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Context Dependence, MOPs, WHIMs and procedures
Recanati and Kaplan on Cognitive Aspects in Semantics

Carlo Penco

Università degli Studi di Genova
penco@unige.it

Abstract. After presenting Kripke's criticism to Frege's ideas on context dependence of thoughts, I present two recent attempts of considering cognitive aspects of context dependent expressions inside a truth conditional pragmatics or semantics: Recanati's non-descriptive modes of presentation (MOPs) and Kaplan's ways of having in mind (WHIMs). After analysing the two attempts and verifying which answers they should give to the problem discussed by Kripke, I suggest a possible interpretation of these attempts: to insert a procedural or algorithmic level in semantic representations of indexicals. That a function may be computed by different procedures might suggest new possibilities of integrating contextual cognitive aspects in model theoretic semantics.

Keywords. Semantics, Pragmatics, Context Dependence, David Kaplan, Francois Recanati, indexicals, procedures.

1. Context of utterance, truth conditions and cognitive significance.

Indexicals are the prototypical examples of context dependent expressions.¹ Frege introduced the idea of context of utterance as a condition for interpreting what is said by a sentence:

“[...] If someone wants to say today what he expressed yesterday using the word ‘today’, he will replace the word with ‘yesterday’. Although the thought is the same, its verbal expression must be different, in order that the change of sense which would otherwise be effected by the different time of utterance may be canceled out” [Frege 1918, p. 64]

¹ Indexicals are expressions like “I”, “Here”, “Now”, “Today”; belonging to different syntactic categories they are typically considered a semantic category characterized by context dependence and perspectival aspects (Perry 1997, Neale 2007). According to some authors they constitute the “basic set” of context dependent expressions, according to others they are just a case among a more general context dependence of lexical items (For a survey see for instance Domaneschi et alia 2010, Domaneschi-Penco 2013).

On this view, depending on the context of utterance, two different sentences may express the same sense. Kripke 2008 challenges this point of view; he remarks that this passage raises a problem with the compositionality principle: the expressions “Today” and “Yesterday” have different linguistic meanings, therefore, Kripke assumes, different senses. If we have two sentences “Today is F” and “Yesterday was F” uttered the following day, the two sentences should express different thoughts, given that the sense of a sentence is composed by the senses of the parts and the rules of composition; and if the senses of the parts are different, they *should* express *different* thoughts. Yet Frege – apparently against his own principles – claims that the two utterances express the *same* thought.²

A way out in this difficulty may come from a rational reconstruction³ of Frege’s ideas given by Wolfgang Kühne 2007: we have to distinguish between “thought” (the metaphysical truth conditions of an utterance in a context) and “ways of articulating the thought” (the epistemological-cognitive aspects of an utterance). If we apply this consideration to the Fregean quotation given above, we find therefore an “easy” solution to Kripke’s worry: the utterances “Today is F” and “Yesterday was F” said the subsequent day are two different ways to articulate the same truth conditions: these two utterances express the same “semantic” sense, what would be for Frege an eternal thought, true independently of time, if true at all.⁴ Also in a Kripkean semantics, the two utterances should have the same truth-values in all possible worlds (in which *that* day exist). It seems therefore possible to accept Frege’s claim that the two sentences express the same thought, if we regard the truth-conditional notion, inspired by Frege’s ontological worries of eternal thoughts.

Still the two utterances have different cognitive significances, and the problem remains on how to connect the cognitive aspect and the truth conditional representation. Different answers have been given to the following question: how to treat the cognitive aspect of thought and of language processing inside a framework of truth-conditional semantics? How can we accommodate cognitive aspects in model theoretic

² Dummett 1989 claims that, given indexicals and other context dependent expressions, Frege’s claims about the sense of a sentence should be translated in claims about the sense of an utterance in a context. We should accordingly reformulate the so-called Fregean “context principle” (the meaning of a word depends on the sense of the sentence/utterance in which it appears).

