

INTEGRATION, LANGUAGE, AND PRACTICE: Wittgenstein and Interdisciplinary Communication

by

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Abstract: The dominant account of interdisciplinary integration mobilizes linguistic metaphors such as bilingualism or the learning of new languages. While there is something right about these linguistic metaphors, I urge caution about philosophical confusions that can arise in the absence of careful scrutiny of how our language relates to the world. Drawing particularly on Ludwig Wittgenstein's insights in his *Philosophical Investigations*, I recommend four therapies to treat confusions that may arise when we uncritically reflect on the relationship between language and the world. Interdisciplinary scholars could benefit from careful attention to the ways that (1) understanding is a social deed, (2) language is a set of tools, (3) analysis into simple concepts loses meaning, and (4) the "grammar" of different regions of language can complicate translation. I then revisit what is correct about linguistic metaphors and emphasize that the challenge of integration is agreeing to a way of organizing social practices and prioritizing social goals, or what Wittgenstein called a "form of life." These closing reflections shift from the therapeutic, anti-theoretical reading of Wittgenstein's later philosophy to a reading that recognizes a positive project in his work.

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Introduction

Scholars of interdisciplinarity commonly raise concerns regarding ambiguity surrounding the notions of interdisciplinarity, interdisciplinary communication, and interdisciplinary integration (e.g., Holbrook, 2013; Huutoniemi, 2014; Lattuca, 2001). These theoretical investigations are not purely academic; practical challenges confront interdisciplinarity on the ground, and there is a sense that navigating these philosophical questions would facilitate interdisciplinary practice (O'Rourke & Crowley, 2013). There's also a sense among scholars of interdisciplinarity that these philosophical questions can be safely set aside because answers to them would not straightforwardly improve practice (Frodeman, 2014). Some interdisciplinary projects do succeed without collaborators agreeing to, or even discussing, a definition of interdisciplinary integration; by the same token, some interdisciplinary projects led by philosophically-inclined collaborators collapse under social and institutional pressure, even with the best definitions in hand. This paper is an attempt to give credence to both the perspective that philosophy can improve interdisciplinary practice and the perspective that philosophy can sometimes stand in the way. I offer the later work of Ludwig Wittgenstein as a guide to the value and the limits of philosophical analysis. From the Wittgensteinian point of view, philosophical problems arise when we reflect on the sorts of challenges that confront interdisciplinary research, but analysis does not so much solve these problems as redescribe the contexts within which the problems arise. By helping us to understand our own impulses to philosophize, these redescriptions show many of our philosophical impulses to be misguided.

Here I offer a brief review of theories of interdisciplinarity, focusing in particular on the central notion of interdisciplinary integration. Although interdisciplinary integration is still the subject of debate, the dominant account of integration mobilizes linguistic metaphors such as bilingualism or the learning of new languages (Klein, 2012). While there is something right about these linguistic metaphors, I urge caution about philosophical confusions that can arise in the absence of careful scrutiny of how our language relates to the world. Drawing particularly on Wittgenstein's insights in his *Philosophical Investigations*, I recommend four therapies to treat confusions that may arise when we uncritically reflect on the relationship between language and the world. Interdisciplinary scholars could benefit from careful attention to the ways that (1) understanding is a social deed, (2) language is a set of tools, (3) analysis into simple concepts loses meaning, and (4) the "grammar" of different regions of language can complicate translation. I then revisit what is correct about linguistic metaphors and emphasize that the challenge of integration is

agreeing to a way of organizing social practices and prioritizing social goals, or what Wittgenstein called a “form of life.” These closing reflections shift from the therapeutic, anti-theoretical reading of Wittgenstein’s later philosophy to a reading that recognizes a positive project in his work.

Interdisciplinary Integration and Linguistic Metaphors

Interdisciplinary research is commonly contrasted with merely multidisciplinary research (Klein, 2010). Both interdisciplinarity and multidisciplinary research find common motivation in the need to solve complex problems that go beyond the scope of a single research expertise. In multidisciplinary research, specialists from various disciplines provide solutions rooted in their own disciplines for addressing the problem (Holbrook, 2012). Interdisciplinary research, on the other hand, requires that specialists combine their expertise to engineer an “integrated” response to the problem. Prominent interdisciplinary theorists—William Newell, Allen Repko, Julie Thompson Klein, and others—take interdisciplinary integration to be the key challenge and goal of interdisciplinary collaboration (Klein, 2012; Repko, 2007; Newell, 2001; O’Rourke, Crowley, & Gonnerman, forthcoming). As O’Rourke, Crowley, and Gonnerman point out, however, the importance and prominence of interdisciplinary integration in the interdisciplinary studies literature has produced neither clarity nor agreement about how integration is accomplished or even what integration is (forthcoming). In 2001, Newell lamented that “No one I have talked to or read (including my own writings) has been able to explain clearly how to integrate disciplinary insights into a comprehensive understanding. We are not even clear on exactly what is *meant* by integration” (p. 18). Repko echoes that “the lack of clarity on precisely *what* to integrate and *how* to integrate” has been the “Achilles’ heel of interdisciplinarity” (2007, p. 7).

Interdisciplinary theorists have made extensive use of metaphor to provide guidance about what integration means. As Veronica Boix Mansilla notes, “A striking array of metaphors have been deployed to describe the nature of interdisciplinary intellectual activity—from working at ‘crossroads’ and in ‘trading zones’ to engaging ‘boundary objects’ and ‘bridges’” (2010, p. 289). Boix Mansilla stresses, though, that these metaphors have failed to inform systematic accounts of the theory and practice of interdisciplinary research.¹

¹ For Boix Mansilla, a properly systematic account of interdisciplinary integration would be spelled out in epistemological and cognitive terms—she provides an account of integration understood as “thought in reflective equilibrium” that is primarily cognitive in nature (p. 295).

