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In defense of objectivity: pursuing truth with respect to core cognition

In Defense of Objectivity

Pursuing Truth with Respect to Core Cognition

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It is a necessary truth of human existence that every experience we are able to perceive must be filtered first through our senses, which must then be interpreted by the brain. Our perceptions are inherently biased by our very biology; each individual's reality is merely an approximation of events that are limited and altered by their body's biological hardware. We obtain information from experience which we necessarily must integrate within individual conceptual frameworks, as our own perceptions are all we may ever know. But there are universal qualities that are retained across all humans—including our unique ability for higher-order logical reasoning and complex inquiry. Logic and reason themselves draw their sources from our external environments; the existence of the outside world underlies all things, even if we may not ever be able to fully understand its intricacies as biological beings. Even still, the consciousness that our brains have bestowed upon us struggles to understand how we may arrive at objective truths in a world that is necessarily filtered through perceptual bias. Modernist thought in the philosophy of science explains that there exists objective truth which we find coherent, even in spite of our inherent cognitive limitations. Reaching objective truth is only possible because we are rational beings—it is our capability to use reason which defines a central "core cognition" retained across the human species. This cognitive core is an intrinsic quality within all humans that allows us to understand the outside world separately from our lived experience by using logic and rationality. We may accept the existence of coherent, objective truths describing reality despite our brain's subjective interference by maintaining that our consciousness allows us to justify empirical observations in relation to a rational cognitive core–a trait which itself lies central to the universal human experience.

Progress and the Pursuit of Objectivity

We may define objective truth as those necessary and apparent facts describing reality that exist outside of human observance; our quest to coherently understand these facts does not change their function or place in the universe. At the basis of all human experience lies basic, fundamental truths about reality that shape the very core of our conceptual frameworks. Indeed, there are certain natural phenomena that remain true across all humans, and which create the basis of understanding for our species. When a force is applied to an object, it will proceed along an approximately predictable trajectory; more broadly, any action in any context requires a reaction. We are only able to observe the world as a series of relationships between a cause and its supposed effect. The existence of an action and its reaction remain empirically true even when the mechanism underlying their relationship remains unclear.

However, our interpretation of how and why these phenomena occur is in a constant state of flux. Our brains, for all their complexity, could never compute or understand the infinite number of factors influencing the exact trajectory of the object; the limitations of our sensory organs set the baseline for what information the mind is able to interpret at all. Yet the brain is still able to make inferences about these effects despite being presented with incomplete information. For instance, the middle temporal visual area in the occipital lobe can approximate a moving object's path despite limited visual input [1]. The innate rationality of human cognition endows us with the capability to look beyond separate sensory inputs to piece together an accurate picture of reality.

The perceptual limitations of an individual can still allow for many conclusions to arise even from identical empirical observations of the same phenomenon, conclusions which are equally plausible to the brain. One individual may understand the discovery of a new species to be evidence of a god's creative ability, and another individual might use the same discovery as proof of Darwin's theory of evolution. In the absence of objective truth, this underdetermination between observation and theory would make science dependent on the perspective of the viewer. Most humans are born with similar sensory systems; neuroscience shows us that each of our brains integrate information from vision, audi-

tion, olfaction, etc., using similar neural pathways. It is due to unique differences in higher-order brain regions which results in differing interpretations about identical stimuli. Observations are influenced by conceptual frameworks, and it becomes logically impossible to escape our a priori assumptions about reality. We must find a way to understand reality beyond bias in order for objective truth to be reachable.

Theories may require subjective imposing for their creation, but they must withstand attempts at falsification to be accepted. Our core cognition seeks to understand relationships between events; when we can discount the existence of certain relationships between phenomenal causes and effects, we can narrow our scope for what objective truth might be. Karl Popper explained that falsification offers us certainty against the threat of underdetermination—even if we may not be able to ascertain the true nature of reality from induction due to our perceptual limitations, we can rule out those theories we know are false in pursuit of the truth [2]. The current epistemology of science operates under the assumption that our experiments today may be proved false in the future, and in doing so presents a bulwark against the idea that science is a social construction while acknowledging our subjective biases. The brain is able to recognize the absence of a relationship between events far more effectively than it is able to identify the exact nature of a relationship between a cause and an effect. Even still, there remain numerous empirically consistent theories with equal claim and predictive power to reality—science must distinguish between these theories for a cohesive objective truth to exist.

