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## Exploring Nonexclusively Physical Concepts /Symbolic Physicality

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ABSTRACT. This paper argues that there are concepts which are not exclusively physical even though they are frequently understood in physical terms. The terms for these concepts (e.g., democracy, hope, emotion, motivation) refer to entities that lack mass, energy, and observability, but nevertheless, they can have causal effects on the world. In this respect, they violate the tenets of physicality as maintained in classical physics. Additionally, they resist final definition and may require a different epistemology from that which underpins our understanding of the exclusively physical world.

Much of my career has involved trying to understand the role of motivation in second language acquisition, and it was a desire to explore the physical basis for motivation that led me to begin studying neuroscience in 1987. I took numerous courses in functional neuroanatomy with Dr. Arnold Scheibel, the distinguished neuroanatomist at UCLA. Coming from background in language, literature, and philosophy, I found it exhilarating to study something that was physical, something that was observable, where referents of the names for things were physical entities, not simply abstract concepts like formalism, constructionism, structuralism, cognition, emotion, and motivation. Even when entities in the brain were not easily labeled, they were given names such as zona inserta, nucleus ambiguous, or substantia innominata, and those entities could be observed, touched, and studied scientifically – they were real!

At the same time, the study of motivation in second-language acquisition already had a history of more than 50 years (Al-Hoorie, 2017) and was continuing with no end in sight. Researchers identified various types of motivation, each capturing a different nuance of the concept: integrative motivation, instrumental motivation, self-determination, attribution theory, goal theories, situated motivation, task motivation, willingness to communicate, skill-challenge motivation,

value and expectancy motivation, L2 motivation self-system, identity theory, investment theory, and commitment theory. Each

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one of these perspectives illuminated the concept of motivation, but there did not seem to be a final characterization of the notion.

Additionally, the concept “motivation” was related to other concepts: incentive, desire, goal, reward, approach, action tendency, wanting, liking, emotion, affect, arousal, valence, appraisal, reward, motivating source, force, stimulus, stimulation, inspiration, inducement, spur, reason, drive, ambition, initiative, determination, enterprise, enthusiasm, commitment, persistence, investment, engagement.

I began to think that there might be a neurobiological system that subserved all these motivation types. In 1997, I published a book called, “The Neurobiology of Affect in Language”. In the 1980s and 90s psychologists began studying the cognitive appraisals of stimulus situations that generated particular emotions. There were several psychology laboratories that converged on roughly the same set of appraisals (novelty, pleasantness, goal/need significance, coping potential, and self and social image, Scherer (1984). I thought these appraisal categories would be relevant not only to emotion but also to

motivation. I then used these categories to analyze and classify the items on questionnaires used in research on motivation in second-language learning. All the items were relevant to one or more of the appraisal categories.

The question for me then became “where in the brain are these appraisals produced and processed?” This occurred just at the time when neuroscience was beginning to view the brain as a highly distributed, integrated, and entangled set of networks that process stimuli over many neural regions. The appraisal terms did not correspond to clearly identifiable regions or networks, a fact that has now become recognized about many psychological concepts.

It was about at this time that I began learning about Peircean sign theory. Semiotics is the study of signs, broadly icons (signs indicating identity or similarity with things in the world, indexes (signs indicating relation of association with things in the world) and

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symbols (signs that did not necessarily refer to physical/material entities in the world, but which could derive their meanings from their relationships with other words).

It became apparent that the human world was filled with symbolic words for concepts that did not necessarily refer to material things, for example, plea, realm, regret, courage, disavowal, agency, vacancy, aggravation, syndrome, eminence, snobbery, phobia, psychiatry, formalism, kindness, friendship, emotion, motivation, sin, beauty. It also appeared that there were degrees and kinds of physicality.

But it was “motivation” that most interested me. One could not point to this concept. One couldn't touch it. It took many different forms, each requiring a definition using related words. But the definitions were not always transparent; they were often vague, ambiguous, and new kinds of "motivation" were frequently proposed. They were nowhere and everywhere, and they were very unlike the entities studied in physics, chemistry, and biology.

