The End of Economic Theory?

"The End of Theory," written by Chris Anderson, suggests that deductive reasoning (e.g., data mining) is sufficient and that inductive reasoning, i.e., theory building, is less important. Deductive reasoning may be sufficient for technological improvements, like marketing research. Marketing research has one fundamental goal: problem solving. A correlation that points out people who like jazz are more likely to buy expensive shoes is problem solving rather than science. However for science, theory building is important since science is the search for truth – i.e., verifiable, repeatable testing of hypotheses (valid and reliable results). Another correlation example, discovering that the gravitational force between two bodies is inversely proportional to the squares of their distances, is not useful in everyday problem solving, but it is truth. The following analysis is a two part attempt to explain why Anderson believes the scientific method is outdated, followed by critical evaluations of this claim by the renowned philosopher Kuhn.

Anderson is asserting that inductive reasoning is no longer a focus of inquiry. He describes the use of data as the main component of understanding why the world evolves the way it does. "This is a world where massive amounts of data and applied mathematics replace every other tool that might be brought to bear" (Anderson, 2008). His claim is not difficult to dissect objectively. However, it is critical to understand that Anderson is asserting this view intentionally to provoke theorists and scientists. Anderson believes sifting through data and discovering the underneath correlation is enough. Finding a correlation between jazz and people who like expensive shoes does not enable discovery about the truth of human behavior. For an example of a truth, consider that these specific people won't buy the expensive shoes if the price exceeds a certain percent of their income because their marginal propensity to consume is less.

Data gathering is only part of the issue, but Anderson believes it is the only requirement for succeeding. “Correlation supersedes causation, and science can advance even without coherent models, unified theories, or really any mechanistic explanation at all” (Anderson, 2008). Lastly, Anderson states, “Today companies like Google, which have grown up in an era of massively abundant data, don't have to settle for wrong models. Indeed, they don't have to settle for models at all” (2008). This statement is key to our analyses of the difference between science and technology.

Science is the search for truth, but Google is not searching for scientific truth. Scientific searches are funded by the government and research universities. Google is searching for ways to solve the problem. How can we present ads to people who like jazz so they will buy more expensive shoes? Data can be used both to inform the development of theory and can also be used to solve problems like Google’s. Chris Anderson’s article is taking Google as an example and trying to trick people into thinking that is science, when it is really just solving a marketing problem.

Moreover, data is necessary but not sufficient to develop theories. Data and theories must coexist. One has to wrestle with both sides of the argument. Inductive reasoning and deductive reasoning are both necessary. Before diving into Kuhn’s evidence for normal science supporting the coexistence of both forms of reasoning, I would like to discuss an important derivative of his scientific findings. Kuhn discussed the scientific collection of data before the discovery of oxygen due to the present data allowing for the measurement of what was happening when things burned. However, there was no theory yet. Kuhn discussed the use of the collected data to theorize the idea there must be something else in the air. Later on, they were able to discover oxygen itself. Thus, data and heory are equally important. One informs deductive reasoning and

the other informs inductive reasoning. One is important for theory and one is important for theory testing.

Furthermore, Kuhn observed multiple patterns of science. The different phenomena Kuhn observed happened at different points in time. It is important to understand where Kuhn stands on his own interpretation of normal science. Normal science is basically what we observe or see the majority the time. Kuhn believed many scientists are critics of what they are studying or theories they are posing. Nevertheless, there is also a significant amount of that specific science that scientists do not critique. Moreover, Kuhn discusses the use of the word paradigm. "It is a package of claims about the world, methods for gathering and analyzing data, and habits of scientific thought and action" (Godfrey-Smith 76). "...The big changes in how scientists see the world - the "revolutions" that science undergoes every now and then - occur when one paradigm replaces another" (Godfrey-Smith 76). How might Kuhn react to Chris Anderson's disacknowledgement of theories and hypothesis? Kuhn might possibly believe Anderson is not properly behaving like a philosopher. We need not just one theory, but the entire package of previous collections of historical data. Kuhn would disagree with Anderson stating that data has made the scientific method useless. As previously stated above, data and theory must coexist. Most importantly, Kuhn's stance on paradigms replacing one another does not fit into Anderson's article. Supercomputers are not a scientific revolution. Computers and data have been in use decades before Anderson's 2008 article was published. Therefore, Kuhn would disagree by most likely referencing paradigms. In order for Google to use data mining to reach their marketing goals, they must have recalled upon previous collections of technology, specifically data mining. In addition to data, scientists have set many null hypotheses testing to

see if their hypotheses are close to the truth when predicting the success of their outcomes, e.g. programming. Supercomputers did not develop in one day. Scientists of all sorts were constantly evolving with decade old theories and proofs of data mining to create a device capable of an exponential rate of data collection. Scientists are still improving their ability to measure and collect data.

We need not to forgo hypotheses, nor data. We must include previous sets of data beginning at the origin up to the current scientific state. It is not a question of one or the other, but a question of properly accounting for unique scientific revolutions. Anderson's piece on big data and the scientific method is simple to critique. One cannot exclude historic scientific practices when acknowledging the success of a new attempt at creating a "scientific revolution." Is data mining to find relationships (e.g. Google) a search for truth? Can data mining be designed to search for unchanging relationships? What if we can conclude the truth using reliability of relationships among the variables? Is it possible to see the difference between data mining on one hand and using models in a search for repeatable results, i.e., truth, on the other? It is extremely difficult to advance science without the use of hypothesis or theories.

Works Cited

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Godfrey-Smith, Peter. Theory and Reality: an Introduction to the Philosophy of Science. Univ. of Chicago Press, 2008.