WHAT KIND OF SCIENCE IS LINGUISTICS?

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More specifically, what kind of science is *theoretical* linguistics – i.e., the study of the syntactic, semantic, phonological, morphological and orthographic *structure* of language?

Well (one might ask), what kinds of sciences *are* there? The most fundamental distinction to be made is between sciences that are *empirical* and sciences that are *formal*. Empirical sciences, such as physics, chemistry and biology, are *a posteriori*, essentially involving observation and experimentation. Formal sciences, such as mathematics and logic, are *a priori*, and essentially involve intuition, reasoning and proof in place of observation and experimentation. Both kinds of sciences also feature theory construction as a central component.

Historically, there are three main positions in the foundations of linguistics, which are distinguished by what they take the ontological status of languages to be. Linguistic *nominalists* hold that languages are collections of physical objects – marks and sounds. Linguistic *conceptualists* hold that languages are psychological objects, such as mental representations of rules or grammars. Linguistic *realists* hold that languages are abstract (non-spatiotemporal) objects. It is frequently assumed in debates among adherents of these positions that the status of a science is determined by the ontological category of its objects of inquiry,[1] and, hence, that a science is empirical if and only if its objects of inquiry are empirical (i.e., observable, concrete

[1] Thus, Katz 1996 (282): "... the nature of the objects which constitute the subject-matter of a science determines the nature of the science."

(spatiotemporal) entities and phenomena). Thus, nominalists hold that linguistics is a physical (empirical) science, conceptualists that it is a psychological (probably empirical) science, and realists that it is a formal (non-empirical) science.

Historically, linguistic nominalists (the American structuralists) adopted the extreme physicalism of the logical empiricists (the Vienna Circle), with its attendant view about the status of empirical science. Since on this view only concrete particulars are real, only empirical science is genuine science, and all inquiry into alleged non-physical reality is pseudo-science. Thus, the nominalists held that linguistics, if it is to be a real science, can be concerned only with physical, observable objects and phenomena. Such purported entities as "ideas" (subjective mental things) and abstracta are not empirically accessible, and, hence, hypotheses about them are not amenable to third-person scientific methods of evaluation. So they can play no role in the constitution or scientific study of language. Marks and sounds, on the other hand, are empirically observable physical objects, and so are fit for genuine scientific study. Hypotheses about them (e.g., concerning their distribution) can be objectively confirmed or disconfirmed. Hence, the nominalists held that languages are just collections of marks and sounds, and that linguistics is the empirical study of them.[2]

[2] It is not clear whether the logical empiricists were more fundamentally motivated by ontological or epistemological concerns. On the one hand, they had a shared aversion to traditional metaphysics and its mysterious non-physical entities. On the other hand, they were impressed with the abject failure of philosophy to make significant progress on its central metaphysical questions, and the contrasting brilliant successes of the empirical sciences. If their motivation was primarily their constitutional distaste for the non-physical, then their empiricism

Linguistic *conceptualists* hold that languages are mental objects of some kind, and that linguistics is thus branch of psychology. Whether or not this makes linguistics an empirical science depends upon the nature of the relevant mental objects. It is possible to be a Cartesian about the mental, and hold that the relevant psychological entities and phenomena are not physical and, hence, that linguistics is not an empirical science. In this case, our access to linguistic reality would be entirely through conscious introspection, and linguistics would be a discipline more like traditional Phenomenology than modern psychology. However, linguistic conceptualists have typically maintained that the relevant psychological structures (e.g., the "language organ") are *brain* structures and, hence, that psychology is, ultimately, a branch of biology. So, for most linguistic conceptualists, linguistics is an empirical science, since psychology is.[3]

In contrast to both the nominalists and the conceptualists, linguistic *realists* hold that

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can be seen as a non-foundational corollary. But if their motivation was primarily epistemological, then their physicalism (and nominalism) can be seen as a non-foundational corollary. Linguistic nominalists can thus be understood as arguing either that languages are marks and sounds because linguistics is empirical, or that linguistics is empirical because languages are marks and sounds. In both cases, however, it is clear that the status of the science and the nature of the objects it studies go hand in hand.