³ Kühne’s reconstruction follows the acknowledgment of the presence in Frege’s works of two different trends concerning the concept of sense: (i) the ontological or *semantic viewpoint*, that is centered in the definition of sense as truth conditions in *Grundgesetze* §23 and has been developed by the semantic tradition after him. (ii) the epistemological or *cognitive viewpoint* that is centred on the definition of sense as informative or cognitive content starting from the essay “Über Sinn und Bedeutung”. See also Penco 2013 on the difference between Kripke and Kühne.

⁴ Frege’s ontological worries are connected to his idea of eternal truth conditional thoughts; a sentence together with different aspects of the context of utterance (time, location, and speaker) may express different thoughts, but the content of each utterance is eternally true, if the truth conditions are satisfied. This is the basic Fregean semantic and ontological stance against the idea of a “minimal proposition” expressed by a sentence and varying in truth and falsity depending on context. See Dummett 2006, p. 12.

semantics since these aspects are exactly those features that model theoretic semantics is designed to ignore? Context dependent expressions are a fundamental test case for this problem. Traditionally direct reference theory has chosen to separate semantics and cognitive significance; recently there has been a change in this perspective, given by two of the main paradigms working inside a direct reference framework: Francois Recanati's truth conditional pragmatics and David Kaplan's semantics (revisited). Recanati 2012, 2013 and Kaplan 2012 give new suggestions on cognitive significance using, respectively, modes of presentation (MOPs) and ways of having in mind (WHIMs). In what follows I will discuss indexicals as a case study for the treatment of cognitive aspects in semantics.

2. Attempts to Find a Unified Treatment: Mops vs Whims.

When we use indexicals we are dealing with singular thoughts, thoughts about an individual entity (be it a time, a place or a person). Recanati 2012 applies an idea (suggested by Evans and McDowell) according to which we may treat singular thoughts as strictly depending on the objects they are about; the sense of an indexical is not a description but a *non-descriptive* mode of presentation (MOP).⁵ Recanati distinguishes linguistic and psychological MOPS, where the linguistic ones are similar to what Kaplan calls "character" and correspond to the *linguistic rule* encoded by the expression, while the psychological ones are what is activated by characters, and may be considered *cognitive constraints* on the rational subject.

Psychological MOPS have a role in thought as *Mental Files*. Mental files are mental counterpart of indexicals and other singular terms⁶, and their relation to the objects they are about is not based on the information they may contain, but on the direct relation they have with the object. The structure of psychological mental files is mapped on the structure of the indexicals: at the linguistic level an expression type like "Today" encodes a linguistic rule that, in a context, connects the corresponding token to the referent (the day of the utterance); at the psychological level the mental indexical corresponding to the token of "Today" has the function of storing information derived by the context of utterance. The thought contains the mental file itself, as "vehicle", not necessarily the information that can be stored in it. If I say "Today is F" I will have a mental file where to store information of different kinds, and tomorrow I will *connect* the stored information using the mental file "Yesterday".

Recanati would consider our problem of "Today is F" and "Yesterday is F" in a way that resembles Künne's move, but with some specification and different terminology. Following our example we might say that the utterances of "Yesterday is F" and "Today is F" – entertained with two different linguistic MOPS and two different psychological MOPS – express two different thoughts, although expressing the same singular

⁵ Frege himself, speaking of sense, did not give only examples with definite descriptions, but also of sense senses as chains of communication beginning with an initial baptism: think of the example of a mountain discovered by two travellers from two different routes and called "Afla" by one and "Ateb" by the other one.

⁶ I will not treat here Recanati's view on definite descriptions, on which there are peculiar problems discussed by Vignolo 2012.

proposition (with the same truth conditions). The two different psychological MOPs or mental files could be coordinated when the subject realizes that the two mental indexicals are connected each other. The information stored in one file can be stored also in the other temporary mental file. In case of loss of memory of a speaker, we may have some interesting problems. Recanati 2012 (pp. 179-182) takes the example presented by Perry on Rip van Winkle, a person waking up after twenty years of sleeping. The sentence “Yesterday was F” uttered (in the same day) by a normal speaker and by Rip van Winkle would express two *different truth conditions*, because the former (uttered by a normal speaker) will be true if the day preceding the day of utterance was F, and the latter (uttered by Rip van Winkle) will be true if the day twenty years ago was F. But here, given Rip’s mentally referring to a day twenty years before, the linguistic mode of presentation contrasts with the psychological mode of presentation. The objective content of the utterance of “Yesterday was F” is different from what Rip van Winkle actually refers to.

