

Is Anecdotal Evidence Science?

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ABSTRACT

It is asked how, if at all, can anecdotal evidence help us understand human thinking and behavior? First, the early views about anecdotal evidence are charted. Second, specific ways anecdotal evidence is used or could be, in conjunction with quantitative studies, independently, or for fields that require subjective self-understanding, running the gamut from economics to teaching, to medicine, to literature, are delved into. Finally, the ways in which anecdotal evidence can be used in scientific inquiry are summarized.

KEYWORDS: Anecdotal evidence, narrative inquiry, qualitative research, rationality

Anecdotal evidence is the short stories or experiences we sometimes, perhaps often, draw upon to understand our environment and make decisions within it. A search of the database Eric for *anecdotal evidence* resulted in 797 hits on January 11, 2023; and 3,496 entries on Academic Search Complete. Anecdotes are cited in research (Kaglic & Munley, 2003; Hersh & John-Steiner, 2011; Starke, 2010), as well as literary inquiries (Asiloglu, 2007; Burley, 2011; Lazaroo, 2020).

Yet sometimes anecdotes are considered an “evidence substitute” (Cannata et al., 2016, p. 1), and have, generally within the academy, been the counterpoint to scientific evidence, “That’s just anecdotal” (van Veggel, 2017). Norouzian and colleagues (2019) point out that anecdotal evidence is not enough to overturn the null hypothesis, the standard used in statistics in evaluating an experiment. Meaning that we are only telling a story from personal experience, perhaps confirming “folk wisdom,” which cannot be generalized. So, the claim goes, anecdotal evidence is not knowledge, by definition, nor can it usefully contribute to it.

However, qualitative research is based on the study of studying individuals, or their artifacts, to understand their subjective experiences (Creswell & Creswell, 2017; Liamputtong, 2010, 2019; Morse, 2018; Tracy, 2010). Further, qualitative research has found favour in a post-positivistic climate where “doing science” and “being objective” has been jettisoned in some quarters either because it was thought not possible, potentially Eurocentric, or both (Denzin & Lincoln, 2018; Herrmann & Bochner, 2020).

Within psychology, as well as the other social sciences more generally, there was a significant push in the twentieth century to be doing science (Pickren & Rutherford, 2010). Often methodological choices that were mimicking those of the natural sciences found favor, specifically, quantitative studies and controlled experiments (with randomization of subjects in a control or experimental group).

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In light of the postpositivist push in the social sciences, in what follows I want to re-evaluate the role, if any, that anecdotal evidence could have to the enterprise of social science research, broadly conceived. How, if at all, can anecdotal evidence help us understand human thinking and behaviour. I first chart the early views about anecdotal evidence in conjunction with the historical logic of using such information. Second, I delve into specific ways anecdotal evidence is used or could be, in conjunction with quantitative studies, independently, or for fields that require subjective self-understanding, running the gamut from economics to teaching, to medicine, to literature. Finally, I summarize the ways in which anecdotal evidence can be used in scientific inquiry.

Even though some have distinguished between anecdotal evidence that we are only telling a story from personal experience, perhaps confirming “folk wisdom,” which cannot be generalized of science? Hence, for the purpose of this paper, I do not make the distinction between stories and qualitatively generated narratives (involving what Gertz called “thick descriptions”) relying on systematic methods.

The History of the Blunder

In the late 1880s a German school teacher, Wilhelm Von Osten, claimed that he had taught a horse to do basic arithmetic. When posed with a question the horse, Clever Hans, would tap his hooves the correct times. Upon further scrutiny, it was finally determined that Hans was being unintentionally cued by the questioner. In short, when Hans could not see the person asking the questions, the answers came out wrong. So, Hans was clever; he could read the body language of the questioner. However, he did not know how to do simple arithmetic.

