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# Three Deadly Venoms: Phenomenology, Existentialism, and Philosophical Constructs to Expand Engineering Education Research Methodologies and Philosophy

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# AC 2011-2104: THREE DEADLY VENOMS: PHENOMENOLOGY, EXISTENTIALISM, AND PHILOSOPHICAL CONSTRUCTS TO EXPAND ENGINEERING EDUCATION RESEARCH METHODOLOGIES AND PHILOSOPHY

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Introduction

Outsiders to the engineering community are unaware of the debate within engineering as to the definition of an engineer. More specifically, the challenge of outlining what an engineer is or of what an engineer consists, may seem like long settled business. Those of us within engineering can rest assured that the debate is alive and well, with the beginning throes of a true, unique engineering philosophy only recently being pondered in the Western world. This work seeks not to elaborate upon the current or historic papers within engineering philosophy, but aims to outline core developments in the world of phenomenology and existentialism primarily inspired by Dall'Alba's recent invocations of Heidegger's works.[1,2] Surely, others in the field have used philosophical terms relating to existentialism, phenomenology, and ontology, some with commercial success;[3] however, core concepts from the philosophers that some within engineering education quote with liberty are missing from critical discourse. Furthermore, while various individuals have laid out concepts in philosophy as they apply to engineers or called for a philosophy of engineering,[4-9] the question of *how we prepare engineers to think philosophically* is an open subject. The more important question of *how we prepare engineers to change the field of professional engineering using philosophical constructs* is even more daunting. In order to better prepare the engineering education community to address those questions, an ongoing dialogue on different philosophical constructs is needed.

This paper aims at taking a few angles of approach to the question of the engineer's perception of his/her *place* in the field of engineering and how a different, philosophical viewpoint can aid engineering education research. Why is this a *problem* that merits significant study? Engineering has been assaulted from all sides by the demands of industry, academic rewiring and strife, professional requirements, and all along has had the requirement of producing students![10-14] The formation of myriad of professional societies in recent years, coupled with new projects such as the *Engineer of 2020* and the *EC2000* have left many in the field unsure if the knowledge required to be an engineer can even be properly taught and evaluated.[15-17] Surely, any ideology that furthers our understanding of the *individual* in relationship to engineering and provides researchers new concepts to test in the field would be welcome.

There are gaping holes in our philosophical understanding of engineering and places where engineering falls short of its fellow disciplines. While history of science has dissembled the natural sciences for hundreds of years, engineering philosophy in the Western tradition is practically a new endeavor. [7,18] With the progression of an engineering philosophy, a more grounded understanding of what engineers *do* and what they *are* should emerge; however, that is not a well traversed topic. The relative lack of an engineering history of science or an engineering philosophy is evident by a dearth of core, theoretical descriptions of the engineering field. While there are treatises that eloquently describe the foundation of design,[19] there is a complete lack of philosophical or social psychological theories of engineering that link foundational constructs in modern philosophy to engineering practice and development.

First, a brief primer on the history of some Western philosophy related to existentialism is needed to explain some core concepts. I will elaborate upon the foundational work of Husserl by succinctly using his own descriptors of modern philosophical history. Second, I shall use Heidegger's work to expand upon the construct of Dasein, and introduce new concepts for the community from a general, education standpoint through a more research oriented, engineering education viewpoint. Third, I will discuss how Dasein applies to engineers or the development of engineers. Throughout this brief work I will periodically reference existential, phenomenological, and ethnomethodological principles; the reader should note that although all three academic traditions share common roots, the first two traditions hail from philosophy, whereas the third tradition is more sociological in nature.

Husserl's History of Philosophy and Important Concepts

Husserl's Die Krisis der Europaischen Wissenschaften und die Tranzendentale Phanomenologie (otherwise known as Phenomenology and the Crisis of Philosophy) is perhaps the seminal work left unread by engineers dabbling in phenomenology and existentialism.[20] As with some great works, the actual writings of Husserl on philosophy are as revealing as how he outlines previous philosophies to differentiate himself. Husserl argues that there are four important revolutions in history of *thought*: Socratic/Platonic arguments based on *logos* and its subsequent development into scientific thought; the *Cartesian* revolution; the *transcendental* revolution of Kant, whereby the only source of necessity is *subjectivity* and thus follows knowledge; and finally, the *phenomenological* revolution, which incorporates the *form* of and *content* of acts of knowing into a *subjective* framework.