Natural resistance to theory proves that objective truth does exist and suggests the direction that science must act toward in pursuit of an accurate explanation of reality. Anomalies within theories are the incarnation of resistance; through resistance we may pursue understanding of reality independent of conceptual schemas. The threat of underdetermination dissolves when we possess criteria for theory formation which determines the efficacy for a particular idea to explain apparent facts about reality. For example, Newtonian physics' inability to accurately describe objects in motion near light speed gave Albert Einstein the platform to propose his theory of relativity. Not only did Einstein account for the same empirical evidence that Newton had, but Einsteinian physics extended its explanatory power to account for empirical evidence that Newtonian physics failed to explain. In this way, progress is rational; paradigms shift because new theories reach beyond the limits of old ones. The continued existence of anomalies in current accepted science does not mean science is false, or that the apparent truth of theories is simply explained by subjective relativism. To the contrary, anomalies point to those areas of thought that have not arrived at objectivity yet and require further exploration to do so.

Given that we only have access to the world through our conceptual schema, those facts that resist subjective truth prevent science from resting purely on relativism. Even if our knowledge is colored by our perceptions and neurological biases, there are necessary and apparent facts about the world that cannot be reconciled by any amount of subjective imposition. If something exists, it will make a deliberate verdict to the conceptual scheme of all humans—it shapes the cognitive core. Even acknowledging that our definitions of terms within theories are clouded by subjectivity, those definitions must satisfactorily explain the relationships we are able to observe in the world. Perhaps the language, visualization, and conceptual framework used to explain an electron might vary between cultures possessing different schemas—however, the physical existence of a negatively charged subatomic molecule, as well as the fundamental relationships between the dispositions of observables associated with that molecule will be retained. To reduce apparent facts about the world to perceptual illusions founded on bias assumes a level of arrogance about humanity's place in reality as a whole and ignores apparent truths independent from human perception.

Progress as a phenomenon may be best understood when we compare our current collection

of knowledge in relation to that which we held at any arbitrary point in the past. Accepting that we are confined by our perspectives does not disprove the existence of objective truth, it only explains why we must use our rationality to arrive at those truths unbiased by subjectivity. In doing so, our conceptual schemes themselves evolve as we gather more objectively true facts about reality—we cannot move backwards from these truths. The discovery that the Earth revolves around the sun ensured that scientific thought could not regress into heliocentrism. When science arrives at truths that are separate from human perception, we must integrate those facts into new theories. In this way, our understanding of reality evolves increasingly closer to objective truth over time. To argue otherwise rejects human rationality, which is central to our collective cognitive core.

Conceptual schemas are the precursor for any knowledge, but knowledge must still be integrated within those schemas in a logical way. This fact separates science from pseudoscience or religion; the ability to update our understanding of reality is crucial to obtain more accurate knowledge of the world over time. Similarly, constant modification to accommodate new information or changing environments is an important component of cognitive functioning. Neuroplasticity shows us that synapses continuously undergo long-term potentiation or depression, strengthening or weakening connections in response to changes in activity–the fundamental process underlying learning and memory. Scientific progress can be understood to be a form of collective learning, where outdated cognitive categories are sacrificed to accommodate new insights about reality. It is these fixed and agreed upon concepts that the collective cognitive core of the human species revolves around and objective truth can exist.

We can define truth relative to the human species as a whole to account for perceptual biases inherent to any particular individual. Modern science rests on the idea of corroboration; any conclusion derived from an individual experiment must be replicable and obtainable by any scientist, regardless of the conceptual schemas that cloud their perceptions. Experimental design rests on hard data that is independent from bias. For example, statistical correlation suggests a causal relationship between smoking and the development of cancer. The methods through which that data is obtained, as well as the conclusion that cancer is directly caused by smoking (rather than cancer being a related side effect of smoking) can be challenged because those factors are determined by subjective human ideas. But when numerous studies using many different methods obtain similar results and arrive at identical conclusions, science can safely assume a causal relationship. It is through species-wide agreement that we can reach objective truth and account for illusions that cloud the neurobiology of individuals. When the same conclusions can be determined by many scientists possessing a diverse array of conceptual schemas, we can hold those conclusions to be accurate representations of reality.

Totality & Human Neurobiology

Objective truth must be understood in relationship to the totality of all human knowledge to account for the perceptual differences inherent to individuals. Hegelian philosophy proposes that reality can be best understood not as a collection of isolated events, but as a dynamic and interconnected whole that relates each part together [3]. Just as individual conclusions must be understood in relationship to species-wide agreement through corroboration, so too must our perceptions be understood in relationship to all other observable phenomena we have experienced within our unique conceptual frameworks.

