

INTERDISCIPLINARY RESEARCH AND PHENOMENOLOGY AS PARALLEL PROCESSES OF CONSCIOUSNESS

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Abstract: There are significant parallels between interdisciplinarity and phenomenology. Interdisciplinary conscious processes involve identifying relevant disciplines, evaluating each disciplinary insight, and creating common ground. In an analogous way, phenomenology involves conscious processes of epoché, reduction, and eidetic variation. Each stresses perspective taking and the role of imagination in achieving essential generalities—either interdisciplinary common ground or phenomenological eidetic intuitions. Integrated products of interdisciplinary research are “categorical intuitions,” in phenomenological terminology, public and able to be communicated. The overall purpose of this comparison is to encourage communication between contemporary practitioners of both approaches to phenomena.

Keywords: interdisciplinary research, phenomenology, consciousness, imagination, perspective taking, variation, interdisciplinary attitude, common ground, integration

Introduction

Interdisciplinary research and phenomenology are reflective processes in which the practitioner assumes a special attitude that shifts how facts are interpreted. Interdisciplinarity engages in disciplinary perspective taking and imaginative variation to reveal interdisciplinary common ground from which to produce an integrative insight. Phenomenology engages in

perceptual and ideational perspective taking through imaginative variation to achieve an essential insight. There are significant parallels in the interdisciplinary attitude for the phenomenological epoché, reduction, and eidetic variation, and the phenomenological account of categorial intuition sheds light on what is distinctive in interdisciplinary integration. I am not attempting to historically or philosophically link the two processes. The overall purpose is to reveal striking similarities in the demands of interdisciplinarity and phenomenology as human conscious processes, and in doing so, to encourage more talk between practitioners. The parallels suggest something essential about how humans can approach complex problems or issues.

Consciousness is obviously a complex problem. Scholars debate what consciousness is, its role in personal identity, the difference between normal and abnormal consciousness, how consciousness is related to the body and brain, and many more issues from a variety of disciplines. The complex problem of consciousness is the focus of phenomenological philosophy. In phenomenology, complexity means that the problem of consciousness is complicated by the fact that we are the conscious beings investigating our own consciousness. This means one must start the descriptive analysis of consciousness, which phenomenologists also call “intentionality,” in the middle of a conscious life that is already unfolding. It is like an eyeball trying to look at itself, if it could do so without a mirror; remarkably, consciousness can become self-reflective in this way. “Intentionality” is a technical term meaning that the starting point for any description of our conscious life is the relationship we have with the world. All experience is experience of something; there’s always a world for consciousness. Rather than assume that the world shapes meaning in consciousness (as sociology tends to do) or assume that consciousness shapes the meaningful world (as psychology tends to do), phenomenology assumes the starting point for meaning (and for philosophy) is the *relationship* between the stream of consciousness and the world. Hence our existence always includes both terms, consciousness and world: We are conscious beings-in-the-world. Phenomenologists describe how things are encountered as meaningful in consciousness and how consciousness has a role in creating meanings in the world. They articulate this relationship as structures, patterns, and levels in consciousness, and differentiate types of consciousness, such as understanding, imagination, perception, memory, dreaming, schizophrenic episodes, and so on.

Just as the complexity of consciousness drives the need for phenomenology as a descriptive practice, the complexity in a range of problems or issues (such as race relations in the U.S., the meaning of

marriage, the value of public art, the nature of consciousness) is a driver for interdisciplinary studies.¹ In interdisciplinary studies, complexity means that the problem has multiple components studied by different disciplines (Newell, 2001). One might rightly suspect that in both cases of trying to understand the complex problem, it pays to have humility, playfulness in imagination, and tolerance for ambiguity. But these two ways of directing consciousness to deal with a complex problem also have in common certain transformations or activities of consciousness. This article seeks to reveal this correspondence and affinity in the interdisciplinary attitude and the phenomenological attitude.

Edmund Husserl's *Logical Investigations* (1900-1901) marks the traditional beginning of phenomenological philosophy, and he systematically elaborates phenomenology as a method in his *Ideas I*, published in 1913. Husserl explains that phenomenology is a method of rigorous reflection on conscious experience, a descriptive approach to articulating how things are presented or encountered in consciousness. It involves a shift in attitude that steps back from immersion in everyday natural beliefs and activities to consider these same beliefs and activities reflectively. Husserl also describes how the phenomenological method involves an active, playful, imaginative variation of the phenomenon to reveal its essential structures. Shaun Gallagher and Dan Zahavi, philosophers who integrate insights from phenomenology and cognitive science, list four basic steps in the "method of phenomenology":

- (1) The *epoché* or suspension of the natural attitude;
- (2) The *phenomenological reduction*, which attends to the correlation between the object of experience and the experience itself;
- (3) The *eidetic variation*, which keys in on the essential or invariant aspects of this correlation;
- (4) *Intersubjective collaboration*, which is concerned with replication and the degree to which the discovered structures are universal or at least sharable. (2008, p. 31)

¹ Phenomenological philosophy has one complex problem for its aim—the problem of consciousness. Interdisciplinary studies is open to any complex problem, including the problem of consciousness.

These four steps have parallels in the interdisciplinary research process shown in the chart.