Descartes, according to Husserl's history, believes that humans use *method* in order to overcome a tendency to accept naive uncertainties.[21] Here the *method* in the Cartesian sense admits that the *subjective* paints our experiences and reasoning. Descartes's role in an engineering education paradigm is indispensable since he helped further the concept of *parsimony* in Western thought. Parsimony is not, as many would believe, the version of Occam's Razor heard on science fiction movies. Parsimony is the reason that engineers (and scientists) write "F=ma" instead of "F=ma+other terms" under most conditions. Not only does parsimony dictate that scientific laws must be as concise as needed to address a physical problem, but they must be expandable to accommodate new situations not yet conceived, (a principle sometimes called *higher causality*.

Kant's role in phenomenology in Husserl's paradigm is that of the straw man. Husserl reflects upon Kant throughout Husserl's works.[20-24] Husserl is concerned with the incorporation of what is *now* thought of as *dialectic* reasoning into a discussion of objective validity and complete justification.[25] Whereas Kant considered the metaphysical urges of the human brain to be inseparable from human thinking, thus defining one of the core aspects of his *transcendentalism*. *Dialectic* reasoning or logic can be summarized thusly; that no thoughts of man are born into the world through purely objective pathways. Human beings, having

*constructed* language, works of art, and scientific principles, all did so by making subjective choices along the way and while a concept may be deemed purely *objective*, the individual human being must choose freely to deem it so. To many engineers, an explanation of *dialectic reasoning* can make them shudder. I am often asked as a researcher how *any* thought cannot be purely objective, to which I often reply with a question, "Is that your opinion or is that thought an empirically verifiable fact in and of itself?"

Husserl then expands upon another core difference between classic philosophy and more modern works. Existentialists and phenomenologists have always had a different view of *ontology* than classic philosophers. Nietzsche, for instance, challenged Plato's and subsequent philosophers' ideas of the temporal nature of *being*, that is to say, that *being* and *becoming* are engaged in a struggle within classic philosophy and the *being* part wins. That which is *being*, akin to the *Dæmons* of Socrates, is transcendental and outside of lived experience, and Nietzsche believes that classic philosophy involves itself mostly with the psychosis of humans to grapple the ideas that traditional philosophy has set up for him/her.

Dasein – What is It, What It is Like, Why It is Important, and Why You Should Care

A Primer on Existentialism and Education

Existentialism as a philosophical construct has three branches that need to be understood in order to be used within engineering education: first, the relationship of existentialism to education in general; second, the relationship of existential philosophies to other disciplines; and third, how existentialism can be used in engineering education research methodologies.

The educational enterprise through the lens of existentialism is a series of crises involving the individual.[26] The core of existential thought is that the *individual* determines his or her course of action. Even when faced with insurmountable odds from the point of view of an outside observer, every human being chooses his decisions. Thus, any educational system that would seek to be existential would endeavor to accommodate the development of the individual. Another reason why existentialism is highly applicable to education as a whole is its focus on the paradox between conflicting interests. Such a conflict is contained within the struggle between the needs of the university and the needs of the individual. In fact, the *paradox* construct within existentialism has its philosophical origins from before Descartes and is even a part of most treatises on parsimonious logic.

The existentialist academic tradition is related to multiple institutions within the academy, and understanding this will aid the engineering education researcher in using existential concepts. While many groups disciplines have interacted with, had friction with, or adopted core tenants of existential philosophy, there are two relationships of significant note: first, the relationship to what in psychology is referred to as the *Third Viennese School of Psychotherapy*; and second, the contrast between existentialism and early behavorialist theorists.

