Variadic Function and Pragmatics-Rich Representations of Belief Reports

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Abstract

Truth-conditional pragmatics (TCP, Recanati 2002, 2003, 2004) advocates so-called ‘top-down’ pragmatic processes that contribute to the truth-conditionally evaluable representation of meaning while not being grammatically controlled. In this paper I propose an analysis of meaning of utterances expressing propositional attitude reports, starting with the assumptions of TCP and in particular employing the device of a variadic function (Recanati 2002, 2005a). Propositional attitude reports are notorious for the problem with accounting for their meaning in that, being a sub-species of intensional contexts, they are sensitive to the substitution of coreferential expressions. Such a substitution may change the meaning of the construction. Following my analysis proposed in Jaszczolt (2005a), I employ Recanati’s concept of variadic adicity to the description of the attitudinal predicate. In particular, I look at expressions of the form ‘A believes that B φs’ and suggest that in order to account for the contribution of the description of B to the meaning of the report, one has to postulate an argument slot for the belief predicate that is filled in by the relevant aspects of the mode of presentation of B when appropriate, and left unfilled in other cases. In effect, this amounts to the variable adicity of the belief operator, varying between two and three arguments: the holder of the belief, the proposition, and on some occasions the mode of presentation under which the proposition is believed. I also comment on the compatibility of the hidden-indexical theory of belief reports with the device of variadic function: by putting the two together we obtain a much more successful account of these problematic constructions.

Next, I address the pertinent issue of the division of labour between semantics and pragmatics, discussing it in the example of the possibility of a formal account within the overall confines of TCP. I make use of Recanati’s pragmatics-rich notion of compositionality (2004: 132) and suggest that compositionality is to be sought on the level of representations of utterance meaning that combines information about meaning coming from different sources, such as the lexicon, sentence structure, subdoxastic enrichment, and conscious pragmatic inference. In the following section, I demonstrate how these insights can be put together in the framework of Default Semantics (Jaszczolt 2005a) that rests on this assumption of such higher-level compositionality. I conclude with a brief discussion of the impact of this analysis on the minimalism/contextualism/meaning eliminativism debate in post-Gricean pragmatics.
1. Overview

*Truth-conditional pragmatics* (TCP, Recanati 2002, 2003, 2004) advocates so-called ‘top-down’ pragmatic processes that contribute to the truth-conditionally evaluable representation of meaning while not being grammatically controlled. In this paper I propose an analysis of meaning of utterances expressing propositional attitude reports, starting with the assumptions of TCP and in particular employing the device of a variadic function (Recanati 2002, 2005a). Propositional attitude reports are notorious for the problem with accounting for their meaning in that, being a sub-species of intensional contexts, they are sensitive to the substitution of coreferential expressions. Such a substitution may change the meaning of the construction. I propose to account for this problem by employing Recanati’s concept of variadic adicity of the attitudinal predicate. In particular, I shall look at expressions of the form ‘A believes that B φ’s’ and suggest that in order to account for the contribution of the description of B to the meaning of the report, one has to postulate an argument slot for the belief predicate that is filled in by the relevant aspects of the mode of presentation of B when appropriate, and left unfilled in other cases. In effect, this amounts to the variable adicity of the belief operator, varying between two and three arguments: the holder of the belief, the proposition, and on some occasions the mode of presentation under which the proposition is believed. I also comment on the compatibility of the hidden-indexical theory of belief reports with the device of variadic function: by putting the two together we obtain a much more successful account of these problematic constructions.

Next, I address the pertinent issue of the division of labour between semantics and pragmatics, discussing it in the example of the possibility of a formal account within the overall confines of TCP. I make use of Recanati’s pragmatics-rich notion of compositionality (2004: 132) and suggest that compositionality is to be sought on the level of representations of utterance meaning that combines information about meaning coming from different sources, such as the lexicon, sentence structure, subdoxastic enrichment, and conscious pragmatic inference. In the following section, I demonstrate how these insights can be put together in the framework of Default Semantics (Jaszczolt 2005a, c, d) that rests on this assumption of such higher-level compositionality. I conclude with a brief discussion of the impact of this analysis on the minimalism/contextualism/meaning eliminativism debate in post-Gricean pragmatics.

2. Intuitive Truth Conditions

Ever since Davidson appropriated Tarski’s semantic definition of truth to natural languages, the truth-conditional analysis of meaning has remained unsurpassed in its explanatory adequacy, and most notably in the clarity and appeal of formalizations and the range of phenomena and constructions it is capable of handling. However, in the past three decades there has been a growing split in the field with respect to the assumptions concerning the unit of which the truth value should be predicated. Traditionally, the units that were regarded as true or false were sentences. Truth conditions applied to the output of the syntactic processing, standardly known as the logical form, and the truth value resulted from assessing this logical form with respect to a particular model. Next, Grice (1978) observed that some pragmatic processing may be necessary before assessing the truth conditions and subsequently the role ascribed to this pragmatic processing in establishing the truth-evaluable representation has been widely debated in the literature. All that Grice mentioned in this respect was the assignment of reference to indexical expressions and disambiguation of ambiguous sentences. His followers, however, are responsible for what is now the wide-spread view, namely that the processes that contribute to the truth-conditional representation are of many various types and include, for example, the precisification of the meaning of connectives such as *or*.

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1 See Tarski 1933, 1944; Davidson 1967; Lepore and Ludwig 2005.
in (1) or specifying the domain of quantification as in (2). The utterance of sentence (1) conversationally communicates (1'), while (2) conversationally communicates (2').

(1) In July I will go on holiday or stay at home and write a paper.
(1') In July I will either go on holiday or stay at home and write a paper, but not both.
(2) Everybody went skiing.
(2') Every participant of the workshop went skiing.

On this view, the outcome of pragmatic processes, be it conscious pragmatic inference or/and unconscious, subdoxastic pragmatic enrichment, depending on the orientation, contributes to the truth-evaluable representation. In other words, truth conditions are predicated of a representation that is enriched with the output of pragmatic processes. The issues associated with this debate are ample and pertinent. On the most general level, the view of pragmatic intrusionism has to be contrasted with the view that semantic representation goes ‘beyond truth conditions’, while truth conditions are predicated of the classical output of syntax. Next, one has to establish whether pragmatic enrichment can be traced to the syntactic form or rather comes from a separate, truly pragmatic domain of inferring speaker’s intentions.

In this paper, I shall adopt the latter perspective and assume that the pragmatic enrichment is not syntactically controlled. The approach we are going to follow in this paper shares the general assumptions with Recanati’s (2002) TCP. In TCP, the meaning presented in (2') results from the uttered (2) in virtue of a so-called ‘top-down’ process, a process of free enrichment that is not linguistically controlled. This process is not triggered by slots in the syntactic representation. In other words, it is not ‘bottom-up’. The main advantage of this approach for the analysis of speaker’s meaning is that it renders ‘intuitive truth conditions’, i.e. the truth conditions of the propositions intended by the speaker, or, more precisely, the propositions recovered by the addressee as if they were intended by the speaker. In TCP, we can retain the precision of a truth-conditional analysis of meaning while shifting the object of study from an abstract unit of a sentence to a cognitively and physically real unit of an utterance. As a result, the meaning under investigation is utterance meaning understood as the meaning recovered by the addressee as that intended by the speaker.

For the purpose of our current analysis of attitude reports, one of the main strengths of TCP is that it relaxes the dependence of meaning on grammar. More precisely, it relaxes the dependence of the meaning of an utterance on the logical form understood as the output of syntactic processing. This is so because in TCP, as well as in this study, truth conditions are predicated of the representation of the utterance meaning. This relaxation of the dependence on syntax opens a window on, for example, reanalysing the argument structure of predicates that appear ambiguous as far as their adicity is concerned. In particular, it opens up the possibility that the predicate ‘believe’ may on some occasions represent a two-place relation between a believer and a proposition, and on others a three-place relation between a believer, a proposition, and the way of thinking about this proposition, called its mode of presentation. A more pragmatics-controlled, or inference-controlled view on adicity will prove seminal in my solution to the problem of representing the meaning of intensional contexts such as propositional attitude constructions. We can now proceed to the presentation of Recanati’s proposal of the variadic function that will be employed for this purpose – a proposal that fits very well in this category of relaxing the syntax-pragmatics bind.

3. Variable Number of Arguments

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3 In this context, the recent attempts to revive ‘minimal’, sentence-based semantics are pertinent. See Borg 2004; Cappelen and Lepore 2005; Jaszczolt 2005e.
In the midst of the debate on the traceability to syntax of aspects of meaning that are added to what is physically uttered, we encounter predicates such as ‘eat’ in (3). The scenario is as follows. Bobby is a dog that has been ill for a few days and unable to feed himself. He has been lying next to a bowl of food, unable to get up and eat. Suddenly, his owner looks at him and utters (3).

