

The Syntax-Pragmatics Merger: Belief Reports in the Theory of Default Semantics

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1. Truth-Conditional Pragmatics and Pragmatics-Rich Semantics

This paper is a voice in the ongoing discussion on the source and properties of pragmatic inference that contributes to the representation of discourse meaning. One of the most promising orientations in this debate is *truth-conditional pragmatics* (TCP, Recanati 2002, 2003, 2004). TCP recognizes so-called ‘top-down’ pragmatic processes that contribute to the truth-conditionally evaluable representation of meaning while not being grammatically controlled. It subscribes to contextualism, a standpoint according to which this pragmatic contribution is always present. In other words, utterances are always processed in context and this context affects their interpretation (see Recanati 1994, 2004). In contextualism, ‘there is no level of meaning which is both (i) propositional (truth-evaluable) and (ii) minimalist, that is, unaffected by top-down factors’. (Recanati 2004: 90). In this paper, I start off from the contextualist standpoint and develop a proposal of representations of utterance meaning, the so-called merger representations, that incorporate the output of such pragmatic inference. The move from TCP to pragmatics-rich *semantics of acts of communication* is facilitated by rethinking the compositionality of meaning and predicating compositionality of such pragmatics-rich structures. I argue that the advantage of ‘semanticizing’ the output of pragmatic sources of meaning is that we can relax the view on compositionality of meaning and offer an algorithm of the interaction of such sources where the requirement of compositionality is imposed on the output of the interaction rather than on the output of the syntactic processing of the sentence. This proposal is applied to belief reports for which it offers representations of their various readings.

2. Truth Conditions for Sentences or Utterances?

In the past three decades there has been a growing division in the field as regards the unit of which the truth value should be predicated. Traditionally, truth and falsity were predicated of sentences in that they applied to the output of the syntactic processing, standardly known as the logical form. The truth value resulted from assessing this logical form with respect to a particular model.¹ Subsequently, ever since Grice (1978) observed that some pragmatic processing may be necessary before the truth-evaluable representation is attained, the role ascribed to this pragmatic processing

in establishing the truth-evaluable representation has been steadily increasing. Grice identifies in this respect the assignment of reference to indexical expressions and the disambiguation of ambiguous sentences. His successors are responsible for what is now the wide-spread view, namely that there is a multitude of processes that contribute to the truth-conditional representation. For example, the precisification of the meaning of connectives such as *and* results in its enrichment to *and as a result* in (1’):

- (1) Laura watched *My Fair Lady* and decided to study phonetics.
 (1’) Laura watched *My Fair Lady and as a result* decided to study phonetics.

It is now widely acknowledged that the outcome of pragmatic processes, be it conscious pragmatic inference or pragmatic defaults depending on the orientation, contributes to the truth-evaluable representation. Truth conditions are predicated of utterances, speech acts, or other units whose representation is enriched with the output of pragmatic inference.

Furthermore, 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.² In this paper I adopt the latter perspective and assume that the pragmatic enrichment is not syntactically controlled. In that I follow Recanati’s TCP. However, as I shall claim in Section 8, exactly the same theoretical assumptions can be maintained while preserving the traditional label of truth-conditional semantics. This may be just a matter of terminological preferences and being more, or less, reverend towards tradition. On the other hand, the choice may also indicate the degree of importance that the theorist attaches to formalization.

In TCP, the pragmatic process that produces (1’) out of (1) is a so-called ‘top-down’ process, a process of free enrichment that is not triggered by slots in the syntactic representation:

“...various contextual processes come into play in the determination of an utterance’s intuitive truth-conditions; not merely saturation – the contextual assignment of values to indexicals and free variables in the logical form of the sentence – but also free enrichment and other processes which are not linguistically triggered but are pragmatic through and through. That view we henceforth refer to as ‘Truth-conditional pragmatics’ (TCP).”

Recanati (2002: 302).

One of the core advantages of TCP for our analysis is that it relaxes the dependence of the meaning of an utterance on the logical form understood as the output of syntactic processing. And, according

to the assumption just adopted, it is the representation of the *utterance meaning* that constitutes the unit of which truth conditions should be predicated.

3. The Three Readings of Belief Reports

The object of my investigation will be sentences reporting speaker's beliefs such as (2):

(2) William believes that the author of *Oscar and Lucinda* is a genius.

Belief reports belong to the category of intensional contexts in that they give rise to various well-acknowledged puzzles when we try to assess their meaning by considering the extensions of the referring expressions in the embedded clause, without taking notice of the way in which these extensions are taken by the reporter or by the owner of the belief.³ For the purpose of this investigation, I shall narrow the field further and consider reports in which the way in which the object is thought of, or the mode of presentation of the referent, that is of interest is the one pertaining to the holder of the belief rather than to the reporter. In other words, in (2), we will look at different ways in which William, not the person uttering (2), can think of 'the author of *Oscar and Lucinda*'. Within such confines, we can distinguish the following two readings of (2). First, there is a reading on which William's belief is about a known, intersubjectively identifiable individual, Peter Carey. This is the *de re* reading. Next, there is a reading that can be distilled from the following scenario. William read the novel *Oscar and Lucinda* some time ago, and, while remembering the novel very well, he forgot who wrote it. In full ignorance of who the author was, he utters (3).

(3) The author of *Oscar and Lucinda* is a genius.

This is the *de dicto* reading – the reading on which William holds a belief about whoever happened to write *Oscar and Lucinda*. Next, if we approach the report in (2) from the perspective of the pragmatics of processing, we must also distinguish the scenario on which William holds a belief *de re* but is mistaken as to the identity of the novelist. Say, William is convinced that Ian McEwan wrote *Oscar and Lucinda*. Here we have a mistaken reference assignment which will make the report in (2) *de dicto* in virtue of being opaque to substitutions of coreferential expressions, but at the same time it is a sub-type of a report *de dicto* that corresponds to a belief *de re*. This is the report that I shall now refer to as *de dicto with a referential mistake*.⁴ The other *de dicto* reading will be referred to as *de dicto proper*.