Within the context of our individual neurobiology, perceptual evidence is integrated into the totality of our experiences. Rather than serving as an argument for relativism, it is this fact that explains how each subject can arrive at objective truth by relating apparent facts about reality to a cognitive core that centers around rationality. The brain does not process sensory information in isolation but integrates those perceptual signals with higher-level cognitive reasoning. For example, the orbitofrontal cortex is a neural structure in the frontal lobe which

plays a key role in decision-making by integrating sensory inputs from visual, auditory, somatosensory, taste, and olfactory stimuli . Evidence is accumulated and related to a larger conceptual framework that accommodates all experiential knowledge to make a choice, allowing or inhibiting a response. The validity of any individual perception is determined in relationship to a holistic network of experiences, which themselves are founded on fundamental truths about reality. The validity of our perceptions is not decided solely by the strength of any one piece of evidence. Rather, the integration of sensory evidence must fit into the broader context of cognitive understanding about objective reality. Objective knowledge is more than the summation of experiences because experiences are dynamically understood in relation to core truths about reality. Truth is apparent in the whole, and the dialectical synthesis of evidence within the framework of the mind allows an objective reality to be coherently understood.

Consciousness itself is far more complex than the sum of all the physical processes that make up individual neural structures. The brain is composed of physical matter and therefore is founded on physical principles that characterize each neural substrate. Although consciousness is dependent on physical phenomena, it cannot be fully understood by simply appealing to the interactions between simpler elements. Instead, consciousness is an emergent phenomenon deriving from neural activity—the complex and dynamic nature of consciousness forms the basis of the cognitive core and allows for unbiased rationality. We are not slaves to subjective experiences because we possess the ability to look beyond them in pursuit of objective truth. The brain can recognize its own limitations to separate illusion from truth in the face of contradictory or novel evidence. Thus, human beings are able to acknowledge and therefore account for their own subjective biases. In doing so, we can search for neutral phenomena that exist separately from human perception and arrive at objectivity.

The physicality of human neurobiology imposes limitations on what can be known; therefore, objective truth must still be defined relative to the human species itself. Acknowledging these limitations does not imply that objective truth cannot be understood by human beings, only that we have an obligation to pursue those objective truths we have access to with respect to our cognitive abilities. We can never know the subjective experience of other organisms—to attempt to understand the worldview of an amoeba is impossible because they operate solely within an entirely foreign experiential context. Like amoebas, humans are similarly confined by their subjective perspective of reality. Through rationality we can pursue objective truth and separate apparent facts about reality from bias, but only regarding truths that are understandable from the human vantage point. If truth is derived in relation to the whole, we are intrinsically prevented from fully comprehending how our experiences relate to the macro-scale of the universe or the micro-scale of the sub-quantum realm. We possess the ability to understand objective truth only at the level of human experience because of the biological hardware we are endowed with. Unless we can create technology that reaches beyond the bounds of our cognitive limitations, we are relegated to pursuing objectivity only within the context of human experience which we can understand.

The Post-Modernist Threat to Objectivity

During the late twentieth century, the philosophy of science began to reject the possibility that we have access to objective truth at all due inherent subjective bias present in all human experiences. The Strong Program holds that science is the outcome of social, political, economic, and other external factors that necessarily cloud scientific ability to accurately understand the world. In this view, reality itself is a social construction; postmodernists use the symmetry thesis to argue that theory formation requires the negotiation of experiential observations with sociological & psychological factors that determine the direction of science itself. If scientific findings are constructed only relative to societal norms, then any claims put forth to describe reality are underdetermined. The idea that truth cannot exist inde-

pendently from subjective bias rejects that humanity possesses the capacity for reason and threatens science's ability to determine objective truth at all.

The problem of induction is a foundational issue for the Enlightenment Project that is based in empirical observation. Acknowledging the circularity of induction explains the significance of the underdetermination threat in theory formation. In David Hume's famous example, we cannot assume that a billiard ball striking another is causally related to the second ball's motion, simply because we observe the two events in relation to each other [4]. We can never know for certain that the resulting motion was not caused by an infinite number of other factors beyond our perceptual abilities, and we rely on our a priori assumptions to predict the outcome. Willard Quine attacked the two pillars supporting logical empiricism as he argued for the impossibility of reconciling specific observations with theory [5]. Our experiences are necessarily informed by prior conceptions; pure forms cannot exist because they must be organized and explained relative to human experience, which is inherently colored by bias. Language is our best means for describing pure forms and establishing nuance, but is inherently subjective in its formulation; thus, form cannot be distinguished from biased content. Conversely, apparent and necessary truths can only prove their consistency within their own system—which is logically impossible according to Gödel's incompleteness theorem. Gödel explains that if math can only be verified using math or induction can only be verified through induction, then even our baseline understanding of truth is colored by immediate experiences. To followers of Quine, our perceptual limits deriving from our sensory experience and our cognitive integration of those experiences prevent us from establishing objective truth in relation to individual events. The Enlightenment Project collapses under its own weight because it always relies on subjectivity to establish truth, owing to the fact that communication itself cannot establish pure definitions.

