DOMAIN CONFUSION

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INTRODUCTION

Hard Science Linguistics (HSL), Yngve 1996, was motivated by a realization that is at once simple and profound. Many intellectual pursuits, linguistics among them, are subject to domain confusion. For the purposes of this paper, a "domain" is an area of study or of intellectual interest usually, but not always, ordered or structured in some way. Yngve 1996 breaks the study of domains into two large categories called the "physical domain" and the "logical domain". These two terms do not refer to the disciplines of physics and logic but, rather, to general ways of studying anything. One might think of the physical domain as including the entire "real world" with its objects[1] subject to various forms of physical tests. The logical domain is the domain of pure theory often unconnected to the real world. It might be easier to think of what HSL calls the "logical domain" as the "theoretical domain". The logical domain consists of the study of intellectual objects which are not subject to the same sorts of tests as are the objects in the physical domain. HSL uses the terms "physical domain" and "logical domain" as conveniences to refer to scientific studies of real world objects (the physical domain) and philosophical studies of theoretical objects (the logical domain).

HSL does not object to theories or theorizing. Insofar as theories are formed to describe how some portion of the real world works by simplifying and testing sets of similar observations, they are perfectly acceptable and useful. Domain confusion does not occur because we create theories. Domain confusion occurs because we create theories about the wrong things. More specifically, domain confusion occurs when a theoretical object is studied as though it were a real world object. We may conveniently use theories to tell us what the real world is like; however, we must keep in mind that neither theories nor theoretical objects are real in the sense that physical domain objects are real.

Linguistics is full of such confusion although linguistics is not the only discipline in which domain confusion occurs. The notion of domain confusion is a general notion rather than one specifically found in linguistics. Domain confusion can occur in any discipline at any time, especially when theories have a lengthy history. For example, talking about and studying "the economy" confuses a theoretical object (the economy) with real world objects (people creating or providing goods and services). One might say that talking as though theoretical objects were real does no harm and is merely a shorthand way of expressing complex ideas. In many cases this is so but not in all cases. The greatest danger created by domain confusion is the danger that domain confusion will not be noticed. This danger is quite severe for linguistics. The remainder of this paper will briefly note some aspects of domain confusion in our discipline. Many of our comments have already been made in other papers or in other conferences. They have often met with anger, lack of acceptance or misunderstanding. Many linguists new to HSL might think that by noting domain confusion, HSL researchers are merely saying "our school of linguistics is preferable to yours". This is not the case. Domain confusion is <u>not</u> a preferred term which masks some more traditional linguistic concern. HSL developed as an attempt to reconstitute linguistics <u>because</u> domain confusion exists and because it is pernicious.

Before proceeding further, we should note that logic and other philosophical disciplines have long noted a problem related to but not identical with domain confusion: reification. "Reification" or "hypostatization" treats a theoretical object as if were a real, concrete thing. By unconsciously reifying a theoretical object, researchers are led into making unsound arguments when they claim that manipulations that are only possible on real world objects are performable on a concept or that a concept developed to explain a portion of the real world has no relation to the concrete things which it was intended to describe. Domain confusion is not the same problem as reification. "Reification" refers to confusing a theoretical object with a real world object. Domain confusion is the problem of creating theories from discussions and analyses of theoretical

(often reified) objects rather than creating theories based on observations and tests of real world objects and then treating the theory created from theoretical objects as though it were created from observations and tests of real world objects. Abstractions are intellectual conveniences. By simplifying our observations of a complex world, we hope to understand parts of that world more easily. No matter how well our abstractions are created, the abstractions are never the physical equivalent of the real world objects that were initially studied. To be useful, no abstraction can be as complex as the real world objects from which it is derived. Any analysis of the abstraction rather than the real world objects on which it is based runs the risk of inaccurately claiming that a feature of the abstraction is a feature of the real world object or that a real world object lacks a certain feature because its abstraction lacks it. By accumulating abstractions into a system, we run the risk of compounding those inaccuracies into an inaccurate system. Furthermore, to make theoretical systems more "accurate", researchers might invent theoretical objects for which no real world equivalent exists.

