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Associative and inferential approaches to pragmatics: The state of the art of experimental investigation.

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Abstract

A debate concerning associative versus inferential approaches to pragmatics has arisen within the recent 'cognitive turn' in the pragmatic field. The nature of *on-line* pragmatic processes has become the focus of attention of philosophers (Recanati 2002*a*, 2004, 2007*b*) and linguists (Wilson & Carston 2007, Carston 2007). In this paper, I review this theoretical debate and then explore and assess the recent experimental literature focusing on it (Rubio-Fernández 2007, 2012). I address the question whether non-demonstrative inferential processes implemented in a fast and automatic system (e.g. the relevance-theoretic comprehension procedure) can be empirically disentangled from 'smart' associative systems; and I raise some doubts about whether current experimental pragmatics is able to inform the theoretical debate on the nature of on-line pragmatic processes. I conclude by emphasising the role that philosophical analysis, with its traditional methodologies, can still play in the field of *cognitive* pragmatics.

1 Introduction

The debate concerning the nature of on-line pragmatic processes is relatively new within the field of pragmatics. The fact that it developed only recently can be explained on the basis of two general trends, which have characterised the study of pragmatics since its origins (Grice 1957, 1967).

First, the study of pragmatics has been largely influenced by its initial theoretical motivations. Gricean pragmatics explicitly represents an attempt to reconcile the semantics of formal and natural languages, through the distinction between sentence meaning and speaker's meaning. The former offers the attempted reconciliation, whereas the latter accounts for the richness of the communicated content (that can go well beyond the linguistically encoded content). The emphasis on the distinction between the truth-conditional content of the utterance (just minimally affected by pragmatic contributions) and the non-truth-conditional aspects of the communicated content (entirely pragmatically motivated) has laid the foundation for a flourishing investigation on the interface between semantics and pragmatics. For many decades, in fact, pragmatics has been conceived as primarily focused on assessing the extent to which *context* interacts with the linguistically encoded meaning to determine the communicated content of an utterance, at the level of both explicit and implicit communication. This trend is an ongoing feature of the present state of the art within the discipline.

Second, pragmatics has been strongly committed to a philosophically-oriented perspective. Grice (1967) introduced an inferential model of communication based on the idea that hearers infer the speaker's meaning from the evidence provided by the conventional linguistic meaning of her utterance. This model does not strive for psychological plausibility. The Cooperative Principle and the conversational maxims are generally seeing as having the status of guiding principles for a *rational reconstruction* of pragmatic interpretation. Issues concerning the nature of the actual cognitive processes which underpin utterance interpretation are left largely unexplored. More recently, the seminal work on 'Relevance Theory' by Sperber & Wilson (1986/1995) has considerably reduced the gap between studies of communication and the cognitive sciences, integrating the previous philosophically-based pragmatic tradition with a more cognitively-oriented perspective: "Pragmatics, as we will describe it, is an *empirical science*, but one with philosophical origins and philosophical import" (Wilson & Sperber 2012, p. 1, *my emphasis*). Cognitive pragmatics, thus, approaches verbal comprehension as a psychological process, which is open to empirical investigations based on methodologies borrowed from psycholinguistics, developmental studies, neuro-psychology and other cognitive sciences.

Interestingly, this change of perspective has also contributed to the emergence of new lines of research, which address issues that had not been explored before,

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from either a philosophical or an experimental perspective. It is within this general picture that we can position the debate about the nature of on-line pragmatic processes. This debate has recently received substantial contributions from linguists, philosophers of language and cognitive scientists (Carston 2007, Recanati 2002*a*, 2004, 2007*b*, Mazzone 2011, Wilson & Carston 2007).

This paper aims at discussing and evaluating the experimental work that has been recently conducted (Rubio-Fernández 2007, 2012) in order to contribute to this philosophical debate. My main focus is Rubio-Fernández (2012), which represents the first attempt to subject the fine-grained differences between inferential and associative approaches to pragmatics to rigorous empirical investigation. I also approach this work as an interesting example of an *empirical* investigation, which has been conducted using *psycholinguistic* methodologies, in an attempt to shed some light on a *philosophical* debate, revived and reinvigorated within this recent *cognitively-oriented* perspective in the field of pragmatics.

In what follows, I first outline the two theoretical models whose predictions are tested in the study, namely the relevance-theoretic framework and Recanati's (2004) account of primary pragmatic processes. Second, I summarise the methodology and results of the experiments conducted by Rubio-Fernández (2012) and then discuss her interpretation of the results. Finally, I present some critical considerations, which lead to a (partial) reanalysis of the results, ending with a more general reflection on the susceptibility of the debate at issue to empirical investigation.

2 Theoretical background

The debate concerning the nature of primary pragmatic processes, that is, the processes that contribute to the recovery of the explicit content of an utterance, has been developed around two alternative positions.[1] On the one hand, Relevance Theory has proposed a unified inferential account of primary and secondary pragmatic processes. According to this framework (Wilson & Sperber 2004), utterances come with a presumption of their own optimal relevance, that is, a presumption that their interpretation will provide the hearer with a satisfying level of cognitive effects requiring no gratuitous processing effort. This warrants the hearers employing the following inferential heuristic:

(a) Follow a path of least effort in accessing and testing interpretative hypotheses

(b) Stop when your expectations of relevance are satisfied.

[1] I adopt the terminology proposed by Recanati (2004) with regard to the distinction between *primary* and *secondary* pragmatic processes. The former are said to contribute to the recovery of the explicit content of the utterance ('what is said', in his terms, 'explicature', in RT terms), whereas the latter are responsible for deriving its implicit content ('what is implicated').

