Review of General Psychology

Intersubjective Mental Behaviorism: Toward a Holistic Philosophy for Human Psychology

--Manuscript Draft--

Manuscript Number:	
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Article Type:	Masked Article
Keywords:	behaviorism, mentalism, intersubjective, philosophy of psychology
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Manuscript Region of Origin:	UNITED STATES
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Intersubjective Mental Behaviorism:

Toward a Holistic Philosophy for Human Psychology

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May 2018

Dear *Review of General Psychology* Editorial Board,

Thank you for your consideration of the submitted manuscript, *Intersubjective Mental Behaviorism: Toward a Holistic Philosophy for Human Psychology*. Review of General Psychology has been home of the major publications associated with my Tree of Knowledge System and my hope is that this will continue.

My two most recent articles in Review of General Psychology have demonstrated how the Tree of Knowledge System maps the construct of human well-being (Henriques, et al, 2014) and how it builds bridges between modern personality theory and integrative approaches to psychotherapy. This article takes my work on the Tree of Knowledge System in a new, more explicitly philosophical direction. In particular, the work highlights how philosophers have consistently identified three broad domains of human knowledge (the objective, the subjective, and the intersubjective), but there has not been to date a successful metaphysical system that can tie these domains together into a coherent picture of the whole. I believe the ToK System provides the viewpoint for how we can move from either mentalist or behaviorist or social constructionist views of knowledge to more satisfying, holistic view characterizes as Intersubjective Mental Behaviorism.

There were no human subjects involved in the writing of this paper. In addition, there were no grant monies associated with the paper either. If you have any questions or need additional information, please do not hesitate to contact me at henriqx@jmu.edu or 540-568-7857. I look forward to hearing from you.

Sincerely,

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Intersubjective Mental Behaviorism:

Toward a Holistic Philosophy for Human Psychology

Abstract

Behavioral, mentalistic, and social constructionist views represent three broad philosophical positions in psychology that make different ontological and epistemological assumptions. Paralleling these positions, philosophers have long noted that considerations regarding human knowledge can be effectively by considering three domains or frames: 1) the objective (i.e., the world as it exists independent of subjective knowers); 2) the subjective (i.e., first person experience and knowledge of the world); and 3) the intersubjective (i.e., what groups of humans share as knowledge). This paper introduces Intersubjective Mental Behaviorism (ISMB) as an integrative framework grounded in the Tree of Knowledge System (Henriques, 2003; 2017) that offers a clear way to frame the human mind and its place in the universe. The current paper describes how ISMB maps human mental behaviors into four domains connected via the concept of informational interface. It then uses the Tree of Knowledge System to make five key linkages across evolutionary time that explicate how the domains came to be and how they are functionally interconnected. The result is an outline for a more comprehensive conceptual system and philosophy for human psychology.

Keywords: intersubjective, mental, behaviorism, objective, Tree of Knowledge, cosmic evolution, unified theory

Intersubjective Mental Behaviorism:

Toward a Holistic Philosophy for Psychology

The Tree of Knowledge System has been proposed as a meta-theoretical framework that clearly defines the field (Henriques, 2004) and clarifies how the key insights from the major paradigms can be assimilated and integrated (Henriques, 2003). The system was used to map the construct of human well-being (Henriques, Kleinman, & Asselin, 2014) and to build bridges between modern personality theory and integrative approaches to psychotherapy (Henriques, 2017). The current paper applies the framework to outline a holistic philosophical approach to human psychology, called Intersubjective Mental Behaviorism (ISMB).

As the name implies, ISMB assimilates and integrates key points from behavioral, mentalistic, and intersubjective perspectives. To clarify those elements, the paper starts with a summary of the objective, subjective and intersubjective domains of human knowledge as described by historians and philosophers. Then parallels between these domains of human knowing and the behavioral, mentalistic, and social constructionist views in psychology are drawn. ISMB is then introduced via its key principles, which include a universal behavioral view of science, an information processing view of living and mental systems, and the view that human knowledge is constructed in a linguistic, sociocultural environment.

The primary goal of the current work is to describe the ISMB framework, and toward that end a map of the human mind is provided that depicts it as four domains of mental behavior connected via the concept of informational interface. This description is enriched by using the Tree of Knowledge System to make five key links in the cosmic evolutionary causal chain of events that provides a way to connect the domains across time. The result is a clearer description

of the key domains of the human mind and how they can be placed in a comprehensive, "big" historical context (see Christian, 2005) than has been previously available.

Given the breadth of the current work, it is important to specify some of the limitations in its scope. The paper does not to dive deeply into long-standing conceptual issues that have driven debates in philosophy and psychology across the ages (e.g., free will versus determinism or modern versus postmodern epistemological assumptions). Rather the focus is on describing, in as clear and straightforward language as possible, an outline that allows scientists and scholars to conceive of a holistic approach to the human mind framed by a big picture emergent evolutionary view. Success in such an endeavor advances the argument that the ToK System can define psychology's subject matter and provide integrative avenues for cumulative growth. With such a description in hand, then the hard work can move toward tackling ancient and ongoing disputes.

The Objective, Subjective, and Intersubjective Domains in Philosophy

In his wide-ranging review of human history, Harari (2015) makes the point that considerations regarding human knowledge can be effectively captured by considering three broad domains: 1) the objective (i.e., the conception of the world as it exists independent of subjective knowers); 2) the subjective (i.e., first person experience and knowledge of the world); and 3) the intersubjective (i.e., what groups of humans share as knowledge about the world). In everyday usage, knowledge refers to awareness of or familiarity with various objects, events, ideas, or ways of doing things. However, as philosophers have long noted, things get complicated quickly. For example, as I glance to the left of my computer, I see a coke bottle on my desk. The naïve commonsense view is that I simply perceive the actual coke bottle in front of me. Some reflection, however, reveals profound questions about the relationship between the

"external" or "objective" reality relative to my subjective perceptions of it. If one were to peer inside my head, for example, one would not find anything like a coke bottle, but rather the white and grey matter that make up my brain. My experience of the coke bottle is—somehow—a product of my brain, but the details remain mysterious in many ways.

Early Enlightenment philosophers such as John Locke invoked the concept of primary and secondary qualities to deal with the distinction between the objective reality and the subjective experience of that reality. Primary qualities consisted of objective properties that really existed in the world (e.g., the light waves bouncing off the bottle), whereas secondary qualities referred to the subjective experience that represented external qualities but did not necessarily exist in the external reality per se (e.g., the experience of the color red). Kant offered a famous distinction along these lines between the phenomenal world (our subjective, first person experience) and noumena, which are the "things in themselves." Kant believed that we could never know things in themselves directly, but we needed to understand how the mind imposes categories on the world (e.g., quantity, quality, and relation) that give us our perception of things. In short, many philosophers have explored the complicated relationship between the objective, external reality and our subjective, perceptual experience of it.

The role that the intersubjective plays in shaping human knowledge can be added to current example by considering the 1980 film, *The Gods Must Be Crazy*, which tells the story of the dramatic impact a coke bottle, which accidentally fell from a passing airplane, had on an isolated tribe in the Kalahari Desert. The tribesmen interpreted the bottle as a gift from the gods, and the film tracked how that meaning permeated the tribe and influenced its members. Such a story highlights the central role that socially constructed narratives play in what people experience as reality (i.e., the coke bottle meant something very different for the tribesmen than

it did for the pilots in the plane). This example orients us toward recognizing that we achieve much of our knowledge about the world by sharing narratives with others. However, as soon as we start to conceive of human knowledge as "simply" a social construction arising from processes of social exchange in local groups in specific historical contexts, questions emerge regarding the nature of objective knowledge. It surely is not the case that the mass of a proton is a function of social convention *alone* (Sokal, 2008). The nature of objective knowledge relative to human subjective experiences or social constructions of truth remain one of the great epistemological disputes of modern times (Goldman, 2007).

