

The 'Explanatory Gap'

The term '*Explanatory Gap*' is a modern philosophical term which is well described by John Horgan in his 1999 book ["The Undiscovered Mind"](#): Quote: The term (explanatory gap) was coined by Joseph Levine, a philosopher at North Carolina State University in "Materialism and Qualia: The Explanatory Gap" published in *Pacific Philosophical Quarterly* in 1983. **'Levine addressed the puzzling inability of physiological theories to account for psychological phenomena. Levine's main focus was on consciousness, or "qualia," our subjective sensations of the world. But the explanatory gap could also refer to mental functions such as perception, memory, reasoning, and emotion—and to human behavior.'**

Within this broad context of describing consciousness (*from basic emotional sensimotor feelings, psychological feelings, e.g. remorse, guilt, embarrassment, intolerance etc. extending to sophisticated abstract thoughts*) that the following pages refer to the term "explanatory gap" and to the subjective qualities (qualia) of human private and public thoughts and related behaviors.

The term 'explanatory gap' infers that there is a gap of coherent meaningful information describing and accounting for qualities and characteristics of *consciousness content*, processes, and states that is explainable to a logical level of understanding. In other words, it is within human concept.

Human consciousness/mind (*individual mental identity, intentions etc.*) and the brain's neural network with its related nervous system *appear to be interdependent and interactive* processes and states that to this day are virtually unexplored and unexplained as to their relationships, functions and processes, creating a gap of misunderstanding and verification. This is often referred to as the mind-body dichotomy (or problem).

If, and how physical neuronal biochemical substances and processes create coherent informational processes that become emergent conscious experiences, mental characteristics, intentions, beliefs. etc. and how, in reverse direction, conscious informational processes, states and volitions (*beliefs, intentions, desires, placebo response, fear, guilt, mental stress etc*), affect the biochemical substance of the physical body is not fully understood. Information, although not always seemingly meaningful, appears to be causal.

The correlations of biochemical brain substance (substrate) activity verifies mental functions but does not explain the emergence or reason for qualities of conscious experience. It is highly doubtful that the experience of seeing a beautiful sunset, the creation of a mathematical algorithm, the sensation of a particular quality of feeling etc, are a specific biochemical or electrochemical formula that can be replicated in a petri dish. This gives rise to many questions as to the 'how', or if, thoughts and *psychological feelings* are separately abstract or merely caused physical effects or even illusions of brain functions.

Mathematics remains a natural human cognitive principle (rule) to comprehend and partially bridge the 'explanatory gap'.

"What is the metaphysical status of numbers and other entities in which mathematics deals? Is there a mathematical realm set apart from the realm of nature, as some great thinkers, including

relatively recently the great mathematician Kurt Gödel, have believed?" —David M. Armstrong
Source: *Pufendorf Lecture 2004*

"Mathematical entities are part of the fabric of reality because they are complex and autonomous. The sort of reality they form is in some ways like the realm of abstractions envisaged by Plato or Penrose although they are by definition intangible, they exist objectively and have properties that are independent of the laws of physics." --Source: David Deutsch, *The Fabric of Reality*

Just as the physical universe (*macro and micro*) is an [instantiation](#) (quantitative instances) of mathematics, counter-intuitively, the abstract complex subjective qualitative universe of human *consciousness content* is an instantiation (qualitative instances) of mathematics and the extended representational characters and symbols that manifest as language. Mathematics is a tool or principle used to describe and predict the appearance of the physical universe but seemingly ignored when applied to subjective, language described, non-physical mental qualities. Intelligence is exemplified by cognitive capacity of natural incremental information sequence (static and dynamic) as in number order which gives primitive intrinsic relational and functional meaning. Categorized and classified human attributes of consciousness content in their natural order give meaning to the qualitative characteristics of that numerical position.

Patterns and sequences of symbols that comprise numerical order and language, are in turn, instantiations of abstract universal mathematics (***grounded universal relational meaningful order***) and are inextricably linked to the qualitative expressions of human consciousness by way of the intelligent natural order of nonphysical discrete categories (*natural categorical boundaries*) of similar mind dependent characteristics and qualities (*including qualities of the continuum of time*). Numerical symbols, with their relational functions, as in the basic entities of numbers, appear to be explicitly correlated to categorical qualitative mental attributes and properties. Human pattern and sequence recognition along with the innate capacity to self organize and manipulate the members of the sequence to create order (or randomness) are the basis of the cognition of categories and relations.