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This comprehension procedure guides the derivation of explicature, contextual assumption and implicatures. Thus, the conceptual distinction between primary and secondary pragmatic processes does not correspond to any actual distinction in the nature (or kind) of processes involved. On the other hand, Recanati (2004) conceives of this distinction as correlating with two different on-line processing systems: for primary processes, there is a low-level associative system, which is responsible for the derivation of 'what is said', and, for secondary processes, there is a genuinely inferential system, which recovers 'what is implicated'. According to Recanati's framework, primary pragmatic processes are governed by a dynamics of accessibility, constrained by semantic associations and world-knowledge structures (i.e. 'schemata').

Rubio-Fernández (2012) represents the only attempt I am aware of to explicitly test the predictions of these two competing approaches. The focus of the study is the phenomenon of pragmatic enrichment (i.e. free enrichment), a process which both Recanati and Relevance Theory take to contribute to the level of explicit utterance content, hence a primary process. It is worth emphasising that this pragmatic category is generally assumed to comprise two different kinds of primary pragmatic processes. It can be used to refer to the local adjustment of a linguistically encoded concept (i.e. 'lexical adjustment' or 'modulation'), or to the provision of linguistically unarticulated conceptual constituents. In the first case, lexically encoded meanings are modulated in context; in the second, pragmatically recovered conceptual constituents are composed into the interpretation of 'what is said' at a local level. In order to clarify this distinction, we can consider the following examples:

(1a) It is raining.

(1b) It is raining in London.

(2a) I'm not drinking tonight.

(2b) I'm not drinking any alcohol tonight.

Intuitively, sentences (1a) and (2a) can be used, in certain contexts, to express the propositions in (1b) and (2b). The first example is generally treated as a case in which the propositional constituent *[in London]*, which is linguistically unarticulated, is added to the proposition intuitively expressed by uttering (1a) in some particular contexts (e.g. when the speaker is looking outside the window of her flat in London). By contrast, the second example is often assumed to be a case of lexical adjustment. This process of enrichment takes as input the linguistically encoded concept drink, and delivers as output an ad hoc, or occasion-specific, con-

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cept DRINK* (whose denotation is narrower than the previous one, e.g. it does not include drinking water).[2]

Rubio-Fernández (2012) investigates the processes that account for instances of pragmatic enrichment "where the reader goes beyond the message linguistically encoded and derives a more specific interpretation as to *why* or *how* a certain action is performed" (Rubio-Fernández 2012, p. 3). Although it is not explicitly stated, some of the examples that make up the materials of her experiment seem to fall within the category of unarticulated constituents. For instance, let us consider the following examples discussed throughout the paper:

(3a) John didn't know how to swim, so when he fell into the water, his best friend threw him a lifebuoy *[TO SAVE HIM FROM DROWNING]*.

(3b) John didn't know how to swim, so when he fell into the water, his best friend threw him a basketball *[TO SAVE HIM FROM DROWNING]*.

In both cases, it seems difficult to interpret the enrichment *TO SAVE HIM FROM DROWNING* as the result of the modulation of a lexically encoded component of the sentence (which word would it be?). Thus, I assume these cases fall within the 'unarticulated constituents' category.[3]

However, as Rubio-Fernández (2012, p. 12) underlines, "the focus of the present study is not the pragmatic process of free enrichment *per se*". Rather, it concerns the accessibility of 'emergent properties' (i.e. context-dependent properties) and, only as a consequence, those instances of free enrichment, which are based on the recovery of such properties. Let us then focus on the distinction between context-independent and context-dependent information (Barsalou 1982). Context-independent information is automatically accessed every time the corresponding word is processed. By contrast context-dependent information is activated only when contextually relevant. The former is said to be accessed via spreading of activation of associates, the latter through local inferential processes (Barsalou 1982, p. 87).[4] Thus, if we consider the word *basketball*, the property

[2] See Recanati (2004), p. 25, for a discussion on the distinction between lexical adjustment and unarticulated constituents.

[3] A marginal consideration may be of interest here. Recanati (2007*a*) has adopted a relativist position on unarticulated constituents. They are assumed to be part of the situation of evaluation, rather than of the explicitly communicated content. In line with this, his most recent notion of free enrichment is confined to lexical adjustment. Rubio-Fernández's study, then, is to be interpreted as addressing Recanati's (2004) framework, or, more generally, any associationist account of primary pragmatic process which includes the provision of unarticulated constituents.

[4] It is worth noticing that Barsalou does not provide any detailed description of (this) alleged inferential process: "The range and nature of these inferential processes are other topics worthy of future discussion" (Barsalou 1982, p. 87). This raises the issue whether these processes could fall under the notion of 'broad inference' put forth by Recanati (2002*a*, p. 119), which is still compatible with an associationist account of them.

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ROUND counts as a context-independent property, which gets automatically activated whenever the word is processed, whereas FLOATS is an emergent property, which is accessed just in relevant contexts (e.g. 3b).

This distinction – and the claimed difference in terms of underpinning cognitive mechanisms – provides the basis for an empirical test of Relevance Theory and Recanati (2004). The two models make different predictions with regard to circumstances in which inferential processes are required at a local, rather than global, level to contribute to the recovery of the explicit content of the utterance. For instance, in order to enrich the utterance of (3b) with the unarticulated constituents *TO SAVE HIM FROM DROWNING*, the interpreter needs to access the emergent property FLOATS of the word *basketball*. This, according to Barsalou (1982), requires a local inferential process to take place.