Several prominent philosophers have called for visions that identify and link these three domains. For example, in his *Three Worlds* lecture, Karl Popper (1978) articulated a vision of reality as consisting of three separable but interrelated "worlds" of knowledge that correspond to the three domains of the objective (i.e., bio-physical), subjective (i.e., perceptual conscious experience and idiosyncratic preferences) and intersubjective (i.e., human cultural), which he summed up as follows:

> There is the physical universe, World 1, with its most important sub-universe, that of the living organisms. World 2, the world of conscious experience, emerges as an evolutionary product from the world of organisms. World 3, the world of products from the human mind, emerges as a product from World 2. In each of these cases, the emerging product has a tremendous feedback effect upon the world from which it emerged.

In *Subjective, Intersubjective, and Objective* (2001), the philosopher Donald Davidson made a similar call and summed up his analysis of the difficulty linking these three domains together as follows:

> I want, first of all, to stress the apparent oddity of the fact that we have three irreducibly different varieties of empirical knowledge [i.e., the subjective, the objective and the intersubjective]. We need an overall picture which not only accommodates all three modes of knowing, but makes sense of their relations to

> one another. Without such a general picture we should be deeply puzzled that the same world is known to us in three such different ways.

As one considers these reflections, it is worth keeping in mind that these three domains of knowing are effortlessly coordinated in everyday life. If, for example, a thirsty friend were to enter my office and asked for a sip of coke, my conscious experience would seamlessly align with my understanding of her subjectivity, and I would effortlessly reach out (presumably into the actual, physical world), and grab the bottle and hand it over to her. The problem from a philosophical point of view, as Davidson and Popper note, is that there is no comprehensive big picture system that seamlessly accounts for the three domains and their interrelations.

To understand the difficulty in integrating the objective, subjective, and intersubjective domains, it is useful to return to the picture of scientific or objective knowledge that emerged during the Enlightenment. Following the tremendous success of Newtonian physics, a matter-in-motion physicalist picture of the universe emerged. It was presumed by many Enlightenment intellectuals that the goal of science was to achieve an objective picture of reality, via analytic reasoning and experimentation that would eliminate any influences of subjective or social biasing forces. However, many modern philosophers of science have noted important problems that emerge with a purely objectivist conception of knowledge. It is well-known that there is a "postmodern" movement that emphasizes the argument that human knowledge is inevitably tied to the subjective, social, and historical contexts and deeply influenced by those in power. Although some broad philosophical systems have been proposed (see, e.g., Wilbur, 2000), no system to date has been widely accepted that provides a clear integrated vision that effectively frames the key issues.

The Behavioral, Mental, and Social Constructionist Views in Psychology

The complex philosophical issues associated with the objective, the subjective, and intersubjective domains have parallels with various positions taken on the philosophy of psychology. Psychology's birth, the opening of Wilhelm Wundt's lab in 1879, was an attempt to develop a science of human subjective experience. However, as psychology's complicated history attests, scientifically studying subjective experience proved difficult. Critics such as John Waston (1913) argued the problem was insoluble, and rejected the validity of any reference to subjective consciousness in the scientific explanations of events. His behaviorist manifesto clearly spelled out the need for psychology to be based on objectively observable variables. He made his case by arguing that the key construct was behavior, defined by him as observable responses that could be measured. Via a focus on behavior, Watson argued, psychology could be a natural science discipline. An important implication of this argument is that behavior is a construct that is central to objective scientific knowledge.

Although there are a wide variety of behavioral positions, they all emphasize the need for a science focused on *objectively* observable behavioral facts—thus, behaviorism has always connected to objectivist conceptions of scientific knowledge. There are, of course, complications if one attempts to develop a science of psychology while denying human subjectivity, and tensions between mentalist and behaviorist views have been at the center of psychology's longstanding epistemological woes (Henriques, 2003). In contrast to behaviorist commitments to independently observable entities, mentalists argue that "the mind" has legitimate ontological and epistemological status in science. Freud's psychoanalysis was heavily mentalistic. Carl Rogers' humanistic phenomenology was also a strongly mentalistic approach, as he emphasized the need for a focus on human subjectivity in his clinical work.

Both psychoanalysis and humanistic approaches were critiqued by behaviorists and other scientifically minded scholars as failing to be true sciences because they did not deal in the realm of the objective, observable, and directly measurable world. A mentalistic approach that has achieved the status of a science, at least in the estimation of most scientific psychologists (for an exception, see Uttal 2000), is cognitive psychology. Ascending via the "cognitive revolution," cognitive scientists framed and defined the mind in terms of computation and information processing (Pinker, 1997). Perhaps the most influential mentalistic view in mainstream academic psychology has been Albert Bandura's (1989) social cognitive theory, which posits that overt actions, mental processes (both conscious and nonconscious), and situations each reciprocally determine one another. Although cognitive psychology allows for latent constructs like information processing, it does commit to a methodological behaviorism (Moore, 2013). That is, along with most other views that emphasize a scientific epistemology for psychology, it posits that psychology's concepts and theories must be anchored, at least indirectly, to objectively measured behaviors.

Since the middle of the 20th Century, another broad philosophical position has emerged, one that challenges some assumptions about the nature of natural science objectivity and human psychology's focus on the individual, decontextualized mind. This can be termed the social constructionist view. As with behaviorism and mentalism, there are a wide variety of different positions and emphases associated with social constructionist positions. Various angles on this position include post modernism (e.g., Rosenau, 1992), feminism (e.g., Malson & Burns, 2009), critical theory (e.g., Teo, 2018), continental philosophy (e.g., Foucault, 1965), and cultural or indigenous approaches (e.g., Chiu, 2017). Although a varied group, social constructionists tend to highlight three interrelated claims. First, human knowledge systems are always embedded in

socio-historical contexts and any full understanding of knowledge requires awareness of the role that history, and of social power and the way social movements and influence play in what is regarded as knowledge. Second, social constructionists often claim that the human mind is, at least in part, constituted by the cultural context in which it resides. Third, many who advocate for a social constructionist view question the viability of natural science approaches and assumptions applied to humans and instead argue that psychology must considered a human science which adopts different epistemological assumptions from modern Enlightenment thinkers.

Mapping the Universe via the Tree of Knowledge System

Intersubjective Mental Behaviorism posits that behaviorism, mentalism, and social constructionism have key insights that are necessary in any philosophically comprehensive view of the human condition. However, they are incomplete and defined against one another in problematic ways. From the vantage point of ISMB, the reason is that they have been framed based on epistemological considerations (e.g., empirical/positivist science versus postmodernism) rather than a coherent picture of cosmic evolution that allows for an effective map of the concepts like behavior, matter, mind, consciousness and culture (Henriques, 2013). ISMB is offered as an approach that can begin to define and align these concepts. It is grounded in the view afforded by the Tree of Knowledge System (Figure 1; Henriques, 2003; 2013), which has been used to solve "the problem of psychology" (Henriques, 2008) and offer a "new unified theory of psychology" (Henriques, 2011) that defines the field and assimilates and integrates insights from the major paradigms in psychological science into a more coherent whole. The framework has compared favorably with other similar views on the unity of knowledge, such as E. O. Wilson's (1998) conception of "consilience" in its capacity to integrate human knowledge (e.g., Anchin, 2008; Quackenbush, 2008).

<<<<<<<Insert Figure 1 Here>>>>>>>>>>>

The most novel feature of the ToK System is that it depicts four different, emergent dimensions of behavioral complexity evolving out of a singularity. Consistent with astronomical findings and mathematical predictions derived from general relativity, the ToK posits that the universe began as a "singularity," out of which the material dimension emerged. Then, as a function of a new complexity building feedback loop (natural selection) operating on a new kind of information storage and processing system (genetics), "Life" evolves as a second dimension of behavioral complexity, and the biological sciences map the properties of living organisms. Then, as a function of the nervous system, animal movement, and learning, "Mind" evolves as a third dimension of behavioral complexity. Finally, as a function of human language and processes of justification, "Culture" evolves as the fourth dimension of behavioral complexity.