The matter of animal intelligence goes back somewhat with discussions of anecdotal evidence. Washburn, in her “The Animal Mind,” considered the “method of anecdote,” as it is used by people to make claims about their animals. She ends up concluding that we should not deny that animals have minds from our observations of them, but finds fault with the anecdotal method, which she claims needs refinement (e.g., familiarity with the species, the individual in question, issues of bias etc., Washburn, 1907/2003, p. 205). One problem with animal intelligence—the problem of anthropomorphism—that parallels the issue with anecdotal evidence is making a claim based on inference that cannot be verified. The problem of animal intelligence is in some ways, an extension of the philosophical problem of other minds: how could we know that others are not just automata?

Allowing us to historically situate Washburn, in an introduction to qualitative research, Denzin and Lincoln (2018, p. 3), observed the following periods in social science approaches:

1. Positivism (objectivism)
2. Interpretive (modernism)
3. Scepticism (critical)
4. Power-knowledge (post-structuralism)
5. Ontological (post-quantitative, post-materialism)

Denzin and Lincoln first identify objectivism, linked to quantitative research and the discernment of *laws*, to ever more layers of interpretation, giving way to scepticism, to the role of ways of knowing, and finally, relativity.

Herrmann and Bochner (2020), writing about narrative inquiry, lay out what anti-positivism—and hence relativity—could look like in the social sciences in more detail, of which I consider the first three of their eight points:

1. The researcher is part of the research data;

2. A social science text always is composed by a particular somebody someplace; writing and performing research is part of the inquiry;
3. Research involves the emotionality and subjectivity of both researchers and participants;

Herrmann and Bochner (2020) prompt us to note the following: Who the researcher is does matter as objectivity is not possible or desirable; the *who* includes the *where* and *when* of the people involved; subjectivity includes not just beliefs but emotions. Further, Urie Bronfenbrenner proposed a bioecological model of development, whereby our thinking is shaped by various layers of forces, including culture (Woolfolk et al., 2020, p. 73).

Kant (1781/1965) famously said, “Perceptions without concepts are blind, and concepts without perceptions are empty.” Thus, we could say this: evidence without theory is blind, and theory without evidence is empty. Washburn was working in the age of positivism. With the case of Washburn, we cannot understand the issue of anthropocentrism without first taking into account our views about animals.

Daniel Kahneman, a Nobel-prize-winning psychologist (winning the prize for economics), wrote a book called *Thinking, Fast, and Slow*. The idea was the mind is composed of basically two systems. Our everyday system is fast: we make judgments all the time about where to go, what to eat, who to meet, and so on. The other system is more reflective and requires we deliberate, and weigh evidence. Kahneman and colleagues have shown that we are sometimes misled by heuristics that allow us to think fast, making intuitive decisions. A drawback of anecdotal evidence that it is heuristic-like, which is also the basis for stereotypes and other types of socially undesirable biases.

However, Taleb, who says he specializes in ‘risk engineering,’ has investigated the idea that the past can be a basis on which to understand the future; some of his most prominent examples are from the financial sector detailed in *The Black Swan: The Impact of the Highly Improbable* but can apply more broadly across the social sciences. He cites E. J. Smith, Captain of RMS Titanic:

But in all my experience, I have never been in any accident...of any sort worth speaking about. I have seen but one vessel in distress in all my years at sea. I never saw a wreck and never have I been wrecked nor was I ever in any predicament that threatened to end in disaster of any sort. (as cited in Taleb, 2007, p. 42)

As Taleb goes on to explain, however, “You cannot manufacture more information than the past can deliver; if you buy one hundred copies of *The New York Times*, I am not too certain that it would help you gain incremental knowledge of the future” (Taleb, 2007, p. 42). As he explains: “Sometimes a lot of data can be meaningless; at other times one single piece of information can be very meaningful. It is true that a thousand days cannot prove you right, but one day can prove you to be wrong” (Taleb, 2007, p. 57). That is to say, it is not always clear that large sample sizes are valuable; sometimes they can be a misleading guide to the future—as Taleb (2007) explored, for instance, with the 2008 economic crash—where anecdotes were quite valuable, at least in hindsight.

How Anecdotal Evidence Can Interact with Quantitative Information

In an article published in the *Chicago Fed Letter*, Kaglic and Munley (2003) discussed how they utilized anecdotal evidence. As they noted, most media reports about the economy focus on macro issues (its boom or bust), not regional issues. Statistics, they noted, do not tell us everything: they do not let us know about the lag time between a statistic and now; and they do not speak to revisions of numbers, which are only a snapshot in time.