According to Recanati,

> "the primary pragmatic processes involved in comprehension are not 'inferential'. Only when the unreflective, normal processes of interpretation yield weird results does a genuine inference process take place whereby we use evidence concerning the speaker's beliefs and intention to work out what he means." (Recanati 2004, p. 34)

This passage suggests that the normal flow of interpretation is disrupted when automatic, purely associative and blind processes fail in delivering a satisfactory interpretation. As a consequence, inferential processes are exploited in order to recover the speaker's meaning on the basis of richer considerations involving the speaker's mental states. In contrast, Relevance Theory advocates a uniformly inferential account of pragmatic processes, which does not only come into play to supplant a more basic system when it goes wrong. Inferential processes affect utterance interpretation from the very beginning, without involving any disruption.

Rubio-Fernández (2012) therefore suggests that Recanati (2004) would predict emergent properties to be accessed in a second (inferential) stage of processing – after the breakdown of the associative mode of processing. Relevance Theory, by contrast, would account for their accessibility within the normal flow of interpretation.

3 Experimental setting and results

Rubio-Fernández (2012) study employs a self-paced reading task, in which participants read segments of sentences, revealed one-at-a-time on the monitor, and decide when to proceed by pressing a button. The material comprised a series of short passages, all of which were presented in three versions, each to a different participant. The passages differ with regard to the familiarity and appropriateness of the

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target word. A familiar target word is one that is primed by the passage (through semantic associations and world-knowledge priming). An appropriate target word is one that is relevant to the context. The following is an example of a critical passage (in its three versions):

> John went to the public swimming pool every afternoon. He spent most of his time there reading the papers. He didn't know how to swim, so when he fell into the water, his best friend threw him **a lifebuoy/ a basketball/ a newspaper** and then just waited by the side of the pool. John was expecting a bit more help.

The three versions correspond to (i) the familiar and appropriate target (e.g. *lifebuoy*), (ii) the unfamiliar but appropriate target (e.g. *basketball*) and (iii) the familiar but inappropriate target (e.g. *newspaper*).

In order to test the predictions sketched in the previous section, two measures of word processing were recorded: an early measure to reveal reading latencies for the critical target phrase (e.g. *a lifebuoy*), and a late measure of the reading times for the segment following the critical target (e.g. *and then just waited*). Reading latencies at this later stage are supposed to reflect any delay in integration processes.[5]

As far as the early processing measure is concerned, both Relevance Theory and Recanati would predict a priming effect in the familiar-and-appropriate condition (e.g. *lifebuoy*) as well as in the familiar-and-inappropriate condition (e.g. *newspaper*). The concept LIFEBUOY would be activated by the current drowning scenario, whereas the concept NEWSPAPER would be primed by the earlier part of the discourse (i.e. *He spent most of his time there reading the papers*). Crucially, according to Rubio-Fernández, the two models exhibit different predictions with regard to the unfamiliar-and-appropriate condition (e.g. *basketball*). Recanati (2004) would not predict any priming. The active scenario (i.e. DROWNING SCENARIO) could not drive the enrichment automatically since it does not contain any slot for the concept BASKETBALL. By contrast, Relevance Theory would predict a significant facilitation effect (though not through priming). The latter is consistent with the view that "backwards inferences" can modulate the recovery of the explicit content of the utterance. In other terms, the explicit content would be constructed in such a way that it satisfies specific expectations about the relevance of the utterance (e.g. the expectation that the relevance of (3b) relies on the cooperativeness of John's friend). Analogously, with regard to the late processing measure, the only condition which Rubio-Fernández considers as critically differentiating Recanati's model and Relevance Theory is the unfamiliar-and-appropriate one (e.g. *basketball*). Recanati, but not Relevance Theory, would predict a disruption of the normal flow of interpretation due to the breakdown of the associative mode of processing and

[5] A control list where the targets appeared in a neutral context was used for the early processing measure. Since the targets differed in length and frequency a direct comparison of their levels of activation was not possible.

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this should be evident in the attempt to integrate the interpretation of the word into the ongoing discourse.

The results supported the relevance-theoretic framework in both cases. In particular, they showed that unfamiliar-but-appropriate targets were significantly facilitated early in processing relative to the control condition (i.e. neutral context), with reading times comparable to the two familiar conditions. Furthermore, their integration in the discourse representation did not disrupt the normal flow of interpretation. The conclusion drawn by Rubio-Fernández (2012, p. 17, *my emphasis*) is that "inferential processes are *fully integrated* in the processing system, operating not only at the global level of the utterance but also at the *local level*".

In what follows I evaluate the extent to which the experimental study supports this conclusion. It is worth noticing that it comprises two distinct claims: first, that inferential processes are fully integrated in the processing system (i.e. they operate in parallel with associative processes); second, that they operate at a local level without causing any disruption. I argue that while the first claim is certainly supported by the present study it is doubtful that it provides evidence for the second claim.

It is worth noting that it is this second claim that mostly differentiates between Recanati (2004) and Relevance Theory. Recanati (2004, p. 47) has indeed argued for a dual system, characterised by a distinction between an associative and an inferential mode of processing, but one which is not to be interpreted as a sequential model. Thus, he would endorse the idea of a full integration of the inferential mechanisms, so far as this is confined to global inferences (e.g. implicature derivation). He does not, however, support the view that (local) inferences are involved in the primary processing system.

4 Critical considerations

4.1 Pragmatic enrichments and local inferences

Rubio-Fernández (2012) adopts the distinction between context-independent and context-dependent properties proposed by Barsalou (1982). In line with Barsalou's description, she takes the first to be accessed via spreading of activation, and the second through local inferential processes. The correspondence between this distinction and the two alternative modes of access is more presupposed than explained.