Outside of some social psychological theories, the *Third Viennese School of Psychotherapy* may best compliment the core tenants of existentialism. One of the most famous individuals of the *Third* school is Viktor Frankl, and his seminal work is on *logotherapy*, (literally meaning "meaning therapy").[27] Viktor Frankl survived incarceration in a Nazi death camp and used his experiences as a psychotherapist to pen a book about the power of *meaning* in individual determinism. His work's main premise is that each individual must find meaning in order to survive and thrive. For instance, the search for *happiness*, in logotherapy, is considered a psychosis, as true happiness stems from a life revolving around meaning. If society wants to maximize the number of highly functional and happy individuals, then it would behoove it to maximize the potential for individuals to explore activities that bring meaning to their lives.

Early behavorialism, such as the works of Vygotsky,[28] has analogous and antithetical approaches to the world when compared to existentialism. For instance, while Vygotsky would say that, contrary to developmentalists, that the way human beings acquire knowledge is not on a fixed, temporal path, he would not go so far as to say that the needs of society are overruled by the needs of the individual or even in continuous conflict. Vygotsky's observations stemmed from cultural change in Russia during his lifetime. He noticed change in what would then be called the *developmental* learning pathways of individuals based on grand scale societal changes. Thus, the societal impetus was responsible for changing lifelong learning habits and the minds of individuals.

In the engineering education community, many efforts are spent on developing *phenomenographical* approaches to problems, but almost none are spent on *phenomenological* or *existential* approaches to problems. The issue at hand may be two-fold: first, phenomenography as a research paradigm has permeated design and other research disciplines within engineering education in recent years;[29,30] second, phenomenography lends itself to a study of internally related categories between individuals of study, whereas phenomenology may not at all; and third, while phenomenography tends to focus on the variation in an experience among a group of people, phenomenology aims for a vigorous description of the experiential impetus itself. It can be conjectured why phenomenography is an easier choice for coding-intensive methods of interpretation, as while it is time consuming, its primary focus is the internally related categories that develop naturally in response to some outside force. A phenomenological or existential interviewer, for instance, may completely forgo the study of internally related sets between human beings and use interviews to build a holistic description of a phenomenon. Such a methodology may involve never comparing two human beings' lived experiences to each other due to issues of incommensurability between the two's experiences with the phenomenon.

There are two types of analysis methods at play here. The analysis can be existential or *indirect*, where the phenomenon at hand is described through the construction of *Dasein* (described later here) and the dissolution of the divide between objective and subjective when analyzing an individual's actions. Also, there can be a phenomenological or *direct* research methodology, involving a stronger focus on the individuals' natural reaction to a situation and

especially with reference to *subjective* thoughts or actions. The net contention of both methods here is to describe the situation of the world at hand through either human *knowing* (direct) or *being* (indirect).

As an example, a type of research that would benefit greatly from an indirect or existential analysis is teaming research in engineering education and beyond. For instance, many works on team formation attempt to measure individual team member's potential for successful team integration.[31-32] The underlying assumption behind such teaming research is that there are metrics that can be tested on individuals and then validated for effective prediction of team outcomes. The outcome or endpoint in all of these cases is team performance. What an existential approach would undertake is an analysis of the teaming construct itself, regardless of shared teaming experiences or testing scores. Each team member may have a completely different experience in relationship to the concept of the *team*, one which would shape his/her view of the world around him while in class. The outcome in such a methodology may be a more robust picture of what teaming is in an abstract sense or what being a certain type of team member means in response to certain teaming situations.

The Complexity of Dasein Unfolding

The battles over where epistemic authority lies, or what common ground engineers must possess to interact and bring forth ideas into the world, or whether or not the artificial is purely derived from the mind of the engineer, all speak directly to the concepts of Dasein, freedom, intentionality, and nothingness in existentialism and phenomenology. Dasein, literally meaning "there being" or "existence" from German, stems from Heidegger.[33] Dasein refers to the human being as human-in-being at the nexus of the human as object and as subject; radically different from the concept of the human being as subject, such as in the classic, ontological sense described by Husserl. Although Heidegger has written extensively on the concept of freedom, for more modern existentialists, the concept of freedom implies the human-in-situation. The situation can be within a previous experience, death, (as so often expanded upon by existentialists,) other creatures, etc. Intentionality in the core sense, from Husserl, defines consciousness when directed at, being about, or being of a thing or object. Nothingness does not imply a void. Nothingness contains that which the human-in-being conjures that does not exist, such as creativity and anxiety. [34]