The question that arises at this point is whether belief reports are three-way ambiguous. In post-Gricean pragmatics, it is generally acknowledged that one should not postulate semantic ambiguities where a more economical explanation is available. This principle is spelled out by Grice (1978) as *Modified Occam's Razor*, according to which one should not multiply senses beyond necessity. In the case of belief reports, the principle suggests that one should not postulate the readings *de re*, *de dicto proper*, and *de dicto with a referential mistake* as evidence for semantic ambiguity when a more economical treatment of such constructions is available. By an independent but equally valid principle, it also seems that one should not postulate ambiguities when there is no evidence from utterance processing that resolving an ambiguity indeed takes place. It has been common practice in such cases to postulate an underdetermined representation. This representation is the output of syntactic processing and is subsequently enriched with further determinations of meaning that come from pragmatic inference and/or other context-dependent sources to be identified more precisely below.

The next question to answer is whether all three readings are equally salient in processing, that is whether they are all equally likely to occur, and whether they all rely on pragmatic inference to an equal degree. It is feasible to search for an answer in an experimental way. However, an empirical enquiry does not seem the best place to start. Current experimental pragmatics relies largely on testing the time of processing of utterances.⁵ This is tangential to our purpose because the question that has to be answered first is whether the pragmatic process that enriches the underdetermined representation is a conscious process of inference or rather some subdoxastic enrichment⁶. Both can take time and the discrimination between them will not yield to methods such as testing the longitude of processing. I propose to commence by posing a hypothesis. I shall put forward a theoretical argument in favour of distinguishing between the statuses of the three readings. In order to do that, we shall use the framework of Default Semantics (Jaszczolt 2005a, b, c) and its concept of a *cognitive default*.

It can be safely assumed that the three readings of (5) differ with respect to the salience that the individual referred to as 'the author of *Oscar and Lucinda*' has for William. On the *de re* reading, William holds a belief about an identifiable person, known to him by name and also by some facts about him such as that he is a famous writer, known for his novels such as *Jack Maggs*, *The True History of the Kelly Gang*, or *My Life as a Fake*. William has a clear picture of who he is thinking about and a clear, strong intention to convey some thought about this individual, namely about Peter Carey. On the *de dicto proper* scenario, William holds a belief about whoever might have written *Oscar and Lucinda* and is communicating this thought with a referential intention that is not as strong and clear as the one in the first case. Finally, the scenario *de dicto with a referential mistake* falls in-between. William has a clear idea who he is thinking and talking about: he is

thinking and talking about Ian McEwan. However, it is obvious that William must have a rather weak idea of who Ian McEwan is, since he is mistakenly attributing to him the authorship of *Oscar and Lucinda* that does not, even to someone with very perfunctory knowledge of contemporary fiction, share any recognizable features with McEwan's novels. William's 'belief storage' about the referent contains some false beliefs and hence makes the belief expressed in (3) 'weaker', defective. William's expression of this belief is also weaker with respect to its referential intention.

We can now move to the classification of the readings of belief reports within the confines imposed here.⁷ On the basis of the above observations, I propose that these readings can be graded on a scale of the strength of the speaker's referential intention. The *de re* reading comes with the strongest referential intention, then the *de dicto with a referential mistake*, and finally *de dicto proper*.⁸

At this point we can go back to the question posed earlier concerning the cognitive statuses of these three readings. There are two main options. First, one can make an initial assumption that whatever interpretation the hearer assigns to (2), this interpretation is triggered by the context. Syntactic processing gives us an underdetermined representation, and pragmatic inference, immersed in the context, supplies the rest. But there are problems with this option. As I mentioned earlier, even a cursory glance at these three readings of attitude reports suffices to classify them as more, or less, likely to occur. The *de re* reading is the most salient reading in virtue of having associated with it the strongest referential intention. This reading is associated with the mental state of belief that has the strongest intentionality. The property of strong intentionality of the mental state warrants the strong intentionality of the surfacing speech act (here: belief report), and hence we can generalize that strong intentionality pertains to *de re* reports.⁹ Now, when a speaker issues an utterance with an intention to communicate some content, this intention is normally the strongest one that can be associated with this type of expression. For example, when a speaker uses a definite description, it can normally be assumed that the speaker has a particular individual in mind, unless the co-text or context signals that this is not the case. Otherwise, the speaker would have used an expression with a weaker referring property such as an indefinite description. By this reasoning we can assume that the strongest communicative intention (and *referential* intention where applicable), and hence also the strongest intentionality, are the norm, or the *default* for that expression. For belief reports, the *de re* interpretation is such a default: the act of referring is aimed at a particular, identifiable individual. I shall call this reading a *cognitive default*. A cognitive default is a default interpretation that arises in virtue of the properties of mental states. The mental state of belief has intentionality, is *about* a certain individual. When the addressee interprets a report on a belief, he/she automatically (by default) associates the strongest intentionality that can in principle be associated with the act of belief reported on.

To sum up, the *de re* reading of (2) is the cognitive default that corresponds to the utterance associated with the strongest referential intention, while *de dicto with a referential mistake* and *de dicto proper* are progressive departures from the default. The output of pragmatic inference and defaults contribute to the truth conditions of the utterance: cognitive defaults account for *de re*, and pragmatic inference for the two varieties of *de dicto*. I return to this analysis in more detail in Section 6. Note that we are departing here somewhat from the model of what is said proposed in TCP where *all* pragmatic additions to the output of the syntactic processing are subdoxastic. The full scale of such departures is presented in Section 5 where I discuss the sources that contribute to the representation of utterance meaning distinguished in Default Semantics.

4. In Search of a Metalanguage

Even if the proposal as developed so far is on the right track, it will not be complete unless we provide an algorithm for the interaction of the output of syntactic processing and pragmatic sources of meaning such as conscious inference and the subdoxastic enrichment. Contextualism about meaning, that is the admission of the ‘top-down’, compulsory pragmatic processes, is not a formal account, but it is not incompatible with a reformulation of the proposal in a clear, formal metalanguage. On this assumption, the next task is to see whether such formalization can be provided. I shall utilise for this purpose a formal account of belief reports that is already present in dynamic semantics, that is the account of attitude reports in Discourse Representation Theory (DRT, see Kamp and Reyle 1993) as proposed by Kamp (2003). Although DRT does not share all the theoretical assumptions with contextualism, it is compatible with it to an extent that suffices for our purposes. DRT allows for pragmatic input to semantic representations and construes this input rather freely. It is also, by definition, sensitive to information from changing context: it builds representations of discourses incrementally, incorporating information that becomes available at various stages of processing. All this will allow us to utilise the language of discourse representation structures (DRSs), while starting with the contextualist orientation. In other words, what we are proposing is to attempt to spell out the default-based contextualist account of belief reports by using the language of DRT, but using it with preserving the overall assumption of TCP that truth conditions that are of real interest are the ones predicated of utterances.