These dimensions are different dimensions of causality (Henriques, 2011), and in that regard, they are somewhat akin to Karl Popper's different "worlds." However, unlike Popper's three worlds, the ToK System explicitly delineates that each dimension of complexity following matter emerges as a function of a novel information processing system. The picture of reality afforded by the ToK is of a fundamental substance, energy, which evolves into different dimensions of behavioral complexity that have different causal properties because of the kind of information that is being processed and communicated by the entities at the respective dimensions.

Principles of Intersubjective Mental Behaviorism

One key implication of the ToK for scientific knowledge is that behavior can be considered the fundamental concept to objectively map the universe and the properties within it (Henriques, 2011). This conception of behavior has important implications for the philosophy of

psychology, and an important focus of earlier writings has been on how the system solves the traditionally contentious perspectives of behaviorism and mentalism (or cognitivism) via the concept of mental behavior. The concept of mental behavior becomes clear when one considers the ToK as a system that defines key terms and their interrelation.

When capitalized, Mind on the ToK System refers the third dimension of behavioral complexity, specifically the behavior of animals as whole entities, mediated by the nervous system. Such behaviors are characterized as *mental* behaviors (Henriques, 2003; 2004). Mental is an adjective that characterizes the unique kind of behaviors exhibited by animals. Animals are unique in that they are multicellular creatures that move freely around in their environments. They are heterotrophic, meaning that they rely on other organisms for their energy sources (i.e., they must consume other organisms because they cannot transform the sun's energy directly into workable forms). The elements of free movement combined with the requirement of finding and eating other organisms are the central forces that shaped the structure and function of the nervous system.

Mental behaviors, depicted by the ToK System, effectively define what Skinner called behaviors (Henriques, 2004). Mental is a necessary adjective because atoms, cells and plants behave (i.e., they move in response to environmental changes). The key issue that needs to be properly framed is that it is not that atoms or cells don't behave as Skinner and his followers implied; rather the issue is that animals behave so differently from other objects. This is why the adjective mental is necessary. Consistent with Skinner, we can state that mental behaviors take place both within the animal and between the animal the environment. The latter can be considered overt mental behaviors, whereas the former are covert from the vantage point of an

independent observer. Hunting, mating, and defending a territory are exemplars of overt mental behaviors.

Unlike Skinner's radical behavioral epistemology, the ToK System allows for a clear conception of 'the mind' in a way that corresponds broadly with the cognitive science revolution (Henriques, 2003). 'The mind' refers the information instantiated within and processed by the nervous system. This refers to both non or subconscious information processing, and subjective conscious experiences, which are considered to be a special, emergent form of neuro-information processing. Perceptions, drives, feelings, imaginings, and nonconscious cognitive processes are mental behaviors; they simply take place within the animal and thus are covert from the vantage point of some independent, third person observer.

The current paper builds on mental behaviorism (Henriques, 2011) by adding the "explicit intersubjective" dimension. This refers to the capacity of human persons to share information about thoughts, feelings, and actions and the world via semantic language. The explicit intersubjective dimension is the dimension of human discourse, the "place" where persons deliberatively justify their actions on the social stage (Ossorio, 2006). Such justifications grow over time and ultimately come to define "Culture," defined by the ToK as large-scale systems of justification (Shaffer, 2008), including things such as laws, rules, norms, and national identities.

This summary allows for the delineation of the key principles of the ISMB perspective. First, the ToK provides a new, meta-perspective for defining key terms like behavior, mind, human consciousness, culture and their interrelations. Second, the ToK System characterizes the scientifically knowable universe as an unfolding wave of behavior—and it connects scientific knowledge to the domain of objective knowledge. This suggests that objective, scientific

knowledge is intimately connected to the concept of behavior, a point that will be elaborated more later. Third, the ToK characterizes Mind as an emergent dimension of behavioral complexity. The mechanisms and causal processes that give rise to this emergent dimension are found in the neuro-information processing properties of the nervous system. In addition, the subjective conscious experience of animals is also characterized as emerging (somehow) from aggregate waves of neuro-information processing (e.g., see Dahaene, 2014). Finally, humans can explicitly link their subjectivities together via symbolic language. Ultimately, this is what gives rise to Culture, which is also a new dimension of behavioral complexity on the ToK.

Mapping the Human Mind via the ISMB Perspective

Central to the ISMB position is the need to clearly delineate and define the domains of the human mind. To begin this process, it is useful to review four common, everyday definitions of the term *mind*. First, 'the mind' often refers to the self-conscious reasoning and deliberative reflection in persons. This is what Rene Descartes meant when he divided the world into the dual domains of "mind" and "matter." Second, the mind also sometimes refers to the conscious experience of being-in-the-world, the "first person" world of felt perceptions, urges, emotional reactions, and imagined wonderings (e.g., the pain of a pinprick, or seeing a red coke bottle). Third, the term mind also relates to what people are doing, ways of investing effort and attention. For example, if someone were to say, "Frank really put his mind toward getting on varsity soccer," we would know that Frank was working hard to get on the team. Finally, there is the "behind the scenes" element or domain of mind; this refers to mental activity beneath or outside of conscious awareness (e.g., the unconscious mind that made Freud famous).

The map of the human mind associated with ISMB differentiates and links these four domains. To see how, I will return to my example of perceiving and interacting with a coke

bottle that opened this paper. Figure 2 offers a "map of reality" of that example based on an ISMB formulation. In it, there are four different domains of human mental behavior that line up with the four common, dictionary meanings of the term.

<<<<<<<Insert Figure 2 Here>>>>>>>>

The first domain is the information instantiated within and processed by the nervous system. This corresponds to the nonconscious, unconscious, or subconscious "behind the scenes" processes and messaging that takes between parts of the nervous system. Consistent with the broad view adopted by cognitive science, ISMB operates from the position that the nervous system is, functionally, an information processing system. That is, the functional organization of the nervous system is to bring in inputs via afferent nerves that monitor changes in both the external environment and the body, and reference those changes against various neuro-computational set points and coordinate outputs via efferent nerves that communicate with the body.

The second domain of the human mind is the subjective theater of experience. This can also be call experiential or perceptual consciousness, and refers to the first-person (or first animal) integrated sensory experience of being in the world. In the current example, it would refer to the consciously accessible sensory perceptual experience of how the coke bottle looked and felt. This view of experiential consciousness is consistent with the work of Bernie Baars and many other cognitive neuro-scientists.

In *The Theater of Consciousness: The Workspace of the Mind*, Baars' (1997) notes the idea of consciousness being akin to a theater has a long history, dating at least back to Aristotle. The idea here is that "the lights come on the stage" when you wake up and go dim when you go to sleep and flicker on and off when you dream. Baars' combines this historical metaphor with

his own approach to cognitive psychology and a "global workspace model" for consciousness, which argues that consciousness is deeply connected to working memory and provides a way to integrate, reference, and compare disparate streams of information. In the model, perceptual conscious awareness is akin to a "spotlight," and refers to what is the focus of conscious attention. In Baars' model, this conscious spotlight operates within the context of working memory (which is the "stage"). Everything else (i.e., sensory input, the implicit concept of self, long-term memories, rules of grammar, automatic behaviors, etc.) is considered back stage (the non- or subconscious information processing that is taking place in the nervous system). The subjective, theater of consciousness can never be shared directly with others, only indirectly, which is one of the things that makes conscious experience so difficult to study scientifically. However, scientists have made much progress, especially with modern brain imagining tools. For example, in *Consciousness and the Brain*, Daheane (2014) empirically examined the "conscious access point" and reported convincing results that conscious experience is closely associated with a "P3 wave," an oscillating wave of brain activity that emerges approximately 300 milliseconds following exposure to a stimulus.

