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The Myth of Semantic Structure

Abstract: That behind the overt, syntactic structure of an expression there lurks a covert, semantic one, aka *logical form*, and that anyone interested in what the expression truly means should ignore the former and go for excavating the latter, has become a common wisdom. It is this wisdom I want to challenge in this paper; I will claim that it is a result of a mere confusion, that the usual notion of semantic structure, or logical form, is actually the result of certain properties of our tools of linguistic analysis being unwarrantedly projected into what we analyze.

Keywords: Language, meaning, logical form, semantic structure, Russell, Chomsky

1. Structure in language

The term *structure* has become one of the ultimate key words of modern theory of language. More complex expressions of language are constituted from simple ones and ultimately from words; and *structures* are the ways of such compositions. In his path-breaking *Syntactic Structures*, Chomsky (1957) presented a classification of languages from the viewpoint of their structural complexity and indicated the relationship between the ensuing hierarchy and the hierarchy of automata; thus setting agenda for the study of syntax of both natural and formal languages for many years ahead.

Let me note in passing that saying that language has *a* structure is a wholly uncontroversial observation – the utterances speakers of any human language make can be observed to share various parts, so that we straightforwardly come to construe them as concatenations of what we call *words*. Further we may decide to see words as more abstract entities, which

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occur within utterances in various *forms* (thus bringing *morphology* into the picture) and to see the concatenations of the forms as instances of *rules* operating on the words, thus reaching what is standardly called *syntax*. This brings us to some distance from what we can literally observe; but to say that ("surface") syntactic structures are simply perceptible is still not an oversimplification that would be too dangerous.

But the concept of structure has come to be considered crucial not only in the context of syntactic studies, but also from the viewpoint of semantics. And many linguists and philosophers seem to take for granted that we can study expressions not only on the level of syntax, but that we can also descend 'into' or 'under' them and study their meanings on the level of semantics, where we should be able to discover, behind their syntactic structures, also semantic ones.

This idea has been reinforced by the doctrine of *logical form* stemming from the writings of Bertrand Russell and his followers (which has become an integral part of the subconscious background of a great deal of approaches to language in the twentieth century): to truly understand what an expression says, Russell urged, we must not look at its surface, syntactic structure, we must use logical analysis to reveal its *logical form*, which shows what the expression is *really* about. Thus a sentence that looks like a subject-predicate statement, hence as a statement ascribing a property to an object, may, according to Russell (1905), turn out to be a statement of a much more delicate semantic structure, talking not about an object denoted by its subject term, but, say, about some constellations of properties.

This observation of Russell has got mingled with Russell's fondness of *facts*. At a certain period of his career (see esp. Russell, 1914), Russell tried to account for the language-world relationship, and consequently for semantics, without using any other ingredient than 'tangible' parts of the world, i.e. avoiding any 'supernatural' entities like the senses of Frege (1892). He ended up with sentences (and their parts) on the one hand, and facts (and their parts, namely objects, properties and relations) on the other. What was important was that Russell considered facts as simply certain complex objects among other objects of the world – the fact such as *that there is a tree ahead of me* is, according to Russell, something I can bump into (it is enough to continue walking forwards). Facts of this kind have structures wholly independent of language, and when Wittgenstein and

others realized that there is no way of doing reasonable semantics with merely facts, that the minimum we have to take on board in addition is something like *potential facts*, i.e. propositions, this was straightforwardly carried over to propositions. Hence propositions came to be seen as potential conglomerates of objects (that may be actual within the minds of the speakers), structured in a way that has nothing to do with language[1].

The picture emerging from such considerations is straightforward: the syntactic structure conceals a more deeply buried, but also more important structure – the semantic one. This way of looking at language was reinforced by the turn Chomsky made soon after his beginning, the turn from understanding the mathematical structures he employed to describe the complexities of syntax in an abstract way to their understanding as real parts of human language faculty. Here the picture was that of these structures working unobservably within the depths of human mind and having to disguise themselves into different kinds of structures that are capable of surfacing from the mind into the open.

I think that by now it is time to take stock of these views. And I am convinced that if we "weigh them in the balances", i.e. check them against the evidence we have (and not the one we are told to have), they will be "found wanting" – they will turn out to be something that we once accepted as interesting conjectures, but then forgot to dispose of when we came to know more about language.