In a strong interpretation of the theory, no two speakers can share the same thought, given that no speaker can have the same psychological MOPs. A first example is given in the case of EGO-files. Partly following Perry 2000, Recanati 2013 (pp. 165-167) says that in a sentence with an indexical, like “I am F”, the indexical “I” expresses the same linguistic MOP and two different psychological MOPs, one for the speaker and the other for the hearer. The hearer cannot have the same psychological MOP because she cannot entertain the thought *as* “I am F”. Therefore, Recanati concludes, we have here *two* thoughts that have the *same* truth conditions for hearer and speaker, but differ for their non-descriptive psychological MOPs⁷.

But what would happen with other indexicals? Given that every indexical thought is ego-centered, although a linguistic MOP-token may be shared by many speaker, its correspondent psychological MOP-token will be different for each person. This strong interpretation has the shortcoming of multiplying thoughts beyond necessity. Although the theory of mental files as indexicals is a very nice attempt to keep together truth-conditional and cognitive aspects, the risk of multiplying entities should be carefully considered. On the one hand Recanati seems to be compelled to multiply mental files in different species: every *epistemically rewarding relation* will activate different mental files of different kinds: demonstrative files, with perceptual MOPS, memory files with memory MOPS, recognitional files with recognition MOPS, and - at the two sides of his classification - proto-files and higher order files (or encyclopedia entries). On the other hand thoughts themselves would increase in number: each singular occasion or context of utterance may produce a specific thought depending on the activated mental file.

On the first multiplication of entities, the multiplication of mental files, Papineau (2013: 167 ff.) remarks that a perceptual file disappears when the epistemic rewarding perceptual contact disappears; for this reason Recanati is obliged to multiply kinds of

⁷ This is also a solution of Frege’s idea that a speaker gives a unique sense to the expression “I”; in a similar vein Kripke (2008: 215) suggests an utterance with the indexical “I” expresses a thought which can be *thought* or *had* only by the speaker himself but may be *understood* by a hearer who apparently «knows what type of thought is being expressed»

files and epistemic rewarding relations: when a perceptual file is closed we have a memory rewarding relation that opens a memory file, and so on. Papineau suggests a simpler view where the mental file, activated by a perceptual relation, outlasts the original encounter and is reactivated when remembered or re-encountered. Once opened, files become therefore permanent repository of information about the item in question.

Although this repair may help to solve some shortcomings of Recanati's view, we have to face the problem of the second kind of overabundance of entities, the multiplication of actual thoughts depending on contexts of utterance. To every use of an indexical there should correspond a psychological MOP that opens a mental file, making therefore a new thought for every occasion of utterance. Papineau's main doubt is the tendency to infer, from the use of indexicals to express a thought, that the thought itself must be similarly indexically structured. Although this criticism seems to hit the target, on the ground that "there seems no rationale for requiring that every epistemically rewarding relation generates its own file" (Papineau 2013: 171-2), yet we have to be careful, given the ambiguity of the terminology about thoughts that we have disambiguated using Künne's distinction: if we refer to *truth conditional thoughts* we have the standard case in which the same type of sentence uttered in different contexts has different truth conditions ("Today is F" is true depending on which day is uttered; "I am tired" is true depending on the time I utter the sentence, and so on). In these cases the thought does not have any indexical structure, because its truth conditions are fixed to the context of utterance and – using Frege's ideas – there is only one eternally valid thought (although Recanati would prefer to speak of the same singular proposition entertained). If we refer of *ways of articulating a thought*, the implicit suggestion is that *different* psychological MOPS, linked to different mental files, may be all connected to the same singular proposition with the same truth conditions (as in "Today is F" and "Yesterday was F"); this multiplication of mental files might be a correct rendering of the different ways of articulating a thought, where - in Recanati's view - there is always the possibility for information to "flow" among different files connected to the same source.