In a pre-test of the material used in the study, Rubio-Fernández combined a self-paced reading task with a property verification task. Participants were presented with short passages in which the same target word was embedded either in a relevant or in a neutral context. They were asked to answer a world-knowledge question at the end of each passage. The pre-test was aimed at determining whether

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the comprehension of the critical (i.e. relevant) context gave access to the intended emergent property. For this purpose, in the critical condition, the question was about a relevant emergent property of the target word, whereas, in the control condition, it was related to the same emergent property of the target word, irrelevant in the context at issue:

> *Critical condition:* John went to the public swimming pool every afternoon. He spent most of his time there reading the papers. He didn't know how to swim, so when he fell into the water, his best friend threw him a basketball and then just waited by the side of the pool. John was expecting a bit more help.

> *Control condition:* Tom was wondering what to spend his birthday money on. He always ended up getting sports equipment but he decided to get something else this year. He had first thought of getting a basketball to join the local team, but maybe he could get a new computer game instead.

> *World-knowledge question:* Can a basketball be used to stay afloat?

The results showed that participants were faster in verifying the emergent property in the critical rather than in the control condition. This difference in response times is interpreted by Rubio-Fernández (2012) not only as evidence that the emergent properties were effectively accessed in the critical context, but also that they were not accessed through a chain of automatic associations. The suggestion is that not only did participants effectively access the emergent property CAN BE USED TO STAY AFLOAT, but also that they accessed it through a local inferential process. This further conclusion is advanced by Rubio-Fernández on the basis of the following consideration: "If participants were equally fast at verifying the emergent properties in both types of context, it could be argued that emergent properties were accessed through an automatic chain of associations *regardless of their contextual relevance*". (Rubio-Fernández 2012, p. 8, *my emphasis*) Such an automatic chain of associations could be something along the following line: BASKETBALL → FILLED WITH AIR → FLOATS → CAN BE USED TO STAY AFLOAT. However, since the response times were significantly different, with a strong facilitation in the critical condition, Rubio-Fernández concludes that an associationist explanation is ruled out.

I doubt that the evidence provided is enough to support this stronger claim and I think that Recanati (2004, 2007*b*) could accommodate the same pattern of results within his own framework. Recanati maintains that the dynamics of activations-and-associations is not immune from considerations of contextual relevance. General world-knowledge structures, or 'schemata', and also particular world-knowledge can constrain the dynamics of accessibility and drive the interpretation in the expected direction. The activation of general and particular world-

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knowledge, however, is not context-independent. Thus, these kinds of information play a significant role when they get activated, i.e. when they are contextually relevant.

In the control condition, the target word is embedded in a neutral context with regard to which the (emergent) property to be verified is irrelevant. In such a context, Recanati would not predict the same facilitation that occurs in the critical condition. The latter could be characterised by the activation of schemata of different sorts, which would remain inactive in the control condition. Thus, longer response times in the control condition are expected by both an inferential account and an associative account, at least when the latter is supplemented with the notion of schemata.

4.2 Pragmatic enrichments or implicatures?

The present study focuses on some particular instances of free enrichment in which the interpretation is enriched with respect to *how* or *why* a certain action is performed. For instance, the interpretation of (3b)

(3b) John didn't know how to swim, so when he fell into the water, his best friend threw him a basketball *[to save him from drowning]*.

is enriched with respect to why the action of throwing a basketball to John is performed, namely *to save him from drowning*.

It is worth pointing out that Rubio-Fernández (2012) does not borrow this characterisation from established accounts of free enrichment in the literature (e.g. Carston, 2002; Hall, 2009; Recanati, 2002*b*; Recanati, 2004). These accounts barely specify the range of free enrichments that can potentially enrich the interpretation. Rather, they either confine themselves to the analysis of particular instances of free enrichment (e.g. the causal or temporal enrichment of 'and' conjunction) or they provide some general constraints on it (e.g. the 'locality constraint'). This underspecification – I suspect – is not unintentional. Once the context-specific nature of free enrichment is properly appreciated, it is this very nature that prevents us from filling out a complete list of its possible occurrences.

Rubio-Fernández (2012) seems to make a very strong claim about the pragmatic enrichments discussed. In particular, her claim could be interpreted as supporting the idea that whenever the interpretation is enriched with respect to how or why a certain action is performed, this is an instance of free enrichment. This idea, however, is certainly wrong. Several non-controversial instances of implicature can be described as providing an answer to why a certain action is performed. For instance, let us consider this paradigmatic example from Grice (1967, p. 32). Andy and Barbara are gossiping about their common friend Smith, who lives in Boston.

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(4a) *Andy:* Smith doesn't seem to have a girlfriend these days.
Barbara: He has been paying a lot of visits to New York lately.

Barbara implicates that Smith has, or may have, a new girlfriend in New York. This implicature enriches the interpretation of Barbara's utterance suggesting a (relevant) reason for Smith travelling so frequently to New York. This seems to fall within the description provided by Rubio-Fernández (2012, p. 3), i.e. "pragmatic enrichments where the hearer goes beyond the message linguistically encoded and derives a more specific interpretation as to *why* and *how* a certain action is performed", but it is accepted by everyone in pragmatics as a case of implicature rather than an instance of free enrichment.

More importantly, this treatment is further supported by several tests, which have been introduced in the pragmatic literature in order to help with drawing the distinction between 'what is said' (i.e. explicature) and 'what is implicated' (i.e. implicatures) which is not always straightforward to see. Let us consider two varieties of the embedding test: the negation embedding test and the conditional embedding test (both subsumed by the so-called "Scope Principle"). These tests allow us to distinguish between those pragmatically derived meanings which fall under the scope of a logical operator (e.g. negation, conditional) and those which do not.[6] The former are supposed to contribute to the truth-conditional content of the utterance (i.e. its explicature), the latter to its implicatures.

Let us apply these tests to (4a):

(4b) He has not been paying a lot of visits to New York lately.

(4c) If he pays a lot of visits to New York lately, he must spend a lot of money.