Language is a vehicle for symbolic reference, and we might define a symbol a sign that gets its meaning through its relation to other signs. Whereas icons and indexes can accrue meaning by reference to entities in physical world, words that reference concepts that are not exclusively physical (words such as mind, soul, emotion, motivation, purpose). These concepts require associations with other words, to convey their meaning, and such words may be particularly difficult to define.

In physics, a physical entity is something that has mass, energy, observability, and causal effects on the world. MASS is a measure of the amount of matter in an object, usually measured in grams or kilograms (definition of mass, Mass-Chemistry Dictionary- Chemicol). There are two basic forms of ENERGY: kinetic and potential. Other types of energy are thermal, radiant, chemical, nuclear, electrical, sound, elastic, and gravitational. OBSERVABLE entities are those whose properties can be directly detected by the senses or inferred from the existence of other physical entities.

The concepts listed above lack mass, energy, and observability, but these concepts/ideas can have causal effects on the physical world. Nevertheless, we have to realize that these less-than-fully-physical concepts have a material basis in human biology. At some point in evolution, the human brain, became capable of producing and processing symbolic concepts which lack three of the four characteristics of physicality: mass, energy, and observability. These properties might be considered what Deacon 2012, 2013) calls ententional concepts or absentials that have influence on the world BECAUSE they are not present, BECAUSE they are lacking. The absence

of mass, energy, and observability, nevertheless leave these concepts with causal properties.

For the human brain to create, use, and understand these concepts, they are often physicalized, by which I mean they are understood by association with physical entities. Evans (2015), following George Lakoff, discusses this in terms of conceptual metaphors that humans derive by way of our embodied experience in the physical world. For example, the "love" concept can be understood via metaphors such as the physical container metaphor (He is in love. Mary fell out of love), the physical force metaphor (She couldn't resist his love. She refused his love.), the physical journey metaphor (We are at a crossroads. We're stuck in a rut. The relationship is on the rocks).

Frequently, in the literature, what I am calling not-exclusively physical concepts are referred to as abstract concepts. However, the term "abstract" hides the physical/material issues that are involved in such terms. Lakoff (2014) argues, "the division between concrete and abstract thought is based on what can be observed from the outside. Physical entities, properties, and activities are "concrete". "What is not visible is called "abstract:" emotions, purposes, ideas, and understandings of other nonphysical things (freedom, time, social

organization, systems of thought, and so on). From the perspective of the brain, each of these abstractions are (sic) physical, because all thought and understanding is physical, carried out by the neural circuitry. That puts 'concrete' and 'abstract' ideas on the same basis in the brain" (p. 7).

In the above, the only physical property that Lakoff identifies as lacking is observability. I would argue that what is also lacking are mass and energy. And the brain attempts to compensate for the absence of certain physical properties by associating the non-exclusively physical concepts with physical entities. Thus, a non-exclusively physical concept can be associated, to a greater or lesser extent, with something physical. For example, the concept Santa Claus is highly physicalized (as an elderly man with a big white beard, a red snowsuit, a sleigh, 12 reindeer who delivers gifts around the world). Other concepts are only minimally physicalized. The Holy Spirit is referred to as the third person of the Trinity, but "person" here does not mean that spirit has become physical; it has merely been redescribed or restructured using a mental concept that is metaphorically derived from the physical world. It would appear that language is required for this physicalization. By virtue of processing by the human brain, which is integrated with the symbolic system, language, a less than fully physical abstract entity



becomes understood through the physical associations (love becomes a container, a journey, and a force). Or a physical entity becomes abstract as less-than-fully-physical entity. Many mental states which we experience physically get classified under a superordinate abstract word, for example, fear, happiness, depression, love, jealousy, envy, and longing, and passion are collectively labeled emotions. And different concepts get different degrees of physicalization (as we see with the concepts Santa Claus and the Holy Spirit).

What should this type of physicality be called. What label would distinguish it from common scientific notion of "physical"? Some suggestions have been minimally physical, allophysical, quasi physical, semiotically physical, partially immaterial, not-exclusively physical, not-fully physical, and symbolically physical.