Recanati distinguishes *thought vehicles* and *thought contents*, and we might say that mental files as thought vehicles are ways of grasping thought contents. Pagin 2013 claims that it is not clear how the idea of thought vehicle can match the idea of mode of presentation. I think however that this criticism might be overcome remarking that we may use different vehicles of thought, different non-demonstrative MOPS to refer to the same thought content, or individual concept (maybe intended formally as a function from possible worlds to extension)⁸.

Speaking of concepts as functions, we don't have yet a clear description of a possible logical form that helps formally representing mental files. On the one hand Re-

⁸ According to Pagin we cannot have two distinct mental files when there is no way to distinguish them but with their being in a relation of acquaintance. If we wanted to distinguish them we should use some descriptive content, contra the idea that mental files are defined non-descriptively. An answer may be that two distinct mental files for the same individual are connected with two distinct psychological non descriptive MOPS. The challenge, however, remains open.

canati tries to give a mental counterpart of a linguistic analysis, on the other hand this mental counterpart needs to be expressed in a truth conditional semantics of pragmatics, inserting the cognitive aspects in the formal treatment of the working of language and linguistic communication. Eventually Recanati remarks that the standard Perry-Kaplan framework “is no longer influential as it used to be” (2012, p. 195), implicitly suggesting therefore that his mental file project might be developed as an alternative to the Perry Kaplan framework. Yet, at the time of writing his book on mental files, Recanati did take into consideration the new stance held by Kaplan 2012 in a paper on Keith Donnellan. It seems to me that this last paper by Kaplan is nearer to Recanati’s stance that it may appear (and therefore the novelty of the approach might contrast the supposed lack of influence of the Kaplan-Perry paradigm in this new update). I will spend the rest of the paragraph to give a short summary of the new ideas presented by Kaplan.

Kaplan 2012 makes a new Fregean move in the context of direct reference theory, developing new suggestions on the background of the standard distinctions between content and character or, in Perry’s terminology, *objective content* and *cognitive role* (see Perry 2000, 2013). The distinction concerns, on the one hand, the objective semantic aspect, dealing with truth conditional content, and, on the other hand, the cognitive (epistemological) aspect, dealing with pragmatics and belief contexts. Two utterances with two different indexicals “I” and “he” may represent the same objective content, but have different characters and therefore performing different cognitive roles, as it appears in the well known examples by Perry on different behaviors depending on the use of “I” and “he” in the context of an attack by a bear or in the context of a supermarket, when seeing sugar leaking from a trolley.

Kaplan does not abandon the distinction between character and content, but thinks that it must be supplemented with the idea of different “ways of having in mind” the same objective content. Ways of having in mind are not just what is expressed by the character or linguistic meaning of an expression, but represent what he claims to be “Frege’s enduring insight” that is:

“in the realm of cognitive significance, we must account not only for what is represented, but also for how it is represented”
(Kaplan 2012, p.158).

What is Kaplan’s new move? It is a fundamental revision of semantics, where, instead of considering only the classical truth conditional content, semantics itself should also take into account cognitive aspects. We cannot separate the theory of objective content from the theory of cognitive significance, Kaplan claims. This separation, that has extruded the problem of cognitive significance from semantics to relegate it to the domain of pragmatics or psychology, may be considered “appropriate”, but it wrongly seems to imply that a systematic theory of cognitive significance “has nothing to contribute to investigations traditionally thought to be semantic.” On the contrary, Kaplan claims,

“Cognitive significance is not foreign to semantics. For the maximum explanatory power, our semantic theory should countenance cognitive content, objective content, and extensions.” (Kaplan 2012, p. 141).

That cognitive aspects have always been discussed by direct reference theorists is not a novelty; the novelty is to consider them as a proper part of semantics, without relegating them to pragmatic problems dealing with psychology or speakers’ behavior. Beyond the difference on where to place the boundary between semantics and pragmatics, Kaplan’s attitude is therefore not so distant from the proposal made by Recanati with the use of non-descriptive MOPs. Where Recanati speaks of linguistic MOPs and psychological MOPs, Kaplan speaks of character and “*ways of having in mind*” (WHIMs) .

