

EDITORIAL

PLAYING THE GAME OF SCIENCE BY THE RULES

Suppose we consider science to be a game. What are the rules of the game, and what difference would this approach make? I will discuss five rules that have been proposed by various philosophers and scientists for the “game” of science, and suggest that this approach to science could be helpful in dealing with questions relating science and Christian faith.

Striving for statistical significance in one’s results is a rule that is commonly followed in psychological science,¹ as well as other sciences in which two or more samples are compared quantitatively. Statistical significance refers to the idea that the results of a research project would be statistically unlikely to be obtained by selecting a comparable set of numbers randomly. Properly done, statistical significance requires a suitably large sample size. Unfortunately, sample sizes are often too small to justify the degree of confidence claimed. Bakker *et al.* report² that as many as half of all reviewed psychology studies had problems with sample size or other types of bias. This study echoes the results of a previous study finding a high proportion of unreliable claims based on the use of statistical significance in other types of studies.³

Simplicity is another rule of the science game, according to Kevin Kelly, a philosopher at Carnegie Mellon University.⁴ The simplest explanation is probably the best explanation, an idea commonly called “Ockham’s Razor,” after William of Ockham (d 1347), the English philosopher who championed the principle. Often called the “principle of parsimony,” this rule is not intended to be absolute, but is useful to avoid the temptation to make theories ever more complex in an effort to protect them from being falsified.

Another proposed rule is to use multiple hypotheses. One famous advocate of this rule, particularly in the study of human fossils, was Sherwood Washburn,⁵ who was voted the leading American physical anthropologist of the twentieth century by the American Association of Physical Anthropologists. Washburn deplored the tendency of scientists to defend their own pet theories about human evolution, and suggested that the consideration and comparison of multiple hypotheses might release researchers from their love affair with their own discoveries and hypotheses. In doing so, Washburn was echoing the sentiments of geologist TC Chamberlin, who famously made a similar suggestion more than 85 years previously.⁶

The temptation to invoke “science” as an authority to buttress one’s own views is still with us, as can be seen in the publicity attending each new fossil hominid discovery. I once attended a meeting discussing evolu-

tion in which one professor stated that each new hominid fossil discovery seems to result in a rearrangement of the hominid evolutionary tree.⁷ The idea was met with some disapproval, but the frequency of claims that new discoveries will force a rearrangement of the human evolutionary tree shows the professor was correct.

Richard Dickerson, a molecular biologist in Los Angeles, claims that the defining rule of science is: “Let us see how far and to what extent we can explain the behavior of the physical and material universe in terms of purely physical and material causes, without invoking the supernatural.”⁸ This approach is generally called “methodological naturalism.” Dickerson argues that explanations involving God’s actions may be true, but they cannot be put forward as scientific explanations. This rule implies that science is truly a game with limited scope, and does not comprise the whole of reality, contrary to the claims of scientism so widely disseminated by the public media.

A final rule of science as a game is to consider all scientific conclusions as tentative. Karl Popper, the famous philosopher of science, wrote: “The game of science is, in principle, without end. He who decides one day that scientific statements do not call for any further test, and that they can be regarded as finally verified, retires from the game.”⁹ Here, the rule seems to be that science can never be trusted to provide final conclusions. There is always a possibility that new discoveries will overturn current scientific consensus, hence further study is always in order. This is a truth admitted by nearly everyone, but seldom put into practice when one’s own ideas are at stake.

These five rules have been proposed¹⁰ for the “game” of science: seek statistical significance; prefer the simplest explanation; consider multiple hypotheses; restrict explanations to physical mechanisms without recourse to divine activity; and never accept science as a final answer. What are we as creationists to do with these “rules?”

The need for care in the use of statistical tests is a point on which everyone can agree. Indeed, all aspects of data collection and analysis should be done with care and accuracy. The integrity of science depends on this, and the occasional incidences of fraud in science are rightly deplored.

The rule to prefer simple answers may be a good starting point, and caution is advisable when protecting a hypothesis from hostile data, but we must not allow ourselves to be prisoners of parsimony. The simplest explanation is not always the best. Conclusions that are chosen solely on the basis of parsimony should be regarded with caution. Evolutionary phylogenies often are chosen from a multitude of possibilities using the principle of parsimony.

Using multiple hypotheses is a good rule in research, especially when addressing historical questions.¹¹ It can always be useful to test a hypothesis, because this provides a basis for evaluating its probable truth. However,

hypotheses that have been rejected may turn out to be accepted when more data are available, so it may be useful to consider even those hypotheses that are thought to have been disproved when exploring a problem.