Table 1 Parallel Practices

Phenomenology	Interdisciplinary Research Process
Epoché	Recognizing the need for interdisciplinarity and identifying relevant disciplines
Phenomenological reduction	Analyzing the problem and evaluating each insight or theory
Eidetic variation	Creating common ground between concepts and theories
Intersubjective collaboration	Constructing a more comprehensive understanding and communicating it

As understood by leading contemporary theorists, the interdisciplinary research process involves the integration of insights from two or more disciplines for a broader understanding of a complex problem than can be attained by a single discipline (Klein & Newell, 1996; Repko & Szostak, 2017). The interdisciplinary research process in Table 1 is truncated from *Interdisciplinary Research* (2017, originally published in 2008) in which Allen Repko and Rick Szostak organize decades of work by interdisciplinary practitioners and theoreticians into a “broad model” of the interdisciplinary process.² The goal is to integrate disciplinary insights to gain a new product—a new model, process, narrative, metaphor—that is not possible using a single disciplinary perspective alone. Creating common ground between diverse disciplinary insights and integration of these insights are key components of interdisciplinary work and distinguish it from multidisciplinary.

² This broad model of the interdisciplinary research process consists of ten “steps” and is also exemplified and demonstrated in *Case Studies in Interdisciplinary Research* (Repko, Newell, & Szostak, 2012). The ten activities are 1. Define the problem or state the research question, 2. Justify using an interdisciplinary approach, 3. Identify relevant disciplines, 4. Conduct the literature search, 5. Develop adequacy in each relevant discipline, 6. Analyze the problem and evaluate each insight or theory, 7. Identify conflicts between insights or theories and their sources, 8. Create common ground between concepts and theories, 9. Construct a more comprehensive understanding, 10. Reflect on, test and communicate the understanding.

Phenomenological Attitude and Interdisciplinary Attitude

The interdisciplinary attitude is analogous to the phenomenological attitude.³ In attempting to advance the understanding of a complex problem, the interdisciplinarian must (1) disengage from the disciplinary attitude, a distancing that (2) allows the interdisciplinarian to contextualize how the disciplinary insight issues from the disciplinary perspective and is tied to it and (3) allows the interdisciplinarian to disengage the disciplinary insight from the discipline to enable an imaginative use of it for creating common ground. In this section, I will discuss each of these moves of the interdisciplinary attitude in parallel to the phenomenological attitude as shown in Table 1. After a section on the role of imagination in each practice, the final section discusses the fourth entry in Table 1, intersubjective collaboration and its parallel of constructing and communicating a more comprehensive understanding.

(1) The phenomenological epoché as a parallel to disengaging from a disciplinary attitude

One can approach a window to open it expecting fresh air, casually and naturally; and one can approach a window to open it expecting fresh air while contemplating what it is such that it is a window, how windows are presented in our awareness, and the meaning of our expectation of fresh air. This latter is a philosophical attitude rather than a natural attitude. Phenomenological practice is the purposeful exercise of this reflection in a demanding, careful way. This care reduces the scope of evidence from all experience to a concern with what is presented and how it is presented—hence it is called a “phenomenological reduction.” Also, there is a withdrawal from or suspension of our natural attitude or general thesis about the world and our place in it. Husserl uses the Greek word *epoché*, which signifies restraint in judgment until evidence is clear (Husserl 1982a, §32, pp. 99-100; 1960, §11, pp. 25- 26; Sokolowski, 2000, p. 49). For example, if I were to carefully consider a phenomenology of the window experience, the causes of windows and the history of windows would not be included in my reflective descriptions of immediate perceptual experience of this window here and now, unless they were constituents in the immediate presentation.

Here are two passages from Husserl’s *Ideas I* that typify his way of describing the epoché as a move to the phenomenological attitude.

³ Since phenomenology is traditionally practiced by individuals, the current study does not address team interdisciplinarity.

We put out of action the general thesis which belongs to the essence of the natural standpoint, we place in brackets whatever it includes respecting the nature of Being: this entire natural world therefore which is continually “there for us,” “present to our hand,” and will ever remain there, is a “fact-world” of which we continue to be conscious, even though it pleases us to put it in brackets. (Husserl, 1982a, §32, pp. 99-100)

And,

Thus all sciences which relate to this natural world...I disconnect them all, I make absolutely no use of their standards, I do not appropriate a single one of the propositions that enter into their systems, even though their evidential value is perfect, I take none of them, no one of them serves me for a foundation—so long, that is, as it is understood, in the way these sciences themselves understand it, as a truth concerning the realities of this world. I may accept it only after I have placed it in the bracket. (Husserl 1982a, §32, 100)

The directive in phenomenology is to horizontalize or equalize phenomena so that hierarchies are neutralized (Ihde, 1977, p. 36). Husserlian philosopher Robert Sokolowski writes that between the phenomenological and natural attitudes “We make a definite distinction, whereas most people wander unclearly back and forth across the border” (2000, p. 49). He also exclaims of the phenomenological attitude, “This is reflection with a vengeance; it is wholesale reflection. Nothing is left out. . . . We do not hold on to several beliefs as a base to give us leverage; we do not retain a floor to stand on” (p. 189). Sokolowski is describing the phenomenological epoché as a suspension or bracketing of belief.