The pragmatic inference that Smith has, or may have, a girlfriend in New York does not fall within the scope of the negation in (4b), or in the scope of the conditional in (4c). The consequent of the conditional (i.e. that Smith must spend a lot of money) depends just on the proposition that Smith pays a lot of visits to New York and not on the additional inference that he may have a girlfriend there.

These considerations should suggest that specifying the reason why a certain action is performed is not a sufficient condition for a pragmatic enrichment to qualify as an instance of free enrichment. On this basis, I question the idea that (at least some of) the pragmatic enrichments discussed in Rubio-Fernández (2012) are genuine cases of free enrichments rather than examples of implicatures.

Let us apply the two varieties of the embedding test introduced above to the example (3b):

[6] See Carston (2002, pp. 191–197) for a detailed description of these types of test.

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(3b) John didn't know how to swim, so when he fell into the water, his best friend threw him a basketball.

(3c) His best friend didn't throw him a basketball.

(3d) If his best friend had thrown him a basketball, he must have picked it up from the basketball team equipment left in the corner.

From (3b) the addressee can pragmatically infer that John's best friend was probably trying to save him from drowning. But, similarly to the pragmatic inference derived from (4a), this inference does not fall either in the scope of the negation in (3c), or in the scope of the conditional in (3d). Once again, the consequent depends just on the proposition that John's best friend threw him a basketball and not on him having the intention of saving John.

If we further appeal to intuitions and introspective analysis, the pragmatic enrichment characterising (3b) should equally fall on the implicit side. Intuitive judgments have been adopted as a criterion to classify pragmatic enrichments by Recanati (1989, p. 310; 1993, p. 240) under the name of the "Availability principle":

> *Availability principle:* In deciding whether a pragmatically determined aspect of utterance meaning is part of what is said, that is, in making a decision concerning what is said, we should always try to preserve our pre-theoretic intuitions on the matter.

The notion of explicature is usually conceived of as the intuitive truth-conditional content of the utterance, i.e. the basis on which we would intuitively judge an utterance to be true or false. Thus, an appeal to intuitions, especially in those cases when they are clear and consistent, is grounded within the characterisation of the notion of explicature itself. Again, let us consider our example:

(3b) John didn't know how to swim, so when he fell into the water, his best friend threw him a basketball *[to save him from drowning]*.

It seems to me that the intuitive truth conditional content of (3b) does not include the (alleged) unarticulated constituents *[to save him from drowning]*. The utterance would be intuitively true even if John's best friend threw him a basketball with the intention of teasing him (rather than saving him). The intention behind the action does not seem to play any role in the assessment of the truth-value of the utterance at issue. These considerations suggest that the enrichment at issue should fall within the non-truth-conditional communicated content of the utterance, i.e. its implicatures.

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The evidence provided so far in favour of an implicature analysis of the pragmatic inference triggered by (3b) seems to find further confirmation in Hall (2009), which is an investigation of the pragmatic constraints on free enrichment, i.e. the ways in which context can or cannot affect explicature. Among them, we find the 'locality constraint', which is motivated by the inferential procedure underpinning utterance interpretation.[7] As a local process, free enrichment modifies subparts of the linguistic logical form. It follows that "other propositions, or semantic arguments/predicates such as NP- or VP-conjuncts (*which can be straightforwardly propositionalized*), that are not partially isomorphic with the linguistic meaning, can stand alone, and therefore will remain as independent propositions" (Hall 2009, p. 102, *my emphasis*). The (alleged) unarticulated constituents which enrich the interpretation of (3a) and (3b), *[to save him from drowning]*, do not fall under the categories of NP- or VP- conjuncts but, as an infinitive phrase, they can be easily propositionalised. Thus, they do not satisfy the 'locality constraint'.

While these arguments support a reanalysis of part of Rubio-Fernández's experimental materials (i.e. the why-cases of pragmatic enrichments) in terms of implicature, it is worth noticing that how-cases seem to be more likely to give rise to lexical adjustment, genuinely affecting the derivation of the *explicit* content of the utterance. When the enrichment involves specifying the mode in which a certain action is performed, this specification can be easily seen as the result of a process of constructing an occasion-specific concept with regard to the context at hand. Let us consider this further example, which is part of the material used by Rubio-Fernández:

(5) Lucy's grandmother was giving a big party tonight. She was cooking several dishes and baking bread. Now she was taking a break sitting at the kitchen counter. Lucy wanted to help, so she started working the bread dough **with a rolling pin/with an empty bottle/with an empty stool** and preheated the oven. She was full of ideas when it came to cooking.

In this case, the enrichment could be seen as involving the concept WORKING. The lexically encoded concept could be modulated (e.g. its denotation could be narrowed) into the concept WORKING*, which specifies a particular mode of using the rolling tool (e.g. *rolling pin* or *empty bottle*). The concept WORKING* would thus denote only those instances of working that involve some stretching out of the item worked.

The difference between why-cases and how-cases is certainly worth further exploration. For the time being, it is enough to appreciate that the two cases seem

[7] In the next section I introduce and discuss the notion of 'mutual parallel adjustment', which warrants the locality constraint. For the time being, I merely want to emphasise that the locality constraint further supports an alternative treatment of the examples discussed.

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to be potentially subject to alternative pragmatic treatments. I will come back to how-cases, and to lexical adjustment more generally, in section 4.5.

4.3 Mutual parallel adjustment

In this section, I explore the consequences of a reanalysis of (at least part of) the material used in the study in terms of implicatures. In particular, I suggest that this reanalysis fits better with the relevance-theoretic notion of mutual parallel adjustment among explicatures, implicated premises and implicated conclusions.