I would suggest, at least for the moment, that we refer to such words as "symbolically physical" and to the concept as "symbolic-physicality" or "not-exclusively physical". Some have suggested that everything including symbolically physical concepts has its origin in the physical domain and therefore everything is physical. The social sciences, the humanities, and the arts all deal with symbolically physical entities, but they do so through physical mediation. This dependence on the

physical world for the emergence and maintenance of the symbolically physical entities is parallel to life being dependent physical entities (non-life) for its existence and maintenance.

If we consider the symbolic concept, "truth," we see that it lacks mass, energy, and observability. This is also true of the concepts, motivation and emotion, democracy, kindness etc. One might argue that "kindness", is observable, and indeed one might observe behaviors that one could, through interpretation or imputation, consider "kindness", but an interpretation or imputation is not the concept. It is merely a classification of a token of the concept kindness.

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For example, I may observe and then interpret a behavior as an index of fear, but that behavior is not fear. Fear is a symbolic concept that when experienced is accompanied by some activity in the subject's nervous system that may be perceived by other witnesses. Both the subject and the observers must make an interpretation or an imputation of that behavior. They may call it "fear", or they may refer to it by one or more of the other labels/names for types of fear (e.g., agitation, dismay, distress, anxiety, worry, alarm, panic).

Emotions are symbolic concepts that require an interpretation or imputation by the subject of the emotion and/or by an observer of the subject's behavior. Emotions don't exist independently in the world. They require some activity in the subject's nervous system and a label for that activity by the subject or an observer. The brain or body activity is not the emotion. It might be argued that this neural activity is the energy component in fear. But what kind of energy is it? Could we call it nervous energy or brain-based energy or body-based energy? If so, we would be ascribing to fear a source of energy that does not seem to be a type of energy that is considered a property in physics.

Deacon explains that words can influence people's thinking and behavior, but "it's not because of anything physically or energetically there in words. It's actually about stuff that's not there. What will have an influence in the world is the meaning, the significance, the surprise value; all of these features that come with our talk, our words, our concepts, our thoughts (14)." "I also don't think that thoughts are in the head. I think that neural activity is in the head, but I don't think that thoughts are, in a sense there is some stuff or energy there. It's like words on a page; the words on a page are not what matters, the words on the page *convey* [my emphasis] will what matter" (14). He continues, "what matters is not something physical, chemical,

energetic. What's so surprising is that, despite the fact that these kinds of things don't have the physical characteristics that should, according to our current theories, cause things to happen – they don't have those attributes – nevertheless they're remarkably powerful and important, once you get to living and mental processes in the world" (Campbell, 2020, 14)

Deacon has explored phenomena that he refers to as "absentals". These are entities which are not present, but which have causal effects as constraints. Could we argue that the absence of mass, energy, and observability in symbolic concepts constitutes the lifting of three constraints that allow the operation of the single property, "causal effects"? Somehow the human mind became capable of conceiving of, producing, and processing symbolic concepts that can have causal effects without having mass, energy, or observability. One might argue that this came about through language, but one may also argue that language only became possible with the advent of symbolic reference which can be free from the physical properties of mass, energy, and observability. Those constraints became absent, thus freeing humans to go beyond iconic and indexical communication. With symbolic reference, they could communicate about entities that did not have a

presence in the material world (i.e., that were absent in the material world but were present in the symbolosphere (Schumann, 2019).

Symbolic concepts then lack three of the four essential properties of physicality, and they do not necessarily refer to material things in the world, but instead they can accrue meaning by their relation to other symbolic concepts (words). Such concepts are special and deserve special attention. They are only minimally linked to the physical world, retaining only the capacity for producing causal effects, and at the same time they free us from some of the constraints imposed by full physicality. But they are also problematic because they are often vague, ambiguous, difficult to define categorically, and they are open to multiple interpretations. Nevertheless, they allow us to talk about absent things, future events, unreal things, nonexistent things, and untrue things.

In this regard, Favereau, (2015, 253) notes "the 'ground' of symbolic reference in a sense depends on such symbols never unilaterally resolving into a single, fixed, intellectual entity or concept." They "will, by design, always be the kind of ongoing and

‘open’ questions that each new generation of symbol users will have to re-articulate and re-negotiate in real time."

