TAXONOMY IN EPISTEMOLOGY

By

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ABSTRACT

This paper outlines a theoretical paradigm for distinguishing thinking, knowing and believing. A new taxonomy is presented for categorizing levels of knowing and outlines a structure of justification for each level. The paper discusses and explains the importance of such distinctions in decision making and thinking in general.

Keywords: Critical Thinking, Epistemology, Cognitive Psychology, Knowing, Believing, Subjectivity.

INTRODUCTION

It is first proposed that a major psychological problem in society today is knowing what to think, what to believe, and, indeed, what to believe in. Decisions are made daily, hourly and perhaps minute-by-minute that affect the lives of every individual and society as a whole based on what we think and what we believe. Epistemology is the study of knowing and the nature of knowledge. Cognitive Psychology is the study of thinking and reasoning. Both go hand-in-hand to distinguish reality and validity from superstition and nonsense. But, inspite of centuries of philosophical endeavor among some of history's greatest minds (Descartes, 2007), people still struggle with this in all that they do.

Articles and papers report research that holds to the strictest standards. News analysts and pundits share perspectives on the day's events and world trends. Politicians determine world order and religious leaders influence the hearts and minds of millions. After centuries, if not millennia, of learning and the development of knowledge and exploration of the human condition, today's world of war, hunger, racial conflict, economic failures and more, might suggest a less than acceptable score. A performance report on the yield of those decisions made by man daily, hourly and even minute-by-minute might suggest to all but the naive that something is wrong because the world is what we make it. Our society is a product of our decisions – our thinking. The focus of this paper is on thinking, knowing and believing. Why do people think what they think and believe what they do? A structure – a taxonomy – is offered as a guide: what to think and why to think it.

Epistemology

Knowing and what that actually means has been the focus of many philosophical endeavors even back to the establishment of the Philosopher King in Plato's Republic (Grube & Reeve, 1992) as the one most empowered to discover and realize truth. The logic of sound thinking, what to think and why to think it, has been a fundamental theme in all Socratic dialogues of Plato. For Socrates, the application of logic was a sufficient process to discover truth through deductive reasoning.

Descartes (published around 1641) later suggested that, since one might be infinitely deceived by an all-powerful evil demon, one must start with the most simplistic and one-dimensional premise (paraphrasing): I think, therefore I am (Lafleur, 1977). From that he proceeded to examine what might be rationally thought. Contrasting with this notion, Hilary Putnam viewed concepts and notions has having had a tangible and real world cause or impetus. Indeed, for Putnam, real world experience was the key to perception and the development of knowledge – that one cannot view the world from outside oneself (Harman, 1982). This issue of experience and the importance of perception and awareness and the process this implies (as compared to some sort of metaphysical or divine enlightenment) is critical in considering the development of knowledge.

In an early account of Western traditions of epistemology, Cooper (1967) looks at the educational philosophy of

Peirce and Dewey - examined more recently by Maccia (2007). Cooper recognizes the concept of knowledge as a sort of universal truth independent of a given individual's knowledge. This is then expanded to recognize the pragmatic limitations of human perception: that knowing is inevitably a flawed human behavior.

Cooper discusses Peirce's revelation that people seek only to establish an opinion rather than to seek an independent truth and that knowing is the process of conceptualization. That is, the flawed human process of knowing is the affirmation of an opinion, even if flawed or erroneous. Indeed, beliefs are fundamental to the nature of being human. Furthermore, humans act and behave in concordance with those notions.

Cooper further examines the evolved notions of Dewey (again found also in Maccia, 2007) recognizing the ambiguous nature of terms such as knowledge and knowing. Terms like a "warranted assertion" suggest that notions require sufficient cause and justification and that experiences are fundamental to the process of developing beliefs. Of course, it may be human nature to rest upon the establishment of a notion rather than to persist in testing. Discriminating through experience the just cause for a belief is critical. And, while a logical part of the experiential process for Dewey, is more of an intellectual process for Peirce.

In any event, both Dewey and Peirce recognized knowing as a process of inquiry rather than a kind of final state of possessing truth or a truth. That process must include the discriminatory examination of what is and what is not, the incidental from the essential, the necessary from the extraneous. Knowledge, as a kind of universal or independent truth, requires one to perceive its essence in this sense. Failing that, one merely creates and satisfies an opinion, a belief, and one becomes the "hunter of unicorns" (Cooper, 1967, p. 23).