The engineering educator wishing to use Dasein in his or her work must first understand that it lends itself to a more existential manner of research, although direct (or phenomenological) researchers make liberal use of it. The concept of Dasein implies the researcher must abandon any divide between analyzing the objectivity and subjectivity of an individual, which is the point of invoking the construct in the first place! The *meaning* individuals create when reacting to a situation is paramount and all individuals are ultimately free to choose their own pathway, as opposed to the situation determining the individual's choice.

When I teach Martin Heidegger to my friends and fellow engineers, I always start off with the statement, "Martin Heidegger is a lot like Bill Clinton, he wants to know what *is* is." More importantly, he is fundamentally concerned with igniting a new fire about the work of Rene Descartes and what he feels are some unaddressed problems with classic and modern philosophy. One of his claims to fame is that he tackles "*je pense, donc je suis,*" in a way that radically separated him from his peers. Another important construct within Heidegger's work that does not appear within engineering education literature is of "meaningfulness," and leads directly to the construct of *Dasein*.

Defining Engineering from an Existential Point of View

As all concepts committed to paper eventually hold names or phrases, and for the purpose of example, engineering shall be defined as *How the self negotiates that which is <u>unobjective into corporeal form</u>. How the self negotiates* determines the role of engineering begins with Dasein and the Dasein acting in the boundary between various object worlds. In the case of Bucciarelli, the human-in-being, or Dasein, acts as engineer traversing object worlds.[5] The assumptions made by the engineer, the way the engineer thinks, the holistic nature of the objects created by the engineer, and the object world and its language, all form the Dasein's role as engineer. The aforementioned qualities of the Dasein as engineer all encompass the definition of nothingness; thus, the qualities of the ideal engineer start with the individual.

As an example, the construct of Dasein can be expanded to fit engineering design research. If one expands upon the modern engineering concept of the artifact as interface, [35] one can synthesize into multiple existential realms. When the artifact becomes interface, this process brings forth a new tool for probing, or negotiating, object worlds. Dasein as engineer, having created the artifact, the quintessential object, and thusly redefining it as interface, a placeholder that arises out of nothingness, has now shown that the intent of his consciousness can be refocused towards what appears to be a non-object. In order to rectify this conundrum existentially, both Simon in his treatment of the artifact as interface and Bucciarelli's object worlds make the ultimate case that the concept of the artifact and the object world is firmly rooted in *that which is.* To Simon, while the reintroduction of a boundary between inner and outer environment can be arbitrary, the intent of the consciousness acting upon the system draws an imaginary line upon the incarnate, or an object. Bucciarelli appeals to the physicality and commonality of which the object world is based throughout his treatise to make explicit the requirement that the engineer does not act upon the realm of mind. The corporeal and knowable world is what Dasein as engineer is surrounded by, what Dasein as engineer acts upon, is subjected to, and what ultimately Dasein as engineer must share in common with other engineers for his consciousness to act upon the object world when multiple object worlds are involved.

Summarizing Heidegger's concepts, it is crucial to note that the following constructs relate directly to engineering philosophy fundamentals: the human being at the nexus of object and subject; that human being's (or amalgamation's) negotiation of the *world*; the human being

experience; and the limits of *being* experienced through constructs such as *negation* and *death*. Ultimately, meaning *presents* itself to humans and is neither created nor destroyed by humans. That holds since *being* and *what beings are* are intertwined throughout the question of *existence*. Finally, the disclosure of *being* is <u>not an objective event</u>. Meaning is *unfolded* (or *disclosed* or *presented)* through a neo-classic interpretation of *moods* and *involvement*. Thus, Heidegger's work resounds well with the evolution of being/meaning expounded upon by Husserl's summary of modern versus classic philosophy.