"For with symbols, we never do converge on a single referent and this is because symbol grounds and referents are multi-dimensional as part of their very meaning (such as "justice" and "opposite") such that to attempt to reduce them to a ‘single’ referent would be to rob them of precisely what gives them their uniquely distributed and generative power... What we need is good enough orientation to get us at least in the ballpark when speaking with others about such multidimensional and physically referentless terms as ‘justice’ ‘friendship’ etc." (253).

Thus, it seems that symbolically physical concepts are eternally linked to the physical world. But then we have to ask whether such concepts can be completely understood by reducing them to their physical components (e.g., neuronal activity in the brain). Some people have argued that if something is processed by the human brain, that entity becomes physical. But the physical brain is promiscuous, it will process any sensation/perception it encounters. The meaning expressed by symbolically physical

words is not the corresponding activity in the brain. Neural activity and its physical manifestation in a signed, spoken, or written word is merely a representation of the word the meaning of which has been assigned to it by human symbolic reference. The meaning has to be inferred by another human being who has the relevant cultural experience. Thus, in some sense, the meaning is in the culture. If I speak the word “poshlust’,” one will not understand its meaning if they are not familiar with the relevant aspects of Russian language and culture. By the same token, Russian speakers will not be able to interpret the meaning of the word, “mediocrity,” if they are not familiar with the relevant aspects of English language and culture. Indeed, native English speakers will not be able to grasp the meaning of “mediocrity” if they haven’t had the requisite experience with the English language and culture. This is because the meanings of words that refer to symbolic concepts are symbolically physical. They cannot be interpreted by physical sight or sound because these entities are not present in our physical world. For example, the meaning of the English words, motivation, democracy, hope, loyalty, or grace are unobservable. One can point to an instance of the concept (a token) if one interprets that instance as an example of the concept.

## Symbolic Reference and Science

The sciences and the scientific method emerged, developed, and have been most successful in producing understandings of the physical world. The question I have is whether science and the scientific method are adequate for understanding the symbolically-physical world. The issue seems to be that symbolic concepts require interpretation.

Essentially, they are instances of symbolic reference (Deacon, 2012, 2013; Schumann, 2019, first article in this collection). Symbolic entities get their meaning from their reference to and association with other words, not with physical things. If one wants to know the meaning of “mediocrity”, one would have to look it up in a dictionary and derive the meaning from the words in the dictionary definition. Or one would have to hear the word in different contexts to derive its meaning. Or one could ask another person to explain what it means and derive the meaning from the explainer’s words. This is very different from asking what a shovel is, and if asked, one way to respond is simply to show the inquirer some shovels or pictures of shovels and demonstrate their use.

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The meaning of symbolic concepts must be grounded in interpretation and imputation (Favareau, 2015) and multiple interpretations are possible. Witness the difficulty that members of the United States



Congress have with the symbolic concepts " impeachment, corruption, collusion, intention, obstruction, misdemeanor, and crime." If we were able to conduct an experiment in which we image the brains of Republican and Democratic Congress persons as they produce and hear the word "obstruction" in reference to the impeachment inquiry, and if we were able to observe the patterns of neural and chemical activity during the experiment, what would we learn about the concept, "obstruction"? In the first place, we may find very different patterns of activation within the Democrats' brains and also individual variation across the Republican brains. "Obstruction" would be processed by all the brains, but each brain's activation would simply constitute a physical representation for an interpretation of the symbolically physical concept. We would not learn the physical basis for a definitive, universal, true, correct, and final meaning of "obstruction". This is because the concept of "obstruction" is not physical in the way that entities with mass, energy, and observability are. The same is true of concepts such as motivation, emotion, concentration, identity, and acculturation. They are symbolically physical entities created by physical human brains. They actually become cultural entities that exist in a society, but they cannot be reduced to or thoroughly understood by observing brain activity related to them. As entities that are created by physical human brains, the cultural evolution of a concept moves the

concept farther and farther from the informativeness of its related neural activation. Of course, someday with the continued development of technology in neuroscience, we may be able to determine the precise neural basis for every instance of a person's thought and use of the concept, "obstruction". But even then, we would simply be noting the varying neural bases for individual interpretations of "obstruction". And of course, the interpretations of "obstruction" (or any other symbolically physical/non-exclusively physical concept) by individuals and cultures will change over time. The neural activation will change as the concept is reinterpreted within a culture whereas the meaning of iron, sodium, zinc, femur, left ear and other physical entities will be more stable and certainly less contentious. And when a well-designed and implemented experiment is performed on these physical entities, the results will be minimally influenced by varying interpretations.

