The future of semantics?

MARTIN STOKHOF*

The paper by Fritz Hamm, Hans Kamp and Michiel van Lambalgen (in what follows abbreviated as 'HKL') is a very rich one. Not only does it contain a wealth of empirical and formal insights concerning the analysis of tense and aspect, planning and causality, and other phenomena, it also contains some penetrating remarks concerning the scope and method of semantic theory. It is the latter aspect of the paper that I want to make a few comments on in what follows.

The state of art

If we look at the development of formal semantics of natural language ('semantics' in what follows if no confusion arises) over the last three decades or so, we see a number of changes, in both methods and scope, that both because of their sheer variety and because of the lack of unanimity among working semanticists give us reason to pause and reflect on the nature of the discipline.

Of course, the idea of science as a linearly progressing enterprise getting closer and closer to the truth about its subject matter has long been exposed for what it in fact is: a myth. We have come to acknowledge that science develops in various ways, with sudden and unforeseen turns in both conceptual apparatus as well as empirical orientation. Some of the hot topics of today were fringe phenomena of a past stage, the conceptual

* ILLC / Department of Philosophy, Universiteit van Amsterdam. Thanks to Michiel van Lambalgen for his critical comments on an earlier version.

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differences between succeeding theories are sometimes very fundamental, and some of the methods, both formal and experimental, by which scientists pursue their goals, change profoundly as well.

One might be inclined to think that what we observed above simply shows that semantics is no exception. But even if we grant that it is subject to the same laws as other disciplines, the development of semantics and the state it is in today are not fully explained by that. As a discipline semantics is very fragmented, there are many different theoretical orientations, and very divergent notions of meaning that define the various frameworks. We have a wide variety of approaches: cognitive semantics, intensional referential semantics, extensional referential semantics, various forms of dynamic semantics, inferentialism, wide and narrow content theories, holistic and atomistic theories, frameworks based on game theory and optimality theory, and so on. This whole gamut is conveniently aggregated by HKL under just two headings: 'realistic' and 'conceptual', but I think this bifurcation covers up much more controversy concerning the nature of semantics that we need to take into account in order to get a good picture of the state semantics is in today. Be that as it may, what really should worry us is that there is hardly any debate between the proponents of these different approaches. Although the literature does contain a fair amount of opinions of the proponents of one approach about the deficiencies of another, what seems to be lacking is a debate in which the differences are discussed against the background of a shared body of convictions as to what semantics is all about.[1]

In other branches of science, say physics or biology, too, there are often quite deep controversies about what the best theory is, about the importance of certain phenomena, or about the strengths and weaknesses of different conceptual frameworks. But, unlike in semantics, here these differences are constantly debated, even in cases where there is little chance of being able to decide the debate in the foreseeable future (for example, due to lack of experimental means). Apparently there is enough commonality in the opinions about what the discipline as such is about, about what it

[1] As a matter of fact this seems true of linguistics in general. In a sense the development of linguistics in the twentieth century was not just about creating suitable theoretical frameworks, it was also a quest for a suitable object of study. And no uniform such object seems to have emerged.

wants to achieve and how it should achieve that, to provide common ground for both controversy and discussion. And that is where semantics is really different: it seems as if the discipline lacks sufficient common ground to shape the context in which such a debate can take place.

The question that this raises is whether this is somehow a remediable deficiency, something that merely reflects the underdeveloped stage of semantics, which is after all a very young enterprise, or whether it is due to some more profound difference between semantics and other disciplines.

In search of a paradigm

One of the claims made by HKL is that a computational approach combined with a turn to cognitive science will provide a more uniform background for semantics. It is their contention that the computational structures that are needed, for example, in an account of tense, present 'a cognitive reality', and that the computational approach is required in order 'to establish a truly productive interaction with cognitive (neuro)-science'. They illustrate this claim by spelling out some 'straightforward predictions concerning semantic processing' that their use of computational representations give rise to. Thus they suggest that a computational and cognitive framework might be the backbone of the paradigm that semantics needs.

That a computational approach lends itself better to assessment of cognitive reality than a referential one is by itself an interesting, though not altogether uncontroversial claim. It might well be true, and if it is, that would be a significant insight. What I want to question, however, is the implicit assumption that adopting the model of cognitive science will settle the issue about the status of semantics. Of course there is ample reason to look at the neuropsychology of language. And it is certainly worthwhile to try to develop models of meaning that are focused on semantic processing. But does the adoption of the cognitive model really resolve the problem of the status of semantics?