Overt actions are the third domain of human mental behavior. It refers to engaging one's muscles to effect change in the environment. Because acting takes place between the animal and the environment, it is readily observable, and this is what has linked acting so strongly to traditional empirical approaches in psychology.

Finally, in humans there are the explicit, language-based processes that foster deliberative, reason-based thinking. Although we can never directly share the feeling portion of our consciousness, we can, of course, talk and explicitly share our verbal narratives. Symbolic language opened up an information highway between human minds; currently, I am directly

sharing my narrative for ISMB with the minds of readers. Other animals can only connect via doing, and thus have a much weaker form of intersubjectivity. Talking is also inherently social and dialogical. We learn first to talk with others, and early in our child development we are essentially social actors (McAdams, 2013) learning the rules, roles, and meanings in the society in which we are raised. This is why something like a coke bottle can have very different meanings for different groups of people depending of the sociocultural context. Over time, humans learn to internalize speech and talk to themselves, giving rise to a private form of intersubjectivity, the internal narrator.

How are these domains of human mental behavior connected? Grounded in the map of the universe as an unfolding wave of energy and information provided by the ToK System, ISMB employs the concept of "informational interface" to help clarify the links and relationships between them. Informational interface refers to the transfer of information patterns across and through various mediums, and includes feedback loops and communication between different kinds of systems. Examples of this abound, especially in the modern information age. Consider, for example, what occurs when two people are engaged in a conversation on the phone. In a phone conversation, an explicit, self-conscious thought is translated into motoric speech and the speech information flows as sound waves into the receiver in the phone. Those soundwaves are translated into electrical signals that are then beamed as radio waves to the nearest cellphone tower, where they are then sent to a satellite in space and beamed back into another cellphone tower, and then into the person's cell phone. They are then retranslated into the speaker, which projects the information through the air via sound waves. These soundwaves are then translated into liquid waves via the ear drum and three small bones (i.e., hammer, anvil and stirrup), which cause vibrations in the cochlea which results in a pattern of fluid that is picked up by auditory

receptors and then translated into words that can be processed and pulled together to form meanings. Finally, the person responds, “I can’t believe she did that!”

The point here is that we can effectively define human mental behavior by characterizing it as four domains linked via informational interface. Specifically, “the human mind” in ISMB refers to: how different parts of the nervous system communicate messages and store information (domain 1); how brain-based information processing gives rise to and is influenced by the unique kind of processing that is the theater of conscious experience (domain 2); how information flows from the nervous system into the muscles (and back again) to give rise to controlled, external movements and purposeful actions (domain 3); and, finally, how experiential consciousness and other neuro-information processes are translated into symbolic language, which can then be shared directly with others (domain 4). From this perspective, the human mind is as a *neuro-behavioral-experiential-linguistic informational interface system*.

ISMB offers this map of the human mind to provide a clear descriptive framework for the different domains and their interrelations. In so doing, it allows scholars to approach the definition of psychology’s subject matter in a new way, one anchored to a conceptual framework with clearly defined domains. This is different from defining the mind in terms of empirical methodological requirements (Henriques, 2004). From an historical standpoint, psychology’s commitment to empiricism is one of the key reasons that behaviors are defined in terms of observable responses. Observation allows for measurement, while measurement then allows for hypothesis testing and experimentation. Thus, the empirical methodology frames the definition of behavior in much of mainstream psychology, designated as methodological behaviorism (Moore, 2013). ISMB adopts a different approach, with the domains being mapped using the conceptual logic stemming from the ToK System.

By itself, a descriptive framework raises many questions. How did these domains come to be? What is their functional organization? How do we effectively link them together to form a coherent narrative? This is where the ToK System does much valuable work. It provides a new view of cosmic evolution that ties together many previously unseen linkages and gives rise to a new picture of the whole.

The Five Linkages that Tie the Map of the Human Mind Together

The ToK System serves to map five key links in a chain that connects the various domains of human mental behavior together in a clear cosmic evolutionary narrative. These links are: 1) Science is a way of objectively understanding the world that emerged out of human culture, and behavior is the central concept science uses for mapping the universe and everything in it; 2) Information processing a the key concept for studying Life (i.e., the behavior of living entities) and for differentiating the world of organisms from the inanimate world; 3) Behavioral Investment Theory and the philosophy of mental behaviorism provide a framework both for understanding Mind as a new dimension of behavioral complexity and for understanding the emergence of cognition and experiential, animal consciousness; 4) the Justification Hypothesis provides a framework for understanding the connections between the evolution of human language, self-consciousness, and human culture; and, finally, 5) the evolution in human justification/knowledge systems took a key turn when the early Greeks (i.e., Socrates, Plato, Aristotle) shifted the focus of justification from knowing *how* to do things toward reflecting on systematic questions about what "true" knowledge is and how one can be explicitly justified in knowing *that something is true*. This development in human justification systems was foundational to what would become modern science, which added the final piece of the empirical method utilized to map the behavior of entities in the universe to decipher objective truths about

nature. With these linkages made, we can view see the domains of human mental behavior in a new light, and understand why they are organized the way they are.

The First Link: Behavior as the Key Scientific Construct

The ToK System depicts the universe as an unfolding wave of energy, matter and information. This unfolding can be characterized as a wave of behavior (a series of changes in object-field relationships). In contrast to how the term is used by behaviorists in psychology, here the most general definition of behavior is emphasized, which is change in an object–field relationship. Framed as such, behavior is the central construct in the sciences at large. That is, objects, fields, and change provide the conceptual bedrock for modern science. Physics can be described as the science of the behavior of objects in general (Wolfson, 2013), with particle physicists studying the behavior of very small objects (e.g., particles like fermions and bosons) using quantum theory, and cosmologists studying the behavior of very large objects (e.g., galaxies) using the general theory of relativity. In this view, it follows that the special sciences study the behavior of certain objects in particular. For example, chemists study the behavior of molecular objects (Breydo et al.2015), and geologists the behavior of rock formations (Kankanamge & Moore, 2016).

This analysis gives rise to a "universal behaviorism" in the sense that everything is part of an unfolding wave of object-field change over time. This principle of a broad, universal behaviorism is the first principle of ISMB. Everything is considered part of the unfolding wave of energy-information depicted by the ToK. However, in making this claim, ISMB does not advocate for reducing all behaviors to physical and chemical processes. Everything is energy and matter, but everything is not *just* energy and matter. Instead, as is clearly depicted by the ToK System, there are different dimensions of behavioral complexity.

The implications of this view of behavioral complexity can be seen clearly via The Periodic Table of Behavior, which is a taxonomy of behavior derived from the ToK System. Virtually all other perspectives depict complexity along a single continuous axis that advances as one moves up different levels of analysis, from particles to atoms to molecules to cells to organisms to animals and to ultimately human societies. Rather than depicting nature on a single axis of complexity (i.e., from particles to atoms to cells to organisms to societies), the ToK System differentiates complexity into two axes, levels of analysis and dimensions of behavioral complexity. The level of analysis refers to the relationship between parts, wholes, and groups, relative to the field or environment in which the object resides. Dimensions of behavioral complexity refer to shifts in patterns of behavior and self-organization that emerge as a function of different, nested information processing systems. This gives rise to a Periodic Table of Behavior. The columns on the Periodic Table are separated because of the emergence of different dimensions of behavioral complexity that arise as a function of different information processing and communication systems.