(3) Look, Bobby is eating!

The predicate ‘eat’ can be regarded as ambiguous as to the number of arguments it requires: while normally it would require two, a subject and an object, in (3) it requires only one. Alternatively, ‘eat’ can be analysed as having a compulsory slot in the logical form that accounts for the overtly missing object in (3). The semantic representation of (3) would then be (3’), where ∅ stands for the missing argument.

(3’) Look, Bobby is eating ∅!

Subsequently, in the processing of (3) by the addressee, (3’) is supposed to be filled in to result in something like (3’’).

(3’’) Look, Bobby is eating his food!

The main problem with this analysis is that (3) does not seem to mean (3’’). Intuitively, it means that Bobby is engaged in the action of eating. The object or substance of this action is not relevant and hence is not mentioned. The most appropriate way of accounting for this intuition is to say that in (3) ‘eat’ does not mean ‘eat something’. Instead, it just means ‘eat’. In terms of lexical semantics, this would mean one of the following two accounts. Either (i) we have two lexical entries for ‘eat’, one requiring two arguments and one requiring only one, or (ii) the adicity of the predicate ‘eat’ is underdetermined. Semantically, ‘eat’ is sense-general and the interpretation could proceed either way, depending on the utterance and its context. The latter is the position taken in TCP and the one we shall follow.

In the spirit of the general assumptions of TCP, and on the basis of arguments laid out in Recanati (2002, 2005a), Recanati rejects both the ambiguity view and the traceability to syntax. Instead, following and expanding on a remark in Barwise (1989: 241, fn 23), he proposes the variability of the adicity, depending on the pragmatic conditions. For example, a speaker may utter (4), meaning in fact (4’), where the particular location of the activity of skiing can be pragmatically inferred.

(4) John is skiing.

(4’) John is skiing in Scotland.

The added specification is not a constituent of the logical form, it is not linguistically controlled. This view results then in the conclusion that the adicity of ‘to ski’ can vary, as is spelled out in the definition of the variadic function:

“A variadic function is a function from relations to relations, where the output relation differs from the input relation only by its decreased or increased adicity. Adding a predicate modifier (adverb or prepositional phrase) to a predicate expressing a n-ary relation R^n thus results in a complex predicate expressing an n+1-ary relation, in which the n^{th}+1 argument is a circumstance: a time, a location, a manner, or what not.”


The representation we obtain for (4) is that in (4’’).
(4′′) \[ \text{Circ_{location: Scotland} (Ski (John))} = \text{Ski_in (John, Scotland)} \]

The intention in the present paper is not to assess the proposal of the variadic function, neither is it to take issue with opposing views. I propose to apply the variadic function to the analysis of propositional attitude reports in order to address the seminal problem of the logical form of attitude constructions, their compositionality problem, and, most of all, to propose a representation of attitude constructions that would fulfil the requirements of being truth-conditionally evaluable from the perspective of the intrusionist, top-down processes of TCP. In return, the success of the current analysis of attitude reports in terms of variadic function could constitute an argument in support of the plausibility of variadic function itself.

4. Three Readings of Belief Reports

Belief reports are the most frequently discussed example of propositional attitude reports. To repeat, propositional attitude reports are sentences of the form ‘A believes that B φ’, reporting on people’s mental states such as beliefs, thoughts, fears, and so forth. The scope of the category of propositional attitudes will not concern us here, we shall focus instead on sentences reporting speaker’s beliefs such as (5).

(5) Tom believes that the president of the U.S. is unpopular.

Such sentences belong to the category of intensional contexts in that they prove problematic when we try to assess their meaning by considering the extensions of the referring expressions in the embedded clause, without making use of the way in which these extensions are taken by the reporter or by the owner of the belief. Again, for the purpose of this argument, I shall narrow the field further and consider only the modes of presentation pertaining to the holder of the belief rather than to the reporter. In other words, in (5), it is Tom who can think of ‘the president of the U.S.’ under a variety of guises, not the person uttering (5). On this assumption, we can distinguish two readings of (5). The first one is a reading on which Tom’s belief is about a known, intersubjectively identifiable individual, George W. Bush. This is the transparent reading and also a reading that, pace the general confusion in the field, I shall call de re, assuming the sentence was uttered at the time of writing of this paper. The other reading is likely to occur in a situation where Tom has very limited knowledge of international affairs and does not know any names of heads of states. However, he happens to know that the president of the United States, whoever he might be, is held responsible by American people for bringing upon them the war in Iraq – a decision the rationale of which many of them question. Tom, ignorant of who the current president of the U.S. is, utters (6).

(6) The president of the U.S. is unpopular.

This is the reading on which Tom holds a belief about whoever is the president of the United States. For the current purpose I shall call it de dicto.  

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The *de re/de dicto* distinction, borrowed into the 20th century philosophy of language from mediaeval logic where it was used to discuss problems with modalities, is predominantly used to describe mental states such as belief. So, beliefs can be *de re* or *de dicto* – or only *de re* or only *de dicto*, depending on the author and on the exact definitions of the terms. The terms have also been adopted to classify linguistic units such as sentences and utterances. However, when we try to apply them to utterances reporting on beliefs, the distinction *de re/de dicto* seems to lose its binary characteristic. Since we are interested in the pragmatics of processing rather than the semantic properties of substitutable names and descriptions, we must also distinguish the scenario on which Tom holds a belief *de re* but is mistaken as to the identity of the president. On this scenario, let us assume that Tom is mistaken as to the identity of the current American president and thinks it is Bill Clinton. This reading makes the belief reported in (5) *de re* in virtue of its being about a particular identifiable referent, but the report itself, in our adopted terminology, is *de dicto* in virtue of being opaque to substitutions of coreferential expressions. It is thus, so to speak, a sub-type of a report *de dicto* that corresponds to a belief *de re*. This is the case of a report that we shall now refer to as *de dicto with a referential mistake*. The ordinary *de dicto* reading will now be referred to as *de dicto proper*. In practice, *de dicto with a referential mistake* is rare in its pure form ‘A believes that B ϕs’ when the referential mistake is attributable to the holder of the belief but not to the reporter. In such cases, the reporter would normally correct it and report on the belief as in (5’), or even (5’’) or (5’’’).

(5’) Tom believes that the president of the U.S. is unpopular but he thinks it is Clinton.

(5’’) Tom believes that Bill Clinton is unpopular but he thinks it because he thinks Clinton is still president.

(5’’’) Tom believes that Bill Clinton is unpopular.

When the role of being president is more salient than the identity of the referent, the reporter may, however, choose to use (5) instead.

Another argument for adopting the tri-partite distinction for belief reports comes from the scenarios on which it is the reporter, rather than the holder of the belief, who is referentially mistaken. In such cases, the reporter can utter (5) while Tom holds a belief about Bill Clinton and utters (6’).

(6’) Bill Clinton is unpopular.

On such a scenario, *de dicto* with a referential mistake is more common in its pure form, without a disclaimer or clarification. For the purpose of the current analysis, however, we are restricting the discussion to the ways of thinking (modes of presentation) of the holder of the belief. So, while the justification for the category *de dicto with a referential mistake* may seem rather weak there, it has to be remembered that when all possible readings, including those accounting for the modes of presentation pertaining to the reporter, are considered, the need for such a category is evident indeed.

5. Variable Adicity of ‘Believe’

Propositional attitude reports constitute a problem for the principle of compositionality because their meaning is not a function of the meanings of the words and the structure in which the words are immersed. The Fregean *sense*, or the more psychologically real constructs such as the mode of

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7 See also Jaszczolt 1999, 2000b, 2005a.
presentation (MoP), the guise, the way of thinking, have been proposed as remedies. Schiffer (1992), for example, tentatively proposes that sentence (7) has a logical form as in (7'), where \( m \) stands for a mode of presentation, \( \Phi^m \) for a contextually given type of this mode of presentation, and \(< >\) indicate intensions.

(7) Ralph believes that Fido is a dog.

(7') \((\exists m)(\Phi^m \& \text{Bel}(\text{Ralph},<\text{Fido, doghood}>,m))\)

On this proposal, known as a version of the hidden-indexical theory of belief reports, we add a constituent \( m \) to the logical form in order to preserve the compositionality of meaning. \( \Phi^m \) is best conceived of as a way in which Ralph thinks about Fido and about doghood. He may have a specific way of identifying Fido, say, as the auditorily identified pet that belongs to his neighbours and that emits sounds half-way between barking and bleating, but not as the visually identified pet that passes in front of his window every morning walked on a lead. However, this addition of \( \Phi^m \) does not solve the problem of the meaning of belief reports. First of all, \( m \) does not come from sentence structure. It is external to linguistic expression and it is contentious whether it should be conceived of as a constituent of the logical form. It seems that it belongs more properly with some higher-level representation of meaning that allows for the input that does not pertain to the constituents of the logical form. Second, it is not clear what information falls under \( \Phi^m \) and how the relevant constituents that in fact fall under \( \Phi^m \) can be extracted from the totality of background information that can in theory fall under \( \Phi^m \). Next, it is not clear whether this information under \( \Phi^m \) has to be consciously accessible to the holder of the belief and to the processor of the belief report.

