

Critical Thinking – Understanding What We Don't Know

Felix qui potuit rerum cognoscere causas

The Roman poet, Virgil (Happy, who is able to understand the causes of things)¹

When professors assign research essays in the social sciences programs of study, we are trying to teach students critical thinking skills: we want them to be aware of their prejudices and preconceptions, question their assumptions, seek evidence, and examine the causes of things. Different disciplines (history, psychology, anthropology, sociology, political science, etc.) have different methods and conceptual models to ask and answer questions, but there are common elements to critical thinking that should be universal.

Cornell University psychology professor Thomas Gilovich has written a book explaining some of the foundations of critical thinking: *How we know what isn't so*.² The first step in designing effective research is to understand what can go wrong in the course of our normal thinking. Gilovich's work is based on experimental evidence that he has compiled, and is a good starting point for understanding the barriers to critical thinking in social science research. The following synopsis of Gilovich should help you to formulate research questions.

We can think of two basic sources of error, which are related. First, the way our minds work causes us to seek explanations for things, and this leads to inherent cognitive and social causes of error; it causes us to think that we know things that are not so. The way that we interact with other people reinforces this tendency. We believe that others believe and think as we do, or we believe what we think others believe. Secondly, we misapply, or fail to apply, the methodological tools that have been designed since the Enlightenment to enable scientific thinking, effectively overcoming the cognitive and social causes of error. We ignore statistics, we fail to randomize samples, and we explore events using intuition and superficial pattern seeking rather than comparative or experimental methods. An educated researcher can do better than this, but often we don't, because cognitive and social sources of error make the alternative too seductive – we are full time amateur explainers, finding easy patterns for which we then seek confirmatory evidence.

Making Stuff Up

We routinely misperceive and misinterpret random events, finding patterns where none really exist. We *want* the world around us to make sense, and so whether we want to or not, we see patterns and clusters – from the “man in the moon” to runs of luck in random coin tosses. Our intuition is that “random” sequences are dispersed, not clustered, so if

¹ The motto of the London School of Economics, chosen by its founders, the Fabian socialists Sydney and Beatrice Webb, to reflect their belief that social progress depends upon understanding cause and effect in social relations.

² Thomas Gilovich, *How We Know What Isn't So: The Fallibility of Human Reason in Everyday Life* (New York: Free Press, 1991)

we see what appear to be clusters of a phenomenon (e.g. a spike of crime at full moon, or a bunch of civil wars in a particular decade) we tend to believe that it represents a pattern, even in the face of strong evidence that it is a random distribution. When we do this, we are essentially deriving something from nothing; there is no real pattern, but we have imagined one.

The antidote in research is to question the patterns that seem to jump out at us, particularly if they confirm our expectations.

Going Too Far

We can also go too far in our generalizations based on weak evidence. Particularly in the social sciences, we may find a localized pattern for which there is a plausible explanation, but can we really generalize from this? Gilovich writes about deriving too much from too little.

To find a number of anecdotes indicating a relationship is a necessary, but not a sufficient condition. If a pattern exists, then there will be a lot of examples of it, but a lot of examples do not constitute evidence of a correlation, let alone causality. We have a natural tendency to accept confirmatory evidence, so it is very common to read undergraduate papers in which the student proposes a thesis, finds one or two pieces of corroborating evidence, and declares the thesis to be proven; not so. Less common, but more effective, is the paper that suggests a relationship, seeks *contrary* evidence to disprove it, and either rejects the thesis, or (finding no contrary evidence) tentatively accepts the thesis pending further investigation. This is “falsification” in the tradition of Karl Popper.³

Hidden or absent data are a common problem in the social sciences. For example, if you are interested in the causes of violent changes of government, then you might identify a number of cases in which governments were overthrown violently. But this selection *excludes* all cases in which governments were *not* overthrown violently. If you find that all your cases were presidential governments, you might deduce that presidential governments are prone to violent overthrow, but you would be erroneously discounting all the presidential governments that you did not select because they did not meet your initial criteria. Your research design left you ill placed to do more than suggest factors to test for in future (better designed) studies.⁴

The self-fulfilling prophecy is a special case of the hidden data problem. Collective expectations lead people to behave in ways that change events, and we then accept the evidence of those events at face value. For example, rumours of insolvency lead to a run on a bank, which causes the bank to fail, confirming the rumours of insolvency. So-

³ Karl Popper, *The Logic of Scientific Discovery* (London: Routledge, 1959, 2002), 10

⁴ For more along these lines, look up “selecting on the dependent variable” and “base rate fallacy”.

called “realism” in international affairs sets up this sort of self-fulfilling prophecy with respect to threats, arms races, and wars.⁵

Since undergraduate essays are almost inevitably incomplete, the best antidote to going too far is to be very circumspect in your conclusions. You may have found evidence of a relationship in *this case*, but how far can you generalize on the basis of your evidence? How convinced should you be by your own work? Critical thinking involves a measure of self-criticism that is all too often lacking in student work.