I want to focus on a particular suite of metaphors that are widespread in discussions of interdisciplinarity: metaphors that liken integrating to learning or creating a new language, such as a pidgin or creole (Klein, 1996, p. 220). A pidgin or creole is a language developed by speakers of different languages to facilitate communication; the new language is a hodgepodge of neologisms and crucial terms or phrases that suffice to coordinate exchange between these different cultures. The “trading zone” portrayal of interdisciplinary collaboration, and the linguistic metaphors that have characterized interdisciplinary communication, have received extensive endorsement and development since their introduction (Galison, 1996). Newell asserts that, “since every discipline has its own vocabulary expressed as concepts, it is sometimes necessary for the interdisciplinarian to create a common vocabulary” (2008, p. 284). David Stone writes that for the dominant, epistemological approaches to interdisciplinarity, “the central barrier to effective interdisciplinary collaboration boils down to language, to our inability to communicate concepts, theories, and methods across disciplines in interdisciplinary contexts” (2013, p. 87). While sharing a language may not be sufficient for interdisciplinary integration, the heavy reliance on linguistic metaphors points to the necessity of collaborators to communicate effectively.

In calling for further philosophical attention to the challenges of interdisciplinarity, J. Britt Holbrook locates several philosophical assumptions in interdisciplinary theorists’ engagement with the notion of language (2012). Holbrook is concerned with the increasingly widespread conviction that interdisciplinary communication involves researchers adopting one another’s “conceptual schemes.” According to this view, researchers from different disciplines use different conceptual schemes to make sense of their experience. This picture of experience distinguishes between the conceptual scheme (i.e., what we bring to experience—in particular the language that we speak) and empirical content (i.e., what is given in experience). Though Holbrook does not chronicle instances of this assumption, the literature on interdisciplinarity has mobilized notions such as a discipline’s “lens” or “worldview” (e.g., Repko, Szostak, & Buchberger, 2013; O’Rourke & Crowley, 2013), notions that rely on the scheme-content distinction that Holbrook problematizes with the help of Donald Davidson. Per Davidson (1974), the scheme-content distinction is implicit in many theorists’ understanding of language, in part because it helps us to make sense of how different perspectives on the world produce different accounts of the world.

Before countenancing Holbrook’s proposal, it is helpful to recapitulate Davidson’s critique of the scheme-content distinction (the distinction between

conceptual scheme and empirical content, summarized above). Davidson demonstrates that this distinction must be confused because maintaining a dualism between conceptual scheme and empirical content commits one to a contradiction. Adherents to the scheme-content distinction suggest that our conceptual schemes *conceptualize* experience, and in working out what this conceptualization actually involves, philosophers offer two sets of metaphors. Conceptual schemes either “organize” (e.g., “categorize,” “systematize,” “divide up”) or “fit” (e.g., “represent,” “correspond to,” “face the tribunal of”) their empirical content. The “organize” metaphors suggest that conceptualization arranges a set of objects, but the core of the scheme-content distinction is that content is experienced as a set of objects only through conceptualization (Davidson, 1974, pp. 11-13). Conceptualization (per these metaphors) organizes something that is both a set of objects and not a set of objects, a contradiction that highlights the confusion. The “fit” metaphors suggest we are sometimes in a position to compare our conceptual schemes with our experience, either in part (e.g., a word or sentence with a particular experience) or in whole (e.g., a whole theory or even language with the sum of our experiences) (pp. 15-16). Davidson points out that sentences can only be true by virtue of other sentences; something like “unconceptualized experience” cannot be compared to or used to evaluate conceptualizations. Thus, it is also a confusion to think of conceptual schemes as corresponding to or representing the experienced world. If both the “organize” and “fit” metaphors lead to confusion, then we would do well to avoid the scheme-content distinction. Individuals who describe experience differently are only words, not worlds, apart.

Although the dominant view of interdisciplinarity mobilizes metaphors suggestive of the scheme-content distinction, Holbrook argues that the view does not maintain that different conceptual schemes are incommensurable. Holbrook refers to this dominant view as the “Habermas-Klein thesis”; according to the thesis, speakers of different disciplinary vocabularies achieve integration by finding common ground to render their conceptualizations commensurable. The pursuit of common ground reflects a rejection of the incommensurability of different researchers’ conceptual schemes. Holbrook notes that the prevalence of the Habermas-Klein thesis indicates that interdisciplinary theorists find an ally in Davidson, who also rejects this incommensurability, but I would suggest that this alliance is tenuous. It is at least not obvious that alternatives to the “different lenses” view, alternatives that propose linguistic rather than ocular metaphors, avoid perpetuating the same scheme-content distinction. What theorists mean by these linguistic

metaphors is something that is revealed in action, in particular in the actions prescribed for overcoming linguistic barriers. If overcoming linguistic barriers amounts to learning which objects “correspond” to which disciplinary terms, then these prescriptions do perpetuate the distinction. For every linguistic metaphor, such as *translation*, there is an interpretation of that metaphor that steers clear of philosophical theorizing and an interpretation that steers straight into the storm.

In developing rival accounts to the Habermas-Klein thesis, Holbrook associates various interdisciplinary theories with philosophical allies. Holbrook offers two alternatives, the “Kuhn-MacIntyre thesis” and the “Bataille-Lyotard thesis,” that take different stances toward the relationship between culture, language, and the world. Briefly, the Kuhn-MacIntyre thesis maintains that languages are incommensurable, or roughly that there is no way of translating between languages without sacrificing meaning. The only way to actually learn another language is “from within” that language, and the polyglot who must constantly translate from his or her native tongue will never truly understand the new languages. The theorists that embrace the Kuhn-MacIntyre thesis double down on disciplinary cultures being worlds apart. The radical difference between different disciplinarians’ experience of the world renders translation between disciplinary languages impossible. This is exactly the conclusion that Davidson thinks that we must avoid, and Davidson cites Kuhn as the paradigmatic theorist of incommensurability.