[3] Since spoken and written expressions (sounds and marks) are not mental objects, conceptualists must hold either that such things are not linguistic at all, or that they are not the fundamental or most important linguistic entities, or that only part of linguistics (the theory of syntax – grammar) is psychological.

languages are abstract (non-spatiotemporal) objects. Sentences are *types*, and as such are in the same ontological category as numbers, sets and propositions. They are not things that can be discovered or studied using empirical methods. Hence, given the assumption that a science is empirical if and only if its objects of inquiry are concrete, according to the realist linguistics must be a formal science, on a par with mathematics and logic, and its methods must be non-empirical.[4]

I think this way of thinking about the foundations and status of linguistics is mistaken. It is not true that the ontological category of the objects constituting the subject-matter of a science determine its nature, or that a science is empirical if and only if it studies concrete objects. Empirical sciences may, and typically do, have abstract objects as their ultimate objects of inquiry. Moreover, it is not the case that the empirical/formal distinction is exclusive. A science may have both empirical and formal aspects or departments (as, indeed, I will argue, may be the case with linguistics).

All sciences are, fundamentally, are concerned to discover *generalizations*. But the *objects* of generalizations are *types* (or *kinds*), and types (kinds) are abstract objects. Hence, all sciences, whether "empirical" or "formal," have abstracta as their ultimate objects of inquiry.

Physics, for example, is in the business of discovering general truths – *laws* – about such things as particles, fields, forces and processes, as *types* (*kinds*). Physicists want to know what is

[4] Katz 1996 again (292): "Given that grammatical questions are about types, that is, about abstract objects, they cannot be answered on the basis of causal interactions with natural objects."

true of electrons *in general* (electrons as a kind of particles), not some particular electron.[5] Likewise biology (*species*, *biomes*), chemistry (*acids*, *enzymes*), astronomy (*spiral galaxies*, *M-type stars*), zoology (*mammals*, *insects*), and all of the other empirical, natural sciences. Any theoretical science, whether empirical or formal, seeks systematic accounts of its proprietary kinds, and so is ultimately concerned with discovering the nature of abstract objects of various kinds.[6]

This is, of course, not to say that individual electrons, animals or stars are abstract objects. Nor does it follow that physics, biology and astronomy are subdisciplines of mathematics or logic. Clearly, there are important differences between the natural and the formal sciences. For one thing, natural scientists are not concerned with studying *all possible* kinds of their proprietary sorts. Biologists, for example, are interested in studying *actual*, not merely possible, species (though these latter might be of interest as entailed by general theoretical principles). Mathematicians and logicians, in contrast, are centrally concerned with what is possible, since this forms their (actual) domain of inquiry.

I do not want to deny that there is a real distinction between empirical and formal sciences. But I do want to deny that the distinction depends upon the ontological categories of

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[5] Though of course facts about particular electrons constitute evidence for the theory of electrons as a kind. This point will take center stage shortly.

[6] If you do not think types are abstract objects, then read the argument as follows: *even if* physical, biological, etc. types were abstract objects, this would not make physics, etc. formal sciences; hence, it is not the case that a science is empirical if and only if its objects of inquiry are concrete.

the objects of their generalizations, since these are one and all abstract objects – *types* or *kinds*. What determines what kind of science a science is is, rather, its *methodology*. It is *how* its proprietary kinds are discovered and investigated that is important – that is, how we come to know which types are proprietary, and how we determine their nature. Methodology is in turn determined by ontology, but not by the ontological category of the proprietary kinds, the ultimate objects of inquiry, or "subject-matter" of the science. Rather, it is the category of the *tokens* of those types that is relevant. Since truths about types are obtained by generalizing upon facts about their tokens,[7] *their* ontological categories determine which methods of inquiry can or must be used. If the proprietary tokens are spatiotemporal objects, empirical methods are appropriate for the discovery and study of the types; if they are abstract objects, formal methods are required.