I think there are two reasons to doubt that. The first concerns the issue of what might be called 'the choice of invariants'. Meaning, the subject matter of semantics, is a complex phenomenon. If we look at it from a non-theoretical perspective, we observe that meaning has referential

aspects, that it is involved in entailment relations, that there are obvious intentional elements, that meaning is related to conversational goals, that some aspects of it relate to individual experience whereas others reflect collective knowledge, that meaning is involved in emotional expression and in information exchange, that it sustains social institutions and individual identities, and so on. In devising a theory we usually focus on one such aspect, which then is the invariant over expressions and situations, uses and users, that the theory deals with. However, the choices we make are not so much informed by an *a priori* insight into what are essential and what more accidental features of the meaning complex, but rather by external factors such as possible applications, prior philosophical assumptions, particular formal interests, and the like.[2] From a pragmatist's perspective this may not be such a bad thing after all: there are many different things one might want a semantic theory to do, and the fact that we seem to be lacking one overarching conception of meaning, that there is no one specific fundamental aspect of the meaning complex that we agree upon, provides theorists with the necessary leeway. The drawback is, of course, that we can not really say that there is something definite that semantics is about. And as for the decision to focus on cognitive, neuropsychological aspects, well, that then represents as good a choice as any other, but not one that is necessarily better.

The second reason to doubt that the cognitive paradigm will prove to be the unifying force that semantics seems to be lacking, concerns its intrinsic limitations, both with regard to its subject matter as well as to its methods, that in their turn inform a particular view on language, meaning and competence. One of the main characteristics of that view is that competence is an individual property, something that can be ascribed to language users on an individual basis. The fact that they are always members of a linguistic community has no essential role to play in determining what competence is and how we can study it. Of course, one way of looking at this assumption is to regard it as a genuine empirical hypothesis concerning the nature of competence. Being a competent language user, it says, is basically an individual property, one that can be explained adequately in terms of the individual's representational and processing

[2] See Stokhof (2002) for some more discussions of these issues.

abilities, memory, and so on. Do note that this view does not necessarily deny that the community plays a role in how competence comes about (learning) and how it is executed (performance). Rather it maintains that semantic competence itself is an individual matter, and that in the totality of language use it is the 'core' that allows extension into the outside world and into the community. However, one could also argue that individualism is an artifact, that its assumption is merely an implication of the paradigm as such. Given that neuropsychological investigations are tied to the physiology of the individual as a material object, whatever it is that we study when we investigate various properties of subjects in this way, will necessarily be individual in nature. Hence if we want to maintain that it is language, its meanings and its use, that we are studying in this way, then competence has to be constructed as individual as well. And from that, particular views on what language and meaning are follow naturally.[3]

Consequences

What follows from these observations? My main claim here would be that it is better to conceive of the debate not as one that is about *what semantics is*, bur rather about *what we want semantics to do*. There is no simple 'fact of the matter' here, one that we can discover and then all agree upon. Rather the issue is about decisions.

Actually, the very history of the discipline bears witness to this. HKL illustrate what they call the 'realist' tradition in semantic with a quote from David Lewis' seminal 'General Semantics' paper (Lewis, 1970). It serves their purpose, which is to contrast realism with cognitivism, adequately, since in Lewis the Fregean ancestry to which the entire analytical tradition is an heir, resounds quite clearly. Semantics basically is about nothing real, in the sense of empirical, its object is an abstract one through and through. Of course, Lewis' adaptation of Frege's Platonism is philosophically somewhat 'extraordinary', to put it mildly. Nevertheless, the

[3] See Groenendijk & Stokhof (2005) for some more discussion of these issues, and of the role compositionality plays here.

basic idea is operative in a great deal of other work that has been done, and continues to be done, in the Lewis-Montague tradition of semantics.

But note that already at the time of Lewis' pronouncements other approaches were suggested that represent different points of view. A good example is provided by Davidson's work. Unlike Lewis, Davidson does want semantics to be about something real. According to him the goal of a semantic theory is to provide a characterisation of semantic competence, i.e., of the ability of speakers of a language to 'determine the meaning or meanings of an arbitrary expression' (Davidson, 1967). However, Davidson does want to pursue this empirical goal in such a way that claims about psychological reality of the concepts and procedures that his theory of meaning employs are avoided: 'The theory may be used to describe an aspect of the interpreter's competence at understanding what is said. We may, if we please, also maintain that there is a mechanism in the interpreter that corresponds to the theory. If this means only that there is some mechanism or other that performs that task, it is hard to see how the claim can fail to be true' (Davidson, 1974). Obviously, the empirical data provided by the execution of competence do restrict the theory, but the theory is not intended as a description of the competence itself, in the sense of the actual underlying (neuro-)psychological mechanisms.

Now the important thing to note is that this is a legitimate choice. If we are interested in speech impairment we define competence (and hence language and meaning) in a different way than when our goal is to build a natural language interface for a machine or a program, or to construct a speech production system. In the first case we are really concerned with how humans actually process language, in the second case we most probably are not, since machines will have to do the same task in a different way. The point is that given that there are no *independent* characterisations of what language, meaning, and competence are, the difference is not a factual one, but a pragmatic difference. Our quest for the 'right' invariants is steered by what we want to *do* with the resulting theory, i.e., by a pragmatic concern, and it is only restricted, not dictated, by empirical fact. To put it differently, meaning is a heterogeneous phenomenon, and we lack notions and principles that are sufficiently theory-independent for us to be able to characterise the ontology of semantics in a uniform

way. In that respect the various approaches one finds in semantics lack a common standard, in that they may simply not be about the same subject matter.