In the preceding, we have been using the term "symbolically physical". "Symbolic" is a term that appears to be acceptable in academic discourse. But the term "nonphysical" causes problems and is especially troublesome. To claim that nonphysical concepts/objects exist smacks of dualism, and in the world of science, dualism is a term of derision. It is an insult to the physicalist status of classical physics, chemistry, and biology. From the time of Galileo, true science has been

consistently restricted to that which is observable, objective, and mathematically describable. But nonphysical (now "symbolically physical" or "not exclusively physical") concepts are unobservable and subjective. If this is the case, our symbolically physical world is outside the domain of science (Goff, 2019). If the symbolic world comes out of the physical brain, then there is an ontological continuity between the physical and the symbolically physical, but there may be an epistemic gap between the two. In other words, we may not be able to know the symbolically physical world in the same way and by the same methods that we know the physical world. Observation and experimentation may not be enough. Again, what is involved then is interpretation, imputation, and inference all of which lead to understandings but not to facts or final solutions. This places the symbolically physical aspects of humanity and the human mind in the epistemological domain of the humanities, the arts, and the social "sciences" (anthropology, sociology, psychology, linguistics, and biosemiotics at the level of symbolic reference).

The point I want to make is that when we move to the symbolic end of the Pericean sign continuum, things become different. Quasi, partial, or symbolic physicality puts us in a different world. Just as in physics, when the atom was cracked open, we entered a different world where

entities behave differently. At the symbolic end of the sign continuum we find the social sciences, the humanities, and the arts. They behave differently than do the entities in physics, chemistry, biology, technology, engineering, and mathematics. If we simply treat the physicality of the symbolic world in the same way we treat it in the inorganic and physical biological worlds, I suspect we will be missing something important about the different kinds and degrees of physicality that we deal with.

Defining concepts that are symbolically physical/ not exclusively physical.

Many concepts which refer to non-fully-physical-entities are difficult to define. Biosemiotics has certainly recognized and wrestled with this problem. The Biolinguistics Glossary Project has done extensive studies on what is meant by terms such as semiotic threshold, intentionality, agency, and umwelt. The Biosemiotics Glade has examined the terms semiosis, agency, representation, scaffolding, and recursivity. Such concepts seem to resist final definition. This, of course, is a source of lexical flexibility. It allows us to generate ideas, ideologies, idealizations, concepts, and conceptualizations that are not tied to

specific physical entities. But at the same time, it generates ambiguous reference, vagueness, and uncertainty. Nevertheless, we constantly hear that science demands clear definitions. And I would agree. Science should have clear definitive meanings for the terms it uses. That is an important constraint on science. And science often meets that constraint because, generally, the objects of its investigation are physical, fully physical. They have mass, energy, observability and causal effects. This is much less true for terms used in philosophy, law, and the social sciences.

Science and the scientific method find themselves in certain difficulties when they face the less than fully physical world produced by the human ability for symbolization. Nailing down non-observable symbolic entities is not what science was developed to do. This is because nonphysical entities do not have the same order of determinism as entities in the physical realm. Symbolic concepts are degenerate and pluripotential. Thus, symbols (words) can have synonyms whereby the same or similar meanings can be carried by different words, and a single symbol (one word) can carry several different meanings (polysemy). And in the case where the entities referred to are nonmaterial, they are unobservable because they lack a physical form.

If the object of research is physical, then the norms of the scientific method are generally appropriate. But if the entity is the product of the human ability to create concepts that are not exclusively physical, we have to ask whether the scientific method provides the right epistemology. In the study of symbolically -physical abstract concepts (e.g., emotion, motivation, identity, acculturation, sales, attitude, patients, goal, appraisal), we might ask whether normative empirical science permits the accrual of final answers. Do symbolically physical entities have the same order of determinism as the entities of physical science?