In physics, facts about individual concrete, observable (albeit indirectly) electrons are evidence for the theory of electrons as a kind. And this is what makes physics an empirical science. We can call this "Methodological Nominalism," and contrast it with the "Ontological Nominalism" characterized above. Ontological Nominalism says that a science is empirical if and only if its objects of inquiry are physical. Methodological Nominalism says that a science is empirical if and only if it studies its proprietary abstract kinds through empirical observation of their physical tokens.

If the tokens are psychological objects, then psychological methods are called for. We

[7] *This* sample of aluminum conducts electricity, *that* sample of aluminum conducts electricity, ...; hence, *aluminum* conducts electricity. Higher-order generalizations go from facts about types to facts about higher-order types: *aluminum* is a metal and conducts electricity, *copper* is a metal and conducts electricity, ...; hence, *metals* conduct electricity.

can call this "Methodological Conceptualism," and contrast it with "Ontological Conceptualism." Ontological Conceptualism says that a science is psychological if and only if its objects of inquiry are psychological. If psychological objects in turn are physical (e.g., brain states or structures), then Ontological Conceptualism collapses into Ontological Nominalism, and psychology is the study of a kind of physical (biological) objects. If on the other hand psychological objects are not physical, then Ontological Conceptualism implies that psychology is the study of such non-physical (though non-abstract, since they exist in time) objects. Methodological Conceptualism says that psychology is the science of psychological types, which are abstract, and that the status of psychology, whether it is empirical or introspective, is determined by the nature of the tokens of those types.

If the syntactic rules of English are represented in the brains of competent speakers of English, then knowledge of those rules could, at least in principle, be gleaned from the study of competent speakers' brains. (This need not involve surgery.) This is completely consistent with holding that sentences, and the rules that generate them, are abstract objects. It simply does not follow (as Katz, Postal and others seem to think) from this kind of conceptualism that sentences themselves are psychological objects. But even if it did, we could still think of sentences as psychological *types*, and, if we wanted to insist that there are infinitely many of them, we could consistently hold that some (most) of these types are untokenable by finite minds.

Perhaps some conceptualists conceive of the "generation" of sentences by rules that are mentally represented as actual *production* of them. But one need not think this way. One may just as well say that the infinitely many abstract sentence-types of a language are not *generated*, but have structures that can be accurately *described by* recursive rules. It no more follows (*pace* intuitionists and constructivists) that someone or something has to *put them together* than that the

range of a recursive function on numbers (i.e., *numbers*) does not exist until the function is applied to them. Recursive rules are not like machines (or people) in a factory assembly line.

If the tokens are abstract, formal methods are required. We can all this "Methodological Realism," and contrast it with "Ontological Realism," which says that a science is formal if and only if its objects of inquiry are abstract. Methodological Realism says that formal methods are required only if the types that are the objects of inquiry have abstract tokens. On this way of categorizing disciplines, mathematics and logic turn out to be formal sciences, since the types they study – *prime number*, *rectangle*, *proposition*, *set* – have abstract tokens, while physics, biology and astronomy are empirical, and psychology is either empirical or introspective.[8]

In sum, the sciences study types, and the natures of types are discovered by studying and generalizing from facts about their tokens. What kind of discipline a particular science is, is determined by what kinds of tokens its proprietary types have. So we cannot infer from the claim that physics and biology use empirical methods that they are not in the business of discovering and describing abstract objects. Nor can we infer from the claim that languages are

[8] Geometry is an interesting case. Physical "rectangles" are not rectangles, since they are three-dimensional, while rectangles are two-dimensional. Yet in geometry we do reason from three-dimensional physical representations to conclusions about abstract two-dimensional particulars. The properties we abstract from the representations, in a process of idealization, are properties of abstract tokens, from whose properties we learn about the abstract types. So, though tokens of two-dimensional geometrical types are themselves abstract objects, we study them (in part – pure definition and reasoning also play a role) by studying concrete tokens of similar three-dimensional types, ignoring the obvious differences.

abstract objects that linguistics is a formal science. It depends on *what kind* of abstract objects languages are, in particular, on what kind – abstract or concrete – of tokens their proprietary types have.

