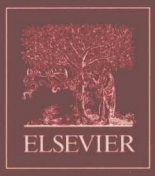

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MEANING: THE DYNAMIC TURN

Editor:
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Meaning: The Dynamic Turn

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The aim of this series is to focus upon the relationship between semantic and pragmatic theories for a variety of natural language constructions. The boundary between semantics and pragmatics can be drawn in many various ways and the relative benefits of each have given rise to a vivid theoretical dispute in the literature in the last two decades. As a side-effect, this variety has given rise to a certain amount of confusion and lack of purpose in the extant publications on this topic.

This series will provide a forum where the confusion within existing literature can be removed and the issues raised by different positions can be discussed with a renewed sense of purpose. The editors intend contributions to this series to take further strides towards clarity and cautious consensus.

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INTRODUCTION

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1 CONTEXTS IN FORMAL SEMANTICS

The papers in this volume represent the results of attempts to address the following questions: (i) Can we view language as a static system and can we reconstruct semantics in terms of a mapping of its expressions on set-theoretical entities, as traditional model-theoretic semantics does? Or (ii) do recent developments in semantics suggest that there is no way to separate language from discourse, *langue* from *parole* and semantics from pragmatics; and that hence model-theoretic semantics is to be abandoned?

According to 'folk semantics', for an expression to be 'meaningful' it must have a thing called meaning attached to it. And despite those linguists and philosophers who argue that this view is misleading, the model-theoretic tradition, which does take this intuition at face value, appears to have lead to many interesting and fruitful results. But the issue now is the extent to which this kind of semantics is capable of accommodating the current trends in the 'dynamization' of semantic theory, and the extent to which it must be replaced by something else.

The modern history of the model-theoretic tradition starts especially with Gottlob Frege, who proposed to exempt meanings from the legislation of philosophy and to subordinate them rather to logic. The logico-philosophical approach to meaning, elaborated by Wittgenstein, Russell and Carnap and resulting in the Montagovian and post-Montagovian formal semantics, wanted to abstract from the way language is actually put to use and account for the semantics of language as an abstract system[1]. The pioneers of this approach to semantics also

[*] I am grateful to Klaus von Heusinger for helpful comments on a previous version of this text.

[1] Elsewhere (Peregrin, 2001) I pointed out that that ambition may be seen as establishing an interesting kinship between this program and Ferdinand de Saussure's program of concentrating solely on language as *langue* (as contrasted to *parole*) and that, consequently, formal semantics can be seen as a way of carrying out his structuralistic program.

concentrated on language as a means of encoding knowledge; and hence first and foremost as a means of expressing context-independent propositions, which thus appeared as the primary subject matter of semantics. Context-dependence was seen mostly as a marginal and unimportant phenomenon: everything, so the story went, worth being said can be articulated by means of a context-independent sentence or sentences – and using context-dependent means is only an oblique (though sometimes perhaps handy) way of doing the same. Such view of language was imputed also into the foundations of formal semantics and governed it for some time.

However, even within this framework there were, from the beginning, serious attempts to incorporate context-dependence into the agenda[2]. In his path-breaking paper on formal semantics, David Lewis (1970) made some proposals in this direction; but the first systematic accounts of context dependence within this tradition were provided by David Kaplan and Robert Stalnaker. Kaplan (1970) pointed out that 'circumstances' intervene into the process of determining an utterance's truth value twice, rather than only once, as possible-worlds semantics appeared to suggest. He urged that the utterance must be first confronted with its *context* to yield an intension which can be only then confronted with a possible world to yield the truth value of the utterance with respect to the world. Thus, deciphering an utterance such as *I am hungry* we must first exploit the context to unfold the indexical *I*, whereby we reach a proposition which then can be true with respect to some possible worlds (namely those in which the current utterer is hungry) and false with respect to others.

Whereas Kaplan concentrated on contexts as inputs to utterances, Stalnaker (1970; 1978) was the first to study contexts also as outputs from utterances, thus introducing a truly dynamic perspective. According to him, an utterance 'consumes' the actual context to yield a proposition (which may than be evaluated with respect to various possible worlds), and parallelly produces a new context which can be consumed by subsequent utterances. In the simplest case, where both contexts and propositions are seen as sets of possible worlds, the new context may be seen as simply the intersection of the context with the proposition. Thus when I say *I am hungry*, two things happen: the content of the sentence uttered gets amended by the context to yield a proposition which becomes the utterance meaning; and the context gets in turn amended by this proposition to yield a new context.