They explained, “Due to the shortcomings in economic statistics, at the Chicago Fed we seek to round out our regional economic analysis with anecdotal information” (Kaglic & Munley, 2003, p. 2). The advantages, they noted, of such an approach is that it is timely, tailored to a certain district, and fills in the gaps between trends. The disadvantage is that it is subjective and cannot be quantified; its accuracy and reliability are unknown, though it could be cross-referenced with statistics. They concluded, “Taken together, economic statistics supplemented with anecdotal information provide our policy-makers with timely and relevant regional economic information, the breath of which can be found nowhere else” (Kaglic & Munley, 2003, p. 3).

In an article on a Bayesian approach to measuring, Norouzian and colleagues (2019) noted that quantitative methods have been widely adopted in the social sciences as a second language. With sound research methods, principled data analysis and transparent reporting practices, they see the ability to make “reasonable inferences” (p. 248) to larger populations. However, they also note that p-values to test the null hypothesis (often $<.05$) are misleading. The Bayesian approach is to test the null hypothesis against a range of alternatives (not just one), each assigned a weight (the Bayes factor) and averages for the probability of the alternatives. Without a Bayesian approach they say there are often false positives and exaggerations, noting that p-values of .005 are twice as likely to be replicated, which is at the heart of science. Yet it is the consideration of complexity, of many scenarios that brings us into the orb of anecdotal evidence.

In “When is Statistical Evidence Superior to Anecdotal Evidence in Supporting Probability Claims,” Hoeken and Hustinx (2009) considered peoples psychological responses to these types of evidence. They distinguished between two types of evidence: specific instances or “narrative evidence,” and statistics (which are a numerical capacity of instances). Evidence, they said, had to be recognized as such, cognitively processed, and judged as legitimate. Within “narrative evidence” they further distinguished between argument by generalization (induction) and argument by analogy (where the qualities of the two cases align). They noted that anecdotal evidence is more effective when inconsistent beliefs are present or desirable consequences not clear.

In their study, participants were more likely to accept statistics over a single case, regardless of the type. For analogies, the “closeness” of the cases mattered. For example, if the addition of streetlights reduced crime in one case, that may be enough to think it would do so in an analogous case, without the need for statistics.

The Employment of Anecdotal Information in Research

In considering how anecdotal evidence is used in process tracing, Stake (2010) considers its use in political science methods. Narrative, he says, is explanatory and scientific. It is part of the process of tracing to understand a series of events. He rejects the idea of a mind-independent reality, further problematized by methodological aims and standards. As he concludes, “Crowding out narrative work may prove detrimental in the long run” (Stake, 2010, p. 25).

Considering our psychological needs, Connaway et al. (2011) noted that we often seek out evidence that is convenient, quick and easy, providing comfort. We work within the bounds of reason. As they put it, “Convivence is thus one of the primary criteria used for making choices during the information seeking process” (Connaway et al., 2011, p. 188). Menz et al. (2021) in looking into pre-service teachers’ misconceptions, concluded that anecdotal evidence may be a legitimate contribution “to teachers’ professional lives” (p. 146), though Vrbová et al. (2021) also noted how they can contribute to biases.

Leach and colleagues (2021) considered how anecdotal evidence can help solve persistent problems of practice (POP), be local, and suggest improvements. We often look to the established literature, but “the fact that sources of evidence beyond the literature are infrequently used to frame

POPs and systematic methodologies are used even more infrequently is concerning as it potentially limits the credibility of POPs” (Leach et al. 2021, p. 2). They conclude we need multiple forms of evidence.

In considering what makes people revise their beliefs when confronted with contradictorily Markovits and Schmeltzer (2007), noted that we think things that we expect to be consistent with our experiences. Inconsistent information challenges our belief system. They concluded that our ability to revise our belief system depended upon coherence, that is, how consistent it is without our other thoughts. So, according to them, the tendency to revise a conditional belief diminishes when embedded in consistent relations. Direct experience can increase belief strength. Inserting random information had a small effect on certainty but more on belief revision.