However, language can still be used as a tool for rational discourse in pursuit of objective truth even if we accept the presence of subjective interference in relating form to content. To discard human rationality outright assumes that a pathway cannot exist to separate objective truth from perceptual bias. Jürgen Habermas attacks this notion and offers a solution through the concept of communicative interaction [6]. He argues that formal universal norms exist within communication that define the bounds of rational discourse. Individuals are able to make claims about reality determined from their conceptual frameworks and based on reason. Although these claims are based on subjective experience, engaging in rational discourse with individuals who maintain their own antithetical claims about reality ultimately allows language to facilitate the comparative analysis of differing claims in pursuit of agreement. Falsification and corroboration are central to this thesis; participants in discourse can falsify the claims of others and discard irrelevant ideas in pursuit of compromise between individuals who maintain a variety of conceptual frameworks. Communication of ideas is central to core cognition because it allows human rationality to be compared between experiential networks. It is for this reason that the brain evolved complex and distinct brain regions dedicated to both speech production and language comprehension. Humanity itself has obtained its evolutionary success through its proficiency at engaging the collective whole, rather than relying on any individual subject. Through rational discourse we are able to understand those truths that persist through many different perceptions of reality intersubjectively. It is these retained truths that we may maintain to be the best representation of objective fact.

Post-modernist thinkers reject the existence of general progress within science. Thomas Kuhn explains that progress can only be made in relation to the reigning paradigm of an age. A scientific revolution only expresses a shift in the questions that science seeks to answer, which are determined by the historical context in which they are posed. To followers of Kuhn, cognitive knowledge of the world has no inherent direction of development;

instead, changes in worldview dictate shifts in scientific thought with respect to external motivations and ideas. Paradigms are incommensurable with each other in that they have no common measure to reduce or translate the meaning of one paradigm to another. Progress is possible only within the paradigm of a given age as a measure of human ability to solve the context-bound questions they pose. Fragmentation within scientific thought is central to the postmodernist thesis that rejects progress toward a singular, overarching, objective truth. Instead, postmodernists argue that knowledge is reflective of the collective experiences that make up each individual's conceptual framework, each claim equally accurate in describing reality as the subject perceives it. Within postmodernism, different interpretations of reality deriving from diverse perspectives are determined by fragmented experiences—these truths are incommensurable with one another. Thus paradigm shifts are more akin to religious conversions in the sense that choosing between them is a matter of subjective preference, rather than a pursuit of coherent objective truth.

To place science at the same level of religion or pseudoscience rejects the fundamental fact that science gifts humanity unparalleled predictive power and utility. We cannot escape our perceptual biases—they are the foundation upon which all our cognitive abilities rest. But reason itself is fundamental to the human experience and is retained between the conceptual schemas of all people. There exist concepts that are fixed and agreed upon independent of subjective experience—and through communicative interaction, we are able to identify these concepts. We must come to terms with progress through history; the rationality that characterizes our collective cognitive core allows us to understand that science has provided the structure for the advancement of modern society as we know it. In the totality of our knowledge lies objective truth, which we have an obligation to pursue despite subjectivity that necessarily clouds our access to reality. Fragmentation, like anomalies, identifies the restrictions of our current collective knowledge. Disagreement suggests falsity, and falsity suggests the existence of truth. We must reject incommensurability as we attempt to reconcile observations with theory, such that we may accurately classify that which we perceive individually within categories that humanity as a whole can agree upon. In doing so, we may safely reject relativism as a threat to rationality and to our cognitive core as we seek to reduce differences in meaning and pursue true species-wide agreement.

Humans struggle to identify their place within a reality that can never be directly comprehended. We are at once too limited by our neurobiology and perceptual organs to see beyond ourselves to understand the totality of all relationships in the universe, and simultaneously too fragmented by our creativity bestowed by consciousness to collectively agree on every apparent truth we experience. We are little more than thinking meat all things considered—our ability to question a reality beyond our understanding is what gifts humanity its unique capacity to conduct science. Science itself is the tangible representation of our pursuit for coherent, objective truth. Only by incorporating our individual experiences into the larger whole of the human species itself will objective truth reveal itself. Although reality is clouded by bias, our collective cognitive core endows us with reason that is retained between all humans. Rationality entices us to attempt to understand a universe far more complex than our biological hardware was ever intended to comprehend.

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