In DRT, attitudinal states such as belief are represented as follows. Let us assume that MOD is a set of so-called ‘mode indicators’ such as BEL (belief), DES (desire), INT (intention), or [ANCH, x] for an internal anchor. An attitude description is then <MOD, DRS> (see Kamp 1990, 1996, 2003). <[ANCH, x], DRS> is an *internal anchor* for a discourse referent *x*, linking *x* to some information within the representation of the mental state. Next, we introduce so-called external anchors for discourse referents. An *external anchor* is a function whose domain is the set of

internally anchored discourse referents in a $\langle \text{MOD}, \text{DRS} \rangle$, and whose range is a set of referents that do not occur in the $\langle \text{MOD}, \text{DRS} \rangle$ (after Kamp 2003). External anchors connect a (singular) proposition with the entities in the domain established by the discourse. A DRS can only have truth conditions if such external connections can be found. Without external anchors, DRT would not be able to represent singular propositions. Further, a predicate *Att* for attitudinal state is added to the language of DRT. Attitudinal states can now be represented as states *s*: *Att* (*x*, *DRS*, external anchor).¹⁰ Discourse referents *w*, *x*, *x'*, *s*, and *s'* are described by the conditions given in the DRS. Sentence (2), repeated below, obtains a DRS as in Figure 1.

- (2) William believes that the author of *Oscar and Lucinda* is a genius.

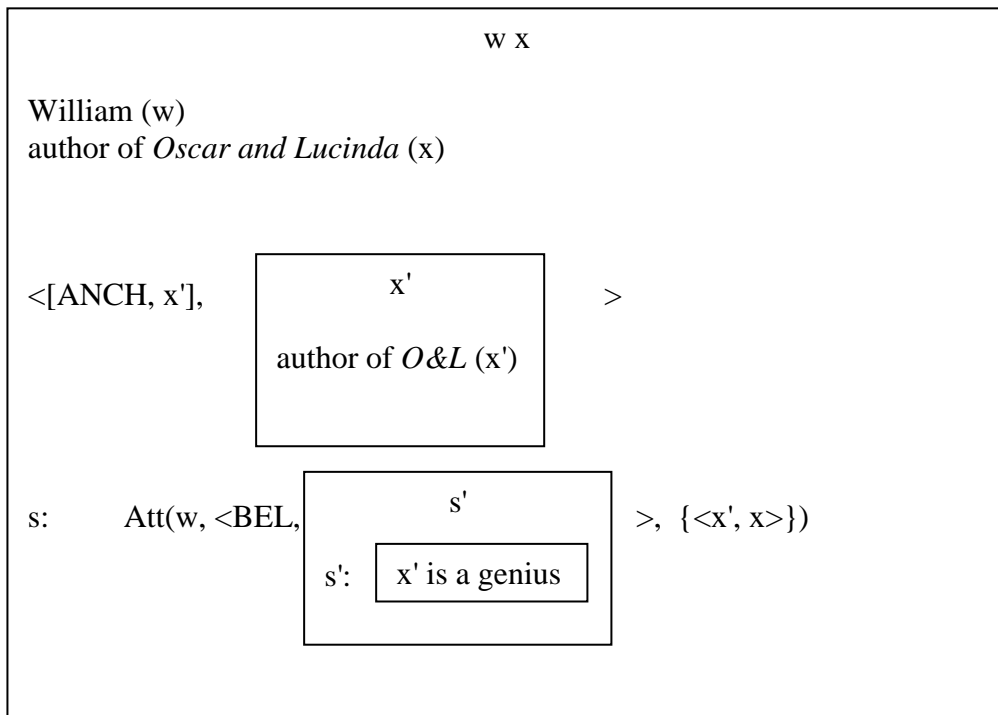


Fig. 1: DRS for (2), modelled on Kamp (2003)

Figure 1 represents the *de re* reading of (2). The discourse referent x is externally anchored, and the sentence can be evaluated as to its truth or falsity in a standard, truth-conditional, model-theoretic manner. In DRT, the other readings are not (and need not) be represented: in order for a DRS to express a proposition, an internally anchored discourse referent also has to be externally anchored (cf. Kamp 2003: 7). The readings of (2) that we called *de dicto with a referential mistake* and *de dicto proper* are thus left out.

First, let us consider *de dicto proper*. The reading *de dicto proper* does not have external anchors. Kamp (1996: 10-12) allows for the possibility that attitudinal states of belief may have no external anchor when the holder of the belief “is under the illusion that he is standing in a relation of acquaintance to some object – he thinks that he is acquainted with an object in the given way but in fact there is no such object.” (Kamp 1996: 12). The belief then is not ‘truly *de re*’ – as Kamp says, it is only ‘formally *de re*’, because the object of belief is not intersubjectively recognizable. On this classification, our category of a report *de dicto with a referential mistake* fully fits within the category of *formally de re* beliefs: there is an object of belief, that is there is an internal anchor,

but the object so-described does not correspond to an entity in the world and there is no external anchor. But some of our readings described as *de dicto proper* also correspond to *formally de re* beliefs, while others are truly *de dicto*. Readings *de dicto proper* correspond to Kamp's *formally de re* beliefs when the object is imaginary. They are truly *de dicto* when the believer has no, even imaginary, object in mind. This is the case, for example, when the belief is held without being fully understood. Sentence (4) is a good candidate for a belief that is held in spite of not being fully understood.

(4) Hyperbolic geometry does not satisfy the parallel postulate.

For most lay persons, the description 'hyperbolic geometry' does not correspond to any entity, be it concrete or abstract. The belief is acquired, stored and held in its entirety: it is not a belief *about* an identifiable object called 'hyperbolic geometry'.

