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In early August 2016, NCSE [reported](#) [5] on the results of the latest of the National Surveys on Energy and Environment. Respondents were asked questions such as, “Is there solid evidence that the average temperature on earth has been getting warmer over the past four decades?” (66% said yes: not so bad) and “Is the earth getting warmer because of human activity such as burning fossil fuels, or mostly because of natural patterns in the earth’s environment?” (46% of those who said yes to the previous question chose human activity: not so good). Interestingly, though, the researchers also asked, “What is the primary factor that has caused you to believe that temperatures on earth are increasing?” and “What is the primary factor that makes you believe that temperatures on earth are not increasing?” (all quoted from the [questionnaire](#) [6] [PDF], questions 7, 9, 10, and 20).

I was interested, and NCSE’s story failed to mention the responses to the “primary factor” questions, because, as a century of research shows, people are not especially accurate in their claims about why they believe what they believe. Who, after all, when asked why they believe what they believe about global warming, would volunteer “blind prejudice” or “it just seems that way to me” or “it scares me to think otherwise” over “careful and dispassionate scrutiny of the evidence”? Textbooks on survey research routinely warn against questions such as these. For instance, Weisberg, Krosnick, and Bowen’s *An Introduction to Survey Research, Polling, and Data Analysis* (third edition, 1996), observes, “The explanations that people offer may make sense and sound reasonable, but they often have nothing to do with the actual causes of behavior.”

In the literature on public acceptance of evolution, researchers have thus generally sought to identify correlations between, on the one hand, acceptance/rejection of evolution and, on the other hand, various demographic factors (educational attainment, degree of religiosity, political affiliation, etc.) and/or basic level of understanding of evolution and/or various cognitive factors (e.g., open-mindedness, deference to authority, need for certainty, etc.). But there are exceptions. A few years ago, in reply to a researcher who was considering whether to include a question like “Why do you believe what you believe about evolution?” on a survey instrument, I assembled a list of prior work with such questions. I don’t promise that it’s complete ( $n = 2$ ) or up-to-date (four years later), but perhaps it will be of interest nevertheless.

First, in the *Journal of Biological Education* in 2000, J. R. Downie and N. J. Barron reported on a study of first-year biology and medical students at the University of Glasgow over the course of almost ten years. Respondents who rejected evolution (a small percentage, between 3.9% and 11.3%, depending on the year) were asked to say why and were allowed to pick any of the following:

- The evidence for evolution is full of conflicts and contradictions.
- I accept the literal truth of a religious creation account that excludes evolution.
- I think that there are good alternatives to evolution that explain the origin and distribution of species.
- Other reasons.

On average, 71% of the biology students and 96% of the medical students who rejected evolution attributed their rejection to their literalism, while concerns about evidence and acceptance of alternatives were cited by only 33% and 19%, respectively, of the biology students and by only 30% and 17% of the medical students. (Multiple answers were allowed, so the numbers aren't supposed to sum to 100%.)

Second, in *Evolution and Development* in 2010, David P. Wilson reported on a study conducted via the internet; as he acknowledges, it was a convenience study and it is impossible to exclude the possibility of selection bias. Respondents who agreed that "God created the universe, including all life, fully developed and similar to how we see it today, out of nothing," were then asked to explain their rejection of human evolution:

- The Bible's book of Genesis is God's authoritative word about how things came to be and should be interpreted literally.
- It undermines the belief that humans were created in God's image and thus separately from all other animals.
- There is no evidence to support evolution by natural selection.
- Evolution has only been shown to occur from negative selection (meaning that no species can evolve to a more "complex" species).
- Micro-evolution can occur (meaning within a species there can be changes but still remain the same species) but there is no evidence for macro-evolution (i.e., one species becoming an entirely new species).
- Other.

Wilson presents histograms without the exact numbers, but eyeballing the figures, it looks like ~72% rejected evolution because of literalism, ~68% because of humans' being created in God's image, ~51% because of no evidence for speciation, ~39% because of no evidence for evolution by natural selection, ~35% because of no macroevolution, and ~8% for other reasons. (As with the previous survey, multiple answers were allowed.)

One swallow does not a summer make, nor two surveys a summa, but it certainly is suggestive that in both surveys literalism was by far the preferred explanation of those respondents who rejected evolution for their rejection of evolution. But what is suggested? That literalism is really the primary cause of rejecting evolution? Or that the rejecters of evolution have accepted the claim that evolution is to be rejected as incompatible with scripture as a normative claim? Or that rejecters of evolution are simply more certain of its supposed incompatibility with holy writ—and thus more likely to tick that box—than they are of its putative scientific failings? More research is needed (to coin a phrase), including a

comparison with the results of surveys showing a robust correlation between literalism and rejection of evolution.

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