While the Habermas-Klein thesis advocates a common language and the Kuhn-MacIntyre thesis insists that no such language is available, the Bataille-Lyotard thesis notes that we can appeal to a common language only up to a point, beyond which we must forge a new language (pp. 1874-1876). It is when communication fails to coordinate collective action that interlocutors must return to the process of socialization to imbue shared meaning into novel symbols. In these moments, “differends” in Lyotard’s nomenclature, speakers reject the legitimacy of available languages to adjudicate the dispute. The task of negotiating a new language to adjudicate such disputes is a daunting task precisely because it lacks the resources, the tools, that languages supply in pursuit of coordinated action.

By explicating radically different philosophical views, Holbrook brings into focus how these different views would support different theories of interdisciplinarity. If Davidson is correct that the scheme-content distinction produces contradictions, however, then either the Habermas-Klein thesis deserves endorsement for rejecting the distinction, or the alternatives should be cashed out in a way that also rejects the distinction. My own view

(discussed below) is that all three of these rival views differ only in how they emphasize different aspects of the complex relationships between experience (in particular, visual experience), language, and the world. They also differ in what they take to be the paradigmatic challenge of communication and their hope for solidarity in the face of this challenge.

While Davidson offers a concise argument against the scheme-content distinction, I instead draw on Wittgenstein (who influenced Davidson) to outline an account of interdisciplinarity that rejects the distinction. The promise of an anti-theoretical, Wittgensteinian account of interdisciplinarity is that it sustains an investigation of language while avoiding the confusions that follow from thinking of language as a conceptual scheme. Explicating Wittgenstein as an anti-theorist provides resources to establish these disagreements as merely disagreements of emphasis. Explicating Wittgenstein as a positive theorist provides resources for justifying solidarity in the face of those complex problems that motivate interdisciplinary inquiry.

Wittgenstein's Philosophy and Philosophy of Language

Davidson is hardly alone in his interrogation of the scheme-content distinction. Among Davidson's forbears, Ludwig Wittgenstein provides one of the more influential accounts of the relationship between language and the world. In what follows, I argue that Wittgenstein's account is especially helpful here for three reasons: (1) the account dissolves the scheme-content distinction and hence avoids the need to theorize the relationship between word and world, (2) the account wrestles with Wittgenstein's own earlier intuitions about this relationship that align with intuitions of interdisciplinary scholars, and (3) the account clarifies the role of philosophers in contributing to interdisciplinary societal challenges.

How does Wittgenstein understand the relationship between language and the world? This understanding is elaborated in Wittgenstein's *Philosophical Investigations*, often considered the defining achievement of Wittgenstein's later thought (1958).² In *Philosophical Investigations*, Wittgenstein is concerned with what must be the case in order for our language to refer to the world. Wittgenstein's predecessors, and indeed Wittgenstein's early work, had treated this inquiry as characteristically metaphysical and had mobilized philosophical theories about what must be the case about our thought and about reality in order for our thought to grasp that reality (e.g.,

² All further references to *Philosophical Investigations* cite the Section (§) of the text. The book is a collection of short aphorisms arranged into such sections.

Frege, 1956; Russell, 1918). Wittgenstein's approach to this problem is anti-metaphysical and decidedly naturalistic.³ The entities that figure into Wittgenstein's response to these problems are the very familiar entities that figure into our accounts of human socialization. As we are socialized into a shared community of meaning, we learn how to use words in particular situations. This socialization constitutes a second nature, a set of practices inherited from one's culture, yet this second nature is an extension of (and not an extension beyond) our first nature (i.e. our biological make-up). This assertion of continuity between our first and second nature suggests a radical departure from earlier philosophical theories—Wittgenstein does not explain how word and world are metaphysically connected, but instead questions the character of this distinction in the first place. As long as language is understood as a tool for *representing* the world, theorists will struggle to explain the relationship between representations and represented (scheme and content). Provide an alternative understanding of language that avoids this distinction, and these metaphysical quandaries seem much less urgent.

Wittgenstein's naturalism is attractive in part because of its simplicity—his later work eschews any elaborate theory regarding the emergence of second nature from first nature. Wittgenstein famously likens the learning of language to the totally mundane practice of learning how to play games. By learning “language-games,” we are trained to use words in particular situations. We learn how to use terms in our language to refer to experience in the same way we learn the rules for using the terms “rook” and “pawn” within the game of chess. This training is different from education in that we are not given reasons to speak one way or another, but rather we are disciplined to habitually associate certain situations with certain expressions. Speakers of a language cannot offer justifications for the words they use that are more satisfactory than a simple report that, as a member of a community, “this is simply what I do” (§217). From our earliest moments, we are disciplined by fellow human beings to make common judgments about the existence of objects and to figure these objects into rule-governed discourse: “If language is to be a means of communication there must be agreement not only in definitions but also... in judgments” (§242).