According to Relevance Theory, the comprehension procedure subsumes three different sub-tasks as it concerns the construction of appropriate hypotheses about explicit content, intended contextual assumptions (in relevance-theoretic terms, implicated premises) and intended contextual implications (or implicated conclusions). These sub-tasks are not sequentially ordered. Thus, the interpreter is not required to *first* recover the explicit content of the utterance, *then* select a useful range of contextual assumptions, and *finally* derive the intended contextual implications. In some circumstances, the comprehension procedure can be effect-driven: the occurrence of tightly constrained expectations about the intended implications (i.e. implicated conclusions) can affect the recovery of explicatures or implicated premises in such a way that the premises are constructed with the purpose of warranting the intended effects:

> In particular, the hearer may bring to the comprehension process not only a general presumption of relevance, but *more specific expectations* about how the utterance will be relevant to him (what cognitive effects it is likely to achieve), and these may contribute, via *backwards inference*, to the identification of explicatures and implicated premises. (Wilson & Sperber 2004, p. 615, *my emphasis*)

The notion of backwards inference is explicitly adopted by Rubio-Fernández (2012) in order to explain the facilitation of unfamiliar-but-appropriate targets (e.g. *basketball*). In this case, in fact, Rubio-Fernández argues that facilitation cannot be explained on the basis of global contextual priming (i.e. priming due to world-knowledge structures) since the target word is unfamiliar. In other terms, it is not plausible to assume that the target word basketball could be primed by a world-knowledge structure such as the 'DROWNING SCENARIO', which is unlikely to include a slot for BASKETBALL (vs. LIFEBUOY). With regard to example (3b), the idea is that at the time of processing the segment 'a basketball', "the reader has already understood that John's best friend was throwing him a life-preserver" (Rubio-Fernández 2012, p. 12), on the basis of the expectation that the relevance of the utterance concerns cooperativeness and helpfulness from John's best friend.

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While I accept the idea that some kind of backwards inference is at play, I argue that the overall interpretation requires a different characterization of the three subtasks involved (i.e. recovering the explicature, the implicated premise and the implicated conclusion) in order to fit the relevance-theoretic notion of mutual parallel adjustment. For this purpose, I first report Rubio-Fernández (2012) proposal concerning what constitutes the implicated premise and conclusion of the interpretation of (3b), and then I sketch an alternative configuration of the overall interpretation.

In discussing example (3b), Rubio-Fernández refers to "the *implicated premise* that John's best friend was throwing him a life preserver" (Rubio-Fernández 2012, p. 3, *my emphasis*) and to "the *implicated conclusion* that John's best friend threw him a basketball to save him from drowning" (Rubio-Fernández 2012, p. 7, *my emphasis*). I think two different considerations are in order. First, in the attempt to fit these characterisations into a (valid) argument we would need to adopt as further premises both the proposition based on the linguistically encoded meaning of (3b), 'John's best friend threw him a basketball', and the contextual assumption that a basketball can be used as a life preserver:

(6)

Premise$_1$*:*	John's best friend threw him a basketball.
Premise$_2$ *(i.e. implicated premise):*	John's best friend was throwing him a life preserver.
Premise$_3$*:*	A basketball can be used as a life preserver.
Conclusion (i.e. implicated conclusion):	John's best friend threw him a basketball to save him from drowning.

This argument is assumed to be the result of a mutual parallel adjustment between the proposition based on the linguistically encoded meaning, the contextual assumptions and the implicated conclusion. It is worth noticing that the implicated conclusion represents what Rubio-Fernández (2012) takes to be the explicature of (3b). Thus, on her account, the kind of adjustment at play is not the mutual parallel adjustment between explicature, implicated premise and implicated conclusion advocated by Relevance Theory. Furthermore, it seems to conflict with Hall's (2009, pp. 106–107) claim that "between logical form and explicature [...] there is no relation of logically valid inference". The reason proposed by Hall (2009) is that free enrichment, *qua* local process (i.e. operating over subpropositional constituents), delivers unarticulated constituents that are recovered on the basis of their high accessibility and confirmed in so far as they contribute to the overall intended interpretation.

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Second, Rubio-Fernández's terminology seems to suggest that the enrichment *to save him from drowning* is to be treated as an implicated conclusion. If we take this suggestion seriously, according to Relevance Theory this 'enrichment' should count as an implicature (rather than as a constituent of the explicature).[8] Most importantly, this line of interpretation provides us with a straightforward inference warranted by mutual parallel adjustment:

(7)

Premise$_1$ (i.e. explicature):	John's best friend threw him a basketball.
Premise$_2$ (i.e. implicated premise):	A basketball can be used to stay afloat.
Conclusion (i.e. implicated conclusion):	John's best friend was trying to save him from drowning.

In this derivation, the contextual assumption, which results from accessing the relevant emergent property of basketball (i.e. CAN BE USED TO STAY AFLOAT), in conjunction with the explicature, inferentially grounds the expected contextual implication (i.e. implicature).

4.4 Reconsidering the results

The considerations proposed in the last two sections support an account of the 'enrichments' at issue in terms of implicatures (at least with regard to why-cases). If my analysis is correct, then Rubio-Fernández (2012) results call for a reinterpretation.

As I mentioned in passing, Recanati (2004) explicitly endorses the relevance-theoretic notion of mutual parallel adjustment, maintaining that the associative and the inferential modes of interpretation do not have to operate sequentially. Their parallel activity, and their mutual shaping, enables inferential processes to contribute to utterance interpretation from an early stage in processing. However, while inferential processes operate at a global level, associative processes intervene at a local level. Associative and inferential processes are, thus, conceived of as parallel systems taking different 'scopes'.