The first question has two possible solutions: the contextualist and the anti-contextualist one. On the contextualist construal, the information included in MoP can contribute to the propositional form of the utterance. On the anti-contextualist construal, it functions separately as implicatures. As we remarked in Section 2, the contribution of the contextual input to the truth-conditional representation is a matter of dispute. While some theories adopt the assumption that semantics has to go beyond truth conditions, others construe the truth-conditional representation broadly, to include the output of pragmatic inference. Questions two and three add to this debate in that they stress the difficulty with perceiving \( \Phi^m \) as a constituent of the logical form due to its non-linguistic origin. \( \Phi^m \) differs depending on (i) the believer’s background knowledge and (ii) which aspects of this background knowledge make a difference to the intended meaning. Moreover, \( \Phi^m \) is not even necessarily pragmatic in the sense of pragmatic inference: it may pertain to some shortcuts through constructing meaning representations that do not require conscious inference. All this makes \( \Phi^m \) a rather ill-fitted candidate for a constituent of the logical form.

Schiffer (2003) ultimately rejects \( m \) as a constituent of the logical form, together with rejecting compositionality on the level of linguistic forms. But, surely, there is no need to reject \( m \) if we make it a constituent of some higher-level, interactive representation that assigns a proportionally higher role to the effects of top-down processing and does not rely on positing slots, constituents in the logical form, whenever such effects are pertinent. In other words, \( m \) is only controversial when it is conceived of as a constituent of a semantic representation that is supposed to be the output of syntactic processing. There is no evidence from the structure of such sentences expressing belief reports that the predicate ‘believe’ contains a slot for the mode of presentation. Furthermore, there is clear evidence from the way in which belief reports are used that \( m \) is not always a necessary constituent of the meaning of such constructions. When the identity of the object of the belief is intersubjectively transparent and not disputable, \( m \) is redundant. But when we (i)

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8 The theory was first proposed by Schiffer 1977. See also Crimmins and Perry 1989; Crimmins 1992; Schiffer 2000; Jaszczolt 1998a, b, 1999, 2000b.

9 See also Recanati 1994.
allow for this ‘on-and-off presence’ of \( m \) and (ii) relax the dependence of the semantic representation on the output of syntax, \( m \) becomes more welcome as a constituent of such a semantic/conceptual representation.

In the remainder of this paper I make a suggestion of how to implement (i) and (ii). For the moment, however, let us attend to the first, immediate potential objection that such moves may encounter. This objection is the potential violation of the principle of compositionality. To start at the beginning of the problem, it has to be remembered that belief reports are intensional contexts for which the principle of compositionality does not hold unless we add an extra constituent to the logical form that would account for the guise under which the proposition is believed by the subject of the that-clause. This solution, proposed in the hidden-indexical theory, is however not satisfactory in that compositionality is not really reinstated: \( m \) does not have an obvious provenance in the syntactic structure, it appears ad hoc, made up in order to patch up the difficulty with the semantic representation. It seems that \( m \) would only acquire a legitimate place in the semantic/conceptual representation of belief reports if the representation itself were less reliant on the syntactic structure. And the latter is exactly what we propose. While Schiffer rejects the compositionality of semantics on the grounds that there is no legitimate slot for \( m \), we make it legitimate by moving the representation itself away from syntax. We define it as the product of an interaction between the structure of the sentence uttered, the lexical meaning of the expressions used, and also the inference performed by the addressee in the context of the discourse and the automatic, salient meanings that arise for the addressee in the process of utterance interpretation. Such a representation is further removed from syntax and \( m \) can find a comfortable place within one of the sources of meaning that contribute to it in the interactive process of meaning construal. The most obvious location for it is pragmatic inference or automatic, salient meanings. The proposal is developed in Jaszczolt 2005a and further discussed in Sections 6 and 7 below. Suffice it to say at present that on such an interactive account we need not sacrifice the compositionality of meaning. We find that the output of such an interaction of the various sources of information about utterance meaning is itself compositional. It is compositional by stipulation, i.e. by definition and by a methodological requirement. We have to find compositionality somewhere because an entirely non-compositional theory of meaning is inconceivable. The way to think about it is as follows. If compositionality is not in the structure, then perhaps, as Schiffer suggests, it is in the world and we need a supervenience theory that will make it accessible for semantics. Or, alternatively, compositionality is to be found in the structure, but the structure has to be understood as subsuming top-down pragmatic input as in TCP (see Recanati 2003). Or, to follow this path of reasoning even further, it is in the conceptual representation that gathers information about meaning coming from various sources. The advantage of the latter option is that we need not resort to inserting \( \Phi^*m \) to the logical form as in (7’) once and for all. For some situations, a less complicated representation will suffice. When \( \Phi^*m \) is not used in the interpretation of a belief report, it need not figure in the representation. The representation in (7’) works for the de dicto proper and de dicto with a referential mistake, but is overly detailed for the de re reading. In the case of the de re reading, the MoP is not relevant for the semantics: the utterance behaves like an extensional, unproblematic context that can be captured by a representation in which a belief is a two-place relation between the believer and the proposition as in (7’’).

(7’’) Bel (Ralph, <Fido, doghood>)

While it would not be an error to adopt \( \Phi^*m \) once and for all, the meaning of the predicate ‘believe’ would have to be compromised, just as the meaning of the predicate ‘eat’ in (3) repeated below would be compromised if we allocated a two-argument structure to it once and for all.

(3) Look, Bobby is eating!

An important insight into the meaning of such predicates would have been lost.
Now, if we follow the TCP option, then the remedy is simple. We contend that pragmatic processes that contribute to the meaning of attitude reports can be top-down, they do not need to correspond to constituents of the logical form. In other words, they need not be triggered by grammar. We add the information that (5) is to be taken to be about Bill Clinton on the reading *de dicto with a referential mistake*, or about anyone who is currently the president of the U.S. on the reading *de dicto proper*, without being concerned about the structure obtained through grammatical processing. We can capture this variability of the processing outputs by utilising the variadic function introduced in Section 3. In the case of *de dicto with a referential mistake* and *de dicto proper* readings of a belief report, there is a semantically relevant $m$ that contributes a variadic function which increases the valence of the Bel relation.

The way to think about the variable relevance of MoP is this. The *de re* reading does not make use of it, its role for the semantics is null and there is no argument slot for it in the semantic representation. This is the standard way of using a definite description and we shall consider the *de re* reading to be the most salient one. The role of MoP increases for the *de dicto with a referential mistake*: it matters for this reading whether in (6) Tom thinks about George W. Bush or about Bill Clinton. But, this identification of the referent is all that matters. The semantically relevant MoP is fairly coarsely-grained, it does not contribute any finer details pertaining to the president that may be present in Tom’s belief. In the reading *de dicto proper*, the granularity of the semantically relevant MoP increases further: any fine detail from Tom’s belief may be relevant. For example, in our scenario for (5), all that Tom knows about the president of the U.S. is that whoever he or she is, is the most important decision-maker in the U.S. In this case, no substitution of coreferential expressions can go through *salva veritate*. To sum up, the granularity of MoP starts from value 0 for *de re*, and gradually increases through *de dicto with a referential mistake* to *de dicto proper*. But, as was argued above, the value 0 is better represented as the absence of $m$ from the representation altogether. This is possible because Bel can have variable adicity – the topic to which I now turn.

The variadic function can capture the difference between the default reading, that is *de re*, and the remaining two context-triggered readings, that is *de dicto with a referential mistake* and *de dicto proper*, by adding an argument place for MoP for the latter two. In other words, we can construe the variability between (7") and (7") as a variadic function of the Bel relation. On this construal, (7") represents the reading on which the MoP need not be brought in, that is it does not contribute anything to the representation of the meaning of the utterance. This is the *de re* reading. (7") represents all those readings on which MoP is relevant and hence is given a place as an argument of Bel. It is relevant in the case of a referential mistake as it has to ‘correct’, so to speak, the reference assignment signalled by the expression used and point to the one intended by the speaker. But, to repeat, since its aim is confined to finding this intended referent and ‘substituting’ it, so to speak, for the one signalled by the expression, it need not be very finely-grained. In other words, not all of the information that the holder of the belief has about the referent need be included in the representation of the meaning of the belief report. This third argument of Bel contains only those aspects of the believer’s MoP that are necessary for identifying the correct referent. In contrast, the *de dicto proper* requires a more detailed, finely-grained MoP in that its role is there to

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10 It has to be pointed out that this reading does not result from contextual enrichment on a par with (1) and (2): it is the standard, default meaning of a belief report, resulting from the referential intention with which the report is uttered and from the intentionality (being ‘about an object’) of the reported mental state of belief. In my previous work (see e.g. Jaszczolt 1997, 1998a, b, 1999, 2000b) I presented arguments in support of the thesis that ‘by default’ this intentionality of belief, and the referential intention of the belief report, come in the strong, ‘undispersed’ form: the act is about an identifiable individual or object, and, analogously, the utterance refers to an identifiable individual or object. Reports *de dicto* depart from this *status quo* in that their intentionality and referential intention are, so to speak, ‘defective’. I explain in Section 7 how such default and non-default readings can be accounted for in the contextualist framework of merger representations.