These distinctions between truly *de re*, formally *de re*, and truly *de dicto* beliefs are, nevertheless, very fuzzy and are not easily applicable in representing belief contexts. This much is obvious even from looking at (4): 'hyperbolic geometry' may trigger absolutely no representation in the believer's mind, or, if the holder of the belief is like us, the description will trigger a rather fuzzy idea of a set of laws concerning a curved space. In short, formal anchors can be more, or less, well defined and the borderline between beliefs formally *de re* and truly *de dicto* is therefore naturally hazy. This fact is well discussed in Sperber's (1985, 1997) account of semi-propositional beliefs that are acquired through metarepresenting. It is also well captured in Asher's (1986: 142) statement that the *de re/de dicto* distinction is only a generalization over a more detailed taxonomy in which we can distinguish (i) beliefs without any anchors; (ii) beliefs with only external anchors; (iii) beliefs with only internal anchors; and (iv) beliefs with both internal and external anchors. For our purposes, it will suffice to conclude that what started as a *de re/de dicto* dichotomy is more likely to be a gradation of well-definedness of internal anchors. In addition, however, we shall follow Kamp (1990, 1996) and Asher (1986) who added a condition to the construction algorithm for DRSs that definite referring terms have some, even if only 'schematic', internal anchor.

However, these readings need not be left out when our aim is to model acts of communication, as in TCP. In TCP, truth conditions are predicated of utterances. When what is true or false is the entire act of communication, the reason for treating *de re* on a special footing disappears. In Section 6, I put together the insights of TCP and the metalanguage of DRT in order to model all three possible interpretations of belief reports. I try to adopt the language of DRT and the available types of anchorings and 'shift' them, so to speak, to the level of interactive representations of Default Semantics. The reading *de dicto proper* of (2) will now make use of the anchor as in

Figure 2, to capture the sense of ‘the author of *Oscar and Lucinda*’ as ‘the author of *Oscar and Lucinda*, whoever s/he might be.’

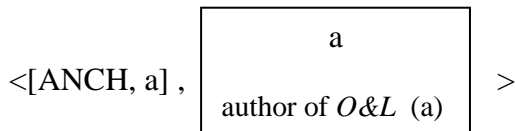


Fig. 2: Internal anchoring for ‘the author of *Oscar and Lucinda*’

De dicto with a referential mistake is more difficult to represent. It corresponds to a *de re* belief, but a belief about a referent whose identity is misrepresented by the believer. The representation has to capture the fact that there is an intersubjectively accepted referent for the belief, but this individual is not who is referred to by the description on this occasion. This is the situation in which William believes that Ian McEwan wrote *Oscar and Lucinda* and refers to Ian McEwan while uttering the description ‘the author of *Oscar and Lucinda*’. This scenario cannot be represented in DRT and, in fact, the problem does not even arise for DRT because this information is not part of the proposition expressed. DRT cannot represent *de dicto with a referential mistake* in that sentence (2) has the same DRS for the readings *de re* and *de dicto with a referential mistake*: there is an external anchor, there is a unique individual that corresponds to the description ‘the author of *Oscar and Lucinda*’, and the DRS has truth conditions. Identifying a referential mistake has nothing to do with representing the meaning of the sentence. But this information about mistaken reference or the lack of a clear referent *is* relevant for a theory of modelling acts of communication. This reading has to be represented in Default Semantics that accounts for merging information about meaning coming from different sources.

5. Merger Representations of Default Semantics

Default Semantics (Jaszczolt 2005a, b, c) allows for various domains of information to partake in assigning the meaning to the utterance. In addition to the sentence structure and word meaning, information can also come from pragmatic input. This input can be of various types. First, there is conscious pragmatic inference. Second, according to Default Semantics, there is pragmatic input that does not amount to conscious processing of contextual clues but rather makes use of standard, presumed meanings. These can be caused by the very design of the human processing system, such as the default *de re* discussed above that arises due to the property of intentionality of mental states, or by the frequently encountered scenarios, stored in the mind as default, presumed, *ceteris paribus* ‘normal’ ways things are. We have called the first *cognitive defaults*¹¹, and we shall call the latter *social-cultural defaults*. An example of social-cultural default is given in (5). While ‘Picasso’s painting’ can be enriched contextually to mean ‘the painting executed by Picasso’, ‘the painting

owned by Picasso’, ‘the painting selected by Picasso’ and a variety of other types of relationship, the first one is indubitably more salient than others, to the extent that it is reasonable to postulate that it goes through without any conscious processing of the context, in virtue of the shared cultural knowledge.

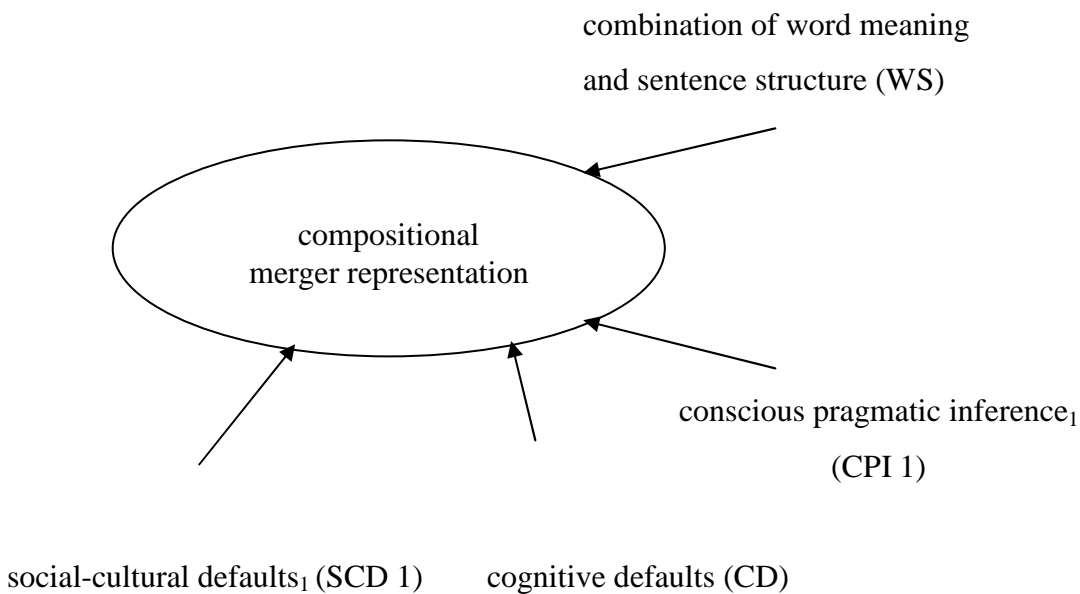
(5) Picasso’s painting is of a crying woman.