If we assume (7) to be the intended overall interpretation, accessing the emergent property CAN BE USED TO STAY AFLOAT corresponds to accessing the contextual assumption, which warrants the implicature *John's best friend was trying to save him from drowning*. A process of backward inference could thus facilitate the accessibility of the emergent property FLOATS of the word *basketball*. Expectations

[8] This approach seems to be inconsistently adopted in the following passage: "It therefore seems that the *global implication* that John's friend was trying to save him to some extent drives the search for relevant properties at the local conceptual level." (Rubio-Fernández 2012, p. 18, *my emphasis*). It is worth noticing that the result of a local process of free enrichment cannot be a global implication.

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about the intended implicature (grounded on the more general expectation about helpful behaviour in the context at hand) could affect the recovery of premises so that they are constructed with the purpose of warranting the intended effects.

The inferential mechanism described so far is entirely compatible with Recanati's (2004) account of implicature derivation and exhibits a global, rather than a local, character. When it comes to implicature derivation, both Recanati and Relevance Theory describe it as a genuinely inferential process, which may involve several instances of forwards and backwards inferences.

In light of the suggested reanalysis, Rubio-Fernández (2012) empirical study does not seem to be able to choose between the competing accounts of primary pragmatic processes given by Recanati (2004) and Relevance Theory. While it reinforces the existing strong evidence in favour of a fully integrated view of inferential mechanisms in pragmatic processing,[9] it falls short in its assessment of the contribution of (alleged) inferential processes at the level of what is explicitly communicated.

However, it is worth emphasising that a more extensive analysis of the material would be needed in order to assess the extent to which Rubio-Fernández's results are undermined by the proposed reanalysis. A clearer distinction between why-cases and how-cases, as noted above, would be crucial for this evaluation. It would potentially be interesting to isolate the data that resulted from the how-cases and assess their statistical significance. Results analogous to the one at issue, but confined to how-cases, would not be subject to some of the critical remarks developed in this paper (i.e. the implicature treatment). They would still face the issue raised in section 4.1, i.e. the necessity for stronger evidence in favour of an inferential account of the accessibility of emergent properties. This would, nevertheless, reduce considerably the ground of comparison between inferential and associative approaches to pragmatics. In the next section, I briefly discuss a study conducted by Rubio-Fernández (2007) on metaphor interpretation and its insights for assessing alternative approaches to lexical adjustment.

4.5 Associative and inferential approaches to lexical adjustment

The discussion so far suggests that a more specific focus on the process of lexical adjustment (involved in the how-cases discussed above) could potentially be more fruitful in order to assess the empirical predictions of Recanati (2004) and Relevance Theory. However, as noted in section 4.1, the fine-grained distinction between the two approaches makes it doubtful that the issue is open to a clear-cut empirical investigation. The associative account of primary processes proposed by Recanati appoints a significant role to the notion of schemata. They are said to constrain the dynamics of activations-and-associations in a contextually relevant

[9] Further evidence can be found, among others, in Breheny et al. (2012) and Breheny et al. (2013).

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manner. The result is that considerations of *accessibility alone* are supposed to be enough to drive the interpretation in the expected way. In other terms, a low-level associative system seems to be able to implement the smartness of the inferential system put forth by Relevance Theory.

Rubio-Fernández (2007) investigates the main empirical predictions of various accounts of metaphor interpretation in terms of lexical adjustment, including Relevance Theory and Recanati (2004). The predictions at issue (e.g. enhancement of relevant properties of the metaphor vehicle and suppression of irrelevant ones) are shared by these alternative accounts and their specific distinctions are not directly tested. However, as Rubio-Fernández (2007, p. 348) underlines, "although these differences might not be open to direct empirical investigation, the result of the present study might shed some light on some of these issues". In particular, I would like to discuss the extent to which her results support Recanati's model of lexical processing in terms of accessibility.

Rubio-Fernández (2007) conducted a cross-modal lexical priming study in order to investigate the patterns of activation and suppression of relevant and irrelevant properties of the metaphor vehicle during metaphor interpretation. Participants were presented (in the auditory modality) with contexts biased in favour of metaphorical interpretation (e.g. *Nobody wanted to run against John at school. He was a cheetah.*). At the offset of the metaphoric prime (e.g. *cheetah*), participants had to make a lexical decision on a visual target. Critical targets were either metaphor-inconsistent subordinates of the metaphor vehicle (e.g. *cat*) or metaphor-relevant distinctive properties (e.g. *fast*). Targets were presented 0, 400 and 1000 ms from the offset of the metaphoric prime in order to investigate the time course of activations of the properties at issue. The results are shown in the following graph:

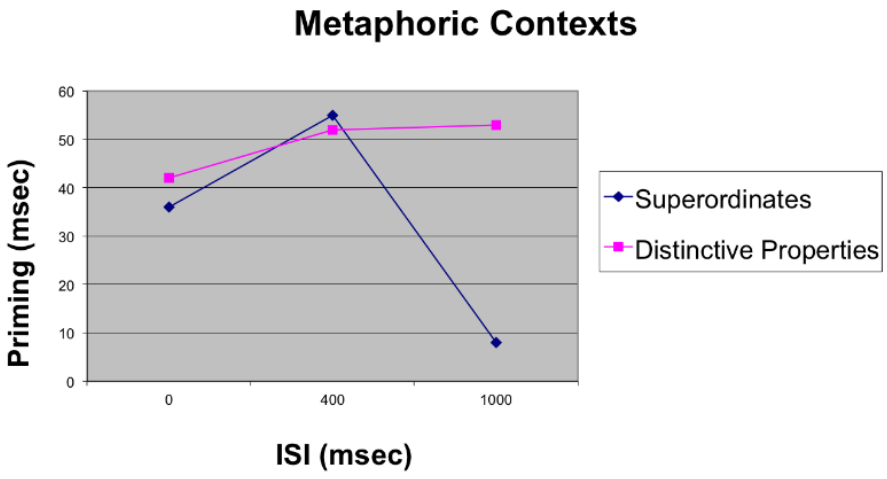

Figure 1: Activation curves of subordinates and distinctive properties in metaphoric contexts.