What are WHIMs? Like Recanati’s MOPs they are something “non-descriptive”, although they may form or may be connected to a cluster of descriptions. There may be different ways of having in mind, depending on different occasions: Donnellan taught us – with the idea of referential uses of descriptions – that we can have an individual in mind “in a way that is independent of the description that we use to refer to it” (Kaplan 2012). Descriptions used to refer are “shaped” to the occasion or to the context where we enter in cognitive touch with the referent: WHIMs might be considered “perceptual modes of presentation”, and are the fundamental aspect of cognitive significance; they are therefore to be sharply distinguished from linguistic meanings (or characters). The consequences that Kaplan derives from these ideas are however slightly different from the Recanati’s ones, although beginning with a striking similarity.

According to Kaplan, we may interpret Frege’s sense of a singular term like “Mont Blanc” as a particular WHIM, expressing a particular cognitive perspective on a state of affair; we may then have two different *thoughts* concerning the same state of affair (for instance “Mont Blanc is higher than 4000 mt” and “*that* mountain is higher than 4000 mt”). Using different WHIMs in fact, as using different mental files, we may not be aware of referring to the same mountain. Therefore one of the main problems of “having in mind” becomes the problem of *coordination or synch of different WHIMs*, a problem that Kripke begun to discuss in a “Puzzle about Belief”.⁹ Indexicals are a perfect example of the problem of coordination.

In Kaplan’s stance we may find an original answer to the criticism given by Kripke to the Fregean quotation discussed at the beginning of the paper. According to Kaplan “my utterance of ‘Today’ yesterday and my utterance of ‘Yesterday’ today may have the *same* cognitive significance, provided I have kept track of these days correctly” (Kaplan 2012, p. 137). This has the advantage of adhering more literally to Frege’s claim of identity of thoughts in case of the two correlated utterances.

⁹ Kripke (2011:125-161). Kaplan (2012:156). See Perry 2013 who gives a solution of Kripke’s puzzle, considered as a problem of syncing, showing that the disquotational principle is not generally valid.

Kaplan's claim however – probably contra Frege – amounts to say than thought, intended as cognitive significance, depends on awareness: if we have a correct awareness of the flow of time, the two utterances express the same thought or cognitive significance.¹⁰ On the influence of Evan's proposal of "dynamic thoughts"¹¹ the main question for Kaplan becomes a question of *awareness*: on the one hand, if I don't bother much, then there is difference in cognitive significance between the two sentences, but, on the other hand, if I bother to keep track of the passing of time, I will continue to "have in mind" the same day, therefore the two sentences will have the same cognitive significance.

This conclusion needs clarification. Kaplan shares Burge's viewpoint according to which Frege's claim of sameness of thought expressed by two utterance "Today is F" and "Yesterday is F" said the subsequent day "makes it clear that cognitive significance is not linguistic meaning" (Kaplan 2012, p. 159). From this Burge derives the idea that thoughts are abstract entities in the third realm, and difference in cognitive significance pertains to our grasping the same truth-conditional thought; for Kaplan this permits to have the *same* thought with the *same* cognitive significance, depending on our awareness. On the contrary it seems that in Recanati we will have two different mental files with different cognitive significance; what is in common with both authors is the need to discuss how two different expressions may be connected or coordinated (how two mental files may be connected to make the information content flow from one to the other).

There is however an apparent contrast between Kaplan's principles; on the one hand, *if* we take care, we may continuously be aware that the two utterances refer to the same day; in this case Kaplan speaks of the *same* thought and the *same* cognitive significance. However, following Kaplan's principle that distinct WHIMs depend of distinct occasions or contexts, when keeping track of *that* day, we are in a different context and different occasion: therefore we will change our *way* to keep it in mind, having the perception of the passing of time, probably by waking up and looking at the alarm clock. It seems therefore, *contra* Kaplan's claim on the sameness of cognitive significance given by awareness, that the difference in the occasion in which I consider the time should prompt *different* ways of having in mind, therefore different cognitive significances. In fact, if a WHIM depends on the *occasion* of utterance, the uttering of "today" and "yesterday" seems to be the stereotypical case of *different* occasions of utterance, and we should take into account the *difference* of WHIMs in order to understand how they may sync.