The disengagement in the phenomenological attitude parallels the disengagement from disciplinarity in the interdisciplinary attitude. Just as the phenomenological attitude is distinct from the natural attitude, interdisciplinarity is distinct from disciplinarity. There is a purposefulness in the rigorous interdisciplinary research process that some ignore because they suppose they are interdisciplinary without pursuing the goal of integration—that wandering “unclearly back and forth across the border” of disciplines is what interdisciplinary research has to offer.⁴ The interdisciplinary analogue⁴ Szostak writes “Whereas the main intellectual challenge to interdisciplinary research a couple of decades ago came from disciplinarians claiming that interdisciplinarity was inherently superficial (because of the years it takes to master even one discipline), the challenge today comes from disciplinarians who claim that anyone can be or even is interdisciplinary. . . . Those that disdained interdisciplinarity decades ago had a better sense of what interdisciplinarians were trying to achieve than those who casually claim to be interdisciplinary today. Quality interdisciplinary work is far from impossible, but also far from being easy” (2013, p. 45)

to phenomenological epoché is to suspend disciplinary position taking—to understand the position taking of the disciplines while not committing to any one particular disciplinary perspective. The practice of disciplines is to generate insights within the context of given assumptions and communicate these findings in articles and books.⁵ It is a position taking, directly and indirectly, on the nature of the physical world, the human mind and body, sociality and social institutions, arts and the human story, and so on. Disciplinary perspectives are somewhat differentiated by unique defining elements: phenomena, epistemologies, assumptions, concepts, theories, methods (Repko & Szostak, 2017; Szostak, 2004). The interdisciplinary attitude involves a move akin to the phenomenological epoché because it suspends or brackets belief in a particular disciplinary perspective, for example, biology, history, or psychology. Moreover, reservations concerning the various claims and assumptions about reality that each discipline makes—e.g., that reality is organic, temporally constituted, brain-centered—are bracketed. Ideally, no judgment is made about disciplinary superiority. The interdisciplinary researcher becomes ready to be immersed in the disciplinary perspective as appropriate, avoiding becoming restricted to any one disciplinary perspective.⁶ The disciplinary perspective is encountered just as it appears with its distinctive epistemology, assumptions, etc. This initial bracketing of disciplinary position taking is a necessary interdisciplinary move pre-requisite to the rest of the process and allows the interdisciplinarian to “identify relevant disciplines.” Since no one discipline is favored, all are treated equitably with respect to the problem.

In addition to this epoché-like move, the interdisciplinary attitude also involves two moves of “reduction.”

(2) The phenomenological reduction as a parallel to contextualizing the disciplinary insight within the discipline

In the natural attitude an object is given all at once as meaningful—a table, let’s say. In the phenomenological attitude one looks at how it appears, how

⁵ This is also the practice of interdisciplines and interdisciplinary studies.

⁶ Being able to draw from more than one discipline to inform your own work involves the reasonable distinction between adequacy and mastery. Repko writes: “Certainly the interdisciplinarian cannot be expected to have the same depth of understanding as does the specialized disciplinary scholar. Perhaps the key insight of interdisciplinary scholarship is that this depth of expertise is not essential. . . . ‘Mastering’ means knowing the discipline well enough to practice it. This is not the goal of the interdisciplinarian in most cases. Rather the interdisciplinarian wishes to draw upon the discipline for a limited purpose and thus needs only to understand the defining elements of those disciplines relevant to the problem” (2014, p.167).

perception of the table is structured by sides, aspects, and profiles (Husserl, 1982a, §41, pp. 86-87). This recognition involves a slowing down and deepening of conscious processes.⁷ Sokolowski draws the distinction this way: “In the natural attitude we head directly toward the object; we go right through the object’s appearances to the object itself. From the philosophical reflective stance, we make the appearances thematic. We look *at* what we normally look *through*” (2000, p. 50). The table is still presented, but the encounter with it has changed because of the shift to consciousness of context or how it is presented. “When we move into the phenomenological attitude, we become something like detached observers of the passing scene or like spectators at a game. We become onlookers” (Sokolowski, 2000, p.48). Such “spectators” are not passive but intellectually and imaginatively investigative.

In the second move of the interdisciplinary attitude, the disciplinary insight is considered in light of the discipline that produced it. Another way to say this is that the interdisciplinarian evaluates the disciplinary context, not just the insight. The interdisciplinarian takes account of how knowledge is produced in a particular discipline, looking *at* what the biologist or sociologist or economist normally looks *through*. The broad model of the interdisciplinary research process calls for evaluating each insight or theory in terms of strengths and weaknesses, and identifying conflicts between insights. Doing so can show how a disciplinary perspective has emphasized a particular side, aspect, or profile of a problem when contributing an insight, thereby producing a skewed understanding of the problem (Repko & Szostak, 2017, p. 190). Concerning how disciplinarians work, Repko and Szostak observe that “Their insights are also skewed in the way that they look at what they *do* see. This is due to the phenomena or the behavior they choose to investigate. Overall their choice of phenomena influences their choice of method, which in turn influences their choice of theory” (p. 205). This evaluation of insights or theories (that might become central in creating common ground for integration) assumes a certain cognitive distance from the discipline that produced the insight but does not seek to change that discipline. The interdisciplinary attitude contemplatively questions the disciplinary perspective and insight. Another way to state this second move in the interdisciplinary attitude is that the disciplinary insight is contextualized by the disciplinary perspective as issuing from that perspective. This contextualization cannot be accomplished from within the disciplinary perspective; it is a purposeful looking for what is not usually seen in doing disciplinary work.

⁷“As a method phenomenology slows down the stream of consciousness in order to create a descriptive attitude which focuses attention on the fullness (Fülle) of things and events. This process reveals the depth and complexity of phenomena which are usually covered over in our habitual, unreflected attitude of perceiving and judging what we experience” (Simms & Swarska, 2013, p. 9).