How to Expand this Construct Further

A few, other concepts need to be outlined: treatment of the self from Karl Jaspers; and the strict notion of identity from Sonnemann. Jaspers' work as outlined by Schrag[36] presents a divide akin to Sartre's *Being* and *Nothingness* or as Schrag and others have put it, *immanence* and *transcendence* (Figure 1). Immanence describes the realm of *empirical* existence. The human being who navigates the world *as is* participates in immanence. The immanent that lies beyond the grasp of the human being's immediate proximity but can possibly be accessed by him or her is the world. When human beings project their perceptions of the immanent, they in turn create the transcendent. Unlike Sartre, Jaspers believes that the self projects into the transcendent via thought, and products of the transcendent, like *existenz*, cannot be treated as objects in the empirical realm. Concerning the treatment of identity, Jaspers clearly believes that perception of the unconditional self projected unto the self occupies *existenz*, whereas the empirical existence that one truly embodies is fundamentally conditional. In the treatment of identity outlined here, the empirical existence of self is basis of identity, whereas the expansion of that identity into the unconditional realm is that which remains to be *perceived* by the self concerning identity.

Sonnemann comes into play here with his treatment of identity.[37] Identity in the work of Sonnemann is not divided into understander and understandee, but involves an individual's understanding of him or herself. The self in the mode of identity pulls from different sources both within the conditional and unconditional realms to construct a spectrum of identity. Combining the work of Sonnemann with that of Jaspers, (Figure 2) I construct the first framework for consideration of identity as Dasein in self-reflection; one that uses *conditional* identity and *unconditional* identity. Perception plays the role of guiding the *self* from empirical existence or the *conditional* to the existenz or *unconditional*.

*Unconditional* identities in the sociological framework are those which derive from the realm outside of the physical world or, in other words, consciousness. To Blumer and the symbolic interactionist (S.I.) tradition, it would appear that all *meaning* that is ascribed to human beings can be considered unconditional because meaning is created within the interaction process.[38] Symbols (or meaning) that derive wholly from the empirical world and are ascribed to human beings could be considered parts of that being's *conditional* identity. In S.I., while

there is not an example of truly *conditional* identity, that is because from the sociological tradition, such identity constructs are negotiated through the S.I. process.

Of important note is the difference of the *situation* of an engineer between S.I. and the existentialists within ethnomethodology.  The presentation of the acts and objects at hand defines the *situation* in ethnomethodology.  The question of the age is *who* presents the acts and objects and *to whom* are they presented?  Within S.I., objects, acts, and the like are linked to the *meaning* ascribed to them.  Blumer asserts that *meaning* is derived from social interactions or more precisely, the interaction process.  The subtle difference between E.M. and S.I. concerning the *situation* and its subsequent *meaning* is that while both fields agree that meaning is *central* to human beings, the situation for existentialists lies solely in the realm of the individual to negotiate.  This construct of singularity is important because Dasein negotiates and ascribes meanings to things whether or not other human beings ever existed or will exist.  Furthermore, private symbols within E.M. carry equal weight with public symbols (or I should say that *all* symbols in an ethnomethodological framework are "equal,") because they reference situations entirely endemic to the individual, such as *freedom* and *death*.

Applications to Engineers

More Relevance to Design and Experts

I have cited Dall'Alba's[1,2] work here for three particular reasons: first, her stage model of expertise differs radically from the "novice versus expert" approach of the majority of studies in the field; secondly, her stance on *becoming* an expert; and third, not only does she invoke Heidegger, but further examination of Heidegger's principles bodes well with her views of engineering development.  Dall'Alba's stage model uses a five-step approach based on Dreyfus' work.[32]  The difficulty in assessing student competency based on a multi-step model such as this is proven by the lack of papers within engineering education that use more than a two-step categorization.  While the specific transition steps between levels are inconsequential, what is of relevance is the pathway to becoming an expert.  Dall'Alba clearly believes that no set of rules transforms a novice into an expert, or as she so eloquently puts it,

"Professional skill in general cannot be taught or learned through the provision or rules."

The expert has sacrificed time, money, and sanity in order to achieve his or her status. Dall'Alba also paraphrases Heidegger by noting,

"We develop our understanding of something through our interpretation of it."