So the relevant questions to ask about linguistics are What are its proprietary kinds? and What kinds of tokens do those kinds (types) have? To begin, we can say that the linguistic kinds are, at least, *language, languages* and *sentences* (*expressions*). Thus, we can ask questions such as What is language? What is *a* language? What kind of language is English? What are the properties of English sentences in general? and What are the properties of this particular English sentence?

To fix ideas, let us focus on (English) *sentences*. Sentences appear to be *types* – they are repeatable, shareable entities. A sentence tokened (uttered) at one time can be tokened (uttered) again at another time. And a sentence can be tokened more than once at a given time. These are the hallmark properties of types (universals). We count sentences in two ways. There are two correct answers to the question how many sentences there are in the box below:

The present king of France is bald.
The present king of France is bald.
The present king of France is bald.
The present king of France is bald.

We can say that there is one sentence, and we can say that there are four sentences. Intuitively, however, the correct thing to say is that there is *one* sentence written four times: there are four tokens of one sentence type. Counting by types seems more fundamental. There is only one

sentence ‘The present king of France is bald’ in English (just as there is only one letter ‘e’ and one word ‘the’), and it is written four times in the box. Thus, if types are abstract objects, then so are sentences. And if languages are sets of sentence, then languages are abstract objects too.[9]

But, again, it does not follow from this that theoretical linguistics is a formal science. In order to determine what kind of science linguistics is, we must consider what sorts of methods are used for studying the tokens of the relevant types. Since written and spoken sentence-tokens are physical objects (the marks and sounds focused on by the nominalists), orthography and phonetics (phonology) will employ physical/empirical methodology to study these aspects of sentence structure, and so will count as empirical subdisciplines of linguistics.[10]

But sentences have syntactic and semantic properties as well. Perhaps we can think of them as bundles of types of various kinds, or complex types. So the nature of syntactic and semantic types would have to be determined before a final verdict on the status of linguistics could be reached.

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[9] In fact, it is *not* the case that the *sentence type* ‘the present king of France is bald’ is tokened four times in the box above, since there are no phonetic tokens there. So what we must say is that a *part* of a sentence type is tokened, or (equivalently, I think) that a sentence is *partially* tokened, in the box.

[10] I am not clear about the status of morphology, since morphological properties are at least in part *grammatical*, and so might better be classed with syntactic and/or semantic properties. Morphology itself might be a mixed science (even “generative,” in the sense of the generative semantics of the 1960s and 70s). Likewise phonology. I leave the application of my argument to these branches of linguistics to the experts.

While the determination of the status of phonetics (phonology) and orthography is straightforward, syntax seems to me to be much more problematic. For, it is not obvious (at least to me) what of kinds of tokens syntactic types (structures) have – or indeed if they are even tokenable types at all. It is plain that they are not intrinsic properties of marks or sounds. For example, the string of marks

(*) John is eager to please the present king of France

has, *qua string of marks* (physical objects), only *geometrical* structure: it is a series of physical tokens of shape-types. Moreover, being a proper noun is not an intrinsic property of the series of shapes 'John'; nor is being the direct object of 'please' a property instantiated in the series of shapes 'the present king of France'. So it cannot be that (*) has syntactic properties in the way in which it has orthographic properties – or the way in which an utterance of it would have phonetic properties. The marks and sounds do not have syntactic structure intrinsically; *they* are not tokens of syntactic types. (The existence of *covert* syntactic structure – e.g., the presence of PRO or *trace* in the syntactic structure of a sentence – only strengthens this point.)

If written and spoken sentence tokens do not *instantiate* syntactic structures – that is, if they are not *intrinsically* related to them – then if they *have* them it must be by being *extrinsically* related to them in some way, or to something that does instantiate them. If we suppose, for example, that it is *meanings* that have the structures syntacticians assign to sentences, then written and spoken sentence tokens would have syntactic structure in virtue of having meanings. And since marks and sounds do not instantiate meanings either, the *having* relation between sentences and their syntactic structures would remain extrinsic in this case.