(3) Eidetic variation as a parallel to disengaging the disciplinary insight from the discipline

Phenomenologists actively imagine possibilities of the phenomenon under investigation, for example, how a house appears, by detaching from the actual perceptual presentation of the house. The goal of such imaginative variation is to gain an essential insight into the structure of consciousness, that is, into how consciousness interprets the world meaningfully. It is an essential insight because something remains unchanged in all the variations in consciousness. Using a term found in Plato, Husserl calls this essence an *eidos*. A pertinent meaning of *eidos* in ancient Greek literature is “one something the same in all.” Each of Plato’s ideal forms are an *eidos*—the Form of the Good is common to all good things, the Form of Beauty is common to all beautiful things, and so on (Plato, 1961, #517b, p. 749).⁸

For instance, a house must be presented in perspectives or profiles, not all at once. This is a part-whole fact about perception, *part* of a *whole* house is presented. Other “eidetic intuitions” about perception, as these essential insights are called by Husserl and his followers, are that an object remains identical even though the many profiles change (it is the same house, an “identity in manifold”), and that every presence (this side of the house) entails an absence (a hidden side). These essential insights are ultimately about how consciousness interprets the world perceptually, how consciousness is invariantly structured, since any material thing (not just houses) must appear in perception in these ways.⁹

Sokolowski helpfully describes Husserl’s procedure for achieving an essential insight, also called an “eidetic intuition”:

We focus on a universal that we have reached [e.g., that all perception involves part and whole]. We posit an instance of that universal kind [e.g., that a house is presented in part (as a side) while also as a whole (a side *of* a whole)]. We then attempt to imagine changes in the object, in a process called *imaginative variation*. We let our imagination run free, and we see what elements we could remove from the thing before it “shatters” or “explodes” as the kind of thing that it is. We try to push the

⁸ Unlike an *eidos*, interdisciplinary common ground is created as a pivot for a more comprehensive understanding for a particular complex problem; the commonality is a means to an end—the integrated interdisciplinary product.

⁹ Phenomenological results are meant to be enduring truths, while interdisciplinary results are idiosyncratic: They depend on the context of the complex problem, the available resources that can be used to address the problem, and the researcher’s decision-making.

boundaries, to expand the envelope of the thing in question. If we can discard some features and still preserve the object, we know that those features do not belong to the eidos of the thing. (Sokolowski, 2000, p. 179)

One need not walk around a house to intuit a feature common in all perceptual experience. One can imagine it. “When we reach an eidetic intuition, we see that it would be inconceivable for the thing in question to be otherwise. The move into imagination gives us a deeper insight than does empirical intuition” (Sokolowski, 2000, p.179). The deeper insight gives us the essential idea (eidetic intuition) of how all houses and material objects in general must appear in perception—as part-whole, with presence and absence, and revealing an identity in manifold profiles.

In the third substantive move of the interdisciplinary attitude, the disciplinary insight is disengaged from the discipline to re-contextualize it for creation of common ground. Like the phenomenological attitude, the interdisciplinary attitude involves free play of imagination as part of the process. The phenomena in the interdisciplinary attitude are the disciplinary insights that contribute to the creation of common ground and the achievement of integration. For example, to ensure a kind of imaginative space in creating common ground, the interdisciplinarian must disengage from the disciplinary perspective of the biologist or economist or political scientist who might each have theories or insights on the complex problem of acid rain (Newell, 2001, p. 19). In discussing this example, Repko and Szostak note that a shared concept can be embedded within the various insights; for instance, “the concept of ‘efficiency’ has related but different meanings for biologists and physicists (energy out/energy in), economists (dollars out/dollars in), and political scientists (influence exerted/political capital expended)” (Repko & Szostak, 2017, p. 248). Common ground may be possible when the same concept is discovered in insights from relevant disciplines, but only when one “releases” or disengages the insight from the discipline in order to redefine it in a more inclusive way (efficiency cannot just be about dollars/economics at this move of the process).¹⁰ This imaginative variation for disciplinary insight assumes a neutral attitude toward the disciplinary insight so that it can be modified to advance an understanding of the complex problem.

¹⁰ In addition to the same concept with related meanings, one finds different concepts with the same or overlapping meanings. For example, with respect to the problem of improving the odds that first year college students who are minorities will continue for a second year, common ground may exist among concepts of “goal-maintenance” in psychology and “retention” in the professional field of education. Note that disciplinary perspectives are not integrated in the interdisciplinary process; relevant insights produced by disciplinary experts are integrated (Newell, 2000, p. 43).

The neutrality or disengagement in the interdisciplinary case means that the disciplinary insights can be imaginatively modified as needed. As discussed below, interdisciplinarity calls for common ground techniques—redefinition, extension, transformation, organization—that must adjust and re-contextualize concepts and theories in ways not possible within the disciplines that produced them (Newell, 2007). Newell writes, “What typifies the decisions involved in the step of creating common ground is that they replace the either/or thinking, which is characteristic of the disciplines, with both/and thinking. Inclusive thinking is substituted for dualistic thinking. Because these decisions require abstract thought about shades of meaning, they have a philosophical character to them” (p. 260). This detachment of the insight from the disciplinary perspective that produced it also helps constitute “the most basic field of work” (Husserl, 1982b, p.196) that is of interest to both phenomenology as descriptive analysis of consciousness and interdisciplinarity as creating common ground among insights.