As I see it, HKL provide a good illustration of the role of such extraneous considerations. Their approach in fact embodies two claims, which for them seem intimately related: that semantics should related to research in cognitive science, and that therefore semantics should be computational. But computationally adequate theories can be devised in many different ways, and what we learn from cognitive science about human inference may not be relevant for some of them. For example, if we are building a computational semantic theory that needs to be implemented as part of a natural language man–machine interface it is not obvious that results from cognitive science will be relevant. In fact, in the book (Lambalgen & Hamm, 2004), on which the article draws, Van Lambalgen and Hamm develop the idea of computational semantics independently from concerns about the way the underlying cognitive substrate works. That provides another illustration that the mere observation that language is processed in a certain way in the brain does not force a conception of semantics on us that has its goals, means and methods *defined* by whatever it is that cognitive science reveals about these processes. Rather we *first* have to decide what we think semantics is about, only then can we draw consequences. Of course, one of the choices we can make is to develop a semantic theory that is in line with the results of cognitive research. In itself that is a perfectly honourable choice, and one that leads to interesting descriptions. But it is a choice, it does not somehow follow from an insight into what semantics 'really' is about, into what meaning 'really' is.

This puts some of the claims made by HKL in a slightly different perspective. Let us look at one in a little more detail. The question whether semantic description involves mental representations received some attention in the early nineties when discourse representation theory developed. HKL discuss the question briefly, using the case of plural quantification and pronominal reference as an illustration. They argue that a proper account of these phenomena requires 'knowledge of the quantificational structure' of the discourse in which an utterance occurs. The information involved needs to be incorporated in the theory at some point, they claim, and mental representations, they suggest, are the obvious candidate. They

do grant that one could also account for the necessary structure elsewhere, in the denotations of expressions, but they seems to regard that as a mere notational variant, for, they claim, 'to think that representationalism could be eliminated just by relocating information that is contributed by the describing discourse in this manner would clearly be an illusion.'

But is it really? Pace HKL, I would say that representationalism is a substantial issue, but in order to be able to see that, we need to look at it from a methodological angle. Take the case of a referential versus a representational description. One could maintain that if we put the required information, in HKL's example the structure required by plural quantification and pronominal reference, in the models used by the referential description ('models' in the technical sense, i.e., domains plus structure plus interpretation function) we regard the resulting theory itself as a 'model' (in the methodological sense) of (relevant aspects of) semantic competence. What the description does is provide us with a model of what semantic competence (with regard to the phenomena at hand, of course) is, or rather, what characterises the execution of competence. Whereas if we encode the required information in some level of mental representation that itself is what the theory is about, we claim that specific element of the theory is what models competence. Now HKL are right if we interpret their claim as only maintaining that as far as input – output constraints are concerned, the predictions made by the two approaches could very well be the same. However, that should not obscure that they do embody quite different views about *what semantics is*. One might say that where one approach models the execution of competence, the other intends to describe competence itself. On the first view semantics is not about competence, although what it is about is related to it, in that its execution provides the necessary empirical constraints. On the second view it is the content and structure of (individual) competence as such that defines the empirical adequacy criteria for the description. And that means that the theory is subject to completely different constraints.[4]

[4] Note that on this way of looking at it, the mere fact that meanings and interpretations are represented in actual execution of competence is irrelevant.

I do not want to argue here in favour of either view. The point I want to make is methodological. It is not a fact of the matter whether semantics is concerned with individual semantic competence, it is a decision. Once a decision is made, representationalism follows, . . . or not.

Conclusion

"I've seen the future of rock and roll and it's name is . . ." Obviously, the phrase has been overused, and too many names have been filled in for any such prediction to have any credibility. But what about semantics? Should one be bold and declare that a fusion of a computational and a cognitive approach HKL-style is the future of semantics? In view of the considerations above my feeling is that such a claim would be too hasty. And it is not only the fact that the relation between semantics and cognitive science can be construed in often subtly different ways, that should make us weary of strong claims here. Also the other component of HKL, viz., the computational perspective on meaning may not be as straightforward as it appears. In (Lambalgen & Hamm, 2004), Van Lambalgen and Hamm make a strong case for such an approach. That the way agents deal with meaning 'in the real world' brings along constraints of computational tractability is a strong argument. But again, there may be different ways of meeting the demand. We know from computational linguistics that very 'superficial', template based matching approaches often do better in certain computational areas than inference-driven theories. And it appears this is not just a matter of various approaches not having been worked out in appropriate detail and to sufficient depth. Rather, the tasks we want to see performed seem to dictate the nature of the theories we should bring to bear on them. And that, too, underscores the point made earlier that meaning as such may not be as homogeneous a phenomenon as we may have thought it to be, and that doing semantics is also a matter of making choices.

So my feeling is that we are still a long way from being able to decide what is right and what is wrong here. In fact, we will probably will not know what the future of semantics before we get there. And that still may take a while. In the meantime, HKL's views on semantics brought forward in the paper are an interesting and exciting contribution to the

debate, since they prompt both further empirical investigation as well as methodological reflection. And in doing that they certainly contribute to their being some future for semantics, whatever it may be.

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