Learning involves conflict. Simply put, a riddle is a problem. Frustration is implicit as where there is no conflict, no frustration, there is no problem to solve and thus no learning can occur. A kind of disequilibrium is an implied necessity. Learning (successfully) - the achievement of knowing what to think - involves a change in perception (Starky & Barr, 1972). Yet, it seems contrary to another postulate that "man seeks to maintain his own equilibrium" (p. 20) - a kind of contentment or tendency to be satisfied with the affirmation of any notion is once conceived.

Consider a Classic Conflict

Thinking, believing, knowing are not the same things and should be distinguished. It has been said in the search for extra-terrestrial life or alien visitation that extraordinary claims should require extraordinary evidence. In other words, to elevate thinking something, suspecting something to levels of believing and even knowing should require extraordinary evidence or proofs.

Religious leaders, teachers, the faithful and more have long debated the issue of science versus faith, what should be taught and how. From long before the 1925 Scopes trial (Linder, 2011) to today's social planners (Terrell, 2011), the notion of intelligent design and other versions of creationism to be taught in the science classroom have been advocated by many. This paper will not reopen nor close that controversy which is outside the scope of this psychological discourse. But, in regards to the thinking involved, it seems that a key point is often missed.

Intelligent Design is omitted from the science classroom not because it isn't a theory nor because it is a theory that threatens or conflicts or is politically incorrect or any other such prohibition. The debate over whether is or is not a theory is a fruitless exercise in semantics. But, the "theory" is an idea that simply cannot be studied or considered on a scientific basis. It can't be tested. There may be many notions about the origin of the universe or the development of mankind that have no basis in science. There are no means at our disposal to test in any scientific manner the elements on which the theory of Intelligent Design is based. It is, by its very nature, a function of faith: believing without proof, scientific or otherwise.

Physics suggests various theories of planetary evolution. Biology suggests various theories of biological evolution. The key epistemological point that is typically omitted from the debate is that our inability to test certain theories

in physics or biology is not due to the nature of the theory but instead due to our limitations in science, technology and other aspects of our physical world. Like the ability to fly was limited by man's inability to technologically build the right machine, our scientific limitations preclude, so far, an ability to definitively settle the issue. But, it is not a flaw or a limitation of the theory itself. However, the inability to test a theory of Intelligent Design is a fundamental limitation of the theory itself.

So, in order to believe something or to know something, one must consider the availability of evidence, testability, logic and other tools that contribute to the development of meaningfulness. Many notions and ideas – or theories - might invoke passion and conviction in the believer but lack any means to impart that to the skeptical and suspicious or the student employing scrutiny and critical thinking. While there are venues for sharing such important ideas, usually through advocacy and persuasion, a scientific classroom, if it is to remain scientific, calls into play a different process. The point is not a religious point, nor it is a political or ideological point. It is an epistemological issue being emphasized here. What is "knowable?"

Knowing in the Scientific Process

It is better, in fact, not to know. That is, the process of reaching a state of "knowing" must follow the constraints of the scientific process and that includes leaving open any issues or questions until that process, following sound scientific principles, has run its course over time. For example, we cannot reasonably attach wing-like extensions to a box and suggest that by flapping those wings the container will fly. Regardless of how convinced we might be or how sound it seems in principle, without a highly ethical, controlled, scientific process we will surely launch our flying public over the cliff and into the abyss of ignorance. While others are invited to debate the point, the fact that man's current level of knowledge has gaps or can't fully account for all aspects and details of existence is no reason to fill those gaps with notions and theories, however strongly believed, that can't be proven, tested or investigated on a scientific basis. It is better not to know. Or, to put it differently, it is critical to realize what and how it is that we do not know if we are ever to progress. Galileo's experiences in suppressed knowledge is a classic case-in-point of confusing faith with factual knowledge with unfortunate consequences.

This paper takes no stand on the notion of faith and religion in which millions of reasonable people have come to adopt a perspective of their own. This paper, however, distinguishes knowing and the treatment of factual knowledge from such convictions. While one might say that spirituality demands faith in our lives, superstition, on the other hand, might be defined as faith without reason. While much of this paper focuses on the meaning of terms (faith, belief, superstition, knowledge, etc.) and the scope and definition of many notions, the issues are substantive and not mere semantics.

Consider a Modern Conflict

Following some embarrassing and unsubstantiated accusations of a well-known sports athlete, he countered with testimony and personal assurances that the accusations were false. The television announcer then posed the question to the public: do you believe he is innocent or guilty? This sort of question comes up a lot and, for many unfortunate victims among today famous persons, perhaps too often. The public is always asked what they believe about this or that. People even seem to ask themselves the same question as they consider what is true or false in various situations.