<<<<<<<<<Insert Figure 3 Here>>>>>>>

The Second Link: Life and the Emergence of Information Processing

Following Matter, Life is the second dimension of behavioral complexity on the ToK System. Although it is possible—perhaps even probable—that life exists elsewhere in the universe, the ToK System maps our current knowledge of the empirically documented universe. The best scientific evidence suggests that planet earth formed approximately 4.5 billion years ago (Lunine, 2006). Life, in the form of simple single cells, was definitely present on earth by 3.7 billion years ago, and may have started as early as 4 billion years ago (Dodd et al., 2017).

Although how life originated remains in dispute (Van Kranendonk et al. 2017), biologists have a basic framework for understanding how life evolved thereafter. The modern evolutionary synthesis combines Darwin's theory of natural selection with genetics. Darwin's theory refers to the idea that a cycle of variation, selection and retention was the key feedback loop that gave rise to the Tree of Life. Darwin did not know the mechanism of variation and retention at the time of proposing his theory. However, the needed elements were found in genetics and the DNA molecule. By the 1930s, biologists synthesized genetics with natural selection, providing a unified framework for understanding the evolution of life.

In 1944, Erwin Schrödinger authored a book asking the question *What is Life?* A physicist by training, Schrödinger pointed out that what is remarkable about life is how it is organized, how it takes in energy to perform work to fend off entropy, and how it appears to be self-organizing and self-perpetuating via reproduction. In chapter four of his book, Schrödinger states that "living matter, while not eluding the "laws of physics" as established up to date, is likely to involve "other laws of physics" hitherto unknown, which however, once they have been revealed, will form just as integral a part of science as the former." According to the ToK, these "other laws" are to be found the way in which information processing (Bray, 2009) gives rise to processes of self-organization (see, e.g., Kauffman, 1996). Central to this claim is the notion that there a fundamental distinction between life and inanimate matter (particles, atoms, molecules, chunks of rocks, stars, etc.) in that the latter do not engage in information processing in the way that animate matter does. Support for this claim can be seen in the way biologist speak of "the language of genetics," genetic codes, genetic software, and so forth. DNA can be thought about as a memory/information storage system, and the various RNA types and relations (messenger,

transfer, regulatory etc.) as “genetic information processing” systems that gives rise to self-organizing cellular structures.

In his book, *Wetware: A Computer in Every Living Cell*, Bray (2009) articulates how the DNA and RNA complexes function as computational systems that give life its complexity:

> Wetware, in this book, is the sum of all the information rich molecular processes inside a living cell. It has resonance with the rigid *hardware* of electronic devices and the symbolic *software* that encodes memories and operating instructions, but is distinct from both of these. Cells are built of molecules that interact in complex webs, or circuits. These circuits perform logical operations that are analogous in many ways to electronic devices but have unique properties. The computational units of life-the transistors, if you will-are its giant molecules, especially proteins. Acting like miniature switches, they guide the biochemical processes of a cell this way or that. Linked into huge networks they form the basis of all of the distinctive properties of living systems. Molecular computations underlie the sophisticated decision making of single-cell organisms such as bacteria and amoebae. Protein complexes associated with DNA act like microchips to switch genes on and off in different cells-executing "programs" of development.

Farnsworth, Nelson and Gershenson (2012) go farther and argue that the defining feature of life is information processing, and that it not only resides in the DNA and RNA molecular structure, but functional information processing is woven together at all levels of life, from the molecular to the ecological, and it is the central concept that allows biologist to understand the unique organized features and properties of living entities. The key point here is that animate matter behaves in a qualitatively different manner than inanimate matter and the root of this qualitative difference emerges from genetic and epigenetic information processing. As Richard Dawkins (1986) put it in the *Blind Watchmaker*, “[I]f you want to understand life, don’t think about vibrant throbbing gels and oozes, think about information technology.”

In thinking about life as a system coordinated by information processing, a question arises regarding the subjectivity of organisms. That is, if organisms, from bacteria to trees, can process information, we can ask the question: *Do they have a subjective perspective on the*

world? This question is debated (see, e.g., Wohlleben, 2016). The answer from a ToK System perspective is that they have a weak, implicit, or proto-subjectivity because they are self-organized, process incoming information, and respond to their surroundings via inputs and outputs. They can even be said to be goal-oriented in a cybernetic way, meaning they tend to systematically approach or avoid certain environments or stimuli (e.g., bacteria will swim to avoid toxins, and leaves will turn toward the sun for light). But lacking a nervous system, cells and plants do not have the full experiential subjectivity of animals; they are, in the words of Bray (2009), "robot(s) made of biological materials" (p. ix). Sentience or fully subjectivity emerges only in the animal kingdom.

The Third Link: Behavioral Investment Theory, Mental Behavior, and Experiential Consciousness

The third dimension of complexity on the ToK System is Mind and, as mentioned previously, it consists of the set of mental behaviors. Behavioral Investment Theory (BIT) is the joint point between Life and Mind, and characterizes the nervous system as "the organ of behavior" that functions as an investment value system (Henriques, 2011). Animal actions are framed in terms of invested work effort, specifically expenditures of time and energy calculated in terms of costs and benefits, relative to opportunity costs of other investment paths not taken. BIT delineates six foundational principles of animal behavior and nervous system functioning: 1) The Principle of Energy Economics; 2) The Evolutionary Principle; 3) The Principle of Behavioral Genetics; 4) The Computational Control Principle; 5) The Learning Principle; and 6) The Principle of Development.

BIT can be thought of as a meta-theoretical framework for the (animal) mind, brain, and behavioral sciences (Henriques, 2004). It plays a key role in the ISBM formulation because it

provides the conceptual linkages between the nervous system as an information processing system (domain 1) that is functional organized to coordinate movement and invest in overt actions (domain 3). It also bridges to domain 2 (conscious experience) via the claim, endorsed by many neuroscientists, that the capacity for conscious experience emerges as a function of the evolution of layers of neuro-information processing. That is, increasingly complicated brains, modes of learning, information integration, and behavioral control gave rise to more extensive capacities for mental experience (first person subjective experience of being). More specifically, via the principle of computational control, BIT directly links experiential consciousness with functional, information processing properties (Henriques, 2011). Experiential consciousness (domain 2 in ISMB) has the three interrelated subdomains, which are: 1) sensation and perception (e.g., seeing a red coke bottle, tasting a salty food); 2) motivational urges (e.g., thirst, hunger, sexual desire); and 3) emotion (e.g., sadness, joy, anger). Nonverbal thoughts are considered imagined sequences that combine these elements into simulations of events and actions (see Redish, 2015).

These three domains correspond to BIT's control theory formulation of mental experience. As noted by early cybernetic formulations, the basic equation for controlled feedback processes is: input – reference goal = output. The basic components that go into such a system are: 1) an input sensor; 2) a reference goal; and 3) an output mechanism. Behavioral Investment Theory uses the structure of the control theory framework to advance the P – M => E formulation (Henriques, 2011) of mental experience, where the "P" refers to perception, "M" to motivation, and "E" to emotion, and the formulation posits that claims what is perceived referenced against motivational templates of approach or avoid, which in turn activates emotion which energizes action, feeding back on changes in perception. Importantly, the P – M => E

connects experiences, such as pleasure and pain, with Skinnerian models of reinforcement, giving rise to an "operant-experiential" view of animal behavior that includes both "feeling" and "doing" as parts of the overall equation. This P – M => E formulation thus connects the (nonverbal) information processing architecture with the structure of conscious experience and the experimental analysis of overt actions. In short, BIT links domains 1, 2, and 3. However, consistent with it being a formulation of animal behavior, it does not explicitly specify the nature of domain 4 (human language and explicit subjectivity). The next link in the chain is required to specify this piece of the puzzle.