Wittgenstein is not alone in emphasizing the role of socialization in our experience, but part of the charm of *Philosophical Investigations* is that Wittgenstein confronts his own earlier attempts to theorize the word-world gap. *Philosophical Investigations* is composed of hundreds of remarks that

³ “Natural” here contrasts then with “supernatural”; Wittgenstein doesn't forward a naturalism that seeks to reduce experience to brute matter.

speak to philosophical confusions, and several of these remarks are directed to the author of *The Tractatus* (Wittgenstein's own work, and the defining achievement of his early thought). Wittgenstein engages what he takes to be confusions that lead philosophers to search for metaphysical theories. As interdisciplinary theorists ponder the philosophical commitments of their own work, they encounter the sorts of philosophical problems that Holbrook recounts regarding reality, incommensurability, and the like. Wittgenstein not only offers an alternative to many of our default assumptions about the relation of language to the world but also carefully considers the linguistic habits that give rise to these assumptions. According to *Philosophical Investigations*, problems arise "when language goes on holiday," or when we hastily presuppose that the meaning of a word in some uses must be the meaning of that word in any of its uses (§38). Wittgenstein refers to this investigation as "a grammatical one" (§90). He elaborates, "Such an investigation sheds light on our problem by clearing misunderstandings away. Misunderstandings concerning the use of words, caused, among other things, by certain analogies between the forms of expression in different regions of the language-game" (§90). If we carefully attend to how we learn to use words, and eventually concepts, through socialization, we quell our anxieties about how these words and concepts relate to the world.

Four Therapies for Interdisciplinarity

Wittgenstein's reflection on language takes the form of a diagnosis of philosophical confusions, and Wittgenstein models the role of the philosopher as offering treatment for the confusions. For Wittgenstein, philosophers do not solve philosophical problems; rather, philosophers provide clarity so that philosophical problems disappear:

The real discovery is the one that makes me capable of stopping doing philosophy when I want to.—The one that gives philosophy peace, so that it is no longer tormented by questions which bring *itself* in question. . . . There is not *a* philosophical method, though there are indeed methods, like different therapies. (§133)

Here I am concerned with redescribing interdisciplinary research so that "it is no longer tormented by questions which bring *itself* in question." Specifically, I am interested in making sense of interdisciplinary integration so that it is a social (and importantly communicative) achievement, rather than an

epistemological or ontological achievement.^{4,5} Interdisciplinary theorists continue to grapple with integration because they have framed the challenge as fundamentally philosophical in nature. As David Stone points out, many interdisciplinarians agree that the problems of interdisciplinary communication require epistemological solutions (2014). When these theorists are explicit about how epistemology might provide solutions, they offer theories that explain how content and scheme relate. Wittgenstein's therapies would discourage interdisciplinarians from looking for epistemological theories that seek to explain the use of a word by investigating, among other things, how physical events cause physiological phenomena, physiological phenomena cause mental phenomena, mental phenomena cause social phenomena, and so on (for example, Repko investigates how "the mind performs a *complicated chain of cognitive operations* in which it integrates disciplinary ideas" (2012, p. 328, emphasis added)). These quests presuppose a robust scheme-content distinction that must be bridged by epistemological and ontological theories; avoiding the distinction allows interdisciplinarians to avoid the theorizing. Below I consider four therapies that might quell theorists' anxieties about the possibility and method of integration.

Understanding is a Social Deed

We are trying to get hold of the mental process of understanding which seems to be hidden behind those coarser and therefore more readily visible accompaniments. But we do not succeed; or, rather, it does not get as far as a real attempt. For even supposing I had found something that happened in all those cases of understanding—why should *it* be understanding? (§153)

⁴ Because integration is here understood as a social (and particularly communicative) achievement, I typically discuss challenges as they confront researchers participating in interdisciplinary collaborations. The constitutive challenge, however, is the integration of two or more disciplinary languages, and this challenge confronts both interdisciplinary collaborations and interdisciplinary research conducted by a single investigator.

⁵ Epistemology and ontology have a role to play in interdisciplinary research, but their role is not as a foundation for that research. Wittgenstein shows that privileging epistemology and ontology (or philosophy more generally) reflects confusions such as the scheme-content distinction. The Wittgensteinian account of interdisciplinarity could still draw on epistemology and ontology to describe certain types of practices. Rather than serve as a foundation for integrating other disciplines, however, epistemology or ontology would be just another discipline in need of integration.

One symptom of the scheme-content distinction is the quest for epistemological theories that explain the connection between scheme and content. Wittgenstein noticed a tendency of epistemological theorists to seek this explanation in the ways that brains work. Among interdisciplinary theorists, this tendency is reflected in Allen Repko's work on the psychological and neurological bases of successful interdisciplinary communication. Repko develops his account of common ground in part by drawing on cognitive psychology, which "explains successful communication between individuals having different perspectives by exploring the way our brain subjectively constructs perceiving, seeing and acting" (2012, p. 326).

The trouble with this account is "that it does not get as far as a real attempt" (§153). In order to make sense of how we understand one another, we need to distinguish questions about reasoning from questions about the causal conditions for reasoning (Rorty, 1979). Cognitive scientists are not wrong that certain neurological processes accompany our ability to understand one another, and Repko is likely correct that, when we do understand one another, similar happenings go on in each of our brains. For Wittgenstein, though, this sort of explanation will not produce a satisfying account of how it is that we understand one another; in such cases, we want to know why it is that we *judge* a situation to be thus or so, or accept a statement *as a reason*, and these are conceptual, rather than causal, questions. Both the problem and the solution are not so much physiological in nature as social; understandings and misunderstandings are a product of similarities and differences in how we were trained. Philosophers mistakenly presuppose that understanding is a subjective affair, having missed that understanding is "constructed intersubjectively" and "socially constituted" (Dreyfuss, 2011, p. 77). We understand one another because we share the same ways of finding meaning in experience. Part of this is to say that talk of brains "constructing" can produce confusions, since it is actually communities engaged in socialization that do the constructing, and brains serve as part of the material of these constructions. For this reason, the construction of meaning is neither reducible nor explainable in solely psychological terms, since this would leave out the crucial role that social interaction plays. Interdisciplinary researchers will not be able to adjudicate disagreements by appeals to cognitive machinery, since part of the context of the disagreement is the social practices in which that cognitive machinery is embedded. Cognitive sciences help us to understand the causal conditions, and especially the physiological conditions, that serve as a platform for understanding.⁶ These conditions, though, fall short of explaining how we

⁶ Machiel Keestra offers an account of understanding (specifically, understand-

understand what one another mean; rather, we draw on these physiological abilities in the social achievement of meaning.