Alternatively, syntactic structures could be structures of mental representations, in which case syntax would be a department of psychology, and hence empirical if psychology is. It does

seem unlikely, however, that – even given a language of thought – brain states *literally* have syntactic structure. For example, it does not seem to make sense to talk about neural assemblies, or patterns of activation, being, e.g., in the C-command relation. (But, again, I leave matters to the experts. I am simply concerned to argue that if syntactic types (as opposed to generative rules) are tokened in the mind/brain, then the methodology of syntax is that of psychology (or neuroscience, or whatever).)

Another possibility is that syntactic structures are not tokenable types at all – that they are, rather, abstract particulars (like numbers), which are not *instantiated in* (*tokened by*) *anything*.

This strikes me as very implausible. While the relations between marks and sounds and their meanings and syntactic structures do not seem to be *intrinsic* (that the marks and sounds of English have the syntax and semantics they do is in some sense contingent) the relation between meaning and syntactic structure seems much more intimate. It does not seem possible that, for example, the *proposition* that the present king of France is bald has a structure that is arbitrarily related to the syntactic structure assigned to the sentence that expresses it. Surely *some* syntactic structure is *logical* structure, and logical structure *is* the structure of propositions. It scarcely seems coherent to hold that (e.g.) the syntactic relation *being the direct object of* is *arbitrarily* mapped onto (or from) the logical relation predicated of István and his dogs in the proposition *István walked his dogs*, or that 'the greater of *a* or *b*' is ungrammatical while 'the greater of *a* and *b*' is not, has nothing to do with the logic of the greater-than relation. (This notwithstanding the fact that some grammatical rules – e.g., against splitting infinitives, ending a sentence with a preposition or beginning a sentence with a conjunction – do not have much to do with *meaning*.)

Thus, it seems most plausible that syntactic structure – at least *deep* structure (e.g., the

kind of structure represented at LF), as opposed to *surface* structure (e.g., arbitrary things like word order) – is kind of *meaning* structure (i.e., a kind of structure that meanings have). If this is the case, then the fate of syntax is intertwined (at least) with the fate of semantics.

One might argue that semantics is methodologically empirical, since its task is to determine what the meanings of words, terms and sentences in a particular language are, and this can be done by asking native speakers what the expressions of their languages mean. Thus, even if languages are (Lewisian) functions from strings of abstract mark- or sound-types to abstract propositions, determining *which* language a given population speaks – i.e., which of those functions is English, or Hungarian – is not a "top-down" enterprise, requiring a priori non-empirical access to abstracta. We need only determine though interrogation or observation what competent speakers mean when they use linguistic expressions of their languages, and theorize about the results.

This strikes me as rather like saying that mathematics is empirical because we can discover mathematical truths by asking mathematicians what they think about numbers. There is a more fundamental issue that is being evaded – *viz*., how it is that one's informants know what they know about the abstract objects in question in the first place? If speakers' reports about which meanings go with which expressions are a source of data for semantics, then the reliability of such data depends upon the reliability of the informants. And this in turn depends upon *their* having access to the meanings of their expressions (as well as to the facts about how those meanings are paired with the expressions of their languages). Presumably they do not accomplish this by having someone ask them what they mean. Presumably, competent speakers have a kind of privileged access to what they mean – *they* know in a way the investigator does not. (Though of course investigators have the same sort of access to what *they* mean by their

words.) In the case of mathematics, if we rely on the reports of mathematicians it is because we suppose that mathematicians have access to the facts about numbers. They have their ways. (Which, of course, at least in the nearer reaches of the numerical underworld, are our ways as well.)

The question then becomes how speakers have access to meanings. And this in turn depends upon what meanings *are* – i.e., assuming that they are abstract objects, whether they are tokenable types or not, and, if so, what the ontological status of their tokens is.