Sociality was a crucial factor in the development of increasingly complex mental lives in animals, and many species have rich, complicated social lives (Safina, 2014). However, nonhuman animals are limited in the extent to which they can share their subjectivity, thus they only exhibit a weak, implicit or proto-intersubjectivity. The situation changes, however, with the emergence of human language. Symbolic language opens up a direct informational highway for sharing subjective realities, thus giving rise to a strong, explicit intersubjectivity, which in turn opens up many opportunities for collective learning (see Christian, 2005).

The Fourth Link in the ISMB chain: The Justification Hypothesis, the Tripartite Model of Human Consciousness, and the Rise of Explicit Intersubjectivity

The ToK System depicts Culture as the fourth dimension of behavioral complexity. Just as genetic information processing was identified as central to the emergence of Life, and neuronal information processing was identified as central to the emergence of Mind, the emergence of Culture is also associated with a new information processing system, human language. Although other animals have sophisticated communication systems, human language

is a unique kind of information processing system. It is an open communication system that includes learned symbols, grammatical syntax, and semantic information processing.

ISMB connects conscious experience (or perceptual subjectivity framed by the P – M => E formulation) with explicit intersubjectivity via the Justification Hypothesis (JH). The JH is the "joint point" between Mind and Culture on the ToK System. The JH is a formulation that consists of three related lines of thought that ties together the inter-relationships between human language, self-consciousness, and the evolution of Culture. First, the JH interprets both human self-consciousness and culture as *justification systems*. Justifications are the linguistic reasons we use to legitimize our claims and actions, and justification systems are interlocking networks of specific justifications that legitimize a particular version of reality. Second, the JH offers an evolutionary hypothesis about the adaptive pressures that drove the origin and design features of the modern self-consciousness system. Specifically, the evolution of language resulted in the problem of social justification (i.e., how individuals explained their actions to others in a way that took social context and influence into account), which in turn resulted in many "interpreter" design features associated with human self-consciousness. Finally, and especially relevant to Intersubjective Mental Behaviorism, the JH, in combination with BIT and the ToK System, gives rise to an updated tripartite model of human consciousness (Figure 4).

Insert Figure 4 here.

Whereas BIT provided the conceptual and functional linkages between the ISMB domains 1, 2, and 3, the JH links in domain 4 and makes clear predictions regarding the relationship between this domain and the others. As depicted, the JH gives rise to a tripartite model of human consciousness as follows: 1) an experiential consciousness system; 2) a private self-consciousness system; and 3) a public self-consciousness system. The experiential system

corresponds to domain 2 in ISMB. As discussed above, it is a nonverbal, perceptual-motivational-emotional, parallel neuro-information processing behavioral guidance system that computes resource availability and organizes action.

The JH allows for a clear articulation of the relationship between experiential consciousness and language-based explicit intersubjectivity. First, as depicted, the JH tripartite model divides the verbal-linguistic-talking portion of human self-consciousness into two separable domains of justification, namely private (justification to self) and public (justification to other), and it offers a clear theory as to why there is filtering between these domains. Namely, language opens up an information highway to one's thought processes. And, although this is valuable for sharing information, it also means individuals are vulnerable to disclosing aspects of their thoughts and beliefs that are problematic in terms of social influence. The private self is the center of self-reflective awareness in adult humans and is made up most immediately of the internal dialogue that weaves a narrative of what is happening and why. It is a second order awareness system, one that translates and feeds back onto the experiential system.

The public self is a mixture of how we want to be seen and how we imagine we are seen by others, although both may be quite different from how one's image is actually received by others. A number of seminal theorists have emphasized the importance of and dynamic tension between the public and private identity and researchers have demonstrated the validity of separating the private from public forms of self-consciousness. For example, the microsociology of Erving Goffman (1959) makes a strong case in favor of the importance of the public persona in a way that is very consistent with the JH. In *The Presentation of Self in Everyday Life,* Goffman describes face-to-face interactions and examined such processes through the lens of stage acting. He articulated how interpersonal interactions could be considered "performances"

as actors learned to manage the impressions they present to others in both the structured and improvised roles of everyday life.

Above the two figures is labeled “The Context of Justification,” which refers to the network of beliefs and values that provide the interacting members a shared frame of reference for their interaction. The religious, legal, and normative systems of social convention all provide the larger context in which the specific actions and scripts of local individuals are played out. Actions, the third domain of the human mind in ISMB, are also labeled in the figure and are the set of overt mental behaviors that individuals actively engage in the external world.

The JH specifies the dynamic functional relation between the experiential system and the private self-consciousness system and the public self. These are labeled as “filters”. Inside each of the individuals are two filters, labeled the Freudian and the Rogerian. The Freudian filter exists between the experiential self and the private self and refers to the process by which unjustifiable or painful images and impulses are filtered out and/or are reinterpreted to be consistent with the individual’s conscious justification system. It is called the ‘Freudian’ filter because the dynamic relationship between self-conscious thoughts and subconscious feelings was (and still is) a central focus in both classical psychoanalysis and modern psychodynamic theory (McCullough Valliant, 1997). The filtering that takes place between the private and the public self is called the Rogerian filter because Rogers shifted the focus from deep and largely nonconscious intrapsychic processes to more conscious thought and experiences and here-and-now interpersonal processes.

Whereas BIT and Mental Behaviorism provide a link between objective behavioral conceptions and experiential subjectivity, the JH provides a framework for understanding the emergence of self-consciousness and explicit intersubjectivity. In linguistic communication,

individuals must not only convey raw data, but they must also understand the explicit and implicit rules that legitimize action and investment and provide justifiable narratives for why they are doing what they are doing. The nature of conscious filtering, as elucidated by pioneering psychologists like Freud and Rogers, can be placed in the system and understood as structures that manage the adaptive problem of justification.

One of the central insights of the JH is that it links individual and micro-relational processes with group and large-scale social processes via the idea of justification systems. Laws, for example, are explicitly organized as systems that legitimize right and wrong. So too are political philosophies and religions (Shaffer, 2008). Even science can be characterized as a system of justification (Henriques, 2011). With this notion, we turn to the final link and explore the evolution of human Culture into the emergence of philosophy in general and science in particular as a kind of large-scale justification system.

The Fifth Link: The Evolution of Culture, Philosophical Reasoning, and the Emergence of the Idea that there is an Objective Reality to be Systematically Investigated

Four of the five linkages are currently in place. To close the loop, we need to trace human cultural evolution to the emergence of modern philosophy and ultimately, science, which is a human knowledge system that functions to develop increasingly accurate maps of behavioral complexity and change (i.e., the best conceptions we have of general, objective knowledge). As noted in the previous section, Culture (with a capital "C") is the fourth dimension of complexity, and consists of symbolically mediated justification systems that linguistically frame human action. Culture, according to the ToK, is conceptually separable from spheres of technology, acquired human behavioral investment patterns (i.e., learned procedures and skills), and the biophysical ecology in which humans live, although there are clearly complex interrelations

between these various domains. With Culture so defined as systems of justification that coordinate people, we can then ask, “Where did Culture come from?” and “What is science?”

Archeologists have documented that by 50,000 years ago a pattern of cumulative growth had begun that would result in a creative, technological, and social explosion, and alter the face of this planet (Klein & Edgar, 2002). During the past 10,000 years, the pace of innovation has continued, including such achievements as agriculture, specialized division of labor, and systems of written language. The 19th and 20th Centuries saw a marked continuation of knowledge and technological growth, a pattern Piel (1972) characterized as “the acceleration of history”, and one that is visually represented in the ToK System. The rate and character of such change makes it clear that explanations for such changes will not be found simply in terms of biological evolution through natural selection, but instead must be considered to be a consequence of socio-cultural and technological evolution.