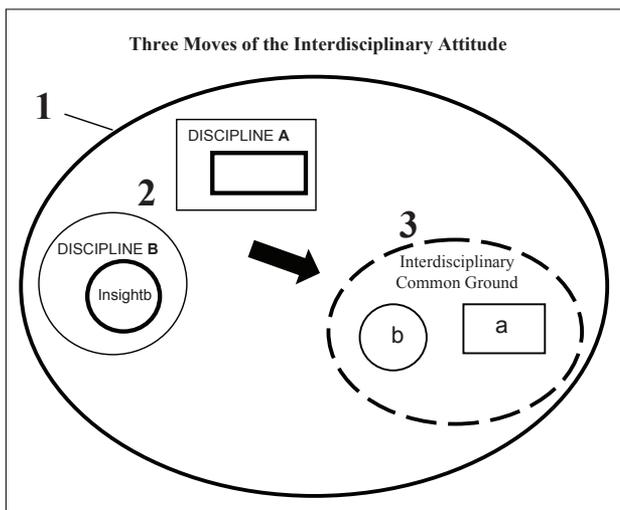


Figure 1. Three moves of the interdisciplinary attitude. 1 is disengaging from a particular disciplinary perspective (akin to epoché) and is foundational for moves two and three. 2 is contextualizing the disciplinary insight within the discipline (akin to reduction). 3 is disengaging the disciplinary insight from the discipline (akin to variation).

Figure 1 shows the three moves or shifts of the interdisciplinary attitude in a simplified way. The interdisciplinary research process requires that the researcher assume an attitude that brackets commitment to or belief in a

particular disciplinary perspective while identifying relevant disciplines (akin to the *epoché*). Move one is represented as the oval within which the other two moves or transformations can unfold. Move two symbolizes how the researcher must reflectively consider the disciplinary insight as a partial solution tied to the discipline that produced it (akin to the *phenomenological reduction*). Here Discipline “A” produces insight “a,” because this is the kind of insight that the disciplinary perspective “A” produces (e.g., biology typically produces theories, concepts, or findings in reports or articles in media such as journals refereed by peers who are experts in biology), as differentiated from Discipline “B” which produces “b” kinds of insights (e.g., disciplinarily trained philosophers typically produce philosophical theories or findings tested in the expert community of philosophers). The second move of the interdisciplinary attitude considers and evaluates each insight in light of its disciplinary perspective.¹¹ Move three depicts insights “a” and “b” with fuzzier lines, symbolizing their imaginative and playful detachment from the disciplinary perspectives that produced them to prepare for the creation of common ground and integration (akin to the *eidetic variation* further discussed in the next section).¹² The interdisciplinary common ground created is depicted with a dashed line since it is more like a bridge or pivot between disciplinary and interdisciplinary understanding than a stopping place.¹³

Consider the following parallel formulation of the phenomenological attitude and the interdisciplinary attitude. I have inserted new emphasized and bracketed text representing the analogue of the interdisciplinary research process [IRP] at the end of Sokolowski’s original formulation of the phenomenological attitude, which is now in bulleted format.

¹¹ Moves two and three assume that the interdisciplinarian has identified conflicts or conceptual gaps between insights or theories and their sources. Common ground (move three) is not necessary if conflicts or gaps are absent.

¹² A reviewer of this journal questions whether integration is possible with no modification of the disciplinary insight. Since the insight must become a functional constituent in a new whole (the integrated product), I do not believe so. Even the common ground technique of organization, which can involve very little or no adjustment of the insight, except that it is now arranged with others in a new way (e.g., in a table or diagram), is still an interdisciplinary move not a disciplinary one. To see how the insight is modified in the case of tabular organization, see Arvidson (2014a, pp. 185-189).

¹³ Interdisciplinary understanding (produced in integrating insights) is not depicted in Figure 1. Phenomenologists know how difficult it can be to maintain the phenomenological attitude. Gallagher and Zahavi note that one must be persistent: “The epoché is an attitude that one has to keep accomplishing” (2008, p. 25). Similarly, the interdisciplinary attitude is something the researcher must keep accomplishing.

- When phenomenology “neutralizes” the intentionalities at work in the natural attitude, it does not dilute, destroy, upset, or ridicule them. It merely adopts a contemplative stance toward them, a stance from which it can theorize them. [*The IRP uses disciplinary concepts or theories in a way that affirms each discipline’s value in contributing to the creation of interdisciplinary common ground. In creating common ground, the IRP adopts a detached stance toward disciplines and does not dilute or destroy them.*]
- Phenomenology complements the natural attitude; philosophy complements true opinion and science. [*Interdisciplinarity complements disciplinarity. It does not replace the disciplines and in fact interdisciplinary work is based on disciplinary work in the same way that phenomena must first be presented in order to be philosophized about (which is one way of stating the phenomenological principle of intentionality—that all experience is experience of something).*]
- Phenomenology may also point out the limitations of the truth and evidences achieved in the natural attitude, but the various arts and sciences already are aware of the fact that they are each partial and limited, although they may not be able to formulate their limitations very exactly. [*The researcher critically evaluates insights of the disciplines as a step of the IRP. We have discussed this as contextualizing the insight within the discipline in the second move of the interdisciplinary attitude. Also, in advancing our understanding of complex problems, it is the limited nature of disciplinary perspectives that necessitates the interdisciplinary perspective. Disciplinarians can also be aware of this limitation.*]
- And sometimes the particular arts and sciences may want to become imperialistic themselves and dominate over all the others... [*The holism of the IRP is a necessary feature of it. In short, if the “interdisciplinary” product is reducible to one disciplinary perspective, then it is not an interdisciplinary product at all but a disciplinary one (and the problem is not a complex problem).*] (Sokolowski, 2000, p. 63)