The expression ‘social-cultural defaults’ is a broad, umbrella term for all those enriched senses of expressions that arise out of the experiences we collect in our lifetime and that have become sufficiently entrenched to ‘click in’ automatically, without conscious inference. Some of these experiences pertain to cultural knowledge, as in (5), others are of social provenance, such as that nannies and nurses are normally female, yet others pertain to scientific facts such as that timber floats on water but metal does not. It is not clear at this stage of theorizing where the boundary between such presumed, fast-occurring enrichments and conscious inferential enrichments lies. But this does not mean that such a category should not be present in a model of utterance interpretation. There are sufficient theoretical grounds for distinguishing between conscious, effortful processing of expressions and fast, automatic, effortless ‘jumping to conclusions’, to use Kent Bach’s apt phrase. The onus of proof lies on those who assume costly processes where intuitively there is only such jumping to conclusions facilitated by frequently occurring scenario, common experience, or other sources of defaults. Although the exact properties of default meanings are still subject to debates, it seems very likely that a category of such shortcuts through costly pragmatic enrichments will be experimentally corroborated.¹²

All in all, in spite of some attempts in experimental pragmatics to discredit default interpretations by appeal to the length of processing, these presumed meanings are not to be disposed of so lightly. In the absence of satisfactory experimental design and, a fortiori, experimental evidence, we can safely resort to a rational principle of not postulating effortful inference without compelling evidence, following the line of Levinson (1995, 2000), Recanati (2003, 2004), Asher and Lascarides (e.g. 2003), and many others.¹³ And, in the case of social-cultural defaults, there is indeed no evidence of such costly processing.

Cognitive defaults and social-cultural defaults are two out of four sources of information about meaning distinguished in Default Semantics that contribute to creating what is said by the utterance: the utterance meaning. Information from these four sources interacts and produces a so-called *merger representation*. The main task of Default Semantics is then to produce an algorithm for this interaction.¹⁴ Diagrammatically, the sources of information about meaning that contribute to the merger representation can be represented in Fig. 3.

Stage I: Processing of the truth-conditional content



Stage II: Processing of implicatures

- social-cultural defaults₂ (SCD 2)
- conscious pragmatic inference₂ (CPI 2)

Fig. 3: Utterance interpretation in Default Semantics (adapted from Jaszczolt 2005a: 73).

To sum up, the picture that emerges is this. There is a representation of meaning that is constituted by word meaning and sentence structure (WS), merged with and any combination of conscious pragmatic inference (CPI), cognitive defaults (CD) and social-cultural defaults (SCD) – 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. WS is to be understood as the output of syntactic processing. Following DRT, we assume that a generative grammar such as Generalised Phrase Structure Grammar (GPSG) serves this purpose with a satisfactory degree of cognitive reality, but we leave the issue of a choice of an adequate syntactic theory open. Next, cognitive defaults (CDs) are effortless, automatic enrichments that are the result of the mental architecture: in short, they arise because the intentionality of mental states is normally the strongest intentionality that pertains to the particular type of expression. Definite descriptions and propositional attitude reports discussed

above are good examples of a CD. Social-cultural defaults (SCDs) were introduced in the discussion of example (5). This leaves us with pragmatic inference which I dubbed ‘conscious’ (CPI) in order to distinguish it from automatic enrichments in CD and SCD. CPI is an ordinary process of inference in conversation, modelled on Grice’s particularized conversational implicature. The representation that results from the interaction of these four sources is called a merger representation and is by stipulation compositional.¹⁵

The next distinction to be introduced is that between SCD 1 and CPI 1 on the one hand, and SCD 2 and CPI 2 on the other. Merger representation is not the only content conveyed by an utterance. There can also be additional meanings recovered by the addressee that can be properly called implicatures. Again, these arise as the output of CPI or as SCDs – let us give them distinct names of CPI 2 and SCD 2.¹⁶ We shall now reserve CPI 1 and SCD 1 for contributions to the merger representation.

In the current analysis of belief reports, we shall focus on WS, CD and CPI 1 as these sources of meaning are relevant for their processing. In what follows, I present a Default Semantics account of propositional attitude reports and attempt to provide the basic formalism for the merger.

6. The Analysis

In the interactive semantics of merger representations, unlike in DRT, we do not start by mapping only from the syntactic structure of sentences into DRSs. Instead of the DRS construction algorithm, there is mapping from WS, CD, CPI 1 and SCD 1 into merger representations. Unlike in DRT, merger representations for the reading *de dicto with a referential mistake* and *de dicto proper* will have truth conditions because compositionality is, in virtue of our initial assumption, a property of these representations, that is of the output of all these four sources.

Asher (1986: 129) metaphorically says that discourse referents are ‘pegs’ on which the hearer can ‘hang’ the ascriptions of properties that the DRS-conditions specify. We adopt this view of the semantic role of discourse referents. In merger representations, the discourse referent x , standing for the person who wrote *Oscar and Lucinda* (‘the author of *Oscar and Lucinda*’), is an argument of the following three conditions:

- (i) for the default *de re* reading: [Peter Carey]_{CD(x)}
 - (ii) for the *de dicto* reading *with a referential mistake*: [Ian McEwan]_{CPI1(x)}
- and
- (iii) for the reading *de dicto proper*: [the author of *O&L*]_{CPI1(x)}