2. Russell plus Chomsky: an unbeatable team?

In a recent paper, Collins (2007, 807) summarizes the reasons that have led philosophers and linguists to the conclusion that beyond the surface, syntactic structure of our expressions there looms a hidden semantic one in the following way:

> It could be said that modern philosophy of language was born in the realization that the structure of the proposition is essentially logical in some sense rather than linguistic, for natural language syntax

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[1] Wittgenstein (1922) talks about "Sachverhalte".

appears to be 'systematically misleading' as to the meanings sentences express. Cutting a long and complex story short, the leading contemporary diagnosis of this traditional thought is that it laboured under a conception of syntax that was too much in the thrall of how sentences *appear* to be structured. By positing various 'hidden' levels of structure, generative linguistics can be understood to have at least established the possibility that meaning is indeed linguistically structured. In other words, the traditional error—the original, albeit very fruitful, sin—was to think that there is no more to syntax than the 'surface' organization of words

Clearly, it is correct that the leading idea of a great deal of the philosophy of language of the first part of the twentieth century (and its smaller, but still substantive part in the second half of the century), was animated by the thought that to find out what our pronouncement is about, we must go beyond the misleading surface structure to the hidden "logical form". It is also correct that Chomsky and other generative linguists were driven to postulating various kinds of structures beyond the overt one slowly singling out one of them as a "logical form". However, I think it is essentially misleading to take these two ideas as complementary; and indeed I think it is wrong to take any of them at face value. I think that at least since the writings of the later Wittgenstein and Quine it has become ever more clear that the Russellian notion of logical form leads us into a blind alley; and I think that the term "logical form" in the mouths of Chomsky and his followers is simply a misnomer.

Before we go to the analysis of Russellian and Chomskian notions of logical form, let me point out that at least since the half of the twentieth century there has been a growing tendency, within philosophy of language, to an alternative construal of the talk about logical forms, a tendency that, I suggest, is on the right track.

One of those who became utterly skeptical about the Russellian concept of logical form was the later Wittgenstein (once himself a champion of the Russellian approach). It is instructive look at the story about Wittgenstein's 'awakening from the dogmatic slumber', thanks to the interference of his friend Sraffa, as presented by Monk (1990, p. 59):

One day (they were riding, I think, on a train) when Wittgenstein was insisting that a proposition and that which it describes must have the same 'logical form', the same 'logical multiplicity', Sraffa made a gesture, familiar to Neapolitans as meaning something like disgust or contempt, of brushing the underneath of his chin with an outward sweep of the finger-tips of one hand. And he asked: 'What is the logical form of that?' Sraffa's example produced in Wittgenstein the feeling that there was an absurdity in the insistence that a proposition and what it describes must have the same 'form'. This broke the hold on him of the conception that a proposition must literally be a 'picture' of the reality it describes.'

I think that be this story literally true or not, the fact is that at that time Wittgenstein started to be prone to see logical analysis not as a matter of digging into the depths of an expression to bring something buried there to light, but rather as something as erecting a watchtower over a vast unknown landscape to "command a clear views of it" (1953, §122).

Quine was equally suspicious about the Russellian approach. His verdict is that what we call logical form is in fact something very different from what Russell held it to be. He claims (1980, p.21)

What we call logical form is what grammatical form becomes when grammar is revised so as to make for efficient general methods of exploring the interdependence of sentences in respect of their truth values.

Hence, according to him, logical form is nothing that can be found within language, it is merely an expedient we use when we want to account for language. Davidson's (1970, p. 140) view is very similar:

To give the logical form of a sentence is to give its logical location in the totality of sentences, to describe it in a way that explicitly determines what sentences it entails and what sentences it is entailed by.

All of this relegates logical forms from parts of the *subject matter* of theories a language into the *toolboxes* of some of them. We use them if we want to make certain properties of expressions more palpable; but they are not something that we would *discover* and *report*.

3. Russell

Russell's analyses were inescapably weighted by the enormous syntactical parsimony of the logic Russell employed to capture the alleged logical forms; as a result, there was simply no way for the forms to coincide with the surface ones. Things would be very different if he had allowed himself a richer logical language, of the kind commonly used by semanticists today.

In his celebrated 'On Denoting' (1905), Russell strove to show that the logical form of such a statement as

(1) The king of France is bald

has little to do with the syntactic/surface form of the sentence and, instead, amounts to

(1') $\exists x\, (S(x) \wedge \forall y\, (S(y) \rightarrow (x=y)) \wedge P(x))$

Why? Because only a formula of this kind can capture the correct truth conditions of (1). No formula of (what Russell took to be[2]) the syntactic structure of (1), i.e. no formula of the shape $P(a)$, could suffice.