The *content* of an engineering class cannot be divorced from the philosophical questioning of what an engineer *is*, and of course, the engineer *is* a creature who creates.  Beyond the mere questioning of what an engineer does, is the question of *where* the engineer performs his job and *how* did he/she get there.  If a driving force behind engineering education is to

produce students who have a greater ability to understand and thereby question their place in engineering, then students first and foremost need to understand the role of the educational institution that is producing them and towards what ends does the production lead. Without a conscious and directed effort by Dasein negotiating the space that is the institution, the expert classification cannot be achieved.

Dall'Alba correctly asserts that Heidegger's concept of being-in-the-world (as contained in Dasein) yields how things appear. To expand upon this in an educational setting, Heidegger not only believes that the development of the student can be aided by the essence of the university, but that the maintenance of the academic institution and the progression of the student must be self-realized.[40] Whereas self-governance may mean an institution governing itself, Heidegger clearly states that Dasein's continuous *self-examination* within the academic sphere is the only path to subject mastery.

The discussion *place* of the apprentice engineer in modern society and how he or she negotiates that sphere, and in the greater context how engineering as a whole can be grounded in terms of design and soiological principles. Engineering design research currently[41,42] concludes that engineering expertise and thus engineering *mastery* is not something that can be explicitly noted, but something that one *knows when one sees it*. While there are books, classes, and "capstone" projects in engineering, a real engineer cannot be strictly defined by any textbook definition. The division here between "master" and "apprentice" engineer is akin to degrees of tacit versus empirical knowledge. The master engineer via Dasein is a creature that derives his or her power and authority in the *process* of engineering, and makes better use of the tacit field of knowledge he or she has accrued over the years than an apprentice. There are two reasons why this description of engineering mastery is important: first, the reckoning of engineering as it stands can be described by principles of existential phenomenology; and second, symbolic interactionist constructs can provide grounding to these problems. Remember that here within an existential framework, objects do not need arise from goal-oriented conduct.[43] Where symbolic interactionism comes into play here is that it links empirical existence and the transcendent via *symbols*. So while *perception* here is an existential construct, perhaps *symbol creation* or *meaning making* would be the appropriate symbolic interactionist construct.

Engineering Responsibility

In Samuel Florman's book,[3] he states after a long treatise on the responsibility of an engineer in respect to the engineer's works that,

"We have defended our engineer against charges that he is evil."

An engineering education should aid the engineer in realizing his or her *situation* in the world. As Dasein in the world, the engineer needs to understand that *all* of his actions have consequences somewhere or perhaps better put, elsewhere. Whereas ABET and most universities want the engineer to learn about cultures outside of his/her own in order to be

*sensitized* or *prepared* for future work situations or contexts, an existential or phenomenological approach using Dasein would help the engineer to see that he/she must not only prepare him or herself, but that the context into which he/she has been born (the university one) will not completely prepare him for the world. To the ends mentioned here, the engineer will realize that he is *capable* of great evil and may very well accomplish great evils in his professional work.

To draw upon another musing in philosophy related to engineering instruction, LoGiudice states,[44]

"The philosophical questions discussed here <u>are already</u> in the minds of the bright, secondary level students. The danger is not that they will go unanswered, but rather that "half-baked" answers will be accepted. Our culture tends to make the difficult and important questions – like "What is man?" – seem easy and useless, and the trivial questions – like "Which dentifrice should I use?" – seem crucial. This problem is one of the challenges educators face, and this course is an attempt to introduce philosophy to highly intelligent youth to help them live more effectively."

Indeed engineering students have had questions about the nature of the world into which they have been born. Engineers could be said to be the students at a university that are more *in* the world than any other, being that engineering is one of the few, four-year professional degrees one can earn, and the fruits of their labours are ubiquitous. Not only should students endeavor to linger on longstanding questions they may have had about the world around them, but they should intend on using powerful tools to address and reflect and re-reflect.