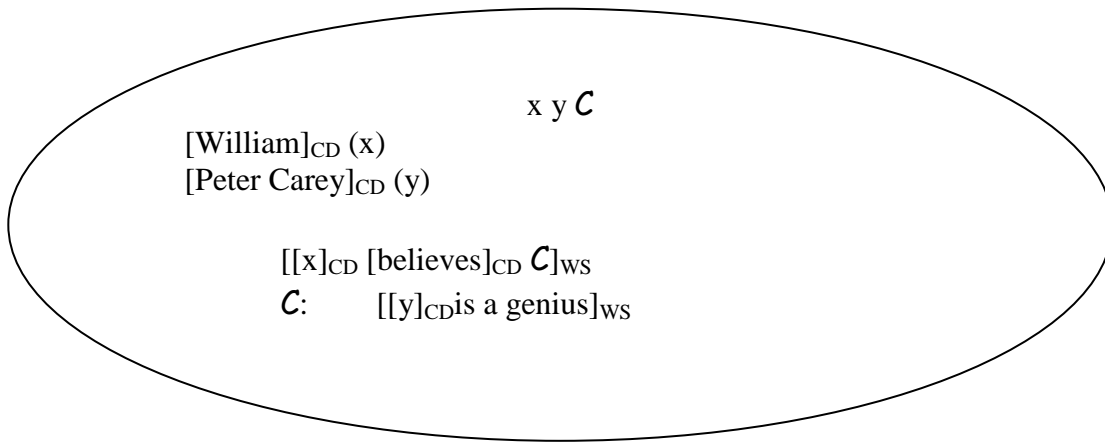
The options (i)-(iii) best capture what we are trying to do in merger representations: we model communicated meaning by using an interactive representation that pays only limited attention to linguistically controlled sources of this meaning, while accounting also for those aspects that are not linguistically controlled.

A brief disclaimer is now due. All this discussion may lead one to conclude that we are proposing here an alternative to the DRT account. This is, however, a false conclusion. By adopting the language of DRSs and some of their construction rules we are not suggesting that there is a problem with DRT as such. We have ‘raised’, or ‘pragmaticized’, the object of analysis to that of the interaction of various sources of information, detached this level substantially from the output of grammar and lexicon, and as such we have been pursuing an enquiry that is substantially different from that of DRT. We are not suggesting that it is a weakness of DRT that it can represent only one reading of attitude constructions. Within the assumptions concerning compositionality and meaning construction followed in DRT, this is not a weakness: one has to have a singular proposition in order to have a truth-evaluable DRS. All we have done here is suggest an alternative way of thinking about utterance interpretation – a way that utilises the insights of the TCP with its top-down pragmatic inference to the full, retaining at the same time the advantages of semanticizing the whole enterprise.

Next, we have to introduce the semantics of the belief predicate. Let us assume that the utterance reporting a belief of the form ‘ x believes that \mathcal{C} ’ can be represented as $\text{Bel}(x, \mathcal{C})$. $\text{Bel}(x, \mathcal{C})$ has the following satisfaction conditions: the individual that corresponds to x on a certain interpretation has the cognitive state that corresponds to \mathcal{C} on that interpretation. We are now ready to propose merger representations for the three readings of the belief report in (2), repeated below.

(2) William believes that the author of *Oscar and Lucinda* is a genius.

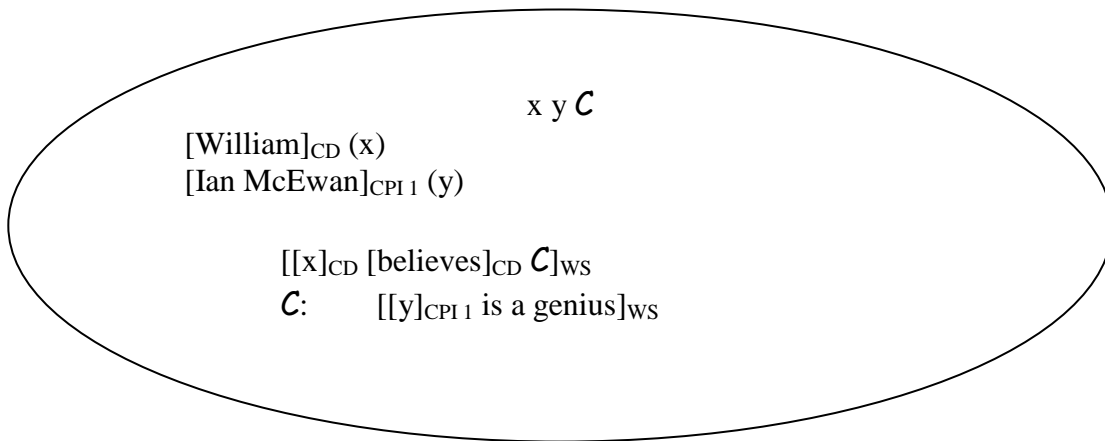
Figure 4 represents the default *de re* reading. The subscripts CD (cognitive default) and WS (word meaning and sentence structure) stand for the source of meaning, and their scope is marked by []. The figure is annotated by a superscript ‘p’ that stands for the fact that the representation is ‘partial’ in the sense that temporality of the eventualities is not worked out.¹⁷



^PFig. 4: Merger representation of the default *de re* reading of (2)

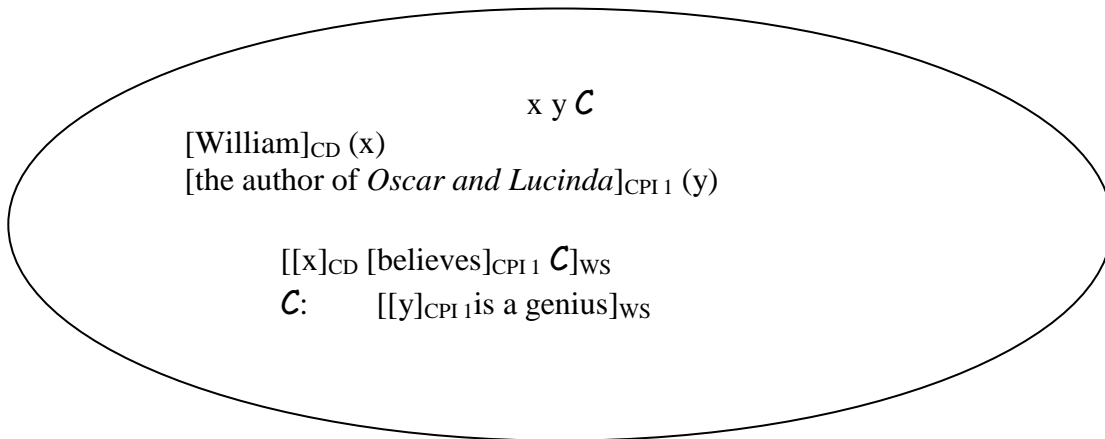
The default status of this reading is clearly represented. The discourse referent x is associated with the person called Peter Carey by means of CD. By the same argument from intending, presented in Section 3, the belief is *de re* by means of CD. Now, $Bel(x, \mathcal{C})$ corresponds here to the condition $[[x]_{CD} [believes]_{CD} \mathcal{C}]_{WS}$. This is to be read as follows: ‘the individual that corresponds to x on this interpretation (William) has a cognitive state that corresponds to \mathcal{C} on this interpretation’. In other words, ‘Peter Carey is a genius’. \mathcal{C} stands for William’s *representation of the eventuality* e: $[[y]_{CD} \text{ is a genius}]_{WS}$.