11 Here one may employ Recanati’s (1993) distinction between linguistic and psychological mode of presentation. It is the latter that we need: we need a theoretical construct, an abstraction, so to speak, over the real thoughts of the holder of the belief (psychological MoPs).
create a representation of the object of the person’s belief, say, Tom’s belief about the president of the U.S., where the object itself is not mapped onto any particular referent.

So far my main arguments for the variable adicity of Bel have been (i) the irrelevance of MoP for the representation of the de re readings and (ii) the intuitive difference in meaning between holding a belief about a clearly identifiable person or object (de re) and holding a belief that something is the case, where the ‘about’ element is to a lesser or greater degree obscured (de dicto with a referential mistake and de dicto proper). Argument (ii) is parallel to, although admittedly less striking that, the apparent ambiguity of the predicate ‘eat’. The latter was described as a case of sense-genericity or meaning underdetermination, in accordance with the tradition of radical pragmatics and current post-Gricean contextualism (see Recanati 2005b; Cappelen and Lepore 2005). The same argument seems to hold for the predicate ‘believe’. ‘Believe’ is a sense-general predicate that assumes the two-argument or the three-argument structure depending on the context of the utterance. But at this point, further questions appear on the horizon. The main question is that of the relative salience of such interpretations. Are both readings of ‘eat’ equally accessible in utterances such as (8) at the point at which the speaker utters ‘eat’?

(8) Bobby eats whenever his master strokes his back.

Similarly, are both interpretations of (5), repeated below, equally salient?

(5) Tom believes that the president of the U.S. is unpopular.

The Default-Semantics model (Jaszczolt 2005a) claims that they are not: some readings are automatic, while others are more costly, arrived at in the process of conscious pragmatic inference. The predicates are semantically underdetermined, or sense-general, and the relevant meaning is arrived at in the process of pragmatic inference or through the application of defaults. But it is also plausible to treat the predicates ‘eat’ and ‘believe’ as lexically ambiguous, on a par with items such as ‘bank’, ‘club’ or ‘bat’. On this assumption, there are several models of lexical access that offer explanations of the activation of the meaning required in the particular context (see e.g. Giora 2003). The direct access model predicts that contextually salient meaning can inhibit the activation of other possible senses of a word and only one, contextually salient interpretation is invoked – even when this interpretation is not very frequently encountered. The modular view predicts that lexical access does not vary across contexts. According to Giora’s (2003: 59) own graded salience hypothesis, ‘salient information is always accessed and cannot be pre-empted by contextual information’. It is accessed automatically and although context has a large part to play in facilitating the activation of the salient meanings and in suppression of the contextually irrelevant ones, there is no direct interaction between contextual information and lexical access. These models have some empirical support but the question remains open. However, it seems that none of them directly applies to our cases of ‘eat’ and ‘believe’ in that sense-genericity yields a more economical and hence more plausible explanation: in agreement with Grice’s Modified Occam’s Razor, there is no ambiguity, no multiplication of senses, and no costly and superfluous activation. I return to this question in Sections 6 and 7 while I discuss the interaction of the sources of information about meaning in Default Semantics. The follow-up question discussed there concerns the processing of sense-general sentences: how is the intended meaning recovered without going through the stage of semantic ambiguity? Again, the integration of information coming from different sources at the level of conceptual representation will provide a possible solution.

6. Merger Representation
In agreement with the general assumptions of TCP, we shall recognize various domains of information that partake in assigning the meaning to the utterance by the hearer. In the most general
terms, in addition to the sentence structure and word meaning, there is pragmatic input. Next, this input can be of various types. Here we are departing somewhat from TCP which holds that all pragmatic processes that contribute to what is said are unconscious (subdoxastic, automatic, and non-inferential, see Recanati 2004: 38). First, on our account, there is conscious pragmatic inference. Second, we shall also recognise the pragmatic input that does not amount to conscious processing of contextual clues but rather makes use of standard, presumed meanings. Such presumed meanings can be of different provenance (see Jaszczolt 2006b) and exhibit various properties. The type of presumed meaning we are interested in here is caused by the very design of the human information processing system. The default de re reading of belief reports arises due to the property of intentionality of mental states, which means that states such as belief have an object, are about something, or, to use the Latin term intendere, they ‘intend’ something.\(^\text{12}\) In Default Semantics, they are called cognitive defaults.

Experimental support for such short-circuited interpretations is still scarce and the results are inconclusive. However, evidence emerging from the empirical studies of the lexical access of ambiguous words may also shed some light on the access of sense-general expressions. And here there is quite a lot to be borrowed from. Giora’s (2003) graded salience hypothesis emphasises the role of frequent, salient interpretations and gives them strong priority in lexical access, to the extent that they are always activated:

“…unlike the traditional modular assumption, the graded salience hypothesis assumes that the modular, lexical access mechanism is ordered: more salient meanings – coded meanings foremost on our mind due to conventionality, frequency, familiarity, or prototypicality – are processed faster than and reach sufficient levels of activation before less salient ones. According to the graded salience hypothesis, then, coded meanings would be accessed upon encounter, regardless of contextual information or authorial intent. Coded meanings of low salience, however, may not reach sufficient levels of activation to be visible in a context biased toward the more salient meaning of the word…”  

Giora (2003: 10).

Similarly, in the case of sense-general expressions, frequent, presumed interpretations are activated fast and with lesser effort than the less salient ones. However, there are also differences. For Giora, for information to be salient, it has to be coded in the mental lexicon. It is a very strong requirement on salience that we cannot transfer onto sense-general words. The latter, by definition, do not have separate coded senses like ambiguous expressions do. Nevertheless, they are subject to the differences in the processes of activation of presumed, default meanings and contextually appropriate non-default meanings. While the first are arrived at effortlessly, fast, and with no or very little inference, the latter are the result of a costly process of pragmatic inference from contextual assumptions.\(^\text{13}\) It can be safely accepted that experimental evidence for graded salience in the case of lexically ambiguous expressions provides then indirect strengthening for the plausibility of the hypothesis concerning the existence of default interpretations of sense-general expressions. In other words, at least it makes it worth investigating. And, with the absence of evidence of costly, context-driven inference, the onus of proof lies with those who reject presumed meanings tout court.

There is indeed considerable experimental evidence in support of such automatic, always activated, salient interpretations in the case of lexically ambiguous expressions. On the other hand, experiments to test underdetermined expressions have not been conclusive (see e.g. Noveck and Sperber 2004) but the problem is that they were targeted at the strongest sense of default interpretation, namely Levinson’s (2000) presumptive meanings that are very local, often word-based, always arising, and quite often have to be cancelled. It seems that relaxing the properties of default meanings of sense-general expressions would give more room for the identification of their properties. But this is a task for future projects in experimental pragmatics.

\(^\text{12}\) See also footnote 10.