In a study of how undergraduate students perceive evidence when studying text, List and associates (2021) said that they identified (a) non-evidence (when irrelevant), (b) pseudo-evidence (general but not specific causes) and (c) genuine evidence (a causal chain of events). Participants distinguished anecdotal evidence from systematically collected qualitative data (interviews, case studies), viewing it as a distinct type of empirical source that is descriptive, correlational or causal. They concluded that the role of anecdotal evidence in supporting reasoning about scientific issues requires further study.

The Employment of Anecdotal Information in the Humanities

In the article “But It Worked for My Mother’s Cat,” Van Veggel (2017) noted that veterinarians need to understand the role of anecdotal evidence, which could be misleading, concealing a placebo, as well as unclarities about correlation, causation, and so on. Almedom (2004) in “Evidence From A Sample of One,” reports how his son opted for a treatment involving observation only. In fact, Burley (2011), commenting on Havi Carel’s (2008) *Illness: The Cry of the Flesh*, discusses that the author’s phenomenological account of her progressive disease. Her goal was to provide a philosophical account that was based on subjective storytelling, to document “health within the illness.”

Lazaroo (2020) in “Ways of Remembering to Write Home,” tells the story of his family's search for belonging and the links it provides to characters in his novels. He writes, “After my father recounted [an] incident involving two policemen, I sensed not only his homesickness but also that perhaps there was something surely wrong in our neighborhood with being dark-skinned” (p. 102). Relying upon Hirsch’s (2012) *Postmemory: Writing and Visual Culture After the Holocaust*, he suggests how descendants of those that have been traumatized can pass those memories along. He cites Said as noting that exiles removed from their “roots, their land, their past,” feel the need to “reconstitute their brokenness” (Lazaroo, 2020, p. 107, as cited in Said, 2000, p. 17). Further, Asiliouglu (2007) noted that cultures rely upon resources like anecdotes; they could be used to shape personality (honesty, realism, and self-awareness).

Indeed, in an article examining the role of surprise and emotions in processing anecdotal evidence, Peng and Huang (2019) noted that people are influenced by anecdotal evidence (e.g., about vaccinations), which creates challenges in the healthcare sector. The authors say, “From a clinician’s’ perspective, anecdotal evidence can help cross-examine the interaction of statistical evidence with personal, contextual factors related to individual patients” (Peng & Huang (2019, p. 767). They claim that the persuasiveness of anecdotal evidence may be related to how it creates an arousal state like surprise. Surprise, they explain, is linked to emotions of sadness and fear (which itself is mediated by feelings of sadness and anger). Since anger reduces anxiety, the suggested, perhaps anecdotal evidence works as a balm. They claim that we should help people understand anecdotal evidence not criticize people for seeking it out.

The Scientific Value of Anecdotes

As Liamputtong (2010) notes, “We must make sure we stay closer to their lived experience and the true meaning of their [our subjects’] experiences. Traditional ways of writing in qualitative research may not allow us to do so, and it means that we have to write in an unconventional way” (p. 213).

In what follows I consider some of the ways that anecdotal evidence could be useful to scientific practice, namely, related to time and place, missing variables, types of anecdotal evidence, contributions to professional life, convivence and bounded rationality, multiple forms of evidence, coherence of one’s belief system, matters that require further study, as well as subjectivity.

Time and Place

Often knowledge about human thinking and behaviour is linked to time and place, such as being locally relevant (Kaglic & Munley, 2003). Being able to abstract from the past to the future is more reliable in traditional physics, where gold behaves the same way now as it has in the past.

However, space and time have also been considered in physics with the idea of modulated gravity, which operates differently at the subatomic level than the cosmic one (Del Poloplo, 2021). (One could imagine things becoming even more complicated if gravity was relative to various circumstances, like heat.) Even in mathematics, theorems are often said to range over various types of abstract objects like natural numbers (e.g., Fermat’s Last Theorem states that there is no solution for “ $a^n + b^n = c^n \leftrightarrow n \geq 3 \in \{Z\}$ ”).