Researchers will almost always acknowledge that their theories are inaccurate to some degree. The inaccuracy is not the problem that the term "domain confusion" is meant to indicate. The problem that is noted by the term "domain confusion" is the problem of how these inaccuracies are created, spotted and corrected. For several hundred years, scientists, i.e., researchers using certain methods of study, have relied on several assumptions to determine the reliability of their theories. The most important assumption has been that if a theory about the real world leads to results independently reproducible by several scientists, that theory is more likely to be an accurate description of the real world than one that does not lead to reproducible results. As is well known, real world objects can be subjected to various kinds of tests, depending on the object. These tests are themselves testable. A test which produces accurate results is usable in scientific inquiry; one that does not is unusable.

This brief review of the scientific method points to an important feature of scientific research: the question of the accuracy of a theory is answerable. It is

answerable because all tests are or can be performed on real world objects. In the logical domain, where the objects of study are theoretical, there is no answerable question of the accuracy of a theory because there is nothing to test. In short, logical domain theories are more or less acceptable but are never accurate. Logical domain theories may contain hundreds of theoretical objects. Each of those abstractions may or may not accurately represent some real world object or may reflect some theoretical concern which is not part of the real world. There is no objective way of determining whether these theoretical objects actually do represent real world objects, if that is what they claim to do or whether they are the results of long-standing reifications. Reified objects may have a long history.

An Example of Domain Confusion

Lyons 1981 contains a brief, useful history of the linguistic theory of universal grammar. He notes

> *Common sense and introspection support the view that thought is a kind of inner speech; and various more sophisticated versions of this view have been put forward, over the centuries, by philosophers. In fact, throughout most of the 2000 years or so during which Western traditional grammar held sway in the various centres of scholarship, no clear distinction was drawn, at the theoretical level, between grammar and logic. In particular periods – most notably in the thirteenth century and again in the eighteenth – systems of what came to be called* ***universal grammar*** *were developed, in which the connection between logic and grammar was made explicit and given some kind of philosophical justification. In all such cases it was grammar that was subordinated to logic, since the principles of logic were held to be of universal validity* Lyons 1981, 239 (emphasis original).

Lyons goes on to point out that by the nineteenth century, questions about the validity of these views arose. The notion of universal grammar went out of

fashion. As we know, it was revived by Noam Chomsky and his followers. Rather than linking grammar to logic, the generativists have linked language to mind.

This paper will not discuss the validity of the notion of universal grammar except to note that this notion is not a scientific one, despite the claims of Chomsky and his followers. It is important to note that the terms “language”, “grammar”, “logic” and “mind” are themselves abstractions. They are the names of theories which are composed of the study of the interactions between other theoretical objects. Note one important but usually overlooked fact in the quote from Lyons, above. In some sense, linguists and those who have studied “language” have debated the existence of “universal grammar” or something like it for over 2000 years without having conclusively determining whether, in fact, there is such a thing as universal grammar. The reason for this failure is because of the domain confusion inherent in this question. In order to examine the question, one must assume that certain other theoretical objects and systems exist and interact with one another. One must assume that there is something called “language” which is structured in a way that is called a “grammar” and that, since “logic” – the assumption that “thought” can be systematized, categorized and, therefore, studied in certain ways (reducing “thought” to a rule based system) – is a similar system, “grammar” acts in systematized, rule-based ways like “logic”. “Logic” is rule-based because “thought” is internal “language” which is rule-based because it has a “grammar” which follows certain rules because it is like “logic”. None of these assumptions can be scientifically tested. There is nothing to test. Notice the appeals to “common sense and introspection” in the quote above.

HSL talks about people communicating. There is no question that people communicate through sounds and other systems. HSL does not deny that these sounds have a physical reality to them. HSL does say that there is no scientific proof that there is a system of rules called a “grammar” that can be studied scientifically. HSL may be wrong. There may be some way to create a test to determine the existence of grammar. In the last few years, neurobiologists have decoded the human genome. We can plausibly assume that if there is such a