Figure 5 depicts the merger representation of the reading *de dicto with a referential mistake*. Just as on the default *de re* reading, the belief is *de re* by means of CD. The difference is that the discourse referent x is associated with the person (Ian McEwan) by means of CPI 1. The result of CPI 1 allows the hearer to associate the description with Ian McEwan, while the default association remains that represented in Figure 4.



^PFig.5: Merger representation of the reading *de dicto with a referential mistake* of (2)

Finally, the reading *de dicto proper* of (2) is represented in Figure 6.



^PFig. 6: Merger representation of the reading *de dicto proper* of (6)

On the reading *de dicto proper*, CPI 1 is responsible both for the belief (*de dicto*) and for the attributive reading of the description. The fact that CPI 1 applies twice makes this reading more distinct from the default *de re* than the one represented in Fig. 5.

7. Towards a Formal Account for Interactive Semantics

Since merger representations take the formalism of DRT and ‘kick it upstairs’ to serve for representing the interactive conception of semantics, the formalism for the semantics for merger representations has to differ from the relational semantics used for DRSs in DRT.¹⁸ The main difference is that mental representations are created with regard to the four sources of meaning: WS, CPI 1, CD, and SCD 1. In other words, in merger representations, the predicative conditions draw on the four sources and compositionality is assumed to obtain at the level of the merger. In order to provide the semantics for the belief predicate, we have to start with ‘believe’ as a two-place operator on terms and representations of eventualities (\mathcal{C}). In Default Semantics (Jaszczolt 2005a), I assume that \mathcal{C} is the second argument of a two-place, first-order predicate. The relational semantics for *believe* is modelled on that for *n*-ary predication, as in (i). $\llbracket \]$ stand for semantic value; P for predicate; t for terms (discourse referents, variables in DRT and Default Semantics); s and s' for the initial and final context in the dynamic-semantic perspective; M is a model; and I is the interpretation (adapted from Jaszczolt 2005a: 141-142).

(i) ${}_s \llbracket Pt_1, \dots, t_n \rrbracket_{s'}^M$ iff $s = s'$ and $\{ \llbracket t_1 \rrbracket_{M,s}, \dots, \llbracket t_n \rrbracket_{M,s} \} \in I(P)$

If we assume for ‘ x believes \mathcal{C} ’ the structure $Bel(x, \mathcal{C})$ and, despite all the problems with intensionality, take Bel to be an ordinary two-place predicate $P(t_1, t_2)$, we obtain (ii).

${}_s \llbracket Pt_1, t_2 \rrbracket_{s'}^M$ iff $s = s'$ and $\{ \llbracket t \rrbracket_{M,s} \} \in I(P)$.

This is not entirely satisfactory, though: t_2 is not a satisfactory substitute for \mathcal{C} . \mathcal{C} is an intensional object that subsumes various degrees of referential intention with which the utterance comes, and *a fortiori* various degrees of intentionality of the belief itself. There is a continuum of degrees of contribution of William’s way of thinking about the author of *Oscar and Lucinda* to the merger representation, starting with no contribution on one end (*de re*), to some very detailed mode, whatever it may be, on the other (*de dicto proper*). To elaborate, the role of the way of thinking, also known as a mode of presentation (MoP), is as follows. 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. The role of MoP increases for the *de dicto with a referential mistake*: it matters for this reading whether in (2) William thinks about Peter Carey or about Ian McEwan. 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 novelist that may be present in William’s belief. In the reading *de dicto proper*, the granularity of the semantically relevant MoP increases further: any fine detail from William’s belief may be relevant. For example, in our scenario for (2), all that William knows about the author of *Oscar and Lucinda* may be that there was one, unique person responsible for writing this novel. 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*.

Such gradation is not formalizable by (ii). It is quite plausible that no formalization for such degrees of granularity can be produced. The closest generalization we can obtain is by capturing the imaginary set of all the possible MoPs by means of an intensional object \mathcal{C} , as in (iii). The advantage of such a move is that we can retain the appearance of Bel as a binary predicate and, at the same time, reflect the variability of MoP.

(iii) ${}_s \llbracket Pt, \mathcal{C} \rrbracket_{s'}^M$ iff $s = s'$ and $\langle \llbracket t \rrbracket_{M,s}, \mathcal{C} \rangle \in I(P)$

where

- (iii.a) \mathcal{C} is a merger representation of a mental state of t modelled on a DRS for an extensional context and constructed according to the reanalysis of a DRS for an extensional context in interactive semantics;
- (iii.b) $P \in \{Bel_{CD}, Bel_{CPI1}\}$
- (iii.c) $t \in \{t_{CD}, t_{CPI1}\}$

Parts (iii.a)-(iii.c) are to be read as follows. (iii.a) says that \mathcal{C} is a merger representation and hence is constructed by means of the interaction of any of WS, CD, SCD 1 and CPI 1. It is constructed in a language modelled on that of DRT. Thesis (iii.b) says that the belief operator is *de re* or *de dicto*₁ when CD is in operation, or *de dicto proper* when CPI 1 is used. Naturally, mental states other than *Bel* can be accounted for analogously. Condition (iii) reflects the thesis that reference assignment to discourse referents can proceed by means of CD or CPI 1.