Imagination, Eidos, and Interdisciplinary Common Ground

Imagination and intellectual playfulness are central in both phenomenology and interdisciplinary research. Section 70 of Husserl’s *Ideas I* includes “The Primacy of Free Phantasy” as its subtitle. Drawing from his mathematics

background, he describes how a geometer must detach or withdraw from the perceptual depiction of an object to imagine its variations.

In his investigative thinking the geometer operates on the figure or model incomparably more in phantasy [imagination] than in perception, and even more so does the “pure” geometer, i.e., the one who dispenses with algebraic methods. In phantasy, to be sure, he must make an effort to attain clear intuitions from which he is exempted by the sketch or model. But in actually sketching and constructing a model he is restricted; in phantasy he has incomparably more freedom reshaping at will the figures feigned, and in running through continuously modified possible shapings, thus in generating an immense number of new formations; a freedom opens up to him for the very first time an access to the expanses of essential possibilities with their infinite horizons of eidetic cognitions.... In its most universal features, the situation is no different for the phenomenologist. (Husserl, 1982a, §70, p. 159)

Through active imagination, the phenomenologist is trying to reveal a *commonality* in conscious experience that is not readily apparent. In *Experimental Phenomenology*, Don Ihde writes, “Phenomenological investigations do violence to the passivity of ordinary viewing. There is a deliberate probing of the phenomenon for something that does not at first show itself, and a growing sense of control over what is seen.... There is a playfulness here akin to the playfulness found in artistic contexts” (1977, pp. 107-108).

In the interdisciplinary research process, the parallel to an *eidos* is interdisciplinary common ground; the parallel to phenomenological variation is disciplinary perspective taking. Each disciplinary insight presents a singular profile or facet of the complex problem being investigated. The insight tends to be relatively specific in its content (e.g., attentional cost) and origin (e.g., psychology), even though it may have broad applicability. Perspective taking in the interdisciplinary research process means adding more angles on the problem by adding more insights, not only from psychology, but from other disciplines or fields (e.g., philosophy, sociology, literary studies, etc.), some of which may turn out to be relevant. But in order to create common ground using various, selected insights, imagination must manipulate the insights. The distinct, relevant disciplinary insights are imaginatively varied to produce an essential generality between them—interdisciplinary common ground. Common ground is essential in the same way as an *eidos* is essential in phenomenology, namely, as a “one something the same in all” variations of the phenomena that apply to the complex problem. In the case of the

interdisciplinary research process, the phenomena are disciplinary insights.

Starting from a line drawing of a triangle, a geometer might imagine variations on triangularity to arrive at an essential insight about it. The geometer discovers the essential possibilities within which any triangle must fall, that is, a three-sided plane figure with a sum of angles 180 degrees. Starting from a perception of a table, a phenomenologist might imagine variations on perceiving a table to arrive at essential insights about perceptual consciousness. The phenomenologist discovers the essential possibilities within which any table or similar perceptual object must fall, that is, it exhibits parts and wholes, identity-in-manifold, and presence and absence (Husserl, 1982a; Sokolowski, 1974). Starting from relevant insights (e.g., concepts, theories) that issue from one disciplinary literature, the interdisciplinarian produces variations by consulting more disciplinary literatures. Choosing the most essential and promising insights in light of the problem, the interdisciplinarian might imagine variations on each disciplinary insight, and on various insights together, to arrive at a common ground transcending any particular disciplinary insight. The interdisciplinarian discovers the essential possibilities within which the various insights can fall, namely, interdisciplinary common ground for this particular complex problem. In phenomenology, imaginative variations “possibilize” phenomena (Ihde, 1977, p. 40). In the interdisciplinary research process, imagination “possibilizes” insights in modifying them for the creation of common ground.

The above two paragraphs describe both cognitive and imaginative variation. Distinguishing these is useful.¹⁴ Varying the selection of disciplinary insights is primarily cognitive, not imaginative. This cognitive variation is essentially the process of multidisciplinary. It is a cognitive disciplinary variation—actively searching for and *understanding* a number of disciplinary perspectives that might contribute to understanding the complex problem. Cognitive variation is assumed in the broad model of interdisciplinary research as the step of “Identify relevant disciplines.” In contrast, playful variation of disciplinary insights to create common ground is primarily imaginative, not cognitive. This imaginative variation describes a distinctive move necessary for interdisciplinarity (rather than multidisciplinary). It is an imaginative variation of disciplinary insights—actively *picturing* a reality in common between distinct disciplinary insights, a different reality than merely serially arranged, opposed, or

¹⁴Variational theory in phenomenology is not just about imagination either. As Ihde notes, “In looking at any phenomenon, one must place it within its possibilities, its variations. And, although Husserl first called these ‘fantasy variations,’ subsequent phenomenologists also used perceptual, kinesthetic and other variations” (2008, p. 6).

disconnected insights. Imaginative variation is assumed in the broad model of interdisciplinary research as the step of “Create common ground between concepts and theories.”¹⁵