2 Systems of Dynamic Semantics

Despite such pioneering work, up to almost the beginning of the 1980s, the mainstream of formal semantics still approached language as a static system. Then, especially after path-breaking papers of Lewis (1979), Kamp (1981) and others, the situation started to change: it started to be ever more clear that the anaphoric structure of natural language, which is being put to work in almost any kind of discourse, cannot be accounted for without some kind of 'going dynamic'. Moreover, Kamp has indicated how to carry out a dynamic turn without

[2] Prior to the establishment of formal semantics, context-dependence was explicitely addressed for example by Bar-Hillel (1954).

abandoning the framework of formal semantics in the wide sense (although perhaps abandoning one in the narrow, i.e. strictly model-theoretic sense). And later Groenendijk & Stokhof (1991), van Benthem (1997) and others showed that the turn can be accomplished even within the narrow bounds of logic and model theory: they presented logical systems which were dynamic just in the way needed for the semantic analysis of the anaphoric structure of language[3].

The most general idea behind the dynamic turn in semantics appears to be the acceptance of the Stalnakerian insight that our pronouncements must be seen both as 'context-consumers' and 'context-producers'. A sentence such as *He wears a hat* is not truly intelligible (and is neither true, nor false) without there being a context for it to 'consume' and to furnish its *he* with a referent. Such a context might be constituted by the circumstances of utterance of the sentence (which may include pointing at a person), but often it is produced by some previous utterances: e.g. by the previous utterance of a sentence like *Look, there is a man passing by!*

Turning the idea of sentences being context-producers and context-consumers into the formally-semantic cash leads to thinking of a sentence as something which has a *context-change potential*: i.e. is able to bring about a change of the actual context. This, in turn, often leads to viewing the denotation of the sentence as something which involves (or simply *is*) a function mapping contexts on contexts (which is taken to be the formal reconstruction of the potential). Contexts are often seen also as *information states*: they are constituted by all the information amassed by the discourse so far. (And, importantly, they contain what can be called an *individuary*[4] – a collection of individuals having been made salient by the discourse – which acts as the casting agency for the needs of the pronouns and other anaphoric expressions of language.) Hence the resulting semantic model consists of (i) a set S of information states and (ii) a family of functions from S to S.

Thus, while on the Kaplanian picture a proposition came to interact with the context to produce the content of the actual utterance ('what is said'), now it is recognized to fulfil also one more important task: to create a new context. And if the Kaplanian picture led to the explication of the proposition as a function from contexts to contents (which were explicated as intensions), now they, *prima facie*, come to be explicable as a pair of functions: one mapping contexts on contents (the *character*, in Kaplan's term) and the other one mapping contexts on contexts (the context-change potential). But in fact these two functions need not be independent: one of the possible ways in which an utterance may produce the new context is to take its content and somehow add it to the old context. In this way, the production of the content may appear as a by-product (or an intermediate product) of the production of the new context; and the context-change potential might be looked at as fulfilling both the tasks. This appears to be what has led some of the semanticists to the identification of propositions with context-change potentials[5].

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[3] Earlier versions of dynamic logic originated especially within the context of computer science.

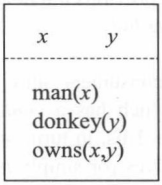
[4] See Peregrin (2000a).

[5] Note, however, that as a sentence must interact with the context to yield not only a new context, but also the content of the actual utterance ('what is said'), identifying its meaning with the context change potential is subsuming the latter task under the former, which may not be unproblematic (cf. Stalnaker, 1999).