It is suggested that the answer to the question should almost always be that nothing is believed in any way at all. Believing in something, if it is to be distinguished from superstition, requires a reason. Thinking that something is likely to some small degree is not sufficient to warrant a belief. Indeed, most cases fail to even provide any basis for determining likelihood, let alone actual belief. The mere notion that something is possible does not and more importantly cannot, in itself, warrant any elevation in status to that of being probable. A sufficient cause for elevating the status must lie in either empirical evidence or logic and reason.

Logic and reasoning inevitably force that the truth of conclusions are dependent on both the complete truth of

each and every premise as well as the reasoning process itself. To actually conclude that the athlete in question is guilty requires a considerable structure of reasoning, truth and reliability. The reason innocent people are found guilty in criminal trials as often as they are is directly due to how easy it is to persuade people that something can be believed without just cause (Giuffreda, 1995; Mayer & Tormala, 2010). But, how is one to know when a possibility becomes a probability? How is one to recognize or judge an elevation in believability?

This problem suggests a hierarchy – a taxonomy - where knowing, believing or thinking something to be real can illustrate and delineate levels of justification. While the exact categorical separations and placements of delineation in the following structure might be debated by reasonable people, the overall principles remain vital elements of critical thinking.

Taxonomy of Knowing

1. Thinking something (Ideas and thoughts just occur.)

Everybody thinks things. Thoughts can occur simply as a result of unsolicited input, imagination, personal bias and even due to chemical inducement. The phrase "I think this or that…" is far too often intended as synonymous with "I believe this or that…" and even "I know this or that…" These distinctions are critical and the terminology rises above mere semantics.

Distinctions in intent and understanding are far too often ignored or confused. Just because something is thought means nothing as to whether it is correct to think it. That is, merely thinking something does not ensure that it is reality. Scrutiny, reflection and introspection on every thought is necessary for such thinking to rise to functional roles in reasoning or to move to higher levels of confidence as represented below.

2. Something is Possible - among infinite unknowns (cannot prove impossibility)

This might include something like aliens landing. One cannot prove it did not happen. Among an infinite range of unknowns and considering that one cannot prove it to be impossible, one must conclude that it is possible. This is level 2. First, notice how even this simple or relatively low level of confidence can supersede or is superior to a mere random or fanciful thought (level one above). This is like saying that most of all things are possible and should be recognized as such.

But, of course, that is not completely true. Even religious faith poorly considered often claims that all things are possible with the lord (a common phrase). That too is not true. That is, for the language to be meaningful in any fashion, expressions must conform to rules. For example, making 2 plus 2 equal 15 in a base-10 system while not undermining the meaningfulness of the number system, is not "doable." Making me cognitively aware that I cease to be a thinking person, is not "doable" because it is a contradiction in terms. Can an omnipresent God actually cease to exist?

It is not the case that ALL things are possible. Some are and some are not. This level 2 accounts for those things we have been unable to disprove or which can't be shown to be impossible. So, one can ask is it possible?.. the answer here might be yes but that alone is not saying anything about probability.

3. Something is Possible - given a particular perception of reality (i.e. given a situation, clues exist)

This would not include something like Martians have landed because there is sufficient evidence that there are no Martians involved in space travel. It might include that water currently exists at the poles on Mars given that some level of ice currently observed could include water. This level 3 might even evolve and elevate to qualify for level 4 as more evidence is acquired.

It is very important here to distinguish between merely possible (a level 2?) and any sense that it is, indeed, likely. This description of thinking, this level 3, accounts for conditions sufficient for something to be. Even though there may be no reason to actually think it is true, one can recognize that something is technically possible even if remotely so.

4. Probable – in that it is just more likely than not (this includes a 51% likelihood. Or, 50.0001, i.e., some standard must be applied). Indicators of falsehood must be less likely

The elevation from level 3 to level 4 demands serious consideration and skepticism. This level might include that water once existed in the past on Mars as clues have tipped in that direction. However, it must be understood that, considering the guilt of an accused sports athlete for example, mounting claims offered repeatedly at levels 2 and 3 – even though increasing in quantity – cannot elevate to level 4 simply because of the quantity of claims and accusations.

Thousands of claims offered at levels 2 and 3 cannot raise to Probability (level 4) which is not and cannot be achieved through a mere preponderance or accumulation of possibilities. Reason must apply. There must be a cause or a reason on which probability is logically based.