Naming is a remarkable human ability; however, the symbolic association between a thing and its name can sometimes lead to distortion, especially when dealing with semi-physical concepts. These concepts may become essentialized and reified, and the assumption may be made that what they refer to must have a physical instantiation that can be studied empirically and be understood directly, fully, and correctly.

Under this notion, concepts such as "freedom", and "love" can't have characterizations that are equally precise and scientific. If we believe that their definitions are definitive, then we merely have non-exclusive

symbolizations being forced to masquerade as independent physical realities.

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According to the Percean scholar, Walker Percy, the fact that the symbol is the object (but in another way) is to some extent mysterious and has to be accepted because it is not amenable to explanation or clarification by means of its part in the triadic relation; science and the scientific method, according to Percy, especially in experimental science, lies outside the domain of denotation, quazy identification, meaning assertion, imputation, and interpretation. Following Percy, Perkins (2011) notes, "dyadic science studies the relationships of things in the

world, but 'the coupling relation of a sentence is not like any other world relation. Yet – indeed for this very reason – it may symbolize any world relation whatever... (Percy, MB 169)'. So, sentences are used by science, but dyadic science can't get outside them or outside itself to examine them with its own other world relation. Yet – indeed for this very reason – it may symbolize any world relation whatever... (Percy, MB 169)'. So, sentences are used by science, but dyadic science can't get outside them or outside itself to examine them with its own method. It can't examine its own sentence uttering activities – it can only examine only the rest of the world" (Perkins, 116). A symbol can be anything, but Percy argues that a vocable (a word) is an ideal symbol. The vocable has to be empty, transparent, and thus lacking any biological relevance; it can't be a sign to take some action. The symbol also has to be different/distinct from the object. A symbol must be the agency in the mental (symbolically physical) world. The symbol is simply valued for the meaning it carries. This allows it to take on the essence of the object, but, of course, in a different way.

So where does this leave us with regard to defining terms that refer to concepts that are not exclusively physical? I would suggest that it might be useful to regard such terms as being potentially in the process of meaning something else, something related but not identical.



Definitions of this sort involve complex signs. They are imputations or interpretations of the word's meaning. They are imperfect tools that give us a partial sense of what the word means or what it can come to mean. Therefore, it may be impossible to find a definitive definition of such terms. However, I would argue that well thought out attempts to do so provide perspectives or points of view that may be useful in understanding the phenomenon, but perhaps only understanding it asymptotically.

Returning to motivation in second language acquisition.

The list the various types of motivation and related words on pages 15 and 16 give a sense of the symbolic word web that the term, “motivation”, occupies. It is real, but it is a symbolically physical entity that accrues meaning from its relationship with all these words and others. In many cases, words in this list can be substituted for

"motivation" because they are synonyms. They are structurally different entities that generate meanings that are similar to the meaning of "motivation".

I would argue that none of these perspectives is wrong. Each of them offers a characterization of motivation that captures some aspect of the phenomenon, but none of them are complete or final. Additionally, it may be the case that finality may never be achieved when we are dealing with symbolically physical phenomena. The natural sciences are much more grounded in physical/material world. In scientific inquiry where words unambiguously index material entities in the environment that can be verified by the senses or the senses plus some amplifying technology (e.g., the electron microscope), certainty can more easily be achieved. However, if a social scientist were to hypothesize that integrative motivation is associated with high proficiency in second language acquisition, confirmation or disconfirmation of the hypothesis would involve several levels of symbolic relationships. The first step would be to operationalize the definition of integrative motivation in a series of questions that second language learners could respond to on a Likert scale. For example,

1. Studying French can be important to me because it will allow me to be more at ease with fellow Canadians who speak French.

2. Studying French can be important to me because it will allow me to meet the converse with more varied people.

3. Studying French can be important to me because it will enable me to better understand and appreciate French Canadian art and literature.

4. Studying French can be important to me because I will be able to participate more freely in the activities of other cultural groups.

(Gardner, 1985, p. 179).

