

Reassessing Epistemic Foundations: The Case for Justified Probable Belief

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Abstract: This paper endeavors to establish a comprehensive account of human knowledge that embraces the probabilistic nature of truth, the integral role of language in our cognitive processes, and the uncertainty and fallibility inherent in our cognitive systems. Drawing upon the work of various philosophers, psychologists, and neuroscientists, the paper advocates for a reinterpretation of the traditional "Justified True Belief" as "Justified Probable Belief." Additionally, the biological underpinnings of this perspective are explored, with an emphasis on synaptic plasticity, dopamine-based learning, and epigenetic mechanisms.

Section 1: Truth as a Probability Calculation

1.1 Argument for Probabilistic Truth

The epistemic stance of probabilism contends that our beliefs are contingent upon probability calculations, reflecting the varying degrees of credence we possess in the veracity of a proposition (Ramsey, 1926). This perspective is substantiated by empirical research in cognitive psychology, particularly the heuristics and biases approach (Tversky & Kahneman, 1974), which demonstrates that humans rely on cognitive shortcuts when rendering judgments under uncertainty, resulting in biases that deviate from traditional logic and probability theory.

Moreover, neuroscientific evidence corroborates the notion that the human brain calculates probabilities when making decisions (Friston, 2010). The Bayesian model of belief updating (Bayes, 1763) provides a mathematical framework for understanding how the brain updates beliefs based on new evidence. In this model, beliefs are treated

as subjective probabilities that are updated as new information is processed, reflecting the uncertainty inherent in our cognitive processes (Tenenbaum et al., 2006).

1.2 Counterarguments and Rebuttals

A counterargument to the probabilistic view of truth is the correspondence theory of truth (Russell, 1912), which posits that a belief is true if it corresponds to an objective reality. This theory suggests that truth is an absolute, independent of human perception and cognitive processes. However, the correspondence theory faces difficulties in explaining how we can verify the correspondence between our beliefs and reality, given the fallibility of our cognitive processes (Putnam, 1981).

In response to the correspondence theory, the coherence theory of truth (Blanshard, 1939) can be invoked. This theory asserts that truth is determined by the coherence of a belief with other beliefs within a system of beliefs. Coherence provides a more plausible account of truth, as it acknowledges the role of human cognitive processes and the interconnected nature of our beliefs.

Section 2: Language as a Symbolic Representation of the Neurological Function

2.1 Argument for Language as a Neurological Representation

The Sapir-Whorf hypothesis (Sapir, 1929; Whorf, 1956) posits that language affects our cognitive processes and that our understanding of reality is mediated through linguistic structures. This perspective is supported by research in cognitive linguistics (Lakoff & Johnson, 1980), which demonstrates that language shapes our mental representations of the world through metaphorical and embodied cognition.

Neuroscientific research further supports this view, as it reveals that language processing involves specific neural networks in the brain (Pinker, 1994). These networks are responsible for encoding, storing, and retrieving linguistic information, which influences our perception, memory, and reasoning (Dehaene, 2014).

2.2 Counterarguments and Rebuttals

A counterargument against the strong version of linguistic relativity is the idea of universal grammar (Chomsky, 1957). Chomsky argues that there are innate cognitive structures underlying language, which are shared across all human languages. This perspective suggests that the influence of language on cognition may be limited, as our cognitive processes are primarily determined by these innate structures.

However, recent research in linguistic diversity (Evans & Levinson, 2009) has challenged the universal grammar hypothesis by documenting significant cross-linguistic variation in linguistic structures and cognitive processes. This research supports a more moderate version of linguistic relativity, which acknowledges the interaction between linguistic and non-linguistic factors in shaping cognition.

Section 3: Reinterpreting Justified True Belief as Justified Probable Belief

3.1 Argument for Justified Probable Belief

Reinterpreting the traditional notion of "Justified True Belief" as "Justified Probable Belief" recognizes the probabilistic nature of truth and the central role of language in our cognitive processes. This shift is congruent with Quine's (1951) critique of the analytic-synthetic distinction and Duhem's (1954) holistic approach to scientific theories, both of which challenge the notion of absolute truth in favor of fallibilism and empirical adequacy.

