

This article was downloaded by: [Capone, Alessandro]

On: 30 April 2011

Access details: Access Details: [subscription number 937058118]

Publisher Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



## Australian Journal of Linguistics

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713404403>

### The Attributive/Referential Distinction, Pragmatics, Modularity of Mind and Modularization

Alessandro Capone<sup>a</sup>

<sup>a</sup> University of Palermo,

Online publication date: 29 April 2011

**To cite this Article** Capone, Alessandro(2011) 'The Attributive/Referential Distinction, Pragmatics, Modularity of Mind and Modularization', Australian Journal of Linguistics, 31: 2, 153 – 186

**To link to this Article:** DOI: 10.1080/07268602.2011.560827

**URL:** <http://dx.doi.org/10.1080/07268602.2011.560827>

## PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

# The Attributive/Referential Distinction, Pragmatics, Modularity of Mind and Modularization\*

ALESSANDRO CAPONE

University of Palermo

*In this paper I deal with the attributive/referential distinction. After reviewing the literature on the issue, I adopt Jaszczolt's view based on default semantics. I relate her view to Sperber and Wilson's Principle of Relevance. I argue in favour of the modularity hypothesis in connection with pragmatic interpretations. I also discuss the issue of modularization à la Karmiloff-Smith in connection with default inferences and, in particular, referential readings of NPs. I reply to some considerations by Cummings and use data from referential/attributive uses of NPs to show that the modularity hypothesis is defensible.*

*Keywords: Pragmatics; Modularity of Mind; Philosophy of Language; Attributive/Referential*

## Part I

### 1. Introduction

In this paper I intend to discuss the issue of pragmatics and modularity of mind through an investigation of the attributive/referential distinction.<sup>1</sup> I shall follow Jaszczolt (1999, 2005) in her proposal that the default reading of NPs such as *Smith's*

---

\*I would like to give my warmest thanks to Jacob L. Mey, Istvan Kecskes, Katarzyna Jaszczolt, Yan Huang, Louise Cummings, James Higginbotham, Ernest Lepore, Franco Lo Piparo, Tullio De Mauro, Keith Allan, Pietro Perconti, Marco Carapezza, Felice Cimatti and Francesca Piazza for their encouragement and words of advice. It is my duty and pleasure to give thanks to Wayne Davis, who devoted two days of his life to commenting on this paper, in this way leading me to a more critical reading of my own writings. I also wish to give thanks to two anonymous referees for their thought-provoking comments. I stress that all remaining errors are my own responsibility.

<sup>1</sup> Bezuidenhout (1997) too considers that the attributive/referential distinction has a bearing on the issue of modularity of mind and pragmatics, even if her conclusions are different from mine.

*murderer* is referential. This view fits in with a view of pragmatics based on modularity of mind and modularization. In connection with pragmatics and modularity of mind, I want to reply to Cummings' (2009) recently expressed view that the processes involved in conversational inferences are not modular, in that they have unrestricted access to a knowledge data base and deductive inferences. She thinks that general intelligence is responsible for pragmatic increments such as conversational implicatures or conversational explicatures. In replying to Cummings, I reiterate my views expressed in Capone (2010b) and I further produce evidence coming from the investigation of the pragmatics of the attributive/referential distinction. Intuitively, default referential meanings of definite descriptions seem to be ideal candidates for modular inferential processes, because they are instantaneous, they arise by default, and are relatively encapsulated. I argue that such default interpretations may interact with contextual clues and that the defaults can be overridden in limited ways. But even in such cases, inferential processes are encapsulated. We presumably need a notion of encapsulation that is particularly suited and calibrated in view of the special inferential processes that constitute pragmatic interpretations. Encapsulation à la Fodor will not do; yet, there are alternatives to Fodor's view of encapsulation which do justice to the idea that pragmatic interpretations are not like scientific theories, capable of being revolutionized an indefinite number of times; instead, they are finite, heavily constrained processes utilizing information which has previously been made pertinent (or relevant) through cognitive nets [unlike Cummings, I believe that modular processes throw a net on what information can be processed and utilized; I call this sort of modular encapsulation 'net-throwing', following a use by Cummings (2009)].

In this paper I argue that referential interpretations of NPs (and, in general, default inferences) are the result of modularization. I expatiate on the interaction between Karmiloff-Smith's (1992) theory of modularization and the theory of definite descriptions and argue that the inferences available through the default semantics archive are nothing but re-descriptions of inferences originally available through the Principle of Relevance.

### 1.1. Keith Donnellan (1966): *Reference and Definite Descriptions*

Before going into philosophical treatments in great detail, to forestall misinterpretations, I want to be clear that philosophers dealing with the attributive/referential distinction accept that there are both referential and attributive uses of NPs, but they do discuss the question whether this distinction is of semantic significance.