Conclusion

At the core of this discussion there have been a few, resounding themes: first, the unfolding of traditions from classic philosophy; second, the introduction of Dasein; and third, a brief unraveling of Dasein in multiple scenarios. I have attempted to introduce multiple philosophical paradigms that attempt to shed light on the dynamic nature of engineering philosophy and future philosophical constructs in engineering. The separation between classic philosophical beliefs and those outlined here touch upon important topics in today's engineering world: the definition of the engineer; the engineer's object world or realm; the engineer's responsibility in society; identity both in general and engineering terms; and the expert engineer.

The literature within engineering philosophy serves as a starting point for further work, as it is rich with connections to "pure" philosophy. Constructs such as identity, which permeate design literature, have analogous traditions within philosophy such as unconditional and conditional. Also, phenomenology and existentialism's focus on *form* and meaningfulness resounds well with underlying principles of engineering design, and a further discussion of how an engineer traverses creating *form* would yield a more robust language and description of the role of the engineer. Even the accepted concept of the *object world* in engineering philosophy has strong connections to "pure" philosophy, further blurring the boundary between the two

traditions.  Finally, the philosophical tradition speaks towards one of the engineer's major goals of negotiating and transferring ideas into object.  The nature via which an engineer brings to light his inner desires is one way the engineer functions in the world and the traversing of an engineer through the world in this context can help define engineering.

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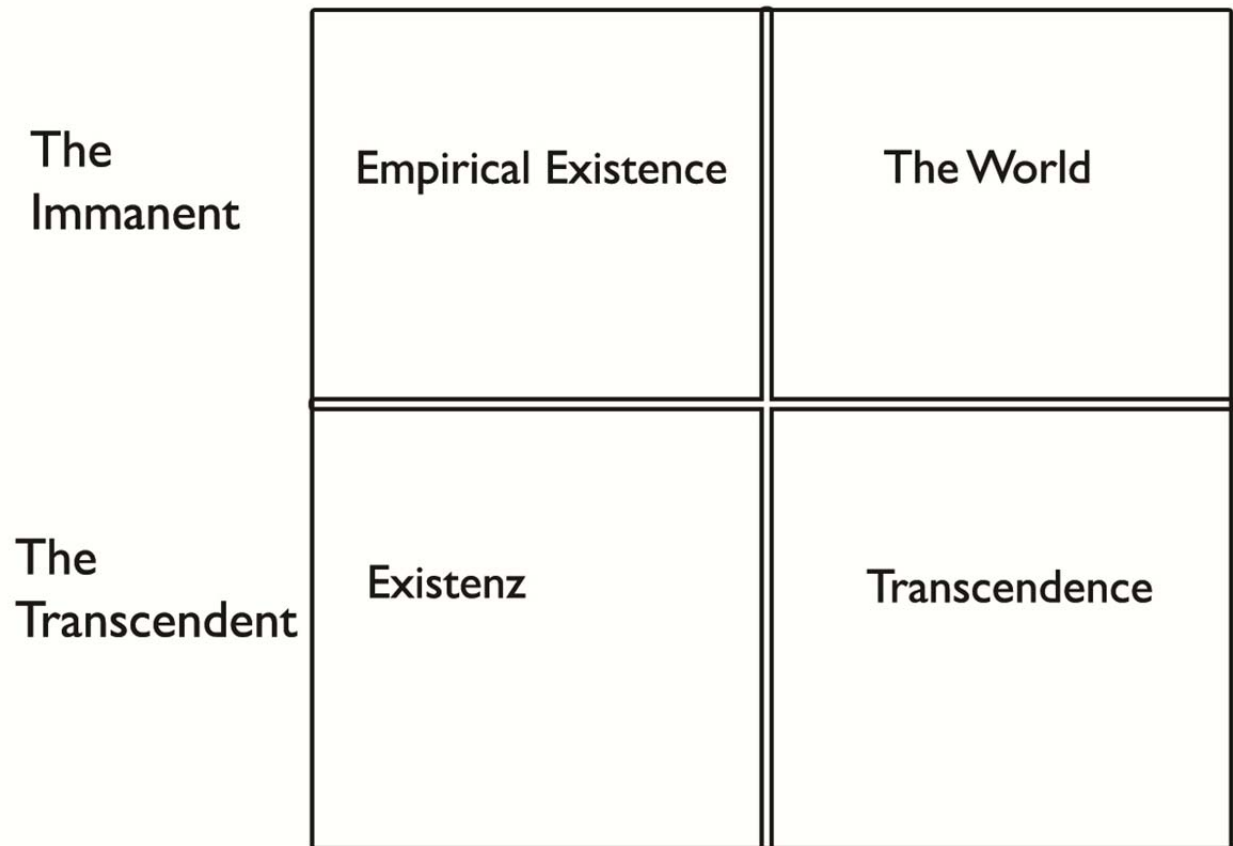
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|---|---|---|
| **The Immanent** | Empirical Existence | The World |
| **The Transcendent** | Existenz | Transcendence |