Shaffer (1998) has articulated a conceptualization that links justification processes and transmission of knowledge with the evolution of technology. He argued that cultural skills and technological developments are transmitted via packets of “recipe knowledge”, which are justified by knowledgeable experts to novices. To envision how this process occurs, imagine a circumstance where novices observe an experienced toolmaker and form “why” questions: “Why do you strike the stone at this angle?” or “Why do you carve the bone this way?” A likely response given by an expert toolmaker would have been a justification: “I strike the rock this way to make it flake—if you strike it that way, the hammer will glance off the rock and you will end up striking your hand!” or “If you carve the bone this way, it will crack and the hook will be useless.”

A second explanation for the accelerating rate of cultural evolution suggested by the JH is the fact that sociolinguistic exchanges between individuals give rise to complex systems of justification (Shaffer, 2005). This process was examined empirically in the influential work of Muzafer Sherif. Sherif realized that the apparent motion individuals see with the autokinetic effect represented a means to create a laboratory analog of events in early human history before the establishment of shared norms, which Sherif believed was the essence of culture. Sherif (1966) found that, when participants were asked to make judgments of the apparent motion by themselves, their initial judgments usually exhibited considerable variability. With repeated judgments, participants reduced the variability around a personal anchor termed a "personal norm." Others' evaluations, however, were typically very influential in the participants' subsequent judgments. Moreover, eventually groups would establish norms that would specify the legitimate perception of movement in a manner that carried moral overtones. According to this analysis, justification systems change, grow and evolve. And with this frame we can begin to trace the more recent histories of cultures, laws, governments and political processes and characterize them in terms of evolving, large-scale justification systems.

Perhaps the most important event in the history of modern justification systems was the emergence of the insights of the early Greeks (i.e., Socrates, Plato, Aristotle), as these early philosophers offered a radical shift in how humans thought about knowledge in a way that would have dramatic implications for human culture (Goldman, 2007). Prior to the Greeks, knowledge was generally thought of in terms of local traditions, religious accounts of the world, and pragmatic or procedural know-how (i.e., knowing how to build a sword or pyramid). That is, there was not a systematic way to question the explicit relationship between subjective experiences of the world, human discussions about why things happened, and acting in the world

with expected effects. However, the early Greeks changed that and turned their eye to more abstract problems in justification. Deeply influenced by the work of early mathematician-philosophers like Pythagoras, the Greek philosophers claimed that local, practical knowledge was not the stuff of true knowledge, and they sought a pathway that allowed them access to universal, absolute, deductive truths about the world. Mathematics provided them a model of what such knowledge might look like, and they thus began a quest to free humankind from the personally and socially constructed perceptual prison and reveal the universe's absolute truths.

Goldman (2007) traces the evolution of ideas and technologies from the ancient Greeks to the emergence of modern science in the Enlightenment period. He points out the technical developments that were central for modern science (e.g., writing and the printing press, central vanishing point perspective drawing), as well as conceptual developments (e.g., the view that nature is a closed system, calculus, Francis Bacon's articulation of the empirical method). What was happening was yet another shift in the structure and function systems of justification, from coherence and logic (the focus of the philosophers), to a focus on the correspondence theory of objective truth about the universe and our place in it (empirically grounded scientific systems).

Whereas the Greeks emphasized attention to metaphysics and the logic of their philosophical systems, the pioneers of modern science emphasized that empirical evidence derived from one's conceptions must be gathered and analyzed and found to be in support of one's conjectures for the idea to be deemed scientifically justifiable. In sum, the fifth and final linkage is the lineage of justification that evolved from everyday pragmatic know-how (which are processes of justification found in all cultures) to reflective and systematic justification processes about knowledge of truth (which was the birth of philosophy founded by the early Greeks) to empirical method-based investigations that are required to determine which truth

claims were justifiable via correspondence with evidence (the birth of modern science in the Enlightenment). This final link allows us to close the ISMB loop and tie together the domains.

An Invitation to a New Metaphysical-Empirical Map of the Human Mind

If we are to follow the logic of the preceding section, the suggestion emerges that good knowledge systems involve both principles of coherence (clear definitions and logical interrelations) and correspondence (empirical findings that align with the definitional and explanatory systems). The position of ISMB is that modern psychologists have paid too much attention to gathering facts and generating theories, but not enough attention has been paid to the coherence of the field's central concepts such as mind, consciousness, and behavior. In popular academic textbooks, psychology is generally defined as "the scientific study of behavior and mental processes," (Myers & DeWall, 2016, p. 7). The emphasis is on science as an empirical method. However, if, as the current analyses suggest, overt actions can be considered a form of mental processes, and internal mental processes can be considered a form of "behavior," then psychology's definitional system is conceptually problematic from the start. This may explain why psychology has had such difficulty producing cumulative knowledge.

Unlike the current emphasis in mainstream psychology on methodological behaviorism and an empirical epistemology, ISMB advocates for adopting a conceptual or "metaphysical systems" approach to the problem of defining the field's subject matter (see, e.g., Henriques, 2013; Henriques, in press). Specifically, ISMB uses the ToK System as a metaphysical definitional system to delineate and link the domains of the human mind. Because it has a long and complicated history, a word about metaphysics is in order. Metaphysics is one of the oldest branches of philosophy. It is, first and foremost, concerned with claims about ontology or what really exists. Koons and Pickavance (2014) state that metaphysics is about understanding:

> the fundamental structure of reality as a whole. How do things fit together in the world? Plato describes this task of philosophy as "carving nature at the joints," comparing metaphysics to a skillful and knowledgeable act of dissection. Here are four relations that seem to be among the fundamental relations of this worldly structure: the relation between things and their properties, between wholes and parts, between causes and effects, and things related to each other in space and in time.

In the early 20th Century, there was a push by a group of scholars known as emergent evolutionists led by the comparative psychologist Conrad Lloyd Morgan to develop metaphysical maps of how complexity has evolved in nature (Henriques, 2011). Yet, as Hibberd (2014) noted, by the middle of the 20th Century metaphysics and grand systems theorizing faced fierce opposition from positivists and postmodernists alike, and generally fell out of favor. The ToK System invites scholars to return to grand metaphysical projects. As noted above by Koons and Pickavance (2014), the metaphysical project is an attempt by the metaphysician to "carve nature at its joints" and to delineate the relationships between things and their properties, between wholes and parts, between causes and effects, and things related to each other in space and in time. This is precisely what the ToK System attempts to do.

The earlier quotation from Karl Popper speaks some about the interconnections between the worlds of the objective/biophysical, subjective/conscious, and intersubjective/human culture. Namely, according to Popper, the subjective (World 2) somehow "emerges" out of the organic sub-World 1, and World 3 (human knowledge and culture) somehow emerges out of World 2. Moreover, Popper recognized that there is feedback between the worlds. For example, we can only know of World 1, at least in an objectively systematic and scientific way, via developments in World 3. However, as Popper noted, there are few good models for understanding clearly and efficiently the connections between the objective world mapped out by science, experiential consciousness, and the socially constructed world (which includes the world of scientists

discovering and justifying their ideas about objective reality). From the vantage point of the ToK System, what Popper is missing is a grand metaphysical system that offers a clear frame for understanding objective reality as mapped by science, the emergence of phenomenal consciousness, and the emergence of human culture in a way that also provides a framework for understanding how science and mathematics evolved out of culture as a human construction that effectively functions to map the physical and biological worlds.

ISMB also is designed to operate as an "everyday" language for the domains of the human mind. In simple terms, ISMB starts with the position of a human knower situated in the world. It points out three separable domains of knowing, which can be described in basic terms from the vantage point of the individual as: 1) doing; 2) feeling and 3) talking. Doing refers to acting in the world; that is, engaging one's muscles to effect change in the environment. Feeling refers to the first-person perspective of being-in-the-world. It consists of both what comes in through the senses to give rise to one's perceptual field (from both inside and outside the body) and to one's drives and emotions which orient one toward action. Talking is the way humans connect their minds together and is dialogical and inherently social. Talking starts as a social reason given process. However, as our reasoning capacities grow, we shift from social reason giving to being capable of more abstract reasoning.