Besides, if we rely on awareness, how can we solve problems of syncing that arise when there is a difference of awareness between speakers? Let us go back to the case

¹⁰ But in case of people with tracking or memory failures the two sentences may represent two different thoughts, as it seems to happen in general with Recanati's mental files.

¹¹ Kaplan seems to have accepted Evan's criticism on his earlier ideas (see Evans 1981, fn.21). Behind Kaplan we find Evans' idea on dynamic thoughts based on the "ability to keep track" places, times and objects in time. The idea of sense of a singular term as "way of thinking" an object becomes, in the case of indexicals, way of keeping track of an object. In case of Today-Yesterday, "the thought episodes on the two days both depend upon the same exercise of a capacity to keep track of a time".

treated by Recanati of the loss of memory of Rip van Winkle. Two fully rational and coherent speakers – who don’t change their mind, but may have awareness failures – may have different beliefs: where a normal speaker may believe that “Yesterday was F” is true, Rip van Winkle may believe that “Yesterday was F” is false, because they are intentionally referring to different days. To solve their disagreement they cannot rely on their awareness: both are aware of the flow of time, but one of them is wrong. They need therefore to rely on some external criteria (either an omniscient point of view, or, for the sake of simplicity, a calendar): awareness alone will not do.

The problem of failures of syncing is similar with proper names (Hesperus/Phosphorus) definite descriptions (the man drinking martini/the man greeting in the doorway) and indexicals: if somebody gives her assent to “Today is F”, but refuses to give her assent to “Yesterday was F” the day after, because she does not realize that just one day passed, shall we say she is irrational? Not really. It is simply a case of ignorance or lack of information. To say that we have the same thought only in case of “awareness” avoids the problem of explaining the differences in informational content given by two different WHIMs. “Today” and “Yesterday” are always conventionally and intentionally correlated, but two different persons may make different correlations. The *psychological origin* of the different correlation may be found in different awareness, in different days people have in mind (certainly Rip Van Winkle is aware of what he refers to with “Yesterday”), but the *logical mistake* is due to a contrast between a *correct* and an *erroneous* use of “Yesterday”¹².

Can the lack of *correct* sync between two utterances of “Today” and “Yesterday” be explained just with lack of awareness? I have suggested that it is not the case: if two people disagree, they cannot rely on “awareness”, because they both are aware to refer to a day they have in mind and both believe it is the same day they refer to as “Yesterday” during what they think it is the day after. There is something “cognitive” in the use of indexicals which is neither linguistic meaning nor awareness. What is missing in the picture is the acknowledgment of different *ways of applying* WHIMs or MOPs to the context of utterance. Rip van Winkle’s way of applying “Yesterday” is just connecting his memories of the last day he remembers; but he might also ask for information, or check on a calendar (as sometimes happens to students who have drunk a lot, and are not sure how much time passed from their binge). Ways to apply WHIMs or MOPs are not only linked to psychology, but to common social practices we learn in learning language and social interaction.

¹² The difference with the standard cases is that in the standard examples (Hesperus/Phosphorus, etc.) two speakers refer to the *same* object and have different beliefs about it; in the Today/Yesterday case two speakers have the same belief about what is conventionally referred to as the same day, even if in fact - in our case with loss of memory - they *intend* to refer to *different* days. Using Kripke’s terminology, in case of Rip van Winkle’s mistake, we may say that the semantic reference of “Yesterday” is different from the speaker’s reference. Of his two WHIMs, one is correctly expressed (when Rip was saying, e. g. “Today is F” at the time of his utterance), the other WHIM is just wrongly expressed with the term “Yesterday”, because erroneously connected in Rip’s mind with the “Today” said twenty years ago.