Probability must be based on a cause. A condition or status creates likelihood. Probability is an important elevation in thinking and requires careful consideration of the justification. Likewise, mere probability at such a low level may be completely impractical and unreliable and summative conclusions should be avoided accordingly.

5. Probable – for practical purposes (again a standard applied: maybe 70% likelihood?)

Maybe Mom is at the store. She said she was going there and one is considering whether to take some action… One might choose to meet her based on the probability that she is there as planned. Data is missing but it is the latest information available. It is also critical to note that there is no conflicting probability: no reason at all to think it would probably be false – that she would not be there.

The application of some standard here is important and necessary. Whether it should be a 70% likelihood may either be too difficult to precisely determine or may fluctuate for practical purposes… such as 65% or maybe 80%. But, the point is valid and important.

Quantifying likelihood in this fashion seems contrived and perhaps it is. But, it illustrates the importance of a standard for moving from a level 4 to a level 5. It shows the attributes that must apply: there must be a reason to accept something as probable; and, there can be no conflicting reason – a reason not to accept, etc.

6. Probable – even given all known facts (standard might require considerable research. Maybe 90% likelihood?)

The point here is reliability. This might be very practical for everyday action so long as consequences for any errors are acceptable (low risk) and one recognizes this operational range is not any sort of real "truth."

This might require a history of consistent reliability. If one holds the pencil in the air and then releases it, it then falls to the floor. If I repeat this process I continue to find that the pencil always falls to the floor. This is reliability. Of course, how it falls might vary and thus, a particular characteristic of the phenomenon might not be a level 6 probability (lacking reliability and consistency).

This example of probability (level 6, 90%) might illustrate how a great deal of our knowledge of the physical world exists and has been developed. The scientific method rarely develops a real proof or discovers a truth and instead provides an operational reliability. One might consider gravity, for example, as an unproven case where we simply have yet to discover the one case that would challenge our views. Still, our many trials throughout human history have provided at least an operational likelihood of reliability that failing to watch our step will send us to an unfortunate impact with the ground.

7. Believed – requires both empirical evidence gathered through extensive, unbiased research and the application of logic and reason through the scientific method (efforts to disprove and explain phenomena alternatively). Also: no other explanation is even considered possible. This presumes a standard of maybe 99% likely or higher.

It cannot be said to be 100% because people are flawed beings. Indeed, how often have some searched for lost car keys only to find them in a location previously deemed impossible. Such a strict standard might be proper and appropriate in our thinking simply because there is no reason to believe, no reason to elevate any of the 1-6 situations to this level without meeting such a standard. That is, one can easily maintain that something is possible or even probable without necessarily believing it to be reality. A statement of belief is a committed declaration of

reality as well as a declaration that others ought to are obligated to accept it as such.

Because of this latter component, a high responsibility accompanies such a claim. When one declares, "I believe the earth to be round," one is also saying that everyone should believe it to be so as well. One is necessarily saying that anyone who believes in the contrary is mistaken and in error and somehow out of touch with reality. It is not permitted – it is not appropriate – it is a violation of this taxonomy – to use this phraseology ("I believe") to refer to conditions that only meet one of the 1-6 levels above. That is, such language must be reserved only to the standards of this level 7 and not treated casually.

8. Known – must meet both the standard of believing and include a considerably more direct personal empirical experience with the phenomena. This requires a 100% level of likelihood.

This standard might be described thus: if something "known" turns out to be false then one's entire view of reality is placed in question. One can know something to be true to the extent that, if it is proved false, then one might be insane and incapable or perceiving reality at all. The Descartes (2007) declaration "I think, therefore, I am" was intended as exactly that. It is a declaration that one can know something in the sense that, if it were to be proved untrue, then one has no ability to perceive reality and a kind of insanity rules.

Again, just as in level 7 above, a statement that something is known, is also a statement that others are obligated to accept it as well. It is not a statement of mere opinion or a subjective impression. It is a statement about the nature of reality and the universe such that anyone thinking to the contrary is necessarily mistaken and in error.

These 8 levels account for a sufficient incrimination of poor or improper thinking and establish a structure for reasoned and critical thinking. Certainly, by addressing a finer or higher resolution in standards which probabilities must meet, any one of the levels might be split to account for some distinction. For purposes here, the 8 levels allow a sufficient and even practical distinction in critical thinking to account for reason and justification and serve well to illustrate the overall taxonomy.