A variety of dynamic semantic models of language emerge from various kinds of explications of the notion of context or information state. Take, as an example of one kind of such approach, Hans Kamp's *discourse representation theory* (DRT)[6]: there the role of the information states is played by *discourse representation structures* (DRSs), each of which consists of a set of individuals and a set of conditions supplied for them by the discourse. Thus a sentence like

(1) *A man owns a donkey*

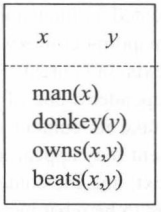
introduces two individuals together with the conditions that the first of them is a man, the second one is a donkey and the first owns the second. This gives rise to the following DRS:



Hence sentences produce DRSs; but they can, and some of them need to, consume DRSs. Thus a sentence such as

(2) *He beats it*

needs a context delivering the reference for its pronouns. If it is uttered in the context represented by the above DRS, it enriches it with the condition that the first of the individuals of the DRS beats the second; hence produces, in effect, the following DRS:



All in all, a sentence is to be seen as something which in general upgrades a given DRS to another, more elaborated one.

[6] Kamp (1981); Kamp and Reyle (1993); van Eijck and Kamp (1997).

Quite a different explication of the notion of context is provided by such systems as Groenendijk & Stokhof's (1991) *dynamic predicate logic* (DPL)[7]. Here the role of information states is played by sets of assignments of objects to the so called *discourse markers*. The intuitive idea behind this could be explained as follows: uttering *a man* introduces an individual which becomes the potential referent for *he*; hence the context produced by the utterance can be reconstructed as assigning this object to *he*. In general, the context is an assignment of all potential referents to all possible anaphoric phrases of language, which are established by the previous utterances. And discourse markers are what assume the role of the phrases within the language of DPL.

Thus, (1) is analyzed as

(1′) $\exists d_1 d_2(\text{man}(d_1) \wedge \text{donkey}(d_2) \wedge \text{owns}(d_1,d_2))$

and produces the context consisting of all functions which map d_1 and d_2 on some elements of the universe such that the first of them is a man, the second one is a donkey and the first owns the second. The subsequent utterance of (2) which is analyzed as

(2′) $\text{beats}(d_1,d_2)$

then reduces this set to the set of only those functions which map d_1 onto an individual which beats d_2. (Thus, within DPL, the conjunction of (1′) and (2′) is – surprisingly – equivalent to $\exists d_1 d_2(\text{man}(d_1) \wedge \text{donkey}(d_2) \wedge \text{owns}(d_1,d_2) \wedge \text{beats}(d_1,d_2))$. The reason is that the operators $\exists$ and $\wedge$ are not the well-known operators of predicate logic: the former in fact establishes an assignment of an 'arbitrary' value to a discourse marker, whereas the latter represents a concatenation.)

A dynamic approach also based on logic but in a rather different way (and in fact older than the previous ones) is represented by Hintikka's proposals to account for the semantics of sentences in terms of games[8]. It is well known that the usual semantics of standard logic (first-order predicate calculus) can be alternatively formulated as based on games: each formula is taken to represent a game of two players (*Me*, attempting to show that the formula is true, and *Nature*, attempting the opposite), such that one of them (*Me*) has a winning strategy just in case the sentence is true. Thus the formula

(3) $\exists x_1 x_2(\text{man}(x_1) \wedge \text{donkey}(x_2) \wedge \text{owns}(x_1,x_2))$

of the standard predicate logic is thought of as representing a game in which *I* am first to pick up two individuals of the universe, a_1 and a_2, so that the game is to continue with the formula

(4) $\text{man}(a_1) \wedge \text{donkey}(a_2) \wedge \text{owns}(a_1,a_2)$.

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[7] See also van Benthem (1997) and Muskens et al. (1997).

[8] Hintikka (1973); Hintikka and Sandu (1997); and also the contributions in the last part of this volume.

(What I aim at is picking up some such individuals that the latter formula will be true.) In the next turn, *Nature* chooses one of the three conjuncts with respect to which the game is to continue then. (What it aims at is choosing that which is most unlikely to be true.) And then the game comes to an end: if the selected atomic formula is true, *I* win, if not, the victory belongs to *Nature*.

Hintikka proposed various kinds of broadening of the range of games representable by sentences, going behind the boundaries of those naturally associated with the formulas of first-order logic. And we can also think of modifying the rules in such a way that they produce 'contexts' with 'individuaries'. (Keeping track of the moves of the game produces, besides other things, a list of individuals picked up by *Me* in the course of the game[9].)