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For the purpose of our discourse, it is interesting to notice that both metaphor-inconsistent subordinates and metaphor-relevant distinctive properties were active up to 400 ms from the offset of the metaphoric prime, with the former showing a slightly higher level of priming at that point in processing. Their patterns of activation differ only at the 1000-ms delay.

According to Recanati's (2004) accessibility-based framework of lexical adjustment, when processing a word, the literal meaning is accessed first and it triggers the activation of further meanings. These are associatively derived from the literal meaning through which they gain part of their activation and they are processed in parallel. The candidate which is retained and undergoes semantic composition is the *most accessible* one. It corresponds to the most active representation when the interpretation process stabilizes.

The question Rubio-Fernández addresses concerns the extent to which the activation patterns observed fit with Recanati's framework. According to Rubio-Fernández:

> "For the present result to have fully supported Recanati's account of lexical interpretation [..], superordinates should have been active at the intermediate delay but at a lower level than distinctive properties, so that the latter would have been selected for interpretation while the former would have stood in conflict with interpretation. However, if the selection of meaning components was directed by considerations of relevance, and not by accessibility alone [..], it would still be possible to argue that superordinates had been discarded from the interpretation although still highly active at 400 ms." (Rubio-Fernández 2007, p. 367)

In other terms, the high activation of metaphor-inconsistent subordinates until late in processing seems to suggest that the selection of meaning components for deployment in the interpretation does not entirely depend on considerations of accessibility. This, in turn, would support the relevance-theoretic picture, which takes considerations of accessibility, on the one hand, and considerations of acceptability, on the other, to play a joint role in the interpretation process.

While this interpretation of the results could shed some light on the theoretical debate at issue, it is not to be taken as conclusive and must be endorsed cautiously. In particular, the vagueness of the empirical predictions derivable from Recanati's account does not allow us to fully embrace the suggested interpretation. For instance, Recanati's claim that the candidate which undergoes semantic composition is the most accessible one "when the interpretation process stabilizes" is still compatible with the result of Rubio-Fernández's study. The key question, which does not seem to have a definite answer, is the following: when does the interpretation process stabilise? Recanati could potentially argue that, since Rubio-Fernández's

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material comprises cases of novel metaphors, the interpretation process stabilises later than 400 ms from the offset of the metaphor vehicle. At that point, presumably falling between the 400-ms delay and the 1000-ms delay, the degree of activation of the figurative meaning of the vehicle (and its associated properties) would be higher than its lexically encoded meaning (and its subordinates), as predicted by his own framework. Thus, this pattern of results would not be interpreted as incompatible with an accessibility-based framework of lexical modulation.

5 Conclusions

In what follows, I take Rubio-Fernández (2012) study as the starting point for a more general reflection on the debate between associative and inferential approaches to pragmatics. In particular, I would like to suggest that the difficulties faced by the present study are also the by-product of the way this debate has been recently framed, which makes it potentially insensitive to empirical investigation.

Recanati's account of primary pragmatic processes is based on the notion of accessibility. As briefly discussed in section 4.1, however, the dynamics of accessibility can be susceptible to highly context-dependent constraints. Far from reflecting mere associative priming (i.e. priming by associates which might or might not be semantically related), it is also affected by non-associative semantic priming. The latter is mediated by schemata, i.e. structured patterns of information stored in our long-term memory. The notion of schemata has recently been extended beyond its original scope (Recanati 2007*b*, Mazzone 2011). As well as general world-knowledge, *particular* world-knowledge (e.g. knowledge about a particular individual, his abilities and preferences) can affect the dynamics of accessibility via the same blind mechanism of associations. The result is that "the smartness of an inferential system can be implemented in a dumb associative system" (Recanati 2007*b*, p. 52).

I suspect the distinction between such a 'smart' associative system, on the one hand, and an automatic, spontaneous inferential system, on the other, may be too fine-grained to be open to empirical investigation. Indeed, this decreases the chances of figuring out clear-cut empirical predictions, which could be tested experimentally. Thus, on the experimentalists' side, it requires an extra attention to develop predictions which are genuinely warranted by the theories. However, this leaves wide space to philosophical analysis. A theoretical investigation of the conceptual tools employed by alternative frameworks, such as the notion of schemata or inferential heuristics, could provide a complementary means to evaluate these alternative approaches.

In this respect, an interesting example is provided by the theoretical investigation on the notion of 'mutual parallel adjustment' and its alleged compatibil-

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ity with a dual, rather than a unitary, pragmatic system (Carston 2007, Recanati 2007*b*). The relevance-theoretical inferential account of primary and secondary pragmatic processes can easily accommodate the idea that such processes operate in parallel and mutually shape their outputs. The final aim is to deliver an overall interpretation of the speaker's meaning, which is to be inferentially warranted. On the other hand, as Carston (2007, pp. 24–27) emphasises, a pragmatic dual system (e.g. Recanati, 2004) can (at least) less obviously be implemented with the notion of 'mutual parallel adjustment'. This implementation is in need of an explanation with regard to how distinct types of processes can interact with each other. In particular, the question about how a global inferential process can shape the input of associative processes at a local level has to be addressed for a proper evaluation of the framework.

As these considerations should suggest, the cognitive turn, which has characterised the recent development of the pragmatic field, has integrated, rather than replaced, its traditional methodologies. The place for philosophical investigation has not only been preserved but is even more needed.

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