Since Newell (2000, 2001, 2007) first introduced the main techniques for creating common ground among conflicting disciplinary insights, they have become established concepts in interdisciplinary studies. They are redefinition, extension, transformation, and organization. *Redefinition* is adjusting a term or concept to find a shared context for conflicting insights. *Extension* is a more imaginative modification since it extends a disciplinary concept or assumption beyond its original domain to the domain of another discipline. *Transformation* or restructuring creates a continuum between two opposing concepts or assumptions, rather than leaving mere opposition.¹⁶ *Organization* involves ordering relationships between insights or variables from more than one discipline, for example, in tables, flow charts, levels (e.g., macro-micro), hierarchies, clusters, and causal chains. Newell (2007, p. 260) and others highlight that these techniques involve a willingness to be playfully imaginative. In all of these modifications, the given disciplinary insight remains, but with a changed meaning.¹⁷ In phenomenological variation, Ihde writes “This is not to say that all givenness disappears, but that the significance of the given is transformed” (1977, p. 109). Likewise the significance of the disciplinary insight is modified through the use of imaginative variation in the common ground techniques.¹⁸

¹⁵ There is no doubt that cognitive variation involves some imagination and imaginative variation involves some cognition. For example, the common ground created through imaginative variation is a concept or idea. But in the process of creating common ground, imagination must become especially animated.

¹⁶ For an example of the restructuring technique in practice, see Arvidson (2013).

¹⁷ For student examples of how an insight changes significance while being modified for common ground see Arvidson (2014a).

¹⁸ A relevant example is how phenomenologist Aron Gurwitsch uses the technique of concept redefinition to find interdisciplinary common ground for his integrative insights in his main work, *The Field of Consciousness* (1964). He preserves the disciplinary insights while modifying them. For instance, Gurwitsch redefines the very general concept of Gestalt as used by Gestalt psychologists, specifying new terms for new concepts—“functional significance,” “Gestalt-coherence,” and “Gestalt-connection of unity by relevancy”—to create common ground between Gestalt psychology and Husserlian philosophy (Gurwitsch, 1964, pp. 275-279; 1966, pp. 347-348). For more on Gurwitsch’s interdisciplinarity see Embree (2003) and Arvidson (2014b). For more research examples see *Case Studies in Interdisciplinary Research* (Repko, Newell, & Szostak, 2012).

Interdisciplinary Integration and the Phenomenology of Categoriality

Phenomenologists demonstrate how thinking is based on perceptual experiences. As I walk around a house, each angle or profile of the house yields to the next. Perceptual objects unfold in profiles, revealing what was previously absent (the next profile), which was implied by the current profile. For example, the other side of the house is suggested by the current view I have on it, and this implied view or profile can appear in perception as I walk around to that side. This unfolding of the perceptual object can continue passively without any higher level meanings in consciousness—concepts, ideas, thinking, theories, predication, or other ways of describing what phenomenology calls “categorial intending.” However, once a class, category, or whole is noticed, and it is noticed that a perceived example belongs to that category, the shift to categorial intending is initiated. For example, I now understand explicitly that this particular view of this particular house is an example of a thing in the category “houses.” This fulfillment of the categorial intending by the presentation of the part and whole at the intellectual level is a “categorial intuition” in phenomenology. It is a novel synthesis of identification in what is presented. In short, categorial intuition names the transition from relatively unarticulated recognition to articulated understanding—“This is a house.”

According to Husserl, this advance beyond the sensible is a learning, a coming to know (2001, §38, p. 262). Understanding something, for example, what this profile of the house represents or what it is an example of, namely houses in general, is a supersensible presentation. What is important for us is that the idea of the house, as an object of consciousness, is a higher level synthesis or integration than the original, unthinking perception of the house. Continuous perception, unarrested in its movement, is passive.¹⁹ Knowing is active. Notice how a categorial intuition—“This is a house”—is naturally expressed in quotes, thereby indicating communication. One point of this section is how articulating thinking as categorial intuition ties together communication of results in both phenomenology and interdisciplinarity, the last row in Table 1 above.

A special case of categorial activity is the cognitive achievement of interdisciplinary integration. Interdisciplinary thinking is a purposeful furthering of knowledge concerning a complex problem. Especially, the aim of interdisciplinary research is to construct a more comprehensive understanding or “cognitive advancement” (Boix Mansilla, 2005) than

¹⁹ A color mural revealed on the next side of the house would arrest the perception and likely initiate categoriality.

disciplinary thinking alone can provide. Repko and Szostak define this interdisciplinary product: “A more comprehensive understanding is the integration of insights to produce a new and more complete and perhaps nuanced whole” (2017, p. 323). This new product might be a metaphor, model, narrative, question, process, policy, plan and so on. The comprehensive understanding is *constructed* from a set of modified concepts or theories (p. 383). In phenomenological terms, interdisciplinary thinking is becoming purposefully engaged in categorial intending.