3 Expression Meaning vs. Utterance Meaning

Whereas formal semantics in its original form saw context-dependence as a form of imperfection, and the relationship between 'true' semantics and discourse analysis or pragmatics as akin to that between pure and applied mathematics, the above sketched dynamic turn has necessarily implied a blurring of this boundary. Formal semanticists have recognized that we can hardly account for meanings of a nontrivial part of natural language without taking into account how discourse functions, how what is said can depend on context, and how it can in turn change the context.

In this way formal semantics has come into contact with a different semantic tradition, the tradition which has, from the beginning, concentrated on the actual processes of communication rather than on language as an abstract system and thus has given pride of place to *utterance meaning* over *expression meaning* – for it is, after all, the utterance meaning which does the job of communication. Within philosophy, this tradition has its roots especially in the Oxford ordinary language philosophy of J. L. Austin, P. Strawson and G. Ryle; but it has been later reinforced by many linguists and cognitive scientists who aimed at an account of how people actually communicate.

The most influential conceptual framework for studying utterance meaning (and its relationship to expression meaning) is due to the Oxford philosopher H. Paul Grice (1957; 1989). His idea was that to understand an utterance is to grasp what the utterer intended to convey, i.e. to grasp the 'speaker meaning', which is only indirectly related to the meaning of the sentence he uttered. (Thus, by uttering *It is late* one may want to say that he should go home, or that his neighbor should not make such a noise etc.) Grice argued that the meaning of the sentence uttered is used only as an indirect indicator of the speaker's meaning, which it yields only in interaction with many general assumptions about the speaker's goals and intentions (such that the speaker intends to convey something, that she intends to convey something which is relevant to her audience etc.).

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[9] See Hintikka and Kulas (1985); and also Janasik and Sandu (this volume).

The idea that to understand somebody's utterance is to find out what he intends to say (using the meaning of the expression he uttered as a mere clue) resulted, within the context of cognitive science, in conceptions of linguistic communication as based on something like a 'mind-reading' (see, e.g., Sperber and Wilson, 2002; and also Breheny, this volume). In a slightly different way, Noam Chomsky and his followers have also contributed to this tradition in that they have turned the attention of linguists to the processes of *generating* utterances, i.e. to the processes which result in the utterer's making the particular utterance she makes (see Hinzen, this volume).

4 But ... What is it All about?

After the dynamic turn, the conceptual foundations of formal semantics became a little bit ambiguous. The static semantic theories of possible worlds or situations were replaced by theories centering around the concepts of context or information state. However, while possible worlds were readily explainable as our means of accounting for "what (empirical) truth is relative to" (Stalnaker, 1986) and hence possible-worlds semantics could be seen as a relatively straightforward account for truth conditions, the foundations of dynamic semantics are still much less clear.

To be sure, there seems to exist an almost universal agreement that what dynamic theories are about is something like an 'information flow' or 'kinematics of discourse'. Thus, Chierchia (1994, 141), claims that what we are now after is the question "how [meaning] affects the information available to illocutionary agents"; and van Benthem (1997, p. ix) urges that even logic is now to concentrate on "the logical structure of cognitive actions, underlying human reasoning or natural language understanding". However, what exactly does this mean?

Prima facie there might seem to be no great fuzziness here. There are information states, so the story goes, and there is communication which changes them; and dynamic semantics is to account for this. However, in what sense do information states exist and how do they actually get changed by means of communication? There seems to be at least two quite different answers available, answers which can be called *individualistic* and *collectivistic*, respectively. According to the first, the contexts we describe are a matter of (i.e. 'are in the head of') an individual speaker, according to the other they have a status of some socially-constructed reality.

Both many cognitive scientists and some linguists with the Chomskyan background appear to be more sympathetic to the individualistic interpretation. Many of them saw a great deal of previous formal semantics as simply chimerical in that it addressed something which did not really exist, and now hail dynamic semantics as a means of turning attention to what is really there: to the manipulation of some mental representations or to workings of some language faculty. After the dynamic turn, these theoreticians have been joined by a host of those which were inspired by DRT interpreted in a mentalist way.