

# CWRU philosopher examines the hypothesis vs. exploratory funding divide

September 27 2013

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A Case Western Reserve University professor wondered why some types of research were more apt to secure federal grants, while others—especially exploratory science—often didn't.

Using the National Institutes of Health (NIH) as a case study, Assistant Philosophy Professor Chris Haufe concluded that hypothesis-based research has the edge over discovery research for several reasons that he explains in a new paper.

Haufe discusses the NIH's peer-reviewed grant process in his *Studies in History and Philosophy of Science* journal article, "Why do funding agencies favor hypothesis testing?"

Hypothesis-driven research is based on scientific theories, while exploration is based on a search for discovery backed by few theories or none at all.

While looking into the types of research most often funded, Haufe shows that instructions to reviewers and applicants strongly favor hypothesis-based inquiries that are related to and relevant to current [science issues](#).

For example, Haufe reports that the NIH guidelines for RO1 grants (described by the NIH as investigator-initiated or a response to a program announcement or request for application) to researchers advise applicants, "A strong grant application is driven by a strong, solid

hypothesis with clear research objectives. The specific aims are a formal statement of objectives and milestones of the research project towards testing the hypothesis."

The article offers two explanations why the NIH prefers hypothesis testing: The research is driven by best practices (how to do and test science), and it's easy for [peer reviewers](#) to separate good from bad science based on the research methods.

Those with a realistic chance to prove what they set out to find and have the biggest impact for the public's benefit tend to receive the federal research dollars, Haufe concludes.

With hypothesis testing, researchers present what the study hopes to accomplish, how it will be done and possible outcomes. Many researchers also conduct pilot studies or draw from findings by other researchers to build a strong case for future success.

Exploratory research, however, is driven more by hope and chance of discovery, Haufe writes.

Funding success also tends to take the path of least risk, Haufe explains.

Hypothesis testing takes the next step in scientific theory, having already stood the rigors of examination. Meanwhile, exploratory research examines unknown areas with no or little-known theories to back them—perceived as a riskier bet.

Haufe said the federal government, with limited funding, wants to support research where there's a chance of success that serves both public and science interests. The closer the research is to what's already known also improves chances of funding, he reports.

The science community has long accepted hypothesis testing. More than 50 years ago, British philosopher Karl Popper became known for his ideas that good [science](#) involved testing to determine validity.

Haufe said hypothesis testing now has become a standard when evaluating research proposals.

Still, Haufe does not want to rule out exploratory research. His next step is to develop guidelines that help determine the scientific merits of exploratory research and what separates a sound project from one that might go nowhere.

Provided by Case Western Reserve University

Citation: CWRU philosopher examines the hypothesis vs. exploratory funding divide (2013, September 27) retrieved 18 April 2024 from <https://phys.org/news/2013-09-cwru-philosopher-hypothesis-exploratory-funding.html>

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