This interdisciplinary, categorial mode of thinking has three characteristic features.²⁰ The first feature is that the integrative product constructed in the interdisciplinary research process is *distinct* from its constitutive insights and the disciplines that produced them. Interdisciplinary common ground is the pivot for integration of insights. Disciplinary insights are integrated in a way that transcends disciplinarity, for example, in the way the double helix model of DNA transcends biology, physics, and the other disciplines and subdisciplines that contributed insights (Watson, 1968). The distinctness of the more comprehensive understanding in interdisciplinarity demonstrates Husserl’s findings about the shift to thinking or categorial intending. Sokolowski writes, “This new beginning installs a new kind of consciousness and a new kind of object, the state of affairs, as the objective correlate of that consciousness” (2000, p. 91). Similarly, in the interdisciplinary research process, the disciplinary insights offer only profiles or angles on the complex problem. The more holistic understanding is distinct from disciplinary insights in the way a musical chord is distinct from the notes that constitute it (Nikitina, 2005, p. 406).

The second feature is that the integrative understanding is *novel*. In phenomenological terms, the interdisciplinary product is categorially a “new level of identity,” a single state of affairs that can be communicated to others. We can communicate about the *same* thing, the categorial object, detached from either of us but in relation to both of us and the world as we encounter it (Sokolowski, 2000, p. 102). In interdisciplinarity, novelty is closely related to distinction, with a shift of emphasis in novelty to the *existence* or reality of the integrated product. It is now something to be pondered and communicated to others, as highlighted in the quotation marks in “This is a house.” The more comprehensive understanding of the complex problem is a “new thing” for which the interdisciplinarian is responsible (Repko & Szostak, 2017, pp. 237, 324). This responsibility is demonstrated

²⁰ These features coordinate with Sokolowski’s observations about Husserl’s account of categoriality in general (Sokolowski, 2000, pp. 88-111; cf. Repko & Szostak, 2017, pp. 236-238).

through communication (the final row of Table 1), once the researcher has constructed the new understanding. When discussing the integration achieved, the interdisciplinary researcher should explicitly and reflectively recount at least three things: the tie between the insight and the discipline that produced it, the modification of the insight in creating common ground, and what the integrated result might mean for the discipline that produced the insight in the first place.

The third feature is that the integrative understanding is *holistic*. As a *Gestalt*, “it is ‘larger’ than the sum of its constituent parts, not in spatial terms, but in *cognitive* terms” (Repko & Szostak, 2017, p. 237). The more comprehensive understanding, as categorial object, is what was originally sought by the researcher through cognitive and imaginative variation in the earlier stages of the interdisciplinary research process. In these stages, the integrative product is only implied.²¹ “Thus, the cube that is perceptually given in and through a manifold of sides, aspects, and profiles is the identity that we refer to when we utter the words ‘the cube’ [in categorial intuition] and begin to predicate features of it. The identity of the cube is the bridge between perception and thought” (Sokolowski, 2000, p. 95). In integrative interdisciplinary research, “the understanding is cognitively ‘larger’ compared to what could be achieved by merely gathering up individual specialty insights and using them to view the problem from a series of disciplinary perspectives the way multidisciplinary does” (Repko & Szostak, 2017, p. 238). These holistic understandings enable real world applications, new metaphors or narratives in understanding, new processes or policies, new questions or models.

Aron Gurwitsch, along with Dorion Cairns, was responsible for bringing Husserlian phenomenology to the U.S. in the early 20th century. Though he pre-dated contemporary interdisciplinary studies as described here, Gurwitsch’s work can be mentioned as an example of how a more comprehensive understanding in interdisciplinary research has these categorial features of being distinct, novel, and holistic (Arvidson, 2014b). Based on integrating insights from Gestalt theory and phenomenology, his integrative product is that consciousness is invariantly structured in a theme, thematic field, and margin organization, with each of these three dimensions having its own peculiar organizing principles (Gurwitsch, 1964, pp. 352-353; Arvidson, 2006). For example, assuming you are reading this sentence attentively, Gurwitsch’s claim is that there must be a *theme* (a focus—e.g., the meaning of this sentence as it is unfolding), relevant to a *thematic field* (a wider context—e.g., the article as whole), with a *margin* (a

²¹ The integrative product is “horizontal” in phenomenological terms.

somewhat irrelevant peripheral awareness—e.g., that you are sitting rather than standing, time is passing, and ambient noises are in the room). He claims that neither Gestalt psychology nor phenomenological philosophy alone could achieve this result that describes the patterning of all possible conscious experience. Gurwitsch's more comprehensive understanding is *distinct* because neither contributing discipline achieves this result. The achievement is *novel* because the field-organization of consciousness is a new identity categorially intended at a new level as a single state of affairs. The achievement is *holistic* because it is not reducible to either discipline's insights or perspectives.

Conclusion

Interdisciplinarity and phenomenology are aligned in requiring a purposeful change in attitude toward what is presented, a redirection or modification of consciousness. Interdisciplinary distancing from a specific disciplinary perspective parallels the suspension of judgment in the phenomenological epoché. Disciplinary contextualizing of the given disciplinary insight—looking *at* what disciplinarians look *through*—parallels the phenomenological reduction. Playful disengaging of the disciplinary insight from the discipline that produced it and the imaginative modification of the insight parallel the practice of eidetic variation. Variation has a central role in both interdisciplinarity and phenomenology. In the former, variation through imaginative techniques is necessary for the creation of interdisciplinary common ground as an essential generality among insights. In the latter, variation traditionally yields an *eidos* or essence that invariantly characterizes the phenomenon. Integrated results of interdisciplinary research can be described as “categorical intuitions” in phenomenological terms; specifically, they are distinct, novel, and holistic. As categorical achievements, they are testable and communicable, the goal of the last step of the broad model of interdisciplinary research.

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