thing as grammar that is part of the human body (in the brain, for instance), it would be encoded in our genes. If this is the case, grammar would then be part of the human genome. The genome is a real world object and can be studied as such. If “grammar genes” can be identified by whatever means geneticists use, the expression of those genes can be tested to determine their real world effects. We do not formulate a precise test here but merely discuss the possibility that such a test can be created to distinguish between what we claim to be a domain confusion in the theory of universal grammar and a proper scientific analysis of the basis of human communication. A study in the physical domain would concentrate on real world objects: the human genome, the generation of certain types of sound by the human body, etc. rather than upon scientifically unfounded abstractions such as grammar and language. An HSL analysis of the problem would not begin with assumptions like “grammar” and “language” and claims that, since there are such “things” as grammar and language, they must have a genetic basis; HSL would ask what the genetic bases for certain observation in the real world might be. Rather than speculating on the theoretical structure of theoretical objects, we ask about how certain parts of the real world interact with other parts of the real world. HSL researchers would not ask: where, in the human genome, is grammar but rather: what in the human genome is linguistically relevant.

The questions that HSL researchers ask are different than those asked by researchers from traditional linguistics backgrounds. Preventing domain confusion demands as much. The questions are dictated by the real world objects being studied and not by the theory one might espouse. For example, an HSL researcher would not ask how or whether grammar is encoded in the genome because the question assumes the reality of grammar for which HSL researchers have no reason to believe is a real-world object. HSL researchers might be concerned with the influence our genes on might have on the way that we humans communicate with each other. The questions that result from this concern must be carefully formulated in order to exclude the possibility of domain confusion. The researcher would use the realities discovered by geneticists and

other scientists on one hand and the observations of human behavior by other scientists on the other in order to formulate their questions. None of the questions would include the mention of theoretical objects like morphemes, syntax, or grammar. Note that HSL researchers are not limited by linguistic theories in their studies, as this example shows. They can easily use the finding of scientists from other fields as part of HSL studies. This is possible because HSL studies use as their basis the same type of object that other scientists study: real world objects.

Recognizing that domain confusion exists in linguistics and correcting it achieves more than to correct a theoretical problem. By correcting the domain confusion inherent in linguistics, as HSL attempts to do, linguistics can become a genuine science. Rather than existing in a theoretical world unrelated to other theoretical worlds, Linguistics becomes a snapshot of a certain portion of reality – the reality of people communicating with each other. The first step along this path is to ask whether the object of study is a real one. What is being studied? Even though many linguistic objects have a long history, it is always worthwhile to ask: what is x? where x is the linguistic object to be studied. Ask: “what is a sign?” or “What is meaning?” The answers to those questions must involve some physical (though not necessarily tangible) aspect of reality. If it does not, the object is theoretical not a real world object. If it is theoretical, the object cannot be studied scientifically. If we do find an underlying, physical reality, we can study it scientifically. We can describe it, we can model it but it is the reality that we must study not the model of the reality.

Conclusion

The problem noted in this paper is not a matter pf preference for one way of asking a question as opposed to another. HSL researchers wish to be scientific and get reliable answers to well-formed questions. If HSL researchers stayed in the logical domain, they could not reach their goals. The nature of logical domain questions and objects is such that no definitive answer can ever be offered to a logical domain question. To see that this is so, simply ask why the issue of universal grammar has not been settled for over 2000 years. The

question has been studied by intelligent people; it is not for lack of brain power that there is no definitive answer to the question. It is not from lack of material for study. The universal grammar question has not been resolved because of the nature of the question. The confusion inherent in the question makes the question irresolvable.

For linguistics to have the sound, scientific basis which it seeks, it will have to restructure its programs of inquiry. Yngve 1996 and several papers in Yngve and Wąsik 2004 mention the benefits of switching to physical domain approaches; they will not be repeated here. Shifting from the theoretical domain in which most traditional linguistic studies are mired to the sound, physical domain pioneered by HSL researchers will not be without difficulty. Reformulating the basis of our studies has proven difficult. Such a reformulation can be done and it is worth the doing. To a large degree, linguistics will have to be begun anew.

Recall that, while we use linguistic examples in this paper, as is appropriate for a linguistics conference, we do not exclusively limit our comments about domain confusion to linguistics. The problem exists in many fields. Having identified the problem in linguistics, there is no excuse now for linguists to be confused.

Bibliography

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I wish to express my appreciation to Victor Yngve and Douglas Coleman for their kind discussions about this topic.

[1] When we use the term “object” in reference to the physical domain, we do not mean to limit the discussion to “things”. We use “object” to refer to anything which is under investigation, whether it be a “thing”, a process or any other part of the real world.