Confirming our preconceptions, credulity, and believing what we are told

Experiments in psychology have shown that people are particularly ready to believe things that they want to be true. Partisan voters watching a debate between leadership candidates will each believe that their candidate has “won” the debate. We tend to believe what we are told, particularly if it is couched in terms of authority, and if it aligns with our interests and our preconceptions.

Much of the evidence we try to manage in social sciences is messy, ambiguous, and inconsistent. In every-day life we tend to simplify and generalize in order to avoid obsessing about petty details, and get on with life. Traffic comes from the left, so we look left automatically when we are crossing the road. But sometimes we can be wrong; there is an “ease/accuracy” trade-off, and we tend to interpret ambiguous or inconsistent evidence in ways that confirms our pre-existing mental maps of the ways in which the world works, because that makes our lives easier.

Here Gilovitch tells us to distinguish between appropriate and inappropriate bias. Yes, we should be sceptical, but not of everything. As researchers, we are entitled to accept the published work of others as a starting point for our own enquiries, although we may also make the rigour and applicability of that work subject to our own critical evaluation. We may choose to accept the results of other researchers, or we may be sceptical of the results hence choose to test them, but we should not be closed-minded; we cannot ignore the work of others, whether it confirms or rejects our pet hypotheses or preconceived notions. We should be aware that we are more likely to be critical of studies or evidence that conflicts with our prior understanding; critical thinking demands that we be aware of this and consider it in our selection of cases and evidence.

Designing Robust Research

Errors result when we draw inferences from incomplete or unrepresentative data, and there are scientific procedures to minimize these errors. These procedures are a function of research design. But we have to be honest about how the process actually works. Peter Medawar, a Nobel Laureate in Chemistry, writes humorously about the messy reality of scientific research – the rapid reciprocation of guesswork and check-work,

⁵ On the paucity of realism as a paradigm for understanding this sort of interaction, see Robert Jervis, *Perception and Misperception in International Relations* (Boston: Harvard Centre for International Relations, 1976).

conjecture and refutation. Yes, we need an agile imagination to develop theories and plausible explanations, but then we have to devise rigorous tests.⁶ Gilovitch makes the case that the biggest impediment to testing our ideas is specifying precisely what sort of evidence we will accept as proof. Without this step, we end up accepting too much loosely supportive evidence in favour of our preconceptions.

Many of the tools available to experimental sciences like chemistry and physics are not available to social science. We can rarely conduct randomized experiments. Random samples won't work for any question involving a small universe of cases, like election results, or civil wars, or state behaviour under particular regimes. We can use "blind" observers to collect data; because they have no prior knowledge of the hypothesis, they are not influenced by preconceptions or biases. We can use comparative methods, like David Hume's method of agreement (most different systems design) or method of difference (most similar systems design) to infer causation from things that consistently co-vary.⁷

Arming Ourselves for Critical Thinking

Gilovitch's book on how we know what isn't so is just the first step towards critical thinking. If we know that we have a natural tendency to explain things, to generalize, to believe what we want to believe, to confirm our preconceptions, and to believe authorities, then we can be on our guard about thinking that we know things when we don't.

We have to go further than this if we are going to try to answer difficult questions about important issues in the social sciences. What causes violence? How do we manage and reduce it? What social policies work, and which ones exacerbate problems? As researchers and practitioners in the realm of politics and public policy, we need to arm ourselves with research methods as well as the habits of critical thought if we are to make progress.

⁶ Peter Medawar, *Advice to a Young Scientist* (New York: Basic Books, 1979), 70.

⁷ Hans Keman, "Comparative Research Methods," Chapter 3 in Daniele Caramani, *Comparative Politics* (Oxford, UK: Oxford University Press, 2008), 63-82.