Subjectivity

As pointed out in level 8 above, subjectivity is often a confused notion in thinking. It is a common view that notions believed might be merely a matter of opinion, that they are subjective. "Subjectivity is not an attribute of all things abstract" (Galloway, 2009, p. 344). Subjectivity, rightly refers to those things for which there is no factual truth. The classic example is a beautiful painting. The painting itself is just paint, colors, canvas and so forth. The attribute of beauty exists entirely in the mind of the viewer and is not actually an intrinsic characteristic of the painting itself. That is, if the viewer ceases to perceive beauty so then does the painting cease to be beautiful except to others who may still perceive it so.

But, for some abstract notions, such as right and wrong, virtue or other abstractions, there might actually be a reality. Like a bag of walnuts hidden from view, one might guess incorrectly that it is a bag of popcorn. Someone else might suggest that they are certain that it is a bag of golf balls. The mere fact that everyone must guess or even issue a so-called educated guess – perceiving the shape of the bulges, the smell, the sound and other unique characteristics fairly considered – does not mean that the notions expressed are subjective. Someone may declare that, since no one can ever know for sure, it's just a matter of opinion; it's all subjective. That is seriously in error and a misunderstanding of the notion of mere opinion and subjectivity. The fact is, there is something in the bag and that's very real. The inability to perceive it directly does not render such perceptions subjective or mere opinion.

This might be analogous to the nature of the universe and our perceptions of it. The universe exists. Reality exists. Our perceptions, while limited by tools and means, are not mere opinion or subjective. Improvement in those tools and means can yield improved and more direct perceptions. As we guess at the nature of our universe and the reality of which we are a part and, while we consider the contents the bag through flawed tools and sensors, test our theories through limited means and through

poorly applied reasoning and biased thinking, the notions themselves are not subjective. There is a reality, however poorly perceived.

Everything thinks. People think things simply because it happens as a biological function. Mere consciousness might be considered as automatically including a state of thinking. But, what is to be thought, what should be thought, what must be and must not be thought is a critical consideration (Manktelow, 1999). Do we think things because we are compelled to do so by reason? Or, are do we think things because we just like or find comfort in it? Superstitions can be very gratifying and reassuring. Ignorance can be very comfortable and peaceful.

"In deductive reasoning, as in many other cognitive processes, we engage in many heuristic shortcuts [that] sometimes lead to inaccurate conclusions. ... To enhance our deductive reasoning, we may try to avoid heuristics and biases that distort our reasoning" (Sternberg, Mio & Mio, 2009, p. 512-13). In order to move closer to reality and away from superstition and bias, thinking what should be thought can be a tougher challenge if proper standards are applied. Our own bias and predisposition as compared to objectivity and a healthy Socratic reasoning process can cloud the reliability and obscure the truth. And, before long, we'll find some of us thinking crazy things like maybe the Earth is flat or the Earth is the center of the solar system, or Galileo is influenced by the devil or who knows what.

Conclusion & Suggested Research

This taxonomy has considerable implications for both human understanding and communication. While there are surely a great many research options suggested by this taxonomy, three areas of research are detailed here.

To what extent do people naturally make or fail to make distinctions consistent with and reflected in this model? Is it more instinctive to discriminate to such detail or not? That is, as beliefs and opinions are declared, how are they expressed? Are the subtleties of this model accounted for by most people or ignored? Perhaps beliefs are more commonly generalized and dichotomized as issues are erroneously perceived as merely black and white.

Would an awareness of these distinctions cause a change in opinion (beliefs) or even a semantic change in language used to describe beliefs. For example, might a seminar or other edification in the various levels accounted in this model make a difference for people. Would they subsequently modify their beliefs? And, to what extent would such modifications be merely semantic as compared to a fundamental change in perspective.

It would also be worthwhile to conduct the latter inquiry in various contexts rather than in the abstract. For example, would persons charged with the responsibility of evaluating the impact of economic or political policies change their stated perspectives, or at least the manner of describing their perspectives? Perhaps in the context of being a juror in a criminal trial having to make a judgment on a defendant's guilt, people might refine or modify their opinions. Would this model have an impact on the concept of Reasonable Doubt? Likewise, in a religious context, how do people modify or refine their perspectives when faced with the distinctions outlined in this taxonomy?

Essentially, these lines of research are intended to align the theory of this taxonomy, while intrinsically sound, with real world behaviors. The failure of people in critical situations (like jury duty described above) to think and consider issues logically and rationally can result in considerable real-world tragedies. Armed with this taxonomy, perhaps educators can begin to make a difference to promote inquiry and to inspire students to examine, to discriminate, to experience. Existing literature tells us that from such endeavors, knowledge is possible. This taxonomy can help one to distinguish the various stages on that path.

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