The rule of methodological naturalism (MN) is problematic (see article by Brand, this volume). MN seems to present a conflict with the rule of using multiple hypotheses because it excludes one type of hypothesis simply on the basis of philosophical preference. This is not a good methodology for advancing knowledge. Even if MN is recognized as only a working hypothesis that does not necessarily correspond with reality, it follows that there are many questions that science is not designed to address because there is reason to believe they involve supernatural activity.

Many Christians hold that science has suffered too much at the hands of MN. This may be because methodological naturalism in science has, in reality, morphed into philosophical naturalism, which at best denies the influence of any supernatural agents in the world and at worst denies they exist at all. Physical evidence of Intelligent Design (ID)¹² limits the appropriateness of methodological naturalism, which may be one reason so many materialistic scientists oppose ID with a quasi-religious fervor. Surprisingly, many scientists who believe in God are equally adamant that there is no evidence of ID in nature.

The problems with MN validate the rule that we should never take a scientific answer as final. Even experimental questions in science may be subject to dispute and uncertainty. How much more should historical questions be taken with great caution. We may be able to say that, unless God acted in a way unfamiliar to us, a particular explanation is the best we have at the moment. The Scriptures can serve as a means of identifying events in which God may have acted in ways not observed today. In such cases, the rule of multiple hypotheses should trump the rule of MN.

Perhaps creationists can be leaders in wisely using the rules of the game of science. One way we might do this is to describe questions in historical science in terms of multiple competing hypotheses, with an evaluation of their respective plausibilities. This would help the public think in terms of multiple hypotheses rather than uncritically accepting the current scientific consensus. The possibility of divine action should be included among our hypotheses, especially when the Bible identifies God as acting in a particular event. Naturally, we should be careful to attribute creationist ideas to their proper source, which may be either science or the Bible, or both. We must also show care in the use of data and analysis.

Creationists should keep in mind the tentative nature of scientific conclusions. We are not alone in wanting to verify our ideas by appealing to the supposed authority of science, but this entails significant risk. Science is constantly making new discoveries, some of which overturn previously

established ideas. When we use the claims of science as proof of the truth of the Bible, we run the risk that the “fact” we promote may soon be refuted, leaving observers with the impression that disproof of the scientific “fact” also disproves the biblical point to which the “fact” had been attached. We can have confidence in the Bible independently of the progress of science. We do well to investigate the discoveries of science and relate them to the biblical record, but we do so in a context in which the Bible is the standard by which all ideas, including the claims of scientists, are judged.

Regarding science as a game rather than a final authority can benefit us as we face the challenges brought to Christian faith by materialistic science. For example, it would help us resist the influence of scientism – the idea that science is the only source of real knowledge. Regarding science as a game would also help us see why we should not uncritically accept the latest scientific claim or fad and attempt to use them either to confirm or deny teachings of Scripture. The result of this approach should also make it less threatening to live with unresolved questions in integrating faith and science, and make us more willing to live lives of faith.

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ENDNOTES

- 1 Bakker M, van Dijk A, Wicherts JM. 2012. The rules of the game called psychological science. *Perspectives on Psychological Science* 7(6):543-554.
- 2 *Ibid.*
- 3 Ioannidis JPA. 2005. Why most published research findings are false. *PLoS Medicine* 2: 124; doi:10.1371/journal.pmed.0020124
- 4 Kelly DT. 2007. Simplicity, truth and the unending game of science. In Bold S, Lowe B, Rasch T, van Benthem J (eds), p 223-270. *Foundations of the Formal Science. V. Infinite Games*. Carnegie Mellon University Research Showcase@CMU
- 5 Washburn SL. 1974. Human evolution: science or game? *Yearbook of Physical Anthropology* 1973. Yearbook Series 17:67-70.
- 6 Chamberlin TC. 1965. The method of multiple working hypotheses. *Science* 148:754-759 (reprint of article first published in *Science* 15 (7 February 1890):92-96.
- 7 Meeting of the Paleontological Society in Denver, October 1999, discussing the evolution-creation controversy.
- 8 Dickerson RE. 1992. The game of science: Reflections after arguing with some rather overwrought people. *Perspectives on Science and Christian Faith* 44:137-138.
- 9 Popper K. 1934, 1959. *The Logic of Scientific Discovery*, ch 2 Section XI Methodological Rules as Conventions. Oxford: Routledge.
- 10 Other “rules” for science could be added, but these five were proposed explicitly for science as a “game.”
- 11 E.g., see discussion in Meyer SC. 2009. *Signature in the Cell*. New York: HarperCollins, p 324-348.
- 12 The Discovery Institute, headquartered in Seattle, WA, has published numerous books on Intelligent Design.