Now disagreements could enter at any level of the analysis -- from the initial definition of integrative motivation to the questionnaire probes designed to elicit information about that motivation. Such studies are unlikely to generate closure. Where they have been conducted, there have always been other researchers who would prefer to use different definitions of motivation or to examine different kinds of motivation or to examine them in different settings or to examine them with different instruments in different populations. As a result, in fact, over the past 60 years there have been literally hundreds of such studies (Al-Hoorie, 2017) and the question of motivation in second language acquisition is still not settled. Because the notion of motivation can only be interpreted by reference to other concepts, closure may never occur.

Operationalizing definitions is the social scientists' attempt to get a clear referent for the concept under investigation, but because reference of this sort can only be achieved by consensus, there is always room to disagree with the consensus and effort to establish a different one.

What does this mean for the study of motivation and SLA? It should not lead researchers to be discouraged about the nature of their efforts. On the contrary, they should just understand the nature of the symbolic world in which such research is conducted. Social sciences are largely carried out in the symbolic world where words do not have physical referents. Therefore, precision, closure and unique solutions are much more difficult to achieve. But that is simply the nature of the symbolic world in which social scientists work. It should also be noted that the exact sciences have only become exact in certain cases when they have been blessed with a technology that can produce observable physical indexes for their constructs.

If the mind indeed includes the brain, the body, the environment, action in the environment, and the symbolosphere([johnschumann.com](http://johnschumann.com)), it is important that we understand it as such. If we live in both inorganic and organic physical worlds AND in a symbolically physical/non-exclusively physical world,

and if the phenomena we are interested in are symbolic constructs which may operate differently from physical entities, then the knowledge we derive from our research may have a very different epistemological status than that derived from the sciences of the physical. It may be important to investigate the kind of knowledge that can be derived from research on symbolic entities.

It would appear then that part of human life is unexplainable by science and not fully explainable by anything else. Because of the success of the physical sciences and more particularly of the technologies that have come out of them, the term "science" has become an honorific, a carrier of prestige, an expression of deference. And if one wants one to be considered a scientist, and wants their field to be considered a science, and wants their research to be considered scientific, then considering issues of symbolic physicality may not be advisable. But in semiotic terms, science, scientist, and scientific are examples symbolic reference. The concept "science" is not observable, not material. There is no Archimedean point outside the universe that defines these terms. We can point to work we consider science, people we consider scientists, but what they do and the restrictions they may place on their domain are conventions.

Thus, science and the scientific method find themselves in certain difficulties when they face the symbolically physical/physical non-material world produced by the human ability for symbolic reference. Nailing down non-observable symbolic entities is not what science developed to do. This is because nonphysical entities do not have the same order of determinism as entities in the physical realm. Symbolic concepts can be degenerate and pluripotential. Symbols (words) can have synonyms whereby the same or similar meanings can be carried by different words, and a single symbol (one word) can carry several different meanings (polysemy). And in the case where the entities refer to our nonmaterial world, they are unobservable because they lack a physical form.

If the object of research is something physical, then the norms of the scientific method are generally appropriate. But if the entity is the product of the human ability to create symbolically physical concepts, we may have to ask whether the scientific method provides the right epistemology. In the study of symbolically physical concepts (e.g.,

emotion, motivation, identity, acculturation, self, attitude, patience, goal, appraisal, etc.), does normative empirical science permit the accrual of final conclusions? When science and the scientific method

are extended to symbolically physical entities, are we demanding too much of them? Are we asking science to do that which is only appropriate to the symbolic worlds of the arts, humanities and the "social" sciences?

## Conclusion

Let's for a moment, divide the world into four spheres: the Nanosphere (the world of subatomic physics), the Physiosphere (the world of classical physics and chemistry), the Biosphere (the world of living things) and the Symbolosphere (the world of symbolically physical/physical non-material concepts, (johnschumann.com)).

Biosemiotics can be seen to cover the biosphere and the symbolosphere. Out of the biosphere (physical life) came the symbolosphere (symbolically physical concepts). Thus, the world of symbolic reference links the physical biosphere with the symbolic concepts that are entertained in the humanities, and the arts. This is the domain of the human abilities for interpretation, imputation, implication, and imagination. With the biosphere having developed the evolutionary basis for the creation symbolically physical concepts, a link was established between the two cultures. This link provides us conceptual framework for a wissenshaft (Brier, 2014) and a semiotics for the humanities (Colby, 2014) for a curriculum that extends from

inorganic world to the organic world to the world of symbolic reference where the laws of physics do not have to apply - the worlds of fiction, fantasy, philosophy, religion, ethics, aesthetics, bullshit, alternate facts, and opinion, politics, and truthiness.