Donnellan discusses definite descriptions such as:

- (1) Smith's murderer is insane

and points out that there can be two uses of definite descriptions: (a) the attributive use and (b) the referential one. In the attributive use, example (1) can be used to say that whoever is Smith's murderer is insane [the definite description denotes an  $x$ , such that  $x$  is Smith's murderer and for all  $y$ , if  $y$  is Smith's murderer, then  $y = x$  (Russell's

uniqueness condition)]; in the referential usage, 'Smith's murderer' is used to refer to what the speaker wants to talk about, what he has in mind, a particular referent.

Donnellan takes denotation to be distinct from reference (or denoting from referring).<sup>2</sup> He provides the following example to illustrate the difference:

- (2) The republican candidate for president in 1964 will be a conservative.

Uttered before the elections, it was very improbable that the speaker was speaking about Mr Goldwater, or that he was referring to Mr Goldwater; even if it could be said that the definite description in example (2) denoted Mr Goldwater (since he happened to be the republican candidate for president in 1964).

The attributive/referential distinction is not only observed in assertions, but also in questions and in orders. If one were to ask:

- (3) Who is the man drinking a martini?

one would, thereby, ask a question about a particular person, who is drinking a martini (Who is that man drinking a martini?) or about whoever is drinking a martini (I know someone is drinking a martini: who is he?).

According to Donnellan one can have not only a bifurcation between attributive and referential uses, but one can also have attributive uses, despite that fact that, by uttering the definite description, one has a certain person in mind. The case discussed by Donnellan is the following. Suppose I am talking about Jones, whom I believe to be Smith's murderer and I say:

- (4) Smith's murderer is crazy.

By uttering 'Smith's murderer', I am not using Jones' behaviour in the dock to justify my belief that Smith's murderer is crazy; I simply rely on the belief that whoever murdered Smith must be crazy to justify my assertion. In this case, I have an attributive usage even if I have a certain person in mind when using the NP 'Smith's murderer'.

### 1.2. Wettstein (1981) on the Attributive/Referential Distinction

Wettstein also believes that the distinction between attributive and referential uses (of definite) descriptions can be supported. However, he objects to Donnellan's idea that one can support such a distinction with considerations on what happens when the definite description fails to fit the referent. He thinks that while it is clear that in cases of attributive readings a statement is false when the definite description fails to fit the referent (alternatively neither true nor false), it is controversial that in the case of referential uses, the statement (made) is nevertheless true.

---

<sup>2</sup> A referee points out that the distinction between referring and denoting is Russell's and not Donnellan's. However, it is clear that Donnellan too adopts this distinction. This point cannot be denied by the referee.

Leaving aside the controversial aspects, Wettstein argues that the case of referential uses is supported by considerations about indefinite definite descriptions. He argues that Kripke (1977) is wrong in thinking that the truth-condition on the referential reading is captured by Russellian semantics, because the Russellian semantics cannot account for what is being communicated in context through a definite description. Since Strawson's influential critique (1951), it has been known that the Russellian truth-conditions for definite descriptions are not sufficient to account for communicative uses, since the uniqueness condition notoriously fails in most cases of ordinary uses. When we say 'The book is on the table' there is nothing in the sentence that can allow us to pick out a unique table. Defences of Russell along the lines of elliptical completions of the definite expression fail, according to Wettstein, because on each use many completions are available and one does not know how to choose among them; neither is it clear that the speaker must have a completion in mind (he may simply have a demonstrative reference in mind). Wettstein, thus, believes that in most uses of definite descriptions the speakers' intentions in referring to a certain entity are settled by contextual clues (usually a demonstrative gesture). Wettstein notes that Donnellan's account of referential uses of definite descriptions is very much in line with this contextual perspective, in which reference is established demonstratively or, in any case, given rich clues from the context. Furthermore, Wettstein goes on to argue that even attributive uses, which can be accounted for, apparently, through the Russellian truth-conditions, show problems similar to referential uses, in that very often definite descriptions are incomplete and one must resort to demonstrative reference in order to fully specify the attributive reading (The murderer → Smith's murder).

### 1.3. Nathan Salmon's Reply

Salmon (1982) takes issue with Wettstein's treatment in that, according to him, Wettstein's approach amounts to a defence of the (semantic) ambiguity thesis. Salmon proposes to distinguish between the speaker's meaning and the sentence meaning. He claims that referential uses are nothing but cases of utterer's meaning and that both the utterer's meaning and the sentence meaning should converge and have a common logical form. Salmon reminds us of the fact that it is not uncommon to find cases in which the sentential meaning and the utterer's meaning diverge, even if one predicts that the utterer's meaning is a development of the sentential meaning. In particular, Salmon claims that in both referential and attributive uses, the attributive reading, to be expressed semantically along the lines of Russellian truth-conditions for definite descriptions, is the common denominator.

### 1.4. Kent Bach and the Attributive/Referential Distinction

Bach (1981) paves the way for a pragmatic treatment of referential interpretations of definite descriptions. He assumes that referential interpretations too, like attributive

ones, have Russellian semantics, but adds that in addition to this basic semantic interpretation, one further layer of interpretation accrues because of the contextual determinations of the speech act.