Sentence meanings are typically taken to be *propositions*, which are typically taken to be mind- and language-independent abstract objects having truth-conditions essentially. Further, such things are usually held to be such abstract *particulars* (i.e., not types) as n-tuples of objects and properties, functions, or sets of possible worlds. If sentence meanings are understood in this way, then semantics, the study of meanings, is a formal science, since meanings so understood do not have tokens at all (though they are themselves abstract tokens of higher-order abstract types). On this view, our apprehension of meanings is non-empirical. We discover and investigate them through intuition and a priori reasoning (e.g., postulates, proofs, models), much as we discover and investigate numbers.

Some philosophers are very worried about ending up having to say that a science, even mathematics, is about abstract, non-spatiotemporal objects, since such objects would seem to be inaccessible to spatiotemporal scientists. It seems to me that the way out this problem (Benacerraf's epistemological problem for platonism[11]) is to maintain that numbers – and all other abstract particulars – are *theoretical entities*. If we reflect on *why* anyone thinks there are

[11] Benacerraf 1973.

such things as numbers, and *why* anyone thinks numbers are non-spatiotemporal, it should become clear that these things are not *encountered* in perception or thought, and then investigated. (Though, I would argue, *concepts* of numbers *are* encountered in thought.) They are, rather, *postulated* in order to explain certain facts (e.g., that the sentence '2 + 3 = 5' is true), and to account for our intuitions about what such things could be (e.g., that it is *absurd* to suppose that 5 has mass, location, size, charge, credit rating, etc.). Similarly, reasoning from intuitions about the similarities among things, the repeatability of properties and relations, the impossibility of, e.g., *red* becoming *green* (though all red *things* change their color to green), and so on, leads to the hypothesis that types and universals exist, and are non-spatiotemporal. There may in fact *be* no such things; but it is wrong to suppose that the only reason one can have to believe in their existence is that one has had perceptual or cognitive *contact* with them. Moreover, it is not clear that a hypothesis has to be even eligible for empirical confirmation or falsification in order to be scientifically legitimate. (Some recent theories in physics and cosmology, for example, include empirically untestable hypotheses.)

But if speakers have *direct* access to meanings – i.e., if they are not theoretical entities, but things we do have direct cognitive contact with – then thinking of them as untokenable abstract particulars would entail that they have direct intellectual contact with abstract objects. And this would seem to require a kind of cognitive faculty that few believe humans possess.

On the other hand, if we suppose that linguistic meanings are identical to thought contents,[12] then there is a way out of this problem. For there are good reasons to think that

[12] This is the default (though by no means uncontested) view in analytic philosophy of mind and language. The thesis that the intentionality of language is inherited from the

thought contents are directly accessible *introspectively* as a kind of *experience*.[13]

I have argued elsewhere (Pitt 2004) that it is possible for a thinker to know the contents of his occurrent conscious thoughts (i.e., *what* he is occurrently consciously thinking) introspectively and non-inferentially, but that this could only be possible if occurrent conscious thoughts had a *sui generis* kind of phenomenology – what I called a "cognitive" (or *conceptual* or *propositional*) phenomenology. According to the view I call "intentional psychologism" (Pitt 2009), there is a phenomenology of occurrent conscious thought that is *proprietary*, *distinctive* and *individuative*. By 'proprietary' I mean peculiar to thought, and as different from more familiar kinds of phenomenology (visual, auditory, olfactory) as they are from each other. By 'distinctive' I mean that thoughts with different contents have different phenomenologies of the cognitive kind. Conscious thoughts are distinguished one from the other in the same way that visual, auditory and olfactory experiences are – phenomenologically. By "individuative" I mean that the cognitive phenomenology of a conscious thought is its content – in the way that the phenomenology of a visual or auditory experience is its content. To think that *p* is to token a maximally determinate complex cognitive phenomenal property – i.e., to have a specific kind of cognitive experience. Thoughts are individuated by their contents, which are experiences, and such experiences, qua types, are repeatable and shareable.