I've suggested that perhaps the tenets of science may not be totally appropriate for the study of abstract symbolically physical/physical non-material concepts. However, to suggest any limits on science is also apostasy and is not easily tolerated in physicalist circles, but the exploration of the symbolically physical world relies on and requires the human abilities for interpretation, imputation, association, and assertion. No teleology or

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ultimate resolution should be expected, but the meanings and the issues that such symbolic concepts carry do not go away. Thus, the epistemological question of whether, in its current construal, science is adequate for the study of nonmaterial symbolic concepts remains an important issue. Scientists often view of the work done in the nanosphere of subatomic physics as unscientific and the same criticism could be leveled at the work done at the other end of the continuum, the symbolosphere. But that may be simply because of the way the



physical nature of the physiosphere and biosphere have been inappropriately imposed on the nanosphere and the biosphere.

## References

Al-Hoorie, A. H. (2017). Sixty years of language motivation research: looking back and looking forward. Sage Open, doi: 10.1177/2158244017701976

Barash, D. (2019). Review of Herbert Terrence, "why chimpanzees can learn the language and only humans can." Wall Street Journal, December 13.

Brier, S. (2014). Cybersemiotics: Suggestion for a transdisciplinary framework encompassing, nature, life, social sciences as well as phenomenology and humanities. International Journal of Body, Mind, Culture. 1(1): 3-53.

Barrett, L. F. (2017). How Emotions are Made: The Secret Life of the Brain. NY: Houghton Mifflin Harcourt.

Campbell, G. (2012). Interview with Terrence Deacon, PhD, Author of Incomplete Nature: How Mind Emerged from Matter. Books and Ideas, Podcast, Episode #47, Online 07/16/2012, 1-38.

Cobly, P. (2014). What the humanities are for – A semiotic perspective. The American Journal of semiotics, Vol. 30, 3/4, 205-228.

Deacon, T. W. (1997). The symbolic species. NY: W. W. Norton.

Deacon, T. W. (2012, 2013). Incomplete nature: How mind emerged from matter. NY: W. W. Norton.

Evans, V. (2015). The crucible of language: how language in mind create meaning. Cambridge Cambridge University Press.

Favareau, D. (2015). Symbols are Grounded not in Things, but in Scaffolded Relations and their Semiotic Constraints (Or How the Referential Generality of Symbol Scaffolding Grows Minds), Biosemiotics, 8 (2), 235-255.

Gardner, R. C. (1985) Social psychology and second language learning: The role of attitudes and motivation. London: Edward Arnold.

Goff, P. (2019). *Galileo's Error: Foundations for a New Science of Consciousness*. New York: Pantheon.

Hutchinson, B. J. & Barrett, L. F. (2019) *The Power of Predictions: An Emerging Paradigm for Psychological Research*. *Current Directions in Psychological Science*. Vol 23 (3), 280-291.

Lakoff, G. (2014). Mapping the brain's metaphor circuitry: Metaphorical thought in everyday reason. *Frontiers in Human Neuroscience*, 8:958. Published online 2014 Dec 16 doi 10.3380 fn hum. 00958.

Peirce, C.S. (1992). *The Essential Peirce: Selected philosophical writings*, Vol.1, N. Hauser & C. Kloesel, Bloomington: Indiana University Press.

Scherer, K. R. Emotion as a multi-component process: A model and some cross-cultural data. In P. Shaver (Ed.), *Review of Personality and Social Psychology: Vol. 5.*, 89-126, Emotions, Relationships and Health. Beverly Hills, CA: Sage.

Sherman, J. (2017) *Neither Ghost nor Machine*. NY: Columbia University Press.

Schumann, J. H. (2019). *The symbolosphere and nonphysical aspects of mind*. (johnschumann.com) This is a set of essays/discussions on

physicality in symbolic reference, the symbolosphere, and science. It is available at <https://johnschumann.com>