At this point, a word in defence of the object \mathcal{C} is needed. \mathcal{C} is an intensional object and as such does not easily fit into formal semantic accounts. Let us compare briefly our analysis with that of DRT. DRT employs eventualities, i.e. discourse referents for events (e) and states (s) as objects of beliefs. Events and states are there formal objects with variable subjects and variable spatiotemporal location. To follow this route would mean to have to resort to anchoring. However, in our approach, we replaced anchoring with the arguments for the belief predicate: the application of CD or CPI 1 resulted in an unambiguous assignment of a reading to the description. We have also managed to retain the intuitively correct representation of belief reports as relations between a believer and a mental state. But the price to pay is an intensional object \mathcal{C} that functions as an umbrella category for all those readings that incorporate varying degrees of the mode of presentation of the referent. This works well in merger representations but would not work in DRT. DRT ascribes compositionality to the structure of the sentence. This structure is indeed enriched in a dynamic way, but nevertheless compositionality remains a property of the linguistic string. The level of which compositionality is predicated is sentence structure. Default Semantics, on the contrary, ‘raises’ the requirement of compositionality to the level of the merger. Hence, an object such as \mathcal{C} , as well as the resolution of reference within \mathcal{C} by means of CD or CPI 1, is allowed there. It is the product, the merger representation, rather than the WS source, that is compositional. Within this model, \mathcal{C} can also be regarded as compositional, in the pragmatics-rich sense of compositionality.

8. Final Remarks and Conclusions

Merger representation require substantial rethinking of compositionality in semantic theory. In the general spirit of TCP¹⁹, in Default Semantics, compositionality is conceived of as a property of merger representations:

Principle of compositionality for merger representations:

The meaning of the act of communication is a function of the meaning of the words, the sentence structure (WS), defaults (CD and SCD 1), and conscious pragmatic inference (CPI 1).

In other words, the representation of the speaker's act of communication that the model hearer can be predicted to construct is composed of the merger of information specified by these four sources. In principle, there is nothing to stop us from 'lifting' compositionality to the level of the merger of meaning components that come from various epistemic domains. But the important question is: what does it exactly mean to 'lift' compositionality in this way? Is semantics still conceived of as compositional? And if so, how are we to construe a semantic theory that would be truthful to this 'compositionality raising'? TCP should have no problem with the composition of the merger.

Recanati (2004: 132) says the following:

“...the semantics of natural language is not insulationist. ...[T]he meaning of the whole is *not* constructed in a purely bottom-up manner from the meanings of the parts. The meaning of the whole is influenced by top-down, pragmatic factors, and through the meaning of the whole the meanings of the parts are also affected. So we need a more 'interactionist' or even 'Gestaltist' approach to compositionality.”

Compositionality is understood here as a methodological principle for a theory of meaning. We make this claim even stronger: compositionality is to be assumed as a necessary property of any semantic theory where 'semantics' is understood as subsuming such top-down pragmatic input.²⁰ The proof of the feasibility of composition so-conceived will lie in providing algorithms for merger representations for a variety of English constructions.

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 we suggested above, as truth-conditional semantics? There are two possible construals. 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. We have argued here 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 I am on the right track, truth-conditional pragmaticists do not aim at a formalization of the account of utterance interpretation because the top-down processes eschew formalization by definition. 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.²¹

Let us take stock. In order to represent the readings of attitude reports as constructed by a model speaker in a conversation, we applied merger representations of Default Semantics where the sources of meaning from which the semantic representation is built are treated on a par. There is a long way to go before we can resolve finally how a merger representation for *Bel* (x, C) is constructed. But, equally, many tools and ideas are already there: the language of DRSs, and the contextualist stance of TCP. Building on these foundation stones, I have proposed a representation of utterance meaning that rests on the four sources of meaning information and on their merger. This required a rethinking of compositionality and ‘raising’ it from the domain of sentence structure (however dynamically understood) to the domain of merger representation, along the lines of Recanati’s proposal of ‘Gestaltist compositionality’. The syntax-pragmatics interface became a syntax-pragmatics merger of the output of WS, CPI 1, CD and SCD 1.

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Notes:

¹ See Montague 1974, and e.g. Dowty, Wall and Peters 1981; Partee 2004.

² The literature on this topic is vast. See e.g. Stanley 2000, 2002; Stanley and Szabo 2000; King and Stanley 2005; vs. Recanati 1989, 1993, 2001, 2002, 2003, 2005; Bach 2000, and many others. See also Jaszczolt 2002: chapter 11, and 2005a: chapter 1 for an overview and discussion.

³ For extensive references and an overview of the research on propositional attitude constructions see Jaszczolt 2000a.

⁴ See also Jaszczolt 1999, 2000b, 2005a.

⁵ See e.g. Noveck and Sperber 2004.

⁶ I.e., below the level of consciousness.

⁷ See e.g. Jaszczolt 1997, 1999, 2000b, 2005a.

⁸ It can be argued that in the middle reading the referential intention is equally strong as that in the first, *de re* reading in that reference is made to a salient, identifiable (albeit incorrect) person. However, for the purpose of modelling discourse, the referential intention in the middle reading can be represented as ‘dispersed’, so to speak, between the individual mistakenly intended by William (Ian McEwan) and the objective correlate of the description in this situation (Peter Carey). I owe this disclaimer to François Recanati.

⁹ For a discussion of this ‘inheritance’ of intentionality see Searle (1983: 27-28), and, for an amended view, see Jaszczolt (1999: 104-111).

¹⁰ Adapted from Kamp 2003.

¹¹ See Section 3.

¹² See Jaszczolt 2006b on the disputes concerning the properties of default interpretations.

¹³ I provide more extensive arguments for cognitive and social-cultural defaults in Jaszczolt 2005a, b.

¹⁴ This task has been attempted for a variety of constructions including referring expressions, propositional attitude constructions, anaphoric dependencies, modalities, and some others in Jaszczolt 2005a.

¹⁵ Compositionality is a methodological requirement. I leave the discussion of this pertinent issue until Section 8.

¹⁶ Note that there is no CD 2. Cognitive defaults are default interpretations that come from the properties of the underlying mental states and hence are always constitutive of the main semantic representation, i.e. the merger representation.

¹⁷ The analysis of belief reports along these lines was first suggested in Jaszczolt 2005a, chapter 5. For a discussion of temporality in terms of merger representations see Jaszczolt 2003; 2005a: chapter 6; and 2006a.

¹⁸ The principles of relational semantics will not be presented here. Suffice it to say that its core feature is accounting for the changing context. See van Eijck and Kamp 1997, or, for a summary, Jaszczolt 2005a: chapter 3.

¹⁹ And also Schiffer 2003.

²⁰ 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.

²¹ 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.