This therapy does not get us especially far toward understanding interdisciplinary integration, but it helps us to steer clear of ill-conceived epistemological investigations. At stake in interdisciplinary communication is not only what collaborators mean by their words, but more pointedly, which words will figure into the vocabulary used by the team. If languages remain incommensurable, collaborators will not know when each language is the appropriate one to use. Learning how different collaborators find meaning in their experiences will help researchers understand each other, but learning to speak multiple disciplinary languages is (as most interdisciplinary scholars point out) only an initial step in interdisciplinary integration (Repko, 2008; Newell, 2006).

Meaning as Reference and Meaning as Use

For a *large* class of cases—though not for all—in which we employ the word ‘meaning’ it can be defined thus: the meaning of a word is its use in the language. (§43)

What we call ‘*descriptions*’ are instruments for particular uses. Think of a machine-drawing, a cross-section, an elevation with measurements, as an engineer has before him. Thinking of a description as a word-picture of the facts has something misleading about it: one tends to think only of such pictures as hang on our walls: which seem simply to portray how a thing looks, what it is like. (These pictures are as it were idle.) (§291)

Another symptom of the scheme-content distinction is the conviction that different schemes must pick out different content in the world. If disciplinary languages reflect different conceptual schemes, then (according to scheme-content distinguishers) the reliability of disciplines testifies to these schemes “fitting” the world as it really exists. Given that many of our disciplinary languages are reliable, the world seems like it must be comprised of all of the different entities to which our disciplinary languages refer. This has led to ontological theorizing among both interdisciplinary theorists and other researchers working in interdisciplinary fields such as evolutionary biology

ing human actions) that explores the phenomena at different levels of explanation (2012). While Keestra appreciates that sociocultural contexts are an important dimension of the phenomena, his efforts to locate understanding “in” the individual, and “foremost [in] the brain,” stand in contrast to the view held here.

and environmental science (Eigenbrode, et al., 2007; Mitchell, 2002; Newell, 2001). Among interdisciplinary theorists, William Newell has given extensive thought to how the world must be in order for interdisciplinary research to accurately portray that world. Integration, on this model, is ideally a matter of expansively representing reality, and interdisciplinary research is ideally a matter of discovering as many entities and relationships as possible. This is, of course, a very daunting task, but it accords with our general sense of different disciplinary specializations referring to a different subset of the objects in the world. *Philosophical Investigations* playfully concedes that this sense is “a dream of our language” (§348).

Perhaps not unsurprisingly, this understanding of interdisciplinary integration is common—for Wittgenstein, this reading accords with one of our many prejudices about the way that language works, and “it is not a *stupid* prejudice” (§340). The trouble is that the turn to ontological theories reflects an investment in the scheme-content distinction that Wittgenstein and later Davidson would diagnose as a confusion. Cashing out the metaphor of conceptual schemes “fitting” reality requires that we encounter reality as the sort of thing that could figure into comparisons and justifications. Give up the conviction that our conceptual schemes work by referring to and corresponding to the objects “out there,” and the impulse to embark on ontological theorizing is quelled.

It is easier to give up this conviction when equipped with an alternative account of language, one that understands meaning as the use of a word rather than understanding meaning as reference. Wittgenstein offers this very different way of looking at language, one which sidesteps the idle picturing account of language and the scheme-content distinction that comes with it. For Wittgenstein, different disciplinary languages develop because different scholarly communities need different tools. Words only pick out entities in the world as part of a set of shared practices—“We may say: *nothing* has so far been done, when a thing has been named. It has not even *got* a name except in the language-game” (§49). Words are instruments, and their use only goes so far as the tasks at hand; less metaphorically, Wittgensteinians would stress that to understand the meaning of a word, one must look at how the use of that word coordinates human practices, human practices that are directed to one or another end. Peter Hacker (2013) elaborates:

To have mastered a certain concept is to have mastered the technique of the use of a certain word in some language or other.

To explain what one means by it in a given context, and to respond with understanding to its use. Concepts are human creations, made

not found. They are comparable to instruments made for human purposes, and their acquisition is comparable to the mastery of the technique of using an instrument. They are rule-governed techniques of word use. (p. 114)

What the different disciplines supply, then, is a set of descriptions for particular uses. These descriptions don't mirror reality like an idle picture on the wall; they facilitate our practical engagement with the world, like a machine-drawing or cross-section. The advantage of this understanding is that different disciplinary languages are not rivals, nor does each provide a picture that must be reconciled with others'. The root of the difference between disciplinary depictions is the different contexts within which each *works*, as we can only explain what we mean in a "given context" characterized, in part, by "human purposes" (Hacker, 2013). What needs to be integrated in this account, which I describe in some detail as the "Wittgenstein thesis" below, are the human purposes for which we use disciplinary descriptions. Pragmatics precedes semantics. Detached from the pragmatics of their contexts, disciplinary descriptions are merely idle pictures that cannot be integrated.