However, if we equip ourselves with a more powerful logical language than that of the first-order logic employed, in effect, by Russell, it is easy to replace the formula with an equivalent formula that does have the subject-predicate structure. The point is that with, say, the apparatus of λ-calculus at hand, we can define

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[2] Most current syntacticians would now deem Russell's syntactic analysis badly unsatisfactory. But this is unimportant in the present context; the point is independent of the specific nature of the syntactic structure.

$$P^{*} \equiv_{\text{Def.}} \lambda p.p(P)$$
$$S^{*} \equiv_{\text{Def.}} \lambda q.(\lambda p.(\exists x\ (p(x) \wedge \forall y\ (p(y) \rightarrow (x=y)) \wedge q(x)))) (S)$$

and consequently we can rewrite (1') equivalently as[3]

$$P^{*}(S^{*})$$

This indicates that what Russell calls *logical form* is merely what becomes of a sentence when it is squeezed into the Procrustean bed of a simple logical language. (It should be stressed that for Russell the simplicity of the logical language was paramount, since he considered it essential to the whole enterprise of logical analysis that the logical building blocks needed to analyze natural language should be minimal, even at the cost of making the resulting analysis complicated.)

Of course all of this does not mean that the Russellian concept of *logical form* is totally senseless – surely it does make sense, however only in a situation when we, doing logical analysis, *purposefully restrict ourselves to a simple language*. (Also we do not claim that such restrictions do not have their point; they surely do: sparseness fosters perspicuity and smooth tractability). The ensuing logical form then is nothing absolute, but rather only something as 'the simplest analysis of the given expression by means of the given formal language'. This means that the only nontrivial usage of the term "logical form", is the usage which is *de facto* technical and which tells us nothing about expressions as such, but rather only about the consequences of our choice of the means of the analysis.

4. Chomsky

It is very difficult to find any explicit articulation of what exactly a logical form is supposed to be in Chomsky's writings. He never says anything more informative than that it is one of the levels constituting the language faculty, which interacts, in certain ways, with other levels (see Chomsky,

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[3] See Peregrin (2001, §10.3) for more details.

1986, 2005, etc.). But what are the "levels"? Are they supposed to be some palpable (though not yet clearly localized) entities or locations within the brain?; or are they simply abstract entities the relationship of which to the structures of the brain is left unspecified? And why should we think that there are such levels in the mind/brain in the first place?

As Chomsky keeps stressing that his approach to language is utterly scientific, the answer to the last question must be that their existence is implied by empirical data. Hence either there is a *direct* empirical evidence of their presence in the mind/brain, or there is an *indirect* evidence. I think we can exclude the first possibility, not only Chomsky does not claim anything like this, but due to the unclarity regarding the nature of the "levels" it is not even clear what such a direct evidence could amount to.

Hence the evidence is probably supposed to be indirect, and indeed it seems that it is this kind of evidence that is cited in the papers of Chomsky and his followers. The most frequently cited data are judgments about grammaticality of various kinds of expressions (and non-expressions). From this viewpoint, the "broadly Chomskian" approach to languages is neatly characterized by Laurence (1996, 282, 284):

> I count a view as Chomskian if it treats the linguistic properties of utterances as inherited from features of the language processor. Chomsky himself explicitly says that he does not think that linguistics directly provides a theory of language processing, and he has had a somewhat skeptical outlook on developments in psycholinguistics. Still, Chomsky insisted that linguistic competence – what he takes linguistic theory to be a theory of directly – is a central and essential component of our language processor. I therefore take accounts of the nature of linguistic properties which link them essentially to features of the language processor to be broadly Chomskian in spirit.
> ...
> On this version of the Chomskian view, the semantic properties of utterances would be thought of as being "inherited" from the semantic properties of the representations at this level, and, in general, the linguistic properties of utterances would be inherited from the associated representations at each of the various levels of processing.

The model I have in mind here is actually very straightforward. Given the empirical claim that language processing consists in recovering a series of representations at various linguistic levels, the view is simply that *it is in virtue of being associated, in language processing, with these representations that an utterance has the linguistic properties it has.* So, just as an utterance has a certain syntactic structure in virtue of being associated with a representation which has that structure, so it has a certain content or meaning in virtue of being associated with a representation which has that content or meaning.

Hence in general we may say that the claims that the language faculty contains the various levels, including the logical form, is the results of studying the "linguistic properties of utterances" and of considerations of what kind of mechanism could produce such utterances. Hence it is the well-known *'black box' kind or reasoning*: we see inputs and outputs and conclude what is happening in between them despite the fact that we cannot see it.

Of course that such 'black box reasoning', if it is to lead to the conclusion to the effect that this or that *is* in the box, must involve not only showing that the conclusion explains the observed data, but also that there is no different, equally adequate explanation available. Only thus can we be substantiated in claiming that it is *this very thing* that is in the box (though the substantiation, of course, is still of a different kind than one based on an observational report.) I do not see anything like this in Chomsky's writings. But perhaps the tacit idea is that due to the complexity of the language faculty, one good conjecture is more than enough.