This view is further supported by considerations concerning the individuation of conscious states generally (see Pitt 2011). Since conscious experiences *as such* (i.e., *qua*

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intentionality of thought is what prompted philosophers to pursue meanings into the mind, and to found the 20th century "psychosemantics" industry (whose captains were Dretske and Fodor).

[13] Soames 2015 defends a similar view of meanings.

conscious states) are individuated phenomenologically, conscious thoughts, which are not reducible to experiences of more familiar kinds, must have their own, proprietary, distinctive and individuative propositional phenomenologies. The first (epistemological) argument claims that *we* distinguish conscious thoughts one from another, and from all other kinds of conscious states, on the basis of their proprietary phenomenology, while the second (metaphysical) argument claims that *they* are distinguished, one from another and from all other kinds of conscious states, on the same basis.

So, if linguistic meanings are thought contents, the study of meaning is the study of experiences of a certain kind, and the methodological status of semantics depends upon how experience is studied. At present, empirical psychology (experimental psychology, neuroscience, cognitive psychology, et al.) has nothing at all to tell us about how it is (how it *could be*) that brain activity gives rise to consciousness. So we cannot rely on it to tell us anything about the nature or structure of (cognitive experience) – at least not in the first instance. Insofar as it is useful (and I am *not* saying it is not) in the study of consciousness, empirical psychology depends upon independent access, through subjects' introspective reports, to the phenomena in question. These form the foundation of the study of consciousness and experience. Discovering the "neural correlates of consciousness," foundational to the establishment of an empirical theory of consciousness, itself essentially depends upon first-person access to conscious states. Without it there would be nothing to correlate, nothing to explain, nothing to theorize about. So, at least for the present, the study of experience, and of meaning, is (on the present view) fundamentally an introspective enterprise. And the status of introspection itself, as a form of observation, will determine what sort of science semantics is.

Is introspection empirical? Well, it is in the sense that it involves *experiential* access to

its objects. Yet at the same time it is not, in the sense that it does not afford *intersubjectively shareable* access to its objects. The latter fact may to some extent be ameliorated by the possibility of shareable *indirect* access, as can be achieved by empirical psychology. But, again, I would argue that such empirical methodology is not foundational in the study of experience, or, in consequence, on the view put forth here, the study of meaning (and perhaps syntax). The primary access we have to semantic data, as to experience in general, is introspective. This need not render semantics "unscientific" (in the sense that Introspectionist psychology was deemed to be such), or unrigorous. There is careless, sloppy, undisciplined introspection, and there is careful, precise, systematic introspection. The latter is, I would argue, exactly what able semanticists (and perhaps syntacticians) are good at.

So far, then, linguistics would seem to be a mixed science, having straightforwardly empirical departments – orthography, phonetics – whose token objects of study are concrete, and a psychological department – semantics – whose token objects of study are a particular kind of conscious experiences. Whether or not this is another empirical part of theoretical linguistics depends upon the epistemic status of introspection.

The outstanding question (for me, anyway) concerns the status of syntax. If (*pace* my arguments above) syntactic structures are literally instantiated by written or spoken sentence tokens, then syntax is a physical science. If they are instantiated by meanings, then syntax is (on the view developed here) a psychological science. If they are abstract particulars not instantiated by anything, then syntax is a formal science.

One need not agree with me about the nature of meaning, the status of the psychology of conscious experience or the place of syntactic structure in order to accept the main point of this paper, which is, to repeat, that the kind of science a science is, is determined not by the

ontological status of its ultimate objects of inquiry, but by the methods used to study them. Even if these ultimate objects are abstract, it does not *follow* that the science is formal. What determines the status of a science is not the ontological category of its proprietary *kinds*, but its methodology; and what determines its methodology is the ontological category of its proprietary *tokens*. Since theoretical linguistics is methodologically diverse, it is more than one kind of science.[14]

[14] I have benefitted from discussion of these issues with participants in the workshop on realist linguistics held at the University of Braunschweig, June 2015, especially Geoff Pullam and Ryan Nefdt.

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