Something is Gained, but Something is Also Lost, in Analysis

To the *philosophical* question: "Is the visual image of this tree composite, and what are its component parts?" the correct answer is: "That depends on what you understand by 'composite'." (And that is of course not an answer but a rejection of the question.) (§47)

To say, however, that a sentence... is an 'analysed' form of [another] readily seduces us into thinking that the former is the more fundamental form; that it alone shews what is meant by the other, and so on. For example, we think: If you have only the unanalysed form you miss the analysis; but if you know the analysed form that gives you everything.—But can I not say that an aspect of the matter is lost on you in the *latter* case as well as the former? (§63)

A third symptom of the scheme-content distinction is the conviction that conceptual schemes can be broken down into their fundamental parts, and that these fundamental parts are what corresponds to objective reality. Again what establishes this conviction as a confusion is the assumption that anything is immediately given in experience that might immediately justify the use of one description over another. When interdisciplinary theorists recommend that researchers analyze complex disciplinary jargon into basic, easily verifiable concepts, they are succumbing to the myth that some concepts are given in

experience (see Sellars, 1956, for more on “the myth of the given”). Rick Szostak is one advocate among interdisciplinary theorists for analyzing complex concepts into basic concepts. Szostak offers examples of collaborators using the same word in different ways. In one example, economists attach a fairly rigid meaning to a term like “investment” while the economists’ collaborators interpret “investment” in a more ordinary, non-technical sense. In another example, various researchers assume different definitions for a complex concept such as “globalization” (2013). In these situations, according to Szostak, “the key lies in breaking down complex concepts—those that lend themselves to different interpretations across disciplines (or cultures)—into basic concepts that can be understood similarly across disciplines” (p. 35).

In early passages of *Philosophical Investigations*, where Wittgenstein is principally arguing against the views he espoused in his early work, Wittgenstein takes aim at the idea that complex concepts must be analyzed into their simple parts. He writes,

When I say: “My broom is in the corner”,—is this really a statement about a broomstick and a brush? Well, it could at any rate be replaced by a statement giving the position of the stick and the position of the brush. And this statement is surely a further analysed form of the first one.—But why do I call it “further analysed”?—Well, if the broom is there, that surely means that the stick and brush must be there, and in a particular relation to one another; and this was as it were hidden in the sense of the first sentence, and is *expressed* in the analysed sentence. Then does someone who says that the broom is in the corner really mean: the broomstick is there, and so is the brush, and the broomstick is fixed in the brush?—If we were to ask anyone if he meant this he would probably say that he had not thought specifically of the broomstick or specifically of the brush at all. And that would be the *right* answer, for he meant to speak neither of the stick nor of the brush in particular. Suppose that, instead of saying “Bring me the broom”, you said “Bring me the broomstick and the brush which is fitted on to it!”—Isn’t the answer: “Do you want the broom? Why do you put it so oddly?” (§60)

Wittgenstein appreciates that analysis seduces us (§63), since analysis is exactly what the conceptual scheme account of language would recommend. When meaning is understood as reference, then the imperative is to find the simple concepts that straightforwardly refer to the world. For Szostak and others, disagreements over the meaning of a complex concept appears resolvable by breaking “composites” down to their simple parts, and matching

these parts to the objects in experience to which they correspond.

Again, Wittgenstein's alternative account of language makes it easier to swallow the conclusion that "an aspect of the matter is lost on you in the [analyzed]case as well as the [unanalyzed case]" (§63). In the broomstick example, the analyzed form leaves out all of what can be said of brooms that cannot be true of "the broomstick and the brush which is fitted onto it"—this includes, at least, that we can sweep with brooms, that a request for brooms usually follows the diagnosis of a dirty floor, that it is time for chores, and so on. These are all language-games in which the word "broom" partakes, and (as Wittgenstein points out in his interlocutor's confusion) these are not language-games where the word "brush" or "broomstick" would do the trick.

More is at stake in analyzing complex concepts such as "globalization" or "investment," however. Certainly, breaking these complex concepts into simple parts may make it easier to operationalize complex concepts into observational terms. These terms may help to garner agreement in an interdisciplinary project—after all, Wittgenstein admits that something *is* gained through analysis. But what about what is lost? Szostak suggests that it is possible to analyze "globalization" to disambiguate the ideological, methodological, and theoretical assumptions that various researchers attach to the term. He recommends "concepts whose meanings are fairly clear" (p. 41), but what this entails hinges on whether one understands meaning as reference or meaning as use. In Wittgenstein's account of language as a set of tools, where the meaning of a concept is its use in language-games, those analyzing a complex concept are liable to lose sight of many of the sophisticated uses for which the complex concept was developed. Researchers with different ideological, methodological, and theoretical assumptions do not merely disagree about the definition of "globalization"; they disagree about what follows from judging a situation as an instance of "globalization." What follows from this judgment is part of the language-game within which "globalization" makes sense, and this language-game informs the concept's definition from the start. When a complex concept is analyzed into simple concepts that all researchers admit should figure into their definition, the researchers sacrifice meaning that is distinctive to their disciplinary language-games. These diverse meanings, which reflect the different purposes for which we develop different disciplines, are what interdisciplinarians find valuable about interdisciplinarity.

Disciplinary Languages Abide by Different Grammars

Asking whether and how a proposition can be verified is only a particular way of asking “How d’you mean?” The answer is a contribution to the grammar of the proposition. (§353)

Grammar does not tell us how language must be constructed in order to fulfil its purpose, in order to have such-and-such an effect on human beings. It only describes and in no way explains the use of signs. (§496)

The final symptom of the scheme-content distinction that I consider here involves confusions that arise when we assume that words always refer to the world the same way (paradigmatically, by pointing to the thing). By this view, interdisciplinary teams learn what one another mean by learning how to pick out the objects to which disciplinary terms correspond. While I have already discussed what is confused about the picture of language that undergirds this account, I want to complicate the Wittgenstein picture of language by elaborating his idea of “grammar.” The grammar of a language-game comprises the rules for how words relate to experience, and much of *Philosophical Investigations* is dedicated to mistakes that arise when we impose the grammar from one region of language on another. At stake is what is lost when we attempt to translate from one language to another. Translation is not merely mapping words from one language onto another, and when languages abide by different grammars, translation requires a great deal of care. Different disciplinary languages were developed to respond to different sorts of problems, and they do so while abiding by different grammars.