By reinterpreting knowledge as justified probable belief, we can better account for the uncertainty and fallibility inherent in our cognitive processes. This perspective also aligns with Peirce's (1877) pragmatic theory of truth, which posits that our beliefs are justified based on their practical consequences and are open to revision in light of new evidence.

3.2 Counterarguments and Rebuttals

One counterargument against the reinterpretation of justified true belief is the Gettier problem (Gettier, 1963), which challenges the sufficiency of the justified true belief account of knowledge by presenting cases where an individual has a justified belief that turns out to be true but is not considered knowledge due to a lack of proper connection between the justification and the truth. Critics may argue that by reinterpreting justified true belief as justified probable belief, the Gettier problem remains unresolved.

However, the reinterpretation of justified true belief as justified probable belief does not necessarily need to resolve the Gettier problem. Instead, the reinterpretation aims to provide a more accurate and nuanced account of human knowledge by accounting for the probabilistic nature of truth and the influence of language on cognition. By acknowledging the fallibility and uncertainty inherent in our cognitive processes, the justified probable belief framework is better equipped to handle the challenges posed by Gettier cases and other epistemological problems.

Section 4: The Biology of the Brain Supporting Truth as Probability Theory

4.1 Argument for the Biological Basis of Probabilistic Truth

The biological mechanisms of the brain further support the idea that truth is a probability calculation. Kandel's (2001) work on long-term memory highlights the role of synaptic

plasticity, a process in which synaptic connections between neurons are strengthened or weakened based on experience. This plasticity enables the brain to adapt to new information and update its internal models of the world. Additionally, recent research on pattern completion and novel experiences (Kumaran & Maguire, 2006) suggests that the brain constantly updates its neurological schemas based on the balance between familiar and new experiences, contributing to the formation and adjustment of unconscious beliefs.

The role of dopamine in the brain's reward system also supports the probabilistic view of truth (Schultz, 1998). Dopamine neurons encode prediction errors, which represent the difference between expected and actual outcomes. These prediction errors serve as a learning signal for updating beliefs and adjusting behavior, reflecting the brain's probabilistic calculations of truth based on available evidence (Montague et al., 1996).

4.2 Counterarguments and Rebuttals

A potential counterargument against the biological basis of probabilistic truth is the idea of biological determinism (Rose, 1995), which posits that human behavior and cognition are solely determined by genetic factors. This perspective suggests that our beliefs and understanding of truth are pre-determined by our genetic makeup, leaving little room for the dynamic processes of probability calculation and belief updating.

However, the concept of epigenetics (Jablonka & Lamb, 2005) offers a rebuttal to biological determinism by emphasizing the interaction between genetic and environmental factors in shaping human cognition and behavior. Epigenetic mechanisms, such as DNA methylation and histone modification, allow for the dynamic regulation of gene expression in response to environmental stimuli, thereby enabling the

brain to adapt and update its internal models of the world based on new information (Sweatt, 2013).

4.3 Clinical Psychological Evidence

Evidence from clinical psychology further supports the biological basis of probabilistic truth. Cognitive-behavioral therapy (CBT), a widely used treatment for various psychological disorders, is based on the idea that maladaptive beliefs and thought patterns contribute to the development and maintenance of psychological distress (Beck, 1976). CBT aims to help individuals identify and modify these dysfunctional beliefs by providing them with new evidence that challenges their current belief system (Hofmann et al., 2012). The success of CBT in treating various psychological disorders provides empirical support for the brain's capacity to update beliefs based on new evidence and adjust its internal models of the world in a probabilistic manner.

Conclusion:

The biology of the brain, as evidenced by synaptic plasticity, dopamine-based learning, and epigenetic mechanisms, supports the view that truth is a probability calculation. Clinical psychology provides further evidence for the dynamic processes underlying belief updating and the probabilistic nature of truth. By engaging with counterarguments and drawing on the work of various philosophers, psychologists, and neuroscientists, this paper has demonstrated the potential of the probabilistic truth framework to reshape contemporary epistemology and philosophical discourse.

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