What can, at best, be referred to as abstract "forces of human intelligence" are aspects of information that take the form of intentional mental characteristics (causal qualities) ultimately causing human mental and physical behavioral phenomena. Individual human embodied minds are instantiations of human constructed languages, which influence the quality of desires, beliefs, attitudes, and expressions of the individual human 'self' consciousness (*experience, awareness etc.*).

Similarly DNA and RNA sequences are biochemical physical instantiations of mathematics and symbols (quantitative instances) that define biophysical characteristics (*Including basic instinctive sensory and motor activity*). The number of genes found in the human genetic code appears to not account for the vast complexity of human mind / consciousness. (humans have less than [21,000 genes](#), the fruit fly has more than 14,000 genes, the round worm more than 19,000)

What appear to be analog qualities of human characteristics are categorically subliminal discrete individuated intensional mental qualities. An analogy: Hearing (ears) is (are) generally thought to be analog; sound waves appear to be interpreted discretely (by the ear's cochlea hair cells).

The fundamental characteristics that express through human embodied consciousness in the form of both individual private and public thoughts are natural instantiate discrete categorical qualitative sets (*natural kinds*). These categorical universal qualitative primary innate essences (*categorical perceptions*) of desires, attitudes, and expressions (characteristics and qualities beyond the sensory) are instantiations of irreducible mathematics, pre-formal language, and language ordered symbols which represent the combinatorial part of consciousness content that is the personal identity or profile referred to as individual mind. They are irreducible universal pre-mathematical relational qualities expressed in varying intensity.

Universals inducted as combinatorial qualities as individuated conscious minds (*feelings, experience, intentions, desires, attitudes, capacity to understand, expressed behaviors etc.*) are explicit mental qualities and characteristics interacting with physical bodies (*brains, nervous system*). The universals translate into particulars of individuals through the identification of the instance of personhood (having distinctive characteristics and social relationships) through manipulating symbols of language with explicit rules (syntax of proper names).

"Traditionally, one of the major arguments for universals has been a semantic one. It has been noted that only a small number of terms in a natural language, can be construed as referring to particular individuals which can be placed and dated. *Proper names*, demonstratives, pronouns, and definite descriptions plausibly refer to individuals." Source: Science & Necessity---Bigelow / Pargetter. *Proper nouns...name. Pronouns name without identifying. Referent proper names (rigid designators) assigned to the physical and mental referent personality (explicit designatee)* by other human conscious entities attaches meaningful non-reducible numerically classified qualitative characteristics (relational numbers being a property of sets) to that particular concrete biophysical individual.

These environmental assigned and individually accepted rigid designators (proper names) convey the encoded qualities of the forces of intelligence (*abstract properties*) that influence the mental phenomena referred to and cognitively recognized by that particular individual human *entity*. The qualities of sophisticated human consciousness manipulated with the vehicles of *universal sequential order* as used in language symbols have, over time, a subtly but obvious effect on the expression of the characteristics of *consciousness content* of individual minds. Just as the keys struck on a piano create harmony or discord, assigned referent proper names (*explicit rigid designators*) will have unintended consequences of discord or harmony as to the relational qualities influencing the desires, expressions etc. of the referent individual. *Seemingly meaningless non-descriptive proper names convey intrinsic intentional meaning.* Beyond immediate sensory and motor activity, the fundamental 'forces of intelligence', over time, mold and influence mental identity, locus of desires and mental perception, and qualitative (*im*)balance (relational equivalents) and (*dis*)harmony may be knowingly or unknowingly created or manipulated.

Equilibrium, harmony, natural order, and apparent discord, chaos and randomness are all instantiations of mathematics; and universal basic abstract phenomenal mathematics (*representing obscured but grounded intrinsic universal relational meaningful order*) is the pathway to bridging the gap leading to an objective understanding of that part of human *qualitative consciousness content* defined as individualized mind.

"*The harder part is to take advantage of this bridge*, showing that the physical properties that a computational description fixes are the properties in virtue of which minds arise. It is not

implausible that minds arise in virtue of causal organization, but neither is it obvious. It is also plausible but not obvious that the discrete combinatorial state automaton framework can capture the precise causal organization (perhaps continuous, perhaps even non-computable) on which mentality depends."

--David Chalmers, 1996, Does a Rock Implement Every Finite-State Automaton?

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