An example helps to illustrate this notion of “grammar.” The literature on risk assessment offers several cases of how words abide by different grammars in different contexts. Paul Thompson provides an analysis of how the word “risk” came to be used as a technical term in ways that betray the grammar of its usage in ordinary language (2012). For many risk assessors, risk is technically operationalized as the magnitude of a hazard multiplied by the probability of that hazard occurring. But in common parlance, Thompson reminds us, the use of the word “risk” requires that someone could *take* the risk or that the action is risky with respect to particular values—the word is inextricably bound up with purposive action, since only agents and not inanimate objects can take risks. Thompson’s point here is grammatical. In the context of risk assessment, the term “risk” abides by a different grammar than it does in ordinary usage; only in the former context would it be appropriate to use the term “risk” apart from agentic vocabularies that countenance

intentions, motivations, responsibilities, and so on. For the uninitiated, the risk assessor's grammar is confusing, or worse, disingenuous.

These grammatical confusions should not be surprising when we attempt to coordinate practices across language-games. According to Wittgenstein, the grammar of our language-games is not transparent to us, nor do practices with a similar form demand similar grammars.⁷ This grammatical opacity and diversity pose a real challenge to interdisciplinary collaboration; translating technical terms across vocabularies that abide by different grammars can result in the loss of a great deal of meaning. In the instance of risk assessment, the agentic grammar of risk in ordinary language is lost when operationalized by risk assessors to facilitate quantification and comparison between cases. Further, no amount of empirical inquiry will resolve which meaning of risk is appropriate, as inquiry presupposes the grammar that structures what we mean by our words. Interdisciplinary theorists appreciate these challenges, but the notion of "grammar" can help locate exactly what's troubling about translation. Different words in different language-games not only pick out different features of experience; how they pick out these features also differs across disciplines. For Wittgenstein, "grammar tells what kind of object anything is" (§373), so translating across languages with different grammars will require translating among things, processes, dispositions, and any of the other kinds of objects that we experience. It is not clear how or whether translation can accomplish this.

Recovering (from) Wittgenstein's Therapies

Where do these therapies for avoiding the scheme-content distinction lead us? First, they lead us away from several symptoms of the scheme-content distinction. Communication barriers to interdisciplinary integration cannot be resolved by analyzing mental processes. Nor will these barriers dissolve once we analyze disciplinary concepts into their ordinary parts; dismantling complex concepts abandons tools that have proved useful in disciplinary pursuits. If we think of language as a set of tools, and of meaning as the use of those tools, then we can avoid the confusions surrounding the scheme-content distinction. This account of language does not give rise to questions regarding which objects are real, which concepts are basic, and how objects and concepts connect. This constellation of philosophical questions is replaced by practical

⁷ While some Wittgensteinians take grammar to be arbitrary, it is at least the case that grammar does not strictly follow any general rules.

questions about what purposes and practices are appropriate for a situation. Answering these questions requires that we appeal to language-games other than those internal to a discipline, since it is exactly the appropriateness of disciplinary language-games (and not their context-independent truth) that is in question. In many cases, collaborators will agree on the relevant language-games to which to appeal; if they don't agree, they will have to invent that third vocabulary, as recommended by the Bataille-Lyotard thesis. On this view, Holbrook's three theses do not constitute *philosophical* disagreements over how language relates to the world, but rather practical disagreements over how to diagnose the communicative situation in a particular moment. While we angle for a universal picture of language, interdisciplinarians are better off conceding that any of these pictures might be appropriate given contingent features of the situation (particularly, whether all parties can agree to adopt a shared language for adjudication). This concession is consonant with the sense that philosophical disagreements can be safely set aside, and it finds support in the therapeutic reading of Wittgenstein.

The Wittgenstein Thesis: Agreement in a Form of Life

Later Wittgenstein can also be read as a theorist, and according to this reading he does offer a positive project for interdisciplinarians working on integration. This positive project is illustrated by one exchange in *Philosophical Investigations*, where Wittgenstein replies to an interlocutor: “‘So you are saying that human agreement decides what is true and what is false?’—It is what human beings *say* that is true and false; and they agree in the *language* they use. That is not agreement in opinions but in a form of life” (§241). For Wittgenstein, a form of life includes the ways that social practices are organized and social goals are prioritized. Agreement in a form of life is, on the one hand, agreement in social practices such as the use of language to effectively coordinate human interaction, and, on the other hand, agreement between the material world and the tools that we use to transact with the material world. Agreement is not “correspondence” between word and world, as it is according to the scheme-content distinction, but a matter of finding the world agreeable to our projects (see James, 1907, for an early articulation of this sense of agreement). I want to suggest that the central premise of a Wittgensteinian thesis, which serves as an alternative to Holbrook's three theses, is that integration means agreement in a form of life. This thesis maintains that (1) integration is not merely agreement in what we say, (2) integration requires coordination of the languages and practices that

we use to respond to problems, and (3) coordination is tested through our practical engagements with one another and with the material world, which together comprise what Wittgenstein called “the rough ground” (§107). It is our practices, which employ language to navigate complex problems, that are integrated through interdisciplinary research.

By explaining integration with an array of linguistic metaphors, interdisciplinary theorists suggest that integration amounts to agreement in the words we use. By a Wittgensteinian account of language, this would not be so far off; as acknowledged in the introduction, there is something correct about these metaphors. These theorists must be careful, though, that if they speak of agreement in a language, this is shorthand for agreement about how the interdisciplinary challenge should be described and addressed (how we ought to *use* language, which is prior to reference). And this agreement is a much more robust accomplishment than simply learning one another’s disciplinary vocabularies. Even if interdisciplinary collaborators agree about what one another mean by the words they use, they must still get on with the task of describing the problem and its solution with some assortment of these words. Importantly, however, this is not the same as creating a new language, as endorsed by the Bataille-Lyotard thesis. It is much closer to creating a pidgin or creole, in that different disciplinary researchers continue to wield disciplinary tools embedded in disciplinary projects.