Let me summarise where we are now. The idea of coordination or sync – that follows Perry’s idea of “cognitive paths” – is an interesting new way to discuss old problems like Kripke’s puzzle about belief. However making thoughts depending on awareness of people makes them very far from Frege’s idea of *cognitive* sense, that was supposed to be as objective as possible and not depending on the subjective vagaries of human psychology. With Recanati and Kaplan we seem to have a step towards a “psychologization” of Fregean thoughts. Is it the right step to take?

3. Three levels semantics between psychology and shared representations.

Kaplan’s suggestion for a three level semantics we have quotes before (“our semantic theory should countenance cognitive content, objective content and extension”) is reminiscent of the three level semantics conceived by Frege for predicates.¹³ Assuming model theoretic semantics as general framework in which to take care of the cognitive dimension of semantics, we might translate Kaplan’s proposal into something like the following:

	Sentence	Predicate	Singular term
<i>Cognitive Content</i>		<i>function from contexts to objective content (character plus MOPS or WHIMS)</i>	
<i>Objective Content</i>		<i>function from possible worlds to extensions (Intensions)</i>	
<i>Extension</i>	Truth Value	Class	Individual

In this setting, character is a function from context to content. However character alone cannot perform the entire job. Characters give general directions independently of when, where and who is speaking; however, as Kripke (2011: 268) remarks, “in any particular case, to determine the reference one needs a specification of the speaker, the time, or both”. In other words, once given the general form of a semantics of indexicals, we are left with a pair (context plus character) which is supposed to give the content for semantic evaluation; however, as Predelli (2005, p.74) says, the semantic module “sits and waits” for clause-index (or character-context) pairs to be delivered by pragmatic processes. But how is it possible to obtain the contents from the clause-index pair? The problem is: should semantics be concerned with *how* semantic values are determined?

In his 2012 paper Kaplan tries to say something more that putting his distinction between character and content into the framework of semantics. Like the distinction between linguistic and psychological MOPS, he needs a distinction between linguistic

¹³ See 1906 Frege’s letter to Husserl (in *The Frege Reader*: 301 ff.). For a discussion see Wiggins 1984, Penco 2013a.

meaning and cognitive significance: “it would be odd to end up viewing cognitive contents as nothing more than the conventional meaning of language” (2012 fn. 38). WHIMs (or psychological MOPs) are something more than linguistic meaning or character. What is exactly the difference? According to Recanati they are the mental counterpart of linguistic entities. According to Kaplan they are the way in which a referent is directly fixed by our intentions, depending on different occasions. Both are mainly dealing with psychological aspects. What is their role in semantics?

Kaplan and Recanati insist that WHIMs and psychological MOPs concern a specific cognitive access to reality, that should explain and clarify aspects of direct reference theory. They both insist on the difference between linguistic meaning and cognitive significance; however cognitive significance cannot be separated from linguistic meaning, just because it can be defined as what is “activated” by the use of linguistic meaning in a context. The need to recognize a new level in semantics that goes beyond character or linguistic meaning is certainly a novelty in the direct reference framework, but we still have to find how to treat the problem inside a semantic theory.

The problem is which logical form – if any – to give to MOPs and WHIMs. As we have just been reminded by Kripke and Predelli, the character of an indexical is a general rule that is valid independently of any special occasion or context of utterance. What happens when the context is taken into consideration? We need to find which specific procedure may be attached to the function that given the context fixes the semantic content. In order to *understand* or *use* an indexical it is not enough to know its character, but also to master the procedures that permit its use in a context: if we know that “I” means “the speaker of the utterance” we don’t know yet *how* to pick the speaker in the context; we need some specific procedures we learn when we learn language: look for where the sound comes from and pick the individual who has made that sound among others. Or, when we have to express ourselves, pronounce that sound to call attention to us, learning how to activate the right sound in the right language and at the right time.¹⁴

If I hear “Yesterday” I need a procedure that helps me in understanding which is the day before the day of the utterance and different procedures may attain that aim (looking at a calendar, ask a friend, keeping in mind the day looking at the sky, remembering happenings). Normally I will have the default assumption of correct memory; but if something falsifies this assumption, I may guess that something went wrong in the way of applying the indexical expression.

