

the social sciences, however, we do detect a decrease in uncited papers—from 49.7% for 1981 articles to 45.3% for 1985 articles. In the arts and humanities, the figure of 93% uncited is fairly steady from 1981 through 1985.

This, we hope, serves to illustrate the great range of statistics one can derive depending upon what “cut” is made from the ISI databases. For example, articles published in the highest impact journals like *Science* are almost never left uncited.

We will be generating, over the coming months, article-only statistics, both U.S. and worldwide, for subdisciplines in the sciences, social sciences, and humanities, corresponding to the overall database statistics referred to by Hamilton in his second article. We have not yet produced a report on these statistics, but in light of the great interest in the numbers, we will now do so.

We hope this information clarifies the record and will end further misunderstanding or politicalization of these statistics.

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System Safety

M. Elisabeth Paté-Cornell's article about system safety (30 Nov., p. 1210) attempts the laudable feat of adding management and oversight processes to a review of safety, but the article is badly flawed by a peculiar, nonscientific view of human performance. Paté-Cornell suggests that some errors “can be attributed to bad luck” (p. 1210) and that some human-attributed errors might be due to “sheer stupidity” (p. 1213). “Bad luck” and “stupidity” are nonscientific, personal attributions that have no role in a scientific discussion of human behavior.

It is the job of cognitive scientists to understand and explain human behavior. We do not use judgmental terms such as “stupid”; rather, we try to determine the circumstances and mechanisms that lead to the behavior. At the time of action, nothing is stupid; that is a judgment placed later, but it has no scientific standing. Calling an event “bad luck” or “stupid” is not helpful, especially in the review of accidents and errors. The real problem with the use of such terms is that they excuse the accident researcher from further responsibility instead of leading them to discover the circumstances that led to the behavior.

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Response: In my study, I reserved the phrase “bad luck” for a specific class of failures: those due to overload. For example, a platform is designed for the 100-year wave, but the 1000-year wave occurs within its lifetime and destroys it. In this case, the chosen design criterion was considered acceptable by the profession, the usual safety factors were applied, the system's capacity was not decreased by a major error, and an event that was not unpredicted (although it had a low probability) occurred. There is no organizational malfunction that needs correction. The choice of a more stringent design criterion would simply have changed the probability of “bad luck.”

The term “stupidity” is defined by my dictionary as: “showing a lack of sense of intelligence.” I used it with this meaning to characterize, and if possible to prevent, a class of problems such as the following: an operator has received the proper training for the environment in which he or she works, and procedures exist to guide actions under most circumstances; but some situations are impossible to anticipate and require a level of reasoning capability that is simply not there. Social science research can then provide guidance to those addressing further questions, for example, What are the reason-

ing capabilities required for this job? What screening procedures can be used? How can these capabilities be enhanced by training or improvement of the working environment? Similarly, it may be helpful to recognize that the problem with the freeway next door is that it could collapse in a large earthquake. The question to the scientists is then, What levels of earthquakes can be anticipated? The question to the engineers is, How can adequate resistance be achieved? My function is not to point a finger after an accident but to anticipate possible failure scenarios. A problem can be clearly identified as “weakness” or “stupidity” or described in apparently neutral terms. Being explicit about the problem is not “an excuse” to leave it at that (neither to the researcher nor to the organization) but is, on the contrary, the beginning of a search for an appropriate solution. I believe that, in a problem-solving mode, it is helpful to “eschew obfuscation.” I agree, however, that in the scientific context, useful common terms sometimes require a precise definition.

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