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Marvel Cinematic Universe Introductions

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Petrinovich's target article focused on how behavioral science is *done*, including how it is often done wrong, and how it should be done. I identify another malign influence on behavioral science, which, so far as I know, has, until now, been ignored (I would be happy to be shown that I am wrong on this). To wit, the way that Introductions to papers are written creates a niche that can be exploited for the purposes of promoting one's work to obtain resources or status, or for self-aggrandizement. I offer a few, probably wrongheaded, suggestions for ending this practice.

The Democrats don't matter. The real opposition is the media. And the way to deal with them is to flood the zone with shit.

Attributed by Vox.com to former White House Chief Strategist and Senior Counselor to President Donald J. Trump, Steve Bannon

I first read Lewis Petrinovich's target article in manuscript form in 1996 only days after I started my Ph.D. The ideas therein, recognized by others now and before, resonated with me. In hindsight, I suspect this was because I was a budding comparative psychologist and ethologist (Petrinovich's fields). However, unlike similar articles, such as Platt (1964), Chamberlin (1890/1965), and papers by Paul Meehl (1920-2003), which I have read and assigned to students countless times, I never even re-read Petrinovich's article. I suspect this had something to do with the fact that, unlike those other articles, his was consigned to a photocopy in a bound collection of readings for A.J. Figueredo's graduate statistics course and has been sitting on one shelf or another since. It took a pandemic for me to revisit the article, by which I mean accessing my office, scanning the article in using the department photocopier, and then, while fixing various bugs and typesetting it so that it was accessible, reading it for the first time in 25 years. Publishing his manuscript in *JMM* was an afterthought.

I envisioned initially that my contribution would relate points made in the article to research on animal personality. However, that idea did not 'stick', perhaps because it was too specific or because I was dealing with a newborn and a three-year-old, and so *nothing* would stick. Fortunately, a colleague asked me to review a manuscript and I agreed, for while the article was in many ways sound technically, in their Introduction the authors,¹ engaged in a behavior that I had seen many

¹ I do not know whether the manuscript was the work of one author or multiple authors, so am using "authors". Also, to avoid breaking confidentiality, I will not quote from the manuscript or provide any specifics.

times before but had never really thought about save to make a general comment about the need to revise the Introduction around so-and-so lines. This time, however, having had re-read Petrinovich's article, I was primed to see how the Introduction did not evaluate critically the research that came before, nor did it show how that study would build on the earlier work or resolve some issue. Instead, the Introduction was used to promote a viewpoint—to use a gentle phrase—held by its authors (cf. Paul Feyerabend's 1975 discussion of Galileo).

There were several signs that the authors wanted to use their Introduction in the way that I just described. I will, for now, leave it to others to examine the behavior in detail and to construct an ethogram, but two stand out. The first was that the authors described the question of whether a phenomenon existed not as a scientific question, but as a debate of some temperature or another. The second, which followed soon after, was a vote counting exercise in which the authors cited some papers that favored their view and some that did not.² However, when counting votes, the authors appeared to ignore the fact that the establishment of scientific facts is not a democratic process. What they did instead was to give equal weights to two types of studies.³ The first type of study would yield a finding X if Y was true but also if Y was not true. The second type of study would yield a finding Z if Y was true, and $\neg Z$ if Y was not true. It should be clear that the second type of study should be accorded more weight than the first type.

These sorts of Introductions resemble what Feynman (1974) referred to as “Cargo Cult Science” (see also chapter 10 in Deary, 2000 for a discussion in the context of human intelligence research).⁴ Feynman's metaphor refers to practices of inhabitants of Pacific islands that were designed to bring back the U.S. Air Force cargo planes (and the cargo) that landed on these islands during World War II. These practices included building control towers, landing strips, and headphones using available materials (Jacopetti, Cavara, & Prosperi, 1962), but some crucial element was missing, and so cargo never arrived. That “something”, Feynman suggested, was “a kind of utter honesty” in that one should report not just what one thinks is “right” about an experiment or study, but also why the experiment or study might not be right, and what other possible explanations for the results.

When it comes to how a study and its hypotheses or questions are justified in an Introduction, a different metaphor, but one that parallels Cargo Cults, is appropriate. A possible metaphor emerged in an editorial in the New York Times. In that editorial, Academy Award winning director, producer, and screenwriter Martin Scorsese contrasted movies from the Marvel Cinematic Universe with cinema (Scorsese, 2019).

² Often, the two sets of references (and sometimes a third set for studies with “inconclusive” results) are lumped together within a single pair of parentheses. That was not the case here, thank goodness.

³ There is a comparable problem, and a large literature that addresses it, with respect to how to weight studies in meta-analyses (S. Vazire, personal communication, August 13, 2021).

⁴ Gelman and Higgs (2021) have highlighted concerns about Feynman's metaphor.

Marvel films, he stated, were made by talented artists, viewed on the big screen, and had numerous other features that films that he considered “cinema” had, but they lacked some things. For instance, the characters and situations were not as complex as those in the real world. Scorsese therefore saw these films not as art, and so they were not to his taste. He also noted that films of this sort (“franchise films”) crowded out cinema.

What is lacking, then, in the kinds of Introductions that I am talking about—let us call them Marvel Cinematic Universe Introductions—should now be clear. The practice of treating all studies as equal is akin to writing scenes in which one-dimensional ‘good guys’ fight one-dimensional ‘bad guys’. Moreover, because the studies that may produce findings X can, much like the Marvel franchises, sequels, etc., often be ginned out rapidly, they crowd out studies that may produce findings Z, that is, they flood the zone. In doing so, Marvel Cinematic Universe Introductions give a false impression about whether Y is real and open a niche that can be exploited by researchers who are reluctant to give up on an idea, want to increase their h-index, and win promotions, grants, and fame. No doubt there are other downstream effects, for example, in degrading the quality of meta-analyses.

Before offering recommendations, I would like to offer a caveat. The problems that I noted are probably limited to studies that address whether a phenomenon exists, for instance, whether some great ape species shows altruism, rather than studies that attempt to estimate or refine an estimate of some parameter, for instance, the heritability of IQ. So, what are my recommendations? From least to most radical they are: 1) improved teaching of what an Introduction should be and how to weigh evidence. The classic animal learning literature is replete with examples (e.g., Tolman, 1938); 2) reviewers and editors should reject studies that are inadequately justified; 3) behavioral science journals, like those in fields such as medicine (and in psychology decades ago), should severely limit the length of Introductions and/or number of papers cited therein; 4) manuscripts should be reviewed *without* Introductions with the reviewers and editors deciding whether the study is justified. I realize that some of these recommendations, and especially the last one, come with risks, including hypothesizing after the results are known (Harlow, 1962; Kerr, 1998). However, they may bring benefits, such as improving the validity of metrics, such as the h-index, and addressing other problems relating to Introductions that have been identified (Nature Human Behaviour, 2020, 2021). In any event, I would argue that it is worth discussing, or even experimenting, to see how these methods or other possibilities affect not just the quality of Introductions, but of the behavioral sciences more generally.

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