But what seems to me to be more troubling is the nature of the data considered as the inputs and outputs of the black box. As we have already pointed out, they concern mostly the grammaticality of expressions. Yet this does not seem to me to be the most interesting aspect of language. If we are to see language in terms of inputs and outputs of organisms, then its most wonderful aspect seems to me to be that we can use expressions to achieve unbelievably complex effects. By emitting a sound I can make somebody get under my car and help me fix my engine; or I can make her go to the zoo, buy a banana and give it to a particular monkey there. And these are, clearly, empirical data. What is it that grants expressions these

almost miraculous abilities? Could it be that it is some structures involved in their production?

It seems to me that structures that could be usefully invoked to explain these semantic features of expressions would have to be social ones[4]. (To be sure, there is a sense in which everything that is social is somehow anchored within the brains of the members of the society; but just as it would be clearly preposterous to replace studying the rules of football by means of studying the brains or legs of football players, it is preposterous to replace studying the rules of language – *qua* interpersonal institutions – by studying the brains of the speakers.) There is nothing 'unscientific' in admitting the fact that interactions of people bring about complicated patterns, which, though surely existing merely thanks to the brains of the persons, constitute facts which should be paid attention on their own score.

5. What do we see when we see a language?

I think that Chomsky's rhetoric has fostered an illusion that the existence of logical forms is an empirical fact – that getting hold of the logical form of an expression is akin to, say, revealing the inner organs of an insect. To me, this view is badly misleading: although in certain contexts, disregarding the gap between a model and reality may be acceptable and helpful, doing so when the nature of meaning and the nature of language are at stake is preposterous. I think that reading the claim that the existence of logical form is a 'scientific fact', we should keep in mind the nature of the situation.

Wittgenstein once claimed that "when we look into ourselves as we do philosophy, we often get to see just (...) a picture. A full-blown pictorial representation of our grammar. Not facts; but as it were illustrated turns of speech." (1953, §295) I want to add that when we look at our language, at our "turns of speech", we likewise often do not see the facts, but again "just a picture". A picture we were educated to see. From this viewpoint it seems to me to be important to try to isolate what we truly *see* when we see a language.

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[4] See Peregrin (2008) for a more detailed discussion of this claim.

What I think we see, and hence what should figure as our ultimate empirical basis when studying language, are the facts concerning people emitting certain sounds (or producing certain kinds of inscriptions), and using specific types of such sounds in specific ways with specific effects. The survey of which types of sounds, i.e. which expressions, they use constitutes the field of syntax. Here is where we encounter the *structure* of language: the expressions of any natural language form an open class of compounds based on a finite stock of primitive building blocks, words (or perhaps, in some cases, some smaller units, like morphemes).

Studying the specific roles of individual expressions within our 'language games', then, constitutes what has traditionally been called pragmatics; but as we have no other data (and, in particular, no data directly for what has traditionally been called semantics – no detectable fibers connecting expressions with things), semantics must be extracted from this basis too. (And of course this may make us doubt the very existence of any clear boundary between semantics and pragmatics; or, more radically the very existence of semantics as something separate from pragmatics.) The syntactic structure remains crucial: the semantic properties of expressions must be conceived of as compatible with the openness of the class of expressions, i.e. as somehow 'compositionally' projectable from simple to more complex expressions. However, there is no obvious new kind of structure independent of the syntactic one for semantics to reveal. (True, not all aspects and elements of the syntactic structure are equally important from the viewpoint of semantics, so it is often helpful to work with simplified, purified or adjusted versions of the syntactic structure – but these, far from being independent of the basic syntactic structures, are merely their derivates.)

Thus, an autonomous semantic structure is – in the best case scenario – a convenient fiction or a working conjecture, or – in the worst – a myth stemming from our uncritical acceptance of received wisdoms. In the latter case we should be wary of it, for it creates a dangerous illusion of explanation. Hence I think that the argument from the authority of (some

of[5]) the founding fathers of logical analysis of language fails; they simply did not vindicate the reality of logical forms.

Given this, the question *What makes us think that there is something as semantic structure?* becomes pressing. And it is hard to avoid the suspicion that the main reason is that some theoreticians of language are flummoxed when it comes to semantics, and hasten to adopt the short-circuit conclusion that semantics is a more deeply buried kind of syntax (which allows them to deal with it by means of the battery of methods which have turned out so profitable for the investigation of syntax).