With schooling and introduction to mathematics and logic, we can become reasoning agents, and can move beyond just what is socially justifiable and ask deeper, more reflective questions about what is true. That is, we can move from social justification to analytic justification and begin to reason about philosophical questions regarding the objective truth and theories of knowledge. This reflective position allows us to return to our feeling and behaving in the world and ask what objective knowledge do we really have as we act, feel and talk in the

world? Science is the system of objective knowledge that maps the unfolding wave of behavior that was sparked by the Big Bang and connects to the present via a remarkable cosmic evolutionary path through for separable dimensions of behavioral complexity.

Conclusion

As philosophers have long pointed out, the objective, subjective and intersubjective domains of human experience and knowledge are readily identifiable domains that raise thorny conceptual problems. Where did they come from? Why are they potentially separable? How are they related, mechanistically, functionally, and historically? Mainstream psychology has generally avoided tackling these questions and has instead focused on analyzing variables via empirical science and methodological behaviorism. The ISMB position adopts a different track. Using the map and links provided by the ToK System, we can now both differentiate these domains of human mental behavior and connect them to the key insights from behaviorism, cognitive science and phenomenology, and social constructionism into a coherent, holistic picture. As such, it offers philosophers and psychologists a new map of how the objective and behavioral can be linked to the subjective and mental, which can be linked to the intersubjective and socially constructed. With such an outline in place, we can now take a few steps closer to a more coherent conception of human psychology, and a more complete understanding of the universe and our place in it.

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Figure 1. The Tree of Knowledge System.

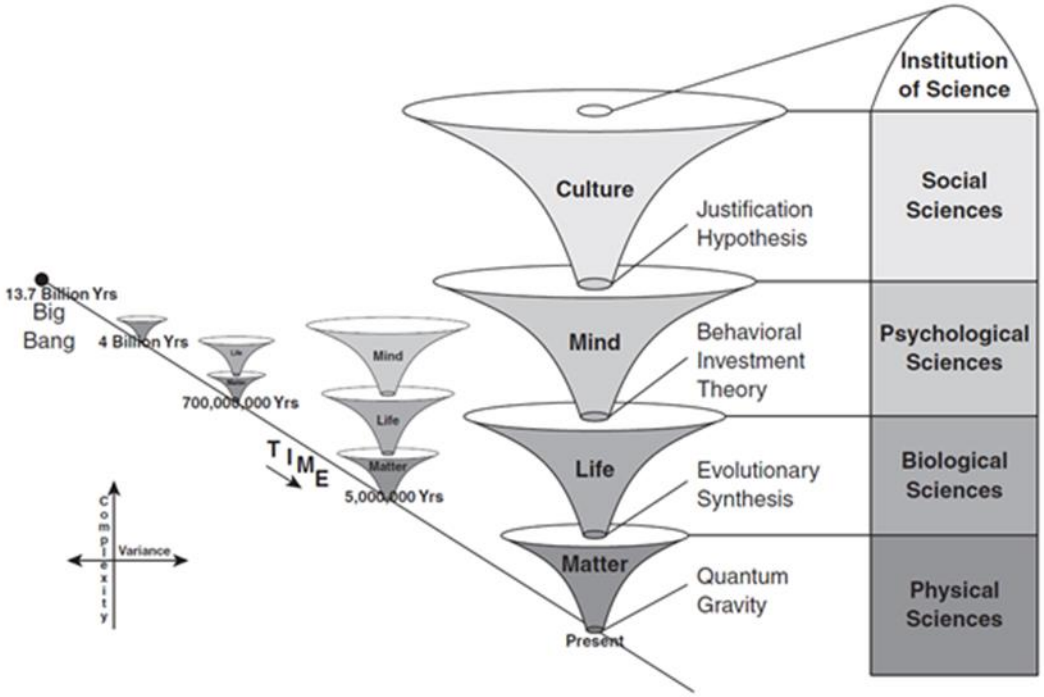

Figure 2. Mapping the Four Domains of Human Mental Behavior

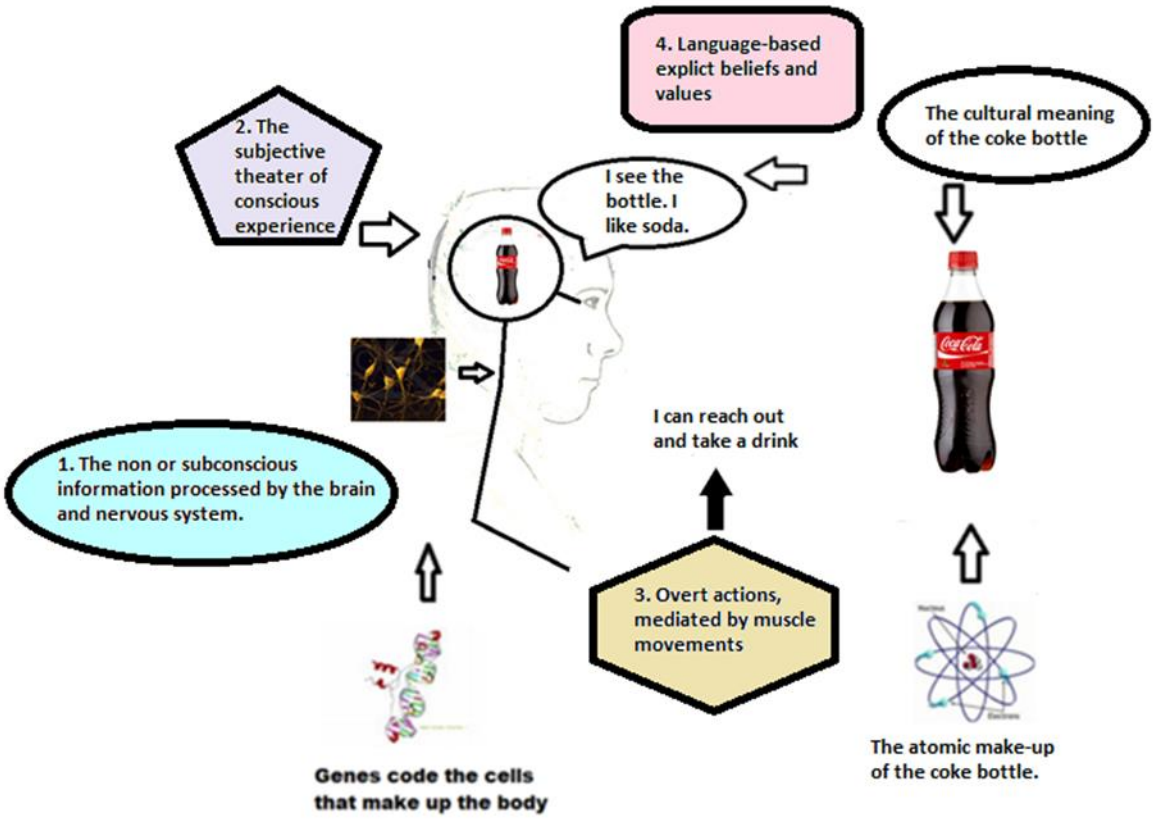

Figure 3. The Periodic Table of Behavior

The Periodic Table of Behavior					
		Dimensions of Complexity			
		Material/Physical	Living/Biological	Mental/Psychological	Cultural/Social
Object-Field Relations	Context of Behavior	Field	Ecology	Environment	Society
	Behavioral Entity	Object	Organism	Animal	Person
Three primary Levels of Object Complexity (Part, Whole, Group)	Groups of Wholes	Molecule	Group/Colony	Family-Group	Family-Community-Nation
	Fundamental Whole	Atom	Cell	Animal	Human
	Fundamental Part	Particle	Gene	Neural Network	Symbol

Figure 4. The Tripartite Model of Human Consciousness