\(^\text{13}\) The properties of default interpretations are not uniform across their types. See Jaszczolt 2006b.
To sum up, in the absence of satisfactory experimental design and, \textit{a fortiori}, experimental evidence, we can safely resort to a rational argument in this matter and hold that such effortless elaboration of sense takes place unless proven otherwise. We shall thus accept it without further ado, following the line of Levinson (1995, 2000), Recanati (2003, 2004), Asher and Lascarides (e.g. 2003), and many others.\footnote{I provide more extensive arguments for cognitive defaults in Jaszczolt 2005a, b, c and d and 2006b. I also discuss there the other type of default interpretation distinguished in Default Semantics called \textit{social-cultural default}. The latter, however, is not relevant for the present discussion and has to be mentioned only for the sake of completeness.}

We can now move to the question of utterance processing and attempt to lay out a model of utterance meaning that combines information coming from all the sources available to the participants in a conversation. For the analysis of belief reports, we have identified the lexicon, the structure of the sentence, and an automatic and fast cognitive default that yields the \textit{de re} interpretation. We can now add costly, conscious pragmatic inference that yields the \textit{de dicto} interpretations. These sources correspond to the following components of a semantic representation in Default Semantics:

- word meaning and sentence structure (henceforth \textit{WS})
- cognitive default (henceforth \textit{CD})
- conscious pragmatic inference (henceforth \textit{CPI})

The representation they produce is in effect a merger of information coming from these sources and it is called a \textit{merger representation}. According to the theory, these sources of meaning interact on equal footing in that in principle the output of any of them can be overridden by any of the others. This constitutes a departure from post-Gricean contextualist accounts such as Carston’s or Recanati’s in that in those accounts the output of grammar (here: \textit{WS}) constitutes the matrix for the explicit meaning, dubbed \textit{what is said} or explicature. It also constitutes a departure from more conservative Gricean accounts on which \textit{what is said} is closely related to what is physically uttered such as Horn’s, Bach’s or Levinson’s. In Default Semantics, the primary, explicit meaning can on some occasions be so different from the output of the lexicon and syntax (\textit{WS}) that it cannot be properly called a development of the logical form of the sentence.\footnote{Here the parallel with Giora’s (2003) graded salience hypothesis for lexical access seems to break down: in the case of sense-general expressions, contextual and linguistic effects do \textit{not} run in parallel. Or, if they do, one has to assume that lexical effects are weak to the extent that their output is something like ‘this expression is further unspecified, consult the context’.} Various cases of communication through a strong implicature or non-literality (currently best kept distinct from implicature and regarded as concept adjustment on the level of thought\footnote{See Carston 2002: chapter 5 on \textit{ad hoc} concept construction.}) would on this theory count as cases of explicit communication: the merger representation would contain the ‘nonliteral’, metaphorical, or strongly implicated meaning.

The details of this proposal are developed at length elsewhere (e.g. Jaszczolt 2005a) and will not be repeated here. But there is one pertinent issue that cannot be omitted from the discussion and this is the question of compositionality. Traditionally, in semantic theory, it is \textit{WS} that is assumed, or hoped, to be compositional. Hence belief reports and other propositional attitude constructions have posed endless problems with the logical form and elicited attempts to incorporate various remedial entities into it such as, for example, in hidden-indexical theory, the mode of presentation of the referent that would increase the adicity of the attitude verb. We have discussed this issue in Section 5 under the variable adicity of \textit{Bel}. Before we move to the merger representations for belief reports in Section 7, a few general comments on the compositionality as it is understood in the pragmatics-rich model of Default Semantics are in order. The question is, at what level the compositionality of meaning is to be sought. The move proposed for merger representations involves a substantial rethinking of compositionality and of the role it is to play in the theory of
meaning. If compositionality is kept fixed to word meaning and sentence structure, in the traditional Fregean way assumed in truth-conditional semantics, one has to resort to various ploys such as slots in the grammar for additional information or hidden indices or unarticulated constituents, in order to ‘repair’, so to speak, a compositional view of meaning. Alternatively, we can hypothesize that compositionality is to be predicated of a different kind of unit. We can allow pragmatic constituents of meaning that are not driven by grammar but instead arise as a result of ‘top-down’ pragmatic processes, as in TCP (Recanati 2002, 2003). Components of meaning arrived at via conscious pragmatic processes (CPI) and cognitive defaults (CD) are precisely such pragmatic constituents of meaning that are not grammatically controlled. If we allow pragmatic constituents of meaning that do not have their counterparts in grammar or in the logical form, we cease to ‘repair’ a faulty theory but rather offer a new, more satisfactory alternative.

I have also suggested that perhaps there is no need to regard these components of meaning as some ‘additional’ components, over and above the ‘core’ constituted by the output of syntactic processing. They are not physically uttered, but, more importantly, they are not articulated on the level of syntax (pace Stanley 2002) or logical form (pace Schiffer 1992, Crimmins and Perry 1989). They come from a qualitatively different source. This separation of pragmatic components from the logical form can now be dressed up to produce a more positive proposal. After all, we are no longer ‘repairing’ a problematic view on compositionality, but replacing it with a more adequate alternative. This suggestion is not only terminological. CPI and CD are fully articulated in their own domains, that is non-linguistic, non-verbal domains. In order to comprehend this, one has to take a step back from Fregean compositionality and observe, critically, that current post-Montagovian semantic theories try to derive more meaning from the grammatical form than the latter can deliver. For example, in Discourse Representation Theory (DRT) as presented in Kamp and Reyle (1993), in order to account for the use of ‘is going’ with future-time reference in (9), or for the use of ‘will’ for dispositional necessity in (10), one is at a loss when one starts with a close association of the semantic feature of temporality with the grammatical feature of tense.

(9) John is going to Greece tomorrow.
(10) John will chew gum during the lesson, just to annoy his teacher.

But the processing of utterance meaning need not necessarily be seen as being so closely founded on the grammar of the sentence. WS need not be given a once-and-for-all priority over the pragmatic constituents such as CPI or CD.

To sum up, the picture that emerges is this. There is a representation of meaning that is constituted by WS, merged with any combination of the pragmatic sources of information such as CPI or CD – allowing, of course, for the situations in which the contribution of these sources is null and utterance meaning can be equated with the output of WS. In Default Semantics, this representation is called a merger representation. Next, there are additional meanings conveyed by the utterance that can be properly called implicatures. Again, these arise as the output of pragmatic inference or constitute default, presumed meanings. Next, the question we asked was whether we should try to maintain compositionality on the level of WS, dealing with problematic contexts individually, or rather make a radical move and admit that the only level about which compositionality can reasonably be predicated is the level of merger representation. In the spirit of TCP and Schiffer (2003), we have taken the latter route: compositionality is conceived of as a property of merger representations to which WS, CD, and CPI all contribute. The representation of the speaker’s utterance of a belief report that the model hearer can be predicted to construct is composed of the merger of information coming from these sources. For other types of utterances, other types of defaults are also employed. All in all, there seem to be sufficiently compelling

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17 See Cappelen and Lepore 2005 for an overview of the extant positions on the matter.
reasons for ‘raising’ compositionality to the level of the merger of meaning components that come from various epistemic domains.

Finally, let us sum up the main differences and similarities between TCP and Default Semantics with respect to the properties of pragmatic enrichment that contributes to the explicit content. In TCP, top-down, free enrichment necessitates a view of meaning that departs from the rigid structure obtained via syntactic processing: there are no slots to be filled by the output of such pragmatic enrichment. For Recanati, all such enrichment is unconscious, subdoxastic: ‘[t]he determination of what is said takes place at a sub-personal level, like the determination of what we see’ (Recanati 2004: 39). On the Default-Semantics construal, there are subdoxastic defaults such as CDs for the de re reading of belief reports, but also pragmatic inference (CPI) that is conscious, context-driven, effortful, and certainly not automatic. For both accounts, however, the compositional nature of meaning is dissociated from the syntactic constraint. Once this move is executed, both conscious and subdoxastic additions to the output of the lexicon and sentence structure are equally permissible in principle. And, to repeat, compositionality is taken to be a methodological principle: it is assumed to be there and the task is to come up with a theory that demonstrates how meaning is compositional. Recanati’s what is said, as well as my merger representation, are two suggestions of such a compositional, and at the same time interactive, unit of meaning.

Before we move to the application of merger representations to belief reports in Section 7, all that remains is to address the question that on the surface seems merely terminological: is the analysis of meaning in terms of merger representations to be classified as truth-conditional pragmatics or, as the name of the theory Default Semantics would suggest, as truth-conditional semantics? There are two possible construals available here. On one, widely accepted type of account, the output of pragmatic processing contributes to the semantic representation and we have a truth-conditional semantic theory that allows for the intrusion of pragmatic input. In postulating merger representations, we have argued for a greater role of the pragmatic input than just an ‘intrusion’ to the grammatical structure: instead of ‘intrusion’, we opted for a ‘merger’ or an ‘interaction’. So, on this construal, we would have an interactive, truth-conditional semantics of merger representations. On the second type of account, we obtain merger representations that have truth conditions in the sense in which utterances have truth conditions in truth-conditional pragmatics. The difference between the two construals lies, as I understand it, in the feasibility of a formal account. If we are on the right track, truth-conditional pragmaticists do not aim at a formalization of the account of utterance interpretation and assume that the top-down processes eschew formalization. Truth-conditional semantics, on the other hand, leaves the possibility of a formal account open – just as various versions of post-Montagovian dynamic semantics try to incorporate pragmatic input into a formal account of discourse. Default Semantics follows the semantic option and provides a (tentative so far) proposal of how the sources of information that contribute to the merger interact. The next step is to develop an algorithm for this interaction in order to have a formal, compositional semantic account of meaning – understood as utterance meaning intended by a model speaker and recovered by a model hearer.