What should happen in the semantic model of these aspects of cognitive significance? How could we represent psychological MOPs and WHIMs? It seems that they should represent individual perspectives of individual psychologies. The move seems

¹⁴ A particularly original way to see the difference between two occurrences of “I” is given in Textor 2015. To avoid interference with human psychology, we might think of which procedures to put in an intelligent system. A robot would need a procedure that, when hearing the sound “I” makes the system individuate where the sound comes from, and brings it to the individual who has made the sound in the context. On the other hand, if the robot has to express itself, it will not look for a sound and search a person, but it will look for activating his voice with the sound “I”.

welcome for some authors, like Papineau, who fully supports Recanati's decision to focus on the individual rather than the community. He is highly suspect of any one notion that could do justice both to the public and individual dimensions of thought: his claim is that "there is any real work for the idea of a public concept, once we have a good account of individual mental files and the use of words to communicate them".¹⁵

However, when we make experiments in psychology of language we are not working on the specific ways the brain works in individuals, but on statistics on what different speakers share in the use of language, to check on the psychological plausibility of a theory or model of language.¹⁶ Papineau himself (2013: 166) recognizes that mental files should be conceived as a sub-personal speech production system. A study of individual competence, in this perspective, would be probably well suited for some kind of connectionist analysis of subsymbolic mechanisms and processes of the mind. As Smolensky 1988 once remarked, besides the analysis of psychological processes, we may have higher-level representations (like the ones developed in symbolic artificial intelligence) as the representations and analysis of the cognitive systems that supervene the processing of individual minds, although they must be compatible with the psychological data.

Following the three levels semantics suggested by Kaplan we might insert an algorithmic level in model theoretic semantics as a possible way to represent Recanati's MOPs and Kaplan's WHIMs, as procedures attached to functions. What is required by a semantic theory is what can be shared among speakers and how cognitive significance may affect our way of expressing and understanding thoughts and thought components. We should therefore look for different *kinds* of objective procedures that may be attached to characters or linguistic meanings (intended as functions from contexts to contents). Without a context of utterance linguistic meanings are *inert*; they need to be activated, and – without a specific procedure – characters cannot give any semantic value. Whether to treat these procedures as part of pragmatics or semantics is still an open question. Yet, speaking of procedures or algorithms we are back to the realm of

¹⁵ Although, as we have seen, he criticizes the postulation of some mental files corresponding to indexicals; he criticizes the analogy because "it encourages the view that there are token mental files corresponding to token linguistic demonstratives, when in truth there is nothing corresponding in our actual cognitive structure." (Papineau 2013: 167)

¹⁶ I mainly refer to works in experimental pragmatics to which I have partly contributed. Today, the relation between psychology and logic is certainly very different than in Frege's times. However Frege's worries on cognitive aspects bring forward many problems in contemporary logic especially dealing with bounded rationality. In order to have a logical or algorithmic representation of cognitive significance, we probably should consider formalizations such as common sense reasoning or default reasoning strategies. On a more general perspective we may agree with Stenning-van Lambalgen (2008, 16) that "using the formal machinery of modern logic leads to a much more insightful explanation of existing data, and a much more promising research agenda for generating further data." I hope that representing MOPs and WHIMs as algorithms attached to functions might provide fruitful developments in model theoretic semantics and offer ways to check also the psychological plausibility of different views on mental files.

objective representation of cognition; truth conditional thoughts can be articulated and grasped from different viewpoints. MOPs and WHIMs aims at showing that linguistic meanings are not enough, and we need something more for describing the working of linguistic and mental interactions. However, we should carefully distinguish between the psychological and neurophysiological search to go “inside” the working of human brain-mind, and a representation of what is open to view, a procedural representation of the different ways in which a truth conditional thought can be represented: different (kinds of) procedures in different (kinds of) contexts of utterance are kinds of things we may grasp and learn.

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