How can collaborators reach agreement about how to describe and address a problem? Interdisciplinary theorists like Newell have argued that much interdisciplinary work is a matter of discovering the system of relations between disciplinary ontologies (Newell, 2006). Again there is something correct about this and something misleading. Interdisciplinary theorists should not be misled into thinking that a complete assortment of disciplinary perspectives, or even the emergence of novel interdisciplinary perspectives that fill in the gaps of existing perspectives, could provide a description of the problem that would secure agreement. Languages do not represent reality once and for all, but provide maps by which we navigate the world. Different disciplinary languages might be thought of as an array of different kinds of maps for a city; we could sit down with a map of the city’s topography, of public transportation, of property values, of political districts, of geologic formations, of species’ habitats, and so on. Which map we are going to follow depends of course on the task at hand. Yet if we take seriously that languages are more like maps than like mirrors, then two dead ends stand out. First, layering maps does not

seem to get us closer to reality—indeed, the whole notion of coming closer to reality drops out of the picture.⁸ Second, assembling a collection of maps provides little guidance for which map we should use. While interdisciplinary researchers should cast aside the daunting task of a comprehensive description, they face the equally daunting task of deciding whose goals should inform the selection of maps.

For Wittgenstein, agreement in a form of life is, in part, agreement in the use and development of tools to achieve communal goals. How *this* agreement is achieved is a daunting task for another essay, but here it is important to emphasize that integration amounts to balancing the tradeoffs in approaching the problem with different instruments (see Hirsch & Brosius, 2013, for a discussion of tradeoffs in the context of conservation and development). Once we understand disciplinary languages as tools that help us to realize different goals, then forging a creole or pidgin is a negotiation of which goals we should work to realize. This turn to the pragmatics of interdisciplinarity shifts the challenge of integration from a primarily epistemological project to a primarily ethical project (Piso, 2015). It reflects a departure from treating truth as the “pivotal explanatory notion” of meaning (Hacker, 2013, p. 130). It suggests that the third language to which incommensurable languages appeal is an ethical vocabulary that adjudicates between the appropriateness of disciplinary instruments by asking whether the outcome of their use would be just. Starting from a shared ethical vocabulary, rather than seeking an altogether new language, is what distinguishes adherents to the common ground approaches from adherents to the Bataille-Lyotard thesis. What initially appears as an interminable philosophical dispute over how language relates to the world should be instead recognized as a disagreement over the legitimacy of shared ethical vocabularies. Rather than constructing a new language, adherents to common ground approaches hold out hope that our shared language will sustain our form of life. That hope is the mark of solidarity (Rorty, 1989).

Finally, interdisciplinary theorists should remember that disciplinary languages do not always show their relations to one another. Because languages are not in the business of representing the world, languages for different purposes sometimes traverse the same terrain without acknowledging their proximity. Agreement in a form of life is not only agreement between human

⁸ The idea that disciplinary perspectives can be farther from or closer to reality is another entailment of the scheme-content distinction. Treating disciplines as sets of tools within reality is perfectly consistent with finding value in layering maps. Even after abandoning the idea of coming closer to reality, we can still use the layering of maps to locate contingencies in our engagements with reality that we might not otherwise anticipate.

beings and their goals; it is also agreement between practices and the material world, which also comprises what Wittgenstein called “the rough ground” (§107). Agreement is here not a matter of descriptions corresponding to the rough ground but rather describers finding the rough ground agreeable to their projects. Interdisciplinary researchers can encounter disagreements between their pursuits and worldly possibility, and these disagreements are felt in their pursuits failing. When our pursuits fail, we should recognize that the language we have used to describe the problem is perhaps part of the problem, and that we need to find a new way of speaking. In these cases, it *is* discovery that is needed, even if discovery alone will not adjudicate what pursuits are worth pursuing (Putnam, 2002). Interdisciplinary researchers must travel back and forth between deliberation and the rough ground, adaptively managing their goals and tools (Norton, 2005).

Conclusion

I follow Wittgenstein in appreciating that “the real discovery is the one that makes me capable of stopping doing philosophy when I want to” (§133). Interdisciplinary theorists have discovered the right set of metaphors in likening integration to the construction of a shared language. The trouble is that we have inherited a confusing account of language, one which features the scheme-content distinction, and one which demands epistemological and ontological theorizing. On that account of language, linguistic metaphors do not help us to avoid philosophical confusions; they exacerbate them. *Philosophical Investigations* prescribes therapies that avoid the scheme-content distinction and its symptoms. By appreciating the ways that (1) understanding is a social deed, (2) language is a set of tools, (3) analysis into simple concepts loses meaning, and (4) the grammar of different language-games complicates translation, interdisciplinary theorists can stop doing philosophy when they want to. These therapies offer a redescription of interdisciplinary research that “is no longer tormented by questions which bring *itself* [the very possibility of interdisciplinary integration] in question” (§133).

Language is not a means of representing reality but a means of participating in and reconstructing reality. On this account of language, linguistic metaphors point us to the real challenge of integration: reaching agreement in a form of life. Interdisciplinary researchers face the daunting task of deciding which disciplinary languages to use in the amelioration of complex problems, and this decision concerns tradeoffs between different ways of managing these problems. The integrated understanding of complex problems is the

understanding that anticipates these tradeoffs and balances them in keeping with the values of the broader community. Integration *is* finding common ground, but it is not our common perceptions that provide this grounding. Agreement in a form of life is agreement in the purposes and projects that interdisciplinary integration helps us to harmonize.

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