7. Merger Representations for the Three Readings of Belief Reports

Default Semantics adapts and extends the language of Discourse Representation Theory (Kamp and Reyle 1993; van Eijck and Kamp 1997; Kamp 1990, 1996, 2003) so that it could be used as a metalanguage for representing the merger of information about meaning that comes from the

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19 Cf.: ‘...it is always possible to satisfy compositionality by simply adjusting the syntactic and/or semantic tools one uses, unless that is, the latter are constrained on independent grounds.’ Groenendijk and Stokhof (1991: 93). For a discussion of compositionality of semantics see Zeevat 1989 and Dekker 2000.

20 See e.g. Kamp and Reyle 1993 and van Eijck and Kamp 1997 on DRT; Asher and Lascarides 2003 on Segmented DRT; or Groenendijk and Stokhof 1991 on Dynamic Predicate Logic.

21 The analysis along these lines was first developed in Jaszczolt 2005a, e.
structure of the sentence, the lexicon, and the pragmatic sources such as defaults and inference. It is used as a tool for modelling acts of communication. It has to be pointed out that Default Semantics is not conceived of as an improvement on DRT. Rather, there is a significant difference of objectives between them. While DRT models discourse through modelling sentence meaning in context, Default Semantics models speaker’s meaning conveyed, with greater or smaller accuracy, by means of an utterance. To exemplify the difference in the domain of propositional attitude expressions, DRT is only interested in representing the *de re* reading where the discourse referents are properly ‘anchored’ to individuals in the world, because only on this reading the sentence is said to express a proposition and can be evaluated as to its truth and falsity. In Default Semantics, all three readings are pertinent as all three are possible outcomes of the interpretation process by a model hearer. It has to be emphasised that this is not a weakness of DRT that it does not represent the remaining two readings. It is not part of the objectives of DRT to reflect the processing of an utterance as performed by the addressee, with all possible misunderstandings, errors in referring, and instances of the lack of information.

Let us use example (5) again, repeated below, and attempt to construct merger representations for its three readings.

(5) Tom believes that the president of the U.S. is unpopular.

Merger representations make use of a revised and extended language of discourse representation structures (DRSs) of DRT and are composed of discourse referents and discourse conditions. The discourse referent *y*, standing for the current president of the United States (*the president of the U.S.*), is an argument of the following three conditions. The subscripts CD and CPI stand for the source of meaning, and their scope is marked by [].

(i) *de re*: \[\text{George W. Bush}]_{CD}(y)
(ii) *de dicto with a referential mistake*: \[\text{Bill Clinton}]_{CPI}(y)
(iii) *de dicto proper*: \[\text{the president of the U.S.}]_{CPI}(y)

The reading in (i) is represented as the default one by means of the subscript CD on the proper name ‘George W. Bush’. The discourse referent *y* is associated with the person called ‘George W. Bush’ by means of CD. In (ii), CPI allows the hearer to associate the description with Bill Clinton, while the default association remains the one with George W. Bush. In (iii), the reading is about whoever fulfils the description ‘the president of the U.S.’.

Next, we have to represent the belief report of the form ‘*x* believes that *ϕ*’. The problematic element is, of course, *ϕ*. I proposed in Section 5 that the predicate ‘believe’ has variable adicity. It is a two-place predicate, that is a predicate taking two arguments, when the reading is *de re*. When the reading is *de dicto* of the type (ii) or (iii) above, an additional argument slot is required for the mode of presentation. So, what we should obtain is a variable argument structure between Bel (x, ϕ) and Bel (x, ϕ, m).

However, we have also established that the best way to approach the meaning of attitude predicates is to treat them as sense-general, semantically underdetermined expressions. Oscillation between Bel (x, ϕ) and Bel (x, ϕ, m) would not reflect this underdetermination. Instead, it would point in the direction of lexical ambiguity. So, it seems that a more adequate move is to retain the appearance of Bel as a binary predicate and subsume the variability of sense under ϕ. In the analysis

23 To repeat the assumption made in Section 4, we are simplifying the picture by omitting from the discussion the case when the reporter is referentially mistaken. We also omit the fact that a referential mistake attributable to the holder of the belief would normally result in a hedging construction in the report. See the discussion of examples (5′)-(5″) in Section 4.
developed in Jaszczolt 2005a, I assigned to these constructions the representation \( \text{Bel}(x, C) \), where \( C \) stands for an intensional object, capable of subsuming the variability of mode of presentation whenever the mode of presentation needs to be specified. \( \text{Bel}(x, C) \) has the following satisfaction conditions: the individual that corresponds to \( x \) on a certain interpretation has the cognitive state that corresponds to \( C \) on that interpretation. The status of \( C \) requires careful attention at this point because its properties make it an unusual participant of a formal representation. Let us juxtapose it briefly with the representation of the content of a belief in DRT. Unlike TCP and Default Semantics, DRT aims at compositionality at some level associated with sentence structure. Therefore, the structure of the belief has to be related to the structure of the report. As Asher (1986: 171) says, ‘in order for a belief report to be true, the DRS that fully describes the structure of the belief must be an extension of that constructed from the complement clause of the report.’ A DRS \( D' \) extends a DRS \( D \) if and only if, when we add conditions and discourse referents to \( D \) under a certain assignment, we obtain an alphabetic variant of \( D \). But this requirement need not be posited for merger representations, although it cannot be disputed either, due to the difference in the assumption as to the level at which compositionality is sought. In Default Semantics, the extension condition takes the structure of the belief to mean not the structure of the \( \text{that} \)-clause in (5) but the merger representation: the composition of the output of WS, CD, and CPI. We have, therefore, a rather different understanding of the ‘structure’ of the belief.\(^{24}\) Hence, \( C \) allows us to substitute proper names and descriptions in square brackets in (i)-(iii) above, which reflects the contribution of the mode of presentation to \( C \). Although admitting an intensional object such as \( C \) into the formal structure is by no means free from problems, it seems to be the best way of capturing the fact that the object is so rich in pragmatic input from CD and CPI that it is no longer tied to the structure of the \( \text{that} \)-clause.\(^{25}\) Coming from the perspective of post-Gricean semantics and pragmatics, there is every reason to find the idea that we should treat the output of all the sources of meaning in merger representation on a par at least very contentious. After all, the past three decades of research on the semantics-pragmatics interface have focussed on the boundary between what is said and what is implicated and this boundary has been regarded as an absolute necessity if we want to preserve truth-conditional semantics. It is part of the canon that we need a unit of meaning, derived somehow or other from the logical form of the sentence uttered, that can be subject to a truth-conditional analysis. However, as we have argued here in the example of attitude constructions, there seem to be compelling reasons for seeking compositionality at the level of the merger of WS, CD, and CPI instead. So, to repeat, any extension condition would have to mean an extension of the merger representation rather than of WS alone.

With all these assumptions in place, merger representations for the three readings are now easy to construct. Let us assume that \( x \) stands for a discourse referent as described by the condition below. The subscript \( \text{CD} \) reflects the assumption that proper names refer directly to the individuals named by them and that this is a cognitive default; the way our cognition is organized.

\(^{24}\) To give an example, Default Semantics has no difficulty with the belief report in (ii) that is founded on the expression of belief in (i):

(i)   Mother to little Johnny who is crying over his injured finger: ‘Oh, you are not going to die.’

(ii)  Johnny’s mother believes that his injury is not serious.

The merger representation for (ii) will contain both the structure and the content of the belief state of the mother, but the structure that is of interest there is the structure of the merger (i.e. the post-merger structure) rather than the sentence structure. It is the structure of the belief state, not the structure of the mother's sentence in (i).

\(^{25}\) It has to be stressed that an intensional object in the argument position of the \( \text{Bel} \) predicate would not be permissible in DRT and other formal accounts that seek compositionality on the level of sentence structure. However, it is perfectly plausible in a pragmatics-rich representation such as merger representation of Default Semantics. To repeat, this is so due to the fact that the latter is modelled on a pragmatics-rich view of compositionality.
[Tom]_{CD} (x)

The discourse referent $y$ acquires conditions as in (i)-(iii) above, depending on the reading of (5). Next, the representation of the report $Bel (x, C)$ is then as follows:

(i) \textit{de re:} \quad [[x]_{CD} [believes]_{CD} C]_{WS} \\
(ii) \textit{de dicto with a referential mistake:} \quad [[x]_{CD} [believes]_{CD} C]_{WS} \\
(iii) \textit{de dicto proper:} \quad [[x]_{CD} [believes]_{CPI} C]_{WS}

$Bel (x, C)$ corresponds to the condition $[[x]_{CD} [believes]_{CD/CPI} C]_{WS}$, to be read as ‘the individual that corresponds to $x$ on this interpretation (Tom) has a cognitive state that corresponds to $C$ on this interpretation’. Notice that both in (i) and (ii) the subscript on [believe] is $CD$. This signals that in both cases the mental state of belief is in its ‘normal’, \textit{de re} form: both represent beliefs about a particular individual, the one that is intersubjectively identifiable in (i) and one that is identifiable for the holder of the belief in (ii). In (ii), the belief itself is in fact \textit{de re} by means of CD because it is about a particular identifiable individual ($res$)\textsuperscript{26}. It has to be remembered that in (ii), the discourse referent $y$ is associated with the ‘wrong’ person (Bill Clinton), and hence the difference between (i) and (ii) is clearly represented. The substitution in (iii) of the index $CPI$ for $CD$ in $[believes]_{CPI} C$ signals that the state of belief is not in its ‘normal’, \textit{de re} form: the belief itself is also \textit{de dicto}.