Once we default to general rules as we are led to by quantitative studies, we can lose sight of the dynamics at the play of time, location and situation. Quantitative data assumes that what happened in the past will tell us something about the future, but it may be temporally and geographically misleading. Speaking to one single person could offer insight into a geo-temporal phenomenon that is more accurate than statistical generalizations.

Missing Variables

In social science research, we have to consider a variety of factors and hypotheses (Norouzian et al., 2019). The usual ones, like SES, gender, race, and so on that make up the standard fare of quantitative studies, could be confounded by variables we have missed that could even be unique to a person.

In physics, we often hear of dark matter and dark energy that 96% of the universe that is unknown (Panek, 2012). We could at least wonder if we are missing things when we try to understand human behaviour. Quantitative research could unwittingly be narrowing the way we look at the world. In the social sciences we have our go-to factors (SES, age, gender, race, etc.), but there could be many other things at play in shaping human thinking and behavior.

Types of Anecdotal Evidence

Even though anecdotal evidence shares in that it is based on examples, there can be different types, like analogy (Hoeken & Hustinx 2009). We may have to look further into how different types of anecdotal evidence functions in various situations.

Some scientific pursuits do not require statistics. The entire field of neuroscience was founded on case studies. Since most of our brains are the same at some gross level, we do not need

to average statistics over large populations. Statistics are not used for most proofs in mathematics. Analogical reasoning could be employed when we cannot obtain evidence of what is happening light years from where we are. We rely on anecdotes to theoretically extend our understandings beyond what we have established.

Contributions to Professional Life

We use anecdotes in professional life to help us understand various career processes in our fields that have yet to be established or explain things to students (Menz et al., 2021; Peng & Huang, 2019).

It is well known in the teaching field that some types of evidence (like multiple intelligences) have been found useful for understanding the classroom, even if they remain contentious. Anecdotal evidence could be invaluable for professional life, for self-understanding, reflection, and building resilience. It is also sought after for psychological reasons to provide comfort, which could reduce attrition in various fields like teaching and medicine.

Convivence and Bounded Rationality

Bounded rationality, the idea that we must make decisions to reach goals with limited information and convenience is one way that we employ anecdotal evidence as part of cognitive systems (Connaway et al., 2011; Vrbová et al., 2021). It is not always practical to have complete information when we make decisions, and this is also true when adjudicating between theories.

We often rely on heuristics, or general principles to solve problems (Woolfolk et al., 2024). Even though heuristics are often considered cognitive defects in reasoning, they may be useful within the constraints of bounded rationality, where one must make a decision here and now. Anecdotal evidence, it is reasonable to think, could be one factor that contributes to our decision-making process within the scientific enterprise.

Quantitative research in the social sciences has a history rooted in positivism. Basically, social scientists attempted to mimic the methods in the natural sciences to obtain the vast successes seen in the nineteenth and twentieth centuries. Yet with postmodernism, there has been renewed awareness that the truths we discover are also the truths we construct. As such, anecdotal evidence could offer opportunism of meaning making that are methodologically divergent. Further, anecdotal evidence builds on practices that are part of our evolved and cultural systems of thought.

Multiple Forms of Evidence

We often seek out multiple forms of evidence (Leach et al. 2021), that range from quantitative to qualitative, which themselves could be historical, biological, psychological, sociological, anthropological, and even speculatively mathematically inspired.

Different methods give birth to different bodies of knowledge. Consider love. We could understand it neurologically, psychologically, economically, socially, and even personally through stories: all these various lenses tell us something, but none have a monopoly on explaining what love is.

Coherence of One's Belief System

Coherence to one's belief system is factor we take into account when we consider revising our ideas (Markovits & Schmeltzer, 2007). We do not overturn established beliefs unless there is

clear evidence to do so. There is a well-known bias in psychology called “confirmation bias,” which is basically the idea that we seek out information that is consistent with what we think while omitting contradictory evidence. Usually thought of as a fault in our thinking, confirmation bias can also be a motivator to understand a phenomenon, either when countervailing evidence is lacking or part of a scientific enterprise where various views compete with each other.

