hard sciences" -- most notably, in physics -- that are not observable. String theory? Quantum mechanics? I mean, for goodness sake -- how long were physicists searching for the Higgs Boson without even knowing if it actually *existed*?! The technology required to search for it didn't even exist for over 30 years. And "natural"? What does natural mean? Produced by nature, so we can't count anything chemical or man-made as scientific? A tangible substance, so we can't count anything theoretical? Selectively using these qualifications as an excuse to exclude psychology and other "soft sciences" (excuse me while I roll my eyes so hard that I risk sending them permanently into the back of my head) from the scientific discipline without questioning the fact that "hard sciences" routinely address topics that are both "unnatural" and "unobservable" is simply lazy.

Now, let's address the charge that psychological concepts are "unquantifiable." Admittedly, yes -- this is often the most valid critique that can be leveled at psychology (although I'm sure the many cognitive psychologists I know who deal in fMRIs, ERPs, EEGs, reaction times, and eye tracking would cringe at this blatant misrepresentation of how they operate). But when it comes to us "social psychologists" who typically study fuzzier concepts (like feeeeeelings), we already know that we must address these potential critiques of our field in a responsible, rigorous way. And we do. With something called *operationalization*.

During the very first week of my Intro to Social Psychology class, I send my students home with one simple assignment -- come back next class with an answer to the question, "What is Love?" I play the Haddaway song as they're walking out the door and tell them to come back in 2 days with a way that they would define and measure "love" if they were creating their own experiments.

A silly exercise? Sure. But after they've handed in their responses and they return to class the following Tuesday, I put up a pie chart that shows them exactly how much their answers truly varied.

About 25% of the students tend to suggest closed-ended self-report measurements. *"Ask Person A how much she loves Person B on a scale of 1 to 5."*

About 25% of the students tend to suggest more open-ended self-report measurements. *"Ask Person A to write about how much she loves Person B; ask several independent coders to read these responses and then provide judgments of how much Person A really seems to love Person B."*

About 25% of the students lean towards physiological measurements. *"Hook Person A up to a bunch of psychophysiological equipment. When Person B comes in the room, measure how much Person A's heart rate goes up and how much Person A's palms sweat."*

And, finally, about 25% of the students find a way to surprise me. I can't remember many of the specific responses that fell into this category off the top of my head, but my all-time favorite one had something to do with making Person A imagine that Person B was about to be pushed off a cliff and then finding out how many other people Person A would be willing to sacrifice in order to save Person B's life. I'm not sure if that experiment would make it past the IRB, but I did really appreciate the creativity.

I put some of these examples up on the board, and the students all laugh. When they first got the assignment, they all inevitably thought it was just a fun, easy way to get quiz points during their first week of class -- and that it was an excuse for me to play "What Is Love?" a few too many times. Almost all of them initially think that operationalizing love is an easy question with an obvious answer. They are almost universally surprised when they see the sheer diversity of their classmates' responses, and come to realize that the answer they thought was "obvious" was not quite so obvious to their classmates after all.

Each and every semester, my class of 100 sophomore-aged undergraduates immediately comes to understand what Dr. Berezow has apparently yet to learn: ***Measurement is complicated. No matter what you study. Period.*** It's complicated if you're trying to explain what exactly Schrodinger was trying to say with his infamous cat problem. It's complicated if you're trying to figure out why there are EIGHT DIFFERENT SCALES that measure the exact same physical concept. It's complicated if you're trying to create the technology that might let you detect a hypothetical particle that, if found, would validate an entire model of particle physics. So why exactly are we supposed to be surprised that it's *still* complicated when you're trying to measure something abstract? Like feeeeeelings?

There is nothing that makes "palm sweatiness" a more valid operationalization of love than "hypothetical willingness to sacrifice other people for your partner," even if the former is the only indicator that is "natural" or "directly observable." Yet we can see how each and every indicator might make sense, *and might tell us something unique about that person and his/her relationship*. Maybe palm sweatiness is a great indicator of the

amount of sex a couple will have during the next few months, but willingness to sacrifice is a better indicator of how long that couple will ultimately stay married. Does that mean that we have to throw the entire concept of "love" out the window because there are many different ways to measure it and these operationalizations have different correlations with our outcomes of interest? Does that mean that love is no longer worth empirical examination? Does that mean that it's no longer worth trying to approximate how we can study and improve human relationships? Or does it just mean that we might have to suck it up and give some thought to the theoretical basis of our operationalizations so we can confidently justify our operational choices, recognize their weaknesses, and understand their strengths?

Now, psychology can -- and does -- run into problems when operationalization is inconsistent or abused. For example, this can be how you end up with too many "researcher degrees of freedom." Make no mistake: If a psychologist tries ten different operationalizations of love and only one results in a significant finding, so that operationalization is the one that is chosen for publication, that is *wrong*. If a psychologist can't get the finding that he/she wants with the typically accepted operationalization for a concept and goes with something totally untested for no good theoretical reason just because it happens to provide a p-value less than .05, that is *wrong*. But operationalization *itself*? The creation, validation, and testing of an operational definition that will serve as the proxy for an unobservable or abstract concept?

That's science, baby. Take it or leave it.

In the end, wouldn't it make more sense to just *appreciate* the nuances involved in operationalization instead of dismissing operational definitions themselves as an inherent weakness of an entire discipline? Rather than throwing out psychology, why don't we throw out sensationalist headlines that undermine how much hard work goes into psychological operationalization in the first place? If only we science writers -- myself included -- would pay more attention to how we treat operationalization when we write about psychological research, I think we could all be amazed at how much more information we would glean from these discussions. The thought, the creativity, the pure brilliance that goes into finding measurable, testable proxies for "fuzzy concepts" so we can experimentally control those indicators and find ways to step closer, every day, towards scientifically studying these abstractions that we once thought we would *never* be able to study -- that's beautiful. Quite frankly, it's not just science -- it's an art. And often times, the means that scientists devise to help them step closer and closer towards approximating these abstract concepts, finding different facets to measure or different ways to conceptualize our thoughts, feelings, and behaviors? That process alone is so brilliant, so tricky, and so critical that it's often worth receiving just as much press time as the findings themselves.

At the end of the day, what a sad, simplistic view of science we must have if we want to throw the baby out with the bathwater every time this complicated, beautiful world we live in gets just a little bit messy.