Next, we have to represent $C$, that is Tom’s representation of what it means for ‘the president of the U.S.’ ($y$) to be unpopular. All we have to do here is to follow the readings of the definite description ‘the president of the U.S.’ already given above as a condition for $y$:

(i) \textit{de re:} \quad C: \quad [[y]_{CD} \text{ is unpopular}]_{WS} \\
(ii) \textit{de dicto with a referential mistake:} \quad C: \quad [[y]_{CPI} \text{ is unpopular}]_{WS} \\
(iii) \textit{de dicto proper:} \quad C: \quad [[y]_{CPI} \text{ is unpopular}]_{WS}

All in all, merger representations for the three readings of belief reports are semantic-conceptual representation structures that reflect the product of the interaction of the sources of meaning WS, CD, and CPI. The combination of the content of square brackets and the subscripts depicts the final product of this interaction, also reflecting the assumption that these sources are to be treated on a par. So, for example, $[Bill Clinton]_{CPI} (y)$ is a possible discourse condition for the meaning of ‘the president of the U.S.’: in the conceptual (merger) representation, the definite description can be substituted with a proper name, and even, like in this case, a proper name with a mistaken reference. CPI attends to the fact that pragmatic inference may result in the assignment of a ‘wrong’ individual to the description. It also has to be noted that CD and CPI operate not only on the referring expressions such as ‘Tom’ and ‘the president of the U.S.’ but also on the predicate ‘believe’ itself. For the latter, they signal whether the mental state (rather than the expression) is \textit{de re} or \textit{de dicto} and as such are very useful for the category of \textit{de dicto with a referential mistake} where the underlying belief is \textit{de re}, i.e. we have $[believes]_{CD}$, but the report is \textit{de dicto}, in virtue of the referential mistake rendered as $[Bill Clinton]_{CPI}$.

8. The Intensional Object $C$ and Variable Adicity

\textsuperscript{26} On a widely accepted classification, this is the case of an opaque reading. But see also Recanati 2000 and fn 6 above.
As was proposed in Section 5, the variable input of pragmatic enrichment of the meaning of utterances expressing belief reports can be well captured by Recanati’s device of a variadic function in that on some occasions the mode of presentation of the referent (discourse referent \( y \)) contributes a substantial input to the merger representation (\textit{de dicto proper}), on others it contributes just enough information to tell the correct referent from the incorrect one (\textit{de dicto with a referential mistake}), and yet on others it contributes nothing at all (\textit{de re}). In the latter case the ‘believe’ predicate requires only two arguments: the holder of the belief (\( x \)) and the belief itself (\( C \)). This variable adicity of ‘believe’ is a significant improvement on the earlier proposal of a three-place ‘believe’ predicate in hidden-indexical theory tentatively offered by Schiffer (1992) and taken up by Crimmins and Perry (Crimmins 1992; Crimmins and Perry 1989). For Schiffer, MoP is the third argument of the ‘believe’ predicate, so to speak, permanently, even in the situations in which substitution of a coreferential expression would not alter the truth conditions (\textit{de re}). This addition of the ‘permanent’ third argument, proposed only tentatively by Schiffer whose view on the compositionality of meaning is rather sceptical (see e.g. Schiffer 1996, 2003), was then dictated by the search for the logical form of belief constructions, on the standard assumption that one has to propose a unique logical form that would account for the vagaries of the readings of the sentences of the form ‘A believes that B \( \varphi \)’. Although the proposal met with ample criticism (see e.g. Barwise 1989; Ludlow 1995, 1996; Jaszczolt 1998, 1999; Cappelen and Lepore 2005), variadic function seems to be the first constructive proposal that unites the intuitive insight of the hidden indices and the flexibility of its application. In our Default-Semantics framework, and following the ‘pragmatic’ view on compositionality, we do not have to be restrained by the consideration of the argument structure. There is no need to search for a unique logical form because there need not be one. Compositionality is now ‘moved to a higher level’, to the interaction of the logical form (output of WS) with other sources of meaning information and hence it is no longer the logical form that has to represent all the readings of such constructions but instead the merger representation takes over this task. To sum up, since merger representations follow the TCP assumption of free, top-down pragmatic processes, syntactic constraints such as the requirement of a certain adicity of a predicate no longer act as constraints. We are free to construe a predicate as taking as many arguments as the particular interpretation requires. To repeat, in the case of belief reports such as (5), we obtain two arguments for the \textit{de re} reading, and three for \textit{de dicto proper} and \textit{de dicto with a referential mistake}.

9. Radical Contextualism?

If we were to classify the Default-Semantics account of belief reports, it would seem to fit within the confines of \textit{contextualism}. Historically, contextualism was a reaction to the view on meaning according to which the truth-conditional content of an utterance is independent from contextual information. On this traditional view, truth conditions are predicated of sentences rather than of utterances and these truth conditions are free from an influence from inference performed by the interlocutors, salient presumed senses, and other pragmatic factors. This view, called \textit{literalism}, gave rise to a less radical form according to which contextual input is present in the truth-conditional content of utterances but it is always controlled by the structure of the sentence. In the recent discussions this view has been called \textit{minimalism}, although it is only a cover term for a variety of proposals (see Recanati 2005b) such as Stanley’s (2000) suggestion that such contextual input always pertains to slots in the syntactic structure, or Borg’s (2004) minimal semantics in which she separates the semantic content from the intuitive content of utterances. Minimalism has been experiencing a considerable revival in the past couple of years (see also Cappelen and Lepore’s (2005) insensitive semantics). But ever since the rise of radical pragmatics in the 1970s and the concept of sense-generality and semantic underdetermination (see e.g. Atlas 1989, 2005), the main trend in post-Gricean pragmatics has been the contextualist one. Generally, according to contextualism, there are pragmatic effects on utterance meaning that cannot be traced to elements of the syntactic structure. After Recanati, we have called them earlier ‘top-down’ processes, processes
that are not linguistically controlled but operate freely to ‘modulate’ the meaning of an utterance. Contextualism comes in different strengths: when this top-down pragmatic enrichment (modulation) is optional, we have what Recanati (2004, 2005b) calls quasi-contextualism. When it is compulsory, in the sense that every proposition expressed must make use of such contextual modulation, we have full-blown contextualism. While quasi-contextualism makes some use of the bare output of the processing of the sentence physically uttered (minimal proposition), full-blown contextualism denies the utility of the term ‘minimal proposition’ altogether.

Default Semantics seems to fit better with quasi-contextualism: in merger representations, the output of the lexicon and the structure of the sentence (WS) is modulated by the output of the pragmatic sources such as inference (CPI) or default interpretations (CD) whenever this is required in a particular conversation. On other occasions, WS alone can render the intended meaning. This optionality of the pragmatic sources makes the view quasi-contextualist. On the other hand, Default Semantics is also more radical than quasi-contextualism but not in the direction of full contextualism. Instead, it is more radical in that it regards the pragmatic sources of information about meaning not as the factors that modulate the output of WS (minimal proposition), but rather as sources that interact with WS on terms of equality. In other words, the sources interact and each can in principle override the others’ output. This allows for the situation exemplified in footnote 22 above: the proposition considered by the addressee as the one intended by the speaker need not constitute a development of the logical form of what was physically uttered. The structure and the lexicon used can also be overridden, as in the case of metaphors, irony, or strong implicatures that are intended as the primary communicated meaning. The minimal proposition is thus made redundant in the cases when it is overridden, but it is preserved when the intended meaning happens to be identical to, or an expansion of, the output of WS.

This characteristic of merger representations makes them at the same time more, and less, radical than the contextualist stance: a minimal proposition is sometimes there, but when it is not, we can go even further than the confines of contextualism allow us and override the linguistic meaning given by an enriched, modulated minimal proposition. To go back to the example in footnote 22 above, we can go all the way to (13). The meaning in (13), rather than that in (12), is the explicit, primary meaning of (11) in the merger representation.