Famously Kuhn (1986) had argued that science operates within “paradigms,” where we see things a certain way, organizing the questions we ask and how we go about answering them. Thus, even in science, the coherence of our belief system is itself a factor in judging the true from the false. Anecdotal evidence could contribute to what we believe and challenge it, providing further corroborations or anomalies.

Further Study

Some matters require further study (List et al., 2021). Doing research at a high level one is often dealing with matters that are either unknown, that is, with little previous research in the area, or there is little practice with the way that it is being conducted. On the frontiers of knowledge, anecdotal evidence may have a role.

The very impetus for this paper is to better understand the role anecdotal information has, or could, in scientific inquiry. This much is clear. We use anecdotal evidence in practice, in our lives, in teaching, and in guiding our research in a plethora of ways. It is also clear that it is often the antithesis of science, being weighed down by associations with psychological processes and reasoning fallacies. Yet what I have tried to show is that the way we do reason—utilizing anecdotal evidence—is potentially beneficial both in daily life and in research—and this could also be all the more necessary at the frontiers of knowledge.

Subjectivity

Anecdotal evidence is consistent with the qualitative demand for subjective accounts of what it is like to be, for example, ill (Almedom, 2004; Burley, 2011) or experience of cultural exile (Asiliouglu, 2007; Lazaroo, 2020). The very problem, or limit, with quantitative methods is that they can miss the experiences of people that could be divergent and, even when somewhat consistent, overlook missing variables.

Quantitative research is caught up within a medical paradigm that is trying to solve biological problems to extend life—to bring about a desired change. The idea that an illness could be accepted, let alone death, is not the thrust of most medical interventions—to let things be. Hence it is not surprising that some have utilized anecdotal evidence as an instrument to document a way of life, such as disability, either individually, even when that is coming to an end, or experiences of exile that are experienced culturally and intergenerationally. The goal is to express subjectivity and meaning, though sometimes a single person can speak to a large human or social phenomenon.

Conclusion: The Justifiable Role of Anecdotal Evidence in Science

Anecdotal evidence could be part of a scientific enterprise in conjunction with a quantitative investigation, filling in temporal and special gaps in a data set, or helping us better understand anomalies or regularities. It could bring to light a plethora of factors we had yet to consider, better us helping to understand various situations and circumstances, perhaps using analogies. It can be useful in practice, for teaching or medicine, or even providing an impetus for research.

We use anecdotal evidence in reasoning all the time in ordinary life, sometimes leading to heuristics, for reasons of convenience and working within the bounds of rationality. Sometimes it functions as part of multiple forms of evidence, linking our current belief system that has stood the test of time, or just where we need to know more at the frontiers of knowledge. As I have pointed out, anecdotal evidence could buttress heuristics and confirmation bias that are not always detrimental within ordinary life as well as the entire enterprise of science, and are sometimes necessitated in both.

Anecdotal information could also stand alone allowing varied ways of understanding the world, especially when the research focus is on human subjectivity, when we want to comprehend the experience of illness, dying, exile, joy, among other things. In fact, just as the medical model that has animated quantitative methodologies in the social sciences has come into question, so too has that bugaboo of anthropocentrism, which was historically linked to anecdotal evidence.

We, as a culture and intellectually, are more sensitive to the lives of animals as the ultimate “other. There has been a change in our thinking about the “real world” and who gets to decide what counts as knowledge. Personal stories are potentially generalizable to some extent, and we know that because they have such wide appeal: people can relate to them.

There are, to be sure, challenges with anecdotal evidence, but there are also questions that have been raised of a different nature about quantitative studies. Further, what counts as knowledge has become more contested even in some corners of physics, which was the epitome of what science is. At least in the social sciences, and moreover, where the aim was to “do science,” we must recognize that our object of inquiry does not allow the same quantitative methods to be employed with the same effectiveness that we imagined in the Newtonian world.

Anecdotal evidence can be part of a scientific inquiry. Anecdotal evidence is not second-rate information or filler. The questions should rather be, is it the right kind of information for what we want to talk and know about? And with all science, only time will tell what comes out true, what is false, for the day on which we wonder.

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A. GUPTA

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