I see no reason for assuming that there is a concept of *semantic structure* beyond the Quinean concept of *syntactic structure revised so as to make for efficient general methods of exploring the interdependence of sentences in respect of their truth values*. Linguistic expressions are instruments we use for certain purposes (and this claim should not be read as contradicting the claim that our brains are wired up in such a way that we are largely predisposed to employ just the instruments of these kinds, which may make it appropriate to talk, as Pinker, 1994, does, about our linguistic capacity as about an *instinct*[6]), and an expression's semantics is a matter of what specific purpose that expression is usable for.

Syntax is a matter of the fact that words are instruments not like hammers or cars, but more akin to toothwheels or valves – they do not serve self-standing purposes one by one, they must function conjointly with many other words. (And needless to say, by the conjoin functioning they can achieve wonderful effects.) And syntax, we can say, is the study

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[5] Frege's views, for that matter, were much more cautious than those of Russell. If, for example, we look at his *Begriffsschrift* (1879), we see that the translation of natural language into his concept notation, *viz.* logical analysis, is, for him, nothing more than divesting natural language statements of the parts irrelevant from the viewpoint of proving and inferring. His later writing may contain pronouncement slightly more resembling Russell's stance, but I do not think that he qualifies as an exponent of the straightforward Russellian dualism of surface/logical form.

[6] It is important to distinguish between a word as such, the sound/inscription type (say "dog") and the slot within our language faculty (if there is something like this) into which it fits. Though the latter may be inborn and largely predetermine what we will do with a word which will fill the slot, the word as such is an instrument in a sense freely (= arbitrarily) chosen to fulfill this task.

precisely of the ways they can be joined; just as engineering is the study of how real toothwheels, valves etc. can be combined to produce usable machines[7]. And would it not be preposterous to decree that engineers should study, besides how the toothwheels, valves etc. are, or should be, combined, also another kind or level of combination, this time related not to the toothwheels and valves themselves, but rather their usabilities or the individual contributions they bring to the usabilities of the ultimate constructs?

As it is not possible to place all the conceivable constructs in front of our eyes, we must deal with them as with potentialities, and we have to see the individual toothwheels and valves as bearing specific contributions to the usability of the ultimate constructs which they may become parts of; and in the same way we come to take words as having their peculiar meanings and seeing composing sentences (and perhaps supersentential wholes) as paralleled by composing their meanings. However, this view makes sense only insofar as there is only *one* structure in play.

It is, of course, important to realize that what has now come to be called *syntax* by most linguists and some philosophers (largely due to Chomsky's influence) is not quite what corresponds, on our engineering picture, to how the constructs are composed of their co-operating parts, but rather to the technologies their producers use to put them together. This fact is, I think, a normal and respectable case of a paradigm shift within a scientific discipline; but we should keep in mind that given this, there is no longer a reason to assume that all parts of what is now called *syntactic* structure should be relevant for semantics. (Unless we were to picture semantics as a matter of propositions put together on an assembly line parallel to the sentence-producing one within the great assembly hall of a language faculty – but my point here is that such a view should not be a matter of course.)

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[7] And without doubt, the empirical study of how this composition works in real time has elicited a significant body of results – making up the concept of syntactic structure that Collins discusses in his paper.

6. Conclusion

The idea that the task of semantics can be solved by means of associating expressions with 'semantic structures' or 'logical forms' independent of their syntactic structures is a myth – such association does not solve what semantics is to solve. Semantics is to explain what grants the sound/inscription types that constitute our languages the peculiar powers that they have and that makes them so usable for us. (Traditionally, explaining these powers was seen as tantamount to explaining the nature of peculiar entities attached to them, *viz.* meanings; but we need not presuppose that this is an inevitable way[8].)

I am aware that especially the preceding section may appear as the expression of a specific philosophical standpoint (a pragmatist one, for that matter), which may make the reader think: "I wash my hands; I am not a pragmatist so this lament is not of concern for me". But I would like to stress that even if you do not share this very standpoint, the basic question remains in force: what makes us think that there is something as a semantic structure independent of the syntactic one? Collins (*ibid*.) talks, in connection with Frege and Russell, about "the empirical mismatch" and the consequent "need to explain how meanings are paired with structures". But as I argued above, the claims of the classics of logical analysis to the effect of the mismatch between surface structure and logical form can in no way be seen as reports of empirical findings – they tell us nothing about natural language as such, they only report the fact that if we want to translate it into a logical language of a very simple structure, discrepancies are bound to arise. Turning this fact into a fact about language is tantamount to changing the train of empirical linguistics for that of speculative metaphysics.

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[8] See Peregrin (2009) for a more thorough discussion of the role of meanings in semantics.

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