(11) Mother to little Johnny who is crying over his injured finger:
‘You are not going to die.’

(12) Primary meaning (what is said/explicature) in quasi-contextualism and contextualism:
‘You are not going to die from this wound.’

(13) Primary meaning in merger representation:
‘Your injury is not serious’.27

It seems that the analysis in terms of merger representations calls for a more radical form of contextualism. The most radical form Recanati (2005b: 189) dubs meaning eliminativism. According to meaning eliminativism, no context-independent, conventional linguistic meaning has to be computed in the process of utterance interpretation. Instead, the senses of an expression encountered by the addressee in the course of past experience are used directly to produce the sense of an expression that is relevant in the current context. There is no process of abstracting of the literal sense from the past uses: the interpretation proceeds directly from past experiences to the current one. There are only actual, particular senses of expressions on given occasions rather than abstract senses extracted from particular uses. Now, how do merger representations fare with this radical form of contextualism? Since the interaction of the output of WS, CPI and defaults may result in overriding the lexicon and syntax of the uttered expression, meaning eliminativism seems

27 Or: ‘There is nothing to worry about’, ‘It’s not a big deal’, ‘The cut is not serious’, etc.
to be a good locum for this framework: linguistic meaning does not have to be respected. However,
the fact that WS is recognised as an independent source of information about the meaning of the
utterance indicates that some part of the processing of this utterance has to go through the stage of
linguistic meanings. Clearly, for the output of WS to interact with the output of the other sources,
there has to be something that we can call the output of WS – be it a minimal proposition, or if the
interaction takes place sooner, i.e. locally, pre-propositionally, then there have to be meanings of
lexical items or phrases that are the input to such an interaction. So, it appears that while
contextualism is too weak and too strong at the same time, meaning eliminativism is simply too
strong. We have to conclude that merger representations are quasi-contextualist in admitting
minimal propositions when these happen to be communicated (and sources of meaning other than
WS are not involved), but are more radical than contextualism in allowing for the overriding of the
modulated proposition. They are not, however, radically contextualist in the sense of meaning
eliminativism in that linguistic meaning is present in the representations as the output of WS. Now,
if we allow the process of modulation to cross the boundary of merely developing the logical form
of the uttered sentence, then merger representations will fit squarely within the category of quasi-
contextualism. And, if I am correct, there is nothing in the definition of modulation that would
prevent it from being so interpreted: it is a pragmatic process that is not triggered by linguistic input
but by the speech act and the search for the communicative intention in this speech act. The issue of
delimiting what is said can be safely kept apart from modulation. Once we allow what is said to go
over and above the development of the logical form of the uttered sentence, merger representations
are clearly quasi-contextualist.

Having established the place for merger representations in the classification of post-Gricean
orientations, the next question to ask is whether the fact that such problematic intensional
constructions as belief reports find a respectable explanation in a quasi-contextualist framework of
Default Semantics strengthens the position of quasi-contextualism in the current debates on the
semantics/pragmatics interface. Unfortunately, the answer is not straightforwardly positive. The
three readings of belief reports were obtained by applying a combination of CPIs and CDs at
various stages of processing of the belief report (see the discourse conditions in Section 7). But
modulation was always present either in the form of (i) CD applied twice, to the object of the belief
and to the belief predicate itself (de re reading); or (ii) CPI applied to the object of the belief and
CD to the belief predicate (de dicto with a referential mistake); or (iii) CPI applied twice, to the
object of the belief and to the belief predicate (de dicto proper). In none of these three cases did we
rely on WS alone. So, while this analysis testifies to the feasibility of the contextualist construal of
meaning that does not go all the way to the radical position of meaning eliminativism, it is not
helpful in deciding between quasi-contextualism and contextualism. It simply follows the
theoretical assumption made in Default Semantics that the activation of the sources of meaning is
not mandatory: it takes place as and when it is needed. An analysis of other semantically
problematic expressions may be of more help here but this is a topic for another occasion.

10. Concluding Remarks
The main objective of this paper has been to present a pragmatics-rich account of the meaning of
utterances reporting on beliefs. In order to represent the readings of belief reports as constructed by
a model speaker in a conversation, I employed merger representations where the sources of
meaning from which the semantic representation is built are treated on a par. This has been done
within the bounds of Default Semantics that is a natural corollary of conceptualizing
compositionality as a property of representations that merge information coming from various
sources, without giving priority to sentence structure. This approach is grounded in the idea of free
contribution of pragmatic processes to what is said advocated by TCP but departs from TCP
slightly in the proposal of CDs and CPI, where TCP recognises instead one category of subdoxastic
pragmatic processes (Recanati 2004). In the analysis of the possible readings of utterances reporting
in beliefs, I have made substantial use of Recanati’s proposal of the variadic function that I have
employed to account for the hypothesis that $Bel$ varies in the number of arguments it takes because the mode of presentation, the third argument, is not always needed.

It is clear from this picture that we are far from a truly adequate solution to the problem of how to represent the variable adicity of $Bel$ that is postulated in this account. However, the analysis proposed here suggests a promising way of looking at attitude contexts through (i) not shunning representations embedded within representations (that is subsumed under $C$) and (ii) not shunning variable adicity. Many tools and ideas had already been around, ready to be used: the variadic function of Recanati’s TCP on one hand, the language of DRT on the other, and within the propositional attitude research, the types of mode of presentation added as constituents to the logical form as distinguished by hidden-indexical theory. Finally, the rethinking of compositionality and ‘raising’ it, so to speak, from the level of sentence structure to the domain of more pragmatically understood interaction, is also vivid in current debates, from the interactive approach tentatively proposed by Recanati, to the supervenience on the physical where the latter is compositionally put together, as proposed by Schiffer. Seen in the light of these debates, merger representations of interactive Default Semantics are the natural step to take.

The level of representation of which compositionality is to be predicated is an issue that cannot be taken lightly. For once, compositionality can mean a variety of things; it can be understood as a compositionality of content that has to be discovered and corroborated by strong theoretical arguments or empirical evidence, or it can be understood as a methodological principle in that if a type of context does not conform to a compositional treatment, it has to be made to do so. In other words, semantic tools have to be found in order to make such a context compositional.

One may ask at this point: if we assume that compositionality of the whole merger representation is there by fiat, then what exactly have we achieved by trying to preserve it? After all, $C$ is an intensional object and hence we have not solved the intensionality problem of representing attitude reports. Arguably, the intensionality problem cannot be solved at the level of the expressions themselves. But our aim was not a formalization that would reduce, so to speak, intensional contexts to extensional, compositional ones. The aim was to show that intensionality can remain an built-in property of expressions that serve as belief reports and, at the same time, compositionality is an open and preferred option for a theory of discourse interpretation. In other words, compositionality is not the compositionality of WS, but a ‘post-merger compositionality’ of merger representations. The liberal attitude to the interaction of the sources contributing to the merger representation allows us to preserve it. To make another comparison: for Schiffer (2003), believing is a relation to unstructured but finely-grained propositions and compositionality of propositions is to be rejected. Our account is not incompatible with this rejection of compositionality on the level of propositions. Neither is it incompatible with the claim that objects of belief are finely-grained and (linguistically) unstructured. Default Semantics has little to say about thoughts and beliefs. It focuses on the representations of utterances which, in their post-merger form, are theoretical constructs and, so to speak, ‘abstracts over thoughts’. While beliefs can be relations to finely-grained and (linguistically) unstructured units, belief operators of merger representations operate on a structure made up of the output of WS, defaults such as CD, and CPI. This structure, the merger representation, has the granularity that is not greater than the requirements of a truth-conditional account make it to be. Our ‘structure’ is thus a structure in a different sense from that predicated of propositions. In this sense, the verb believe in an intensional believe that context triggers a relation to structured but coarse-grained merger representations and a compositional account is an open, and preferred, option. Merger representations are coarse-grained generalizations over thoughts and, like thoughts, need not only language but also other, non-linguistic components to have structured, compositional meaning – in the sense in which merger representations are structured and compositional.

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28 In the sense of top-down processing. See Section 1.
29 See the discussion in, e.g. Groenendijk and Stokhof 1991.
To repeat, we are not taking issue with the assumptions of semantic theories such as DRT. All we have done is suggest an alternative way of thinking about the interpretation of belief utterances – a way that is grounded in TCP and its top-down pragmatic inference, while retaining the advantages of conducting this analysis within the domain of a theory of meaning understood broadly as an interactive, merger-based theory of meaning of acts of communication. Whether it proves a more satisfactory approach than the more standard, grammar- and logical-form-based analyses such as the hidden-indexical theory\textsuperscript{30} remains to be seen.

\textsuperscript{30} See also an overview of the accounts of propositional attitude reports in Jaszczolt 2000a and 2005f.
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