Figure 1.  An artist's rendering of Schrag's[36] interpretation of Karl Jaspers' vision of the Immanent and the Transcendent.
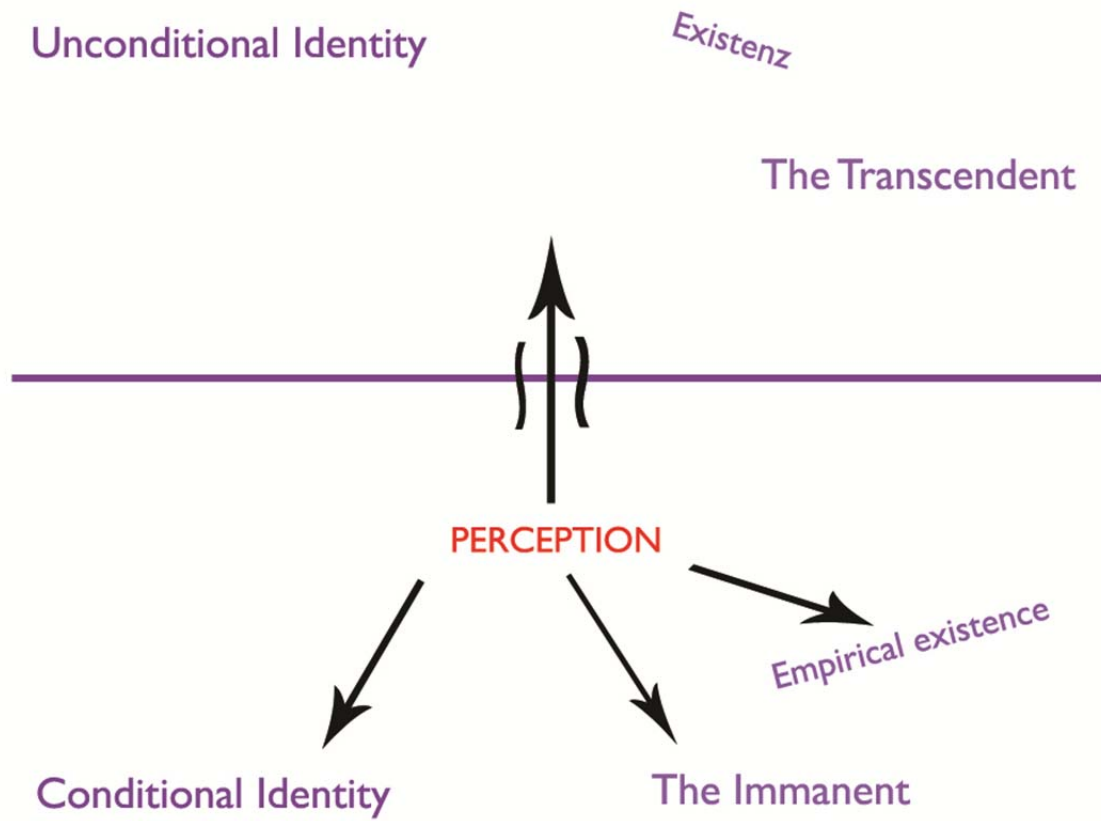
Figure 2. An interpretation that includes the notion of perception being the way in which the self assesses itself.