## 2. The Semantic Turn: Devitt

Devitt (2007) develops an anti-inferential or conventionalist account of referential readings of definite descriptions. Unlike Neale (1990) and Bach (2004), he does not accept that the transition from a quantificational reading to a referential reading is necessary. Instead, he proposes that there is a convention of use, whereby, by the use of a definite description, the speaker intends to establish a causal/perceptual link to an object. Devitt opposes the particularized implicature view (of referential uses of definite descriptions) on the grounds that, according to him, it has no psychological plausibility, given that the preferred standard reading of definite descriptions is the referential one. He also opposes a standard, generalized implicature view of definite descriptions because he thinks it is simpler to posit a convention for the referential interpretation of definite descriptions. The main reason why he opposes the standard implicature view is that, according to him, in this case the implicature, if there is one, has become frozen, conventionalized. His position is presumably similar to the one by Davis (1998), who also argues that generalized conversational implicatures are conventional implicatures.<sup>3</sup>

## 3. Relevance Theory Approaches to the Attributive/Referential Distinction

The first author to address the issue of the attributive/referential description within the framework of Relevance Theory was Rouchota (1992). For Rouchota, attributive and referential interpretations form part of the explicature developed on the basis of partial and fragmentary linguistic input, semantic meaning being largely under-determined. Thus we have a radical departure from previous pragmatic approaches, which were closely related to Grice's views about conversational implicatures. It is true that Grice considered questions of reference and of ambiguity resolution as part of the proposition expressed, but he relegated other important phenomena which are of significance for propositional content to the status of conversational implicatures. Referential and attributive readings of definite descriptions are clearly part of the propositional content of the utterance (I mean: they are part of the full pragmatically enriched propositional content).<sup>4</sup> However, while Rouchota recognizes that the

---

<sup>3</sup> Incredible though this view may appear, there is evidence in favour of it to be found in the picture of modularity of mind and, in particular, in my paper on default semantics and the architecture of the mind. In this paper too, I advance my claims concerning standardizations of conversational inferences.

<sup>4</sup> Both Referee 2 and Wayne Davis (personal communication) note that this point deserves discussion. Since, like Kripke, I accept that a speaker who says 'The man drinking a martini' intending to refer to the man drinking water is literally saying something false (however charitably interpreted), my claim that referential uses of definite descriptions are clearly part of the propositional content of the utterance seems to be confined to referential interpretations of expressions which were used correctly. Thus, if 'The President of USA' is used (in

referential and attributive readings are part of an explicature, it is not clear that she provides a pragmatic derivation similar to that of conversational implicatures. Instead, she treats definite descriptions as if they were similar to pronominals in the referential usage and, like pronominals, capable of being saturated by information derivable through contextual clues. The attributive reading is similarly obtained through rich contextual clues. In short, there are contexts promoting the referential reading or the attributive reading. This is a heavily contextualist view, which does not take into account the possibility of generalized implicatures. While I and several other authors (e.g. Jaszczolt and Devitt) believe that the referential interpretation is standardly preferred, Relevance Theorists make nothing of this strong intuition.

An advantage of this approach is to show that the length of the definite description may be connected with further implicatures. For example, a speaker who says 'The notoriously moody tennis player gave signs of his bad temper when he threw his racquet at his opponent's head' may implicate that he disapproves of the intended referent, McEnroe, or a speaker who says 'The fat customer is sitting in his usual chair' may well convey sarcasm. Consider now Rouchota's example 'The man drinking the martini looks miserable'. She considers that the choice of the considerably longer definite expression instead of, say, a demonstrative, must have great cognitive effects, in order to justify the cognitive costs incurred. Thus an implicature may get through that the man is drinking a martini because he is miserable. This is a somewhat contorted explanation, although it has a grain of truth. If a definite description was preferred to a demonstrative, there must be a reason. This might have to do with politeness, given the precept that one should not point at people especially if they can notice that one is pointing at them. It is simply impolite to point at people, because it is an obvious way of showing that one is talking about them and that one does not care whether other people notice that one is calling attention to them. Another interesting case discussed by Rouchota is 'Napoleon is in bed' where one uses a proper name which does not apply to the referent to mean something like 'The man who believes he is Napoleon is in bed'. This is an inverted commas interpretation. There are interesting remarks in this paper, one of these being that there must be heavy contextual clues to justify an attributive reading. A man who shows surprise at the way Smith was murdered and mutilated may well say 'Smith's murderer is crazy' without having someone in mind, meaning that the predicate applies to whoever is the murderer. Since he does not know who committed the crime, he cannot have someone in mind. Even if he had someone in mind, heavy contextual clues could still militate in favour of an attributive reading. Suppose, in fact, that a further contextual

---

2010) to refer to Clinton and not to Obama, I take this to be an illegitimate use, a case of intentionality which is dispersed between the intended referent and the referent which the expression can be legitimately used to refer to (Jaszczolt 2005). This is not a case of enrichment, but a case of a loose usage, which is interpreted through the principle of charity. Charitable interpretations are not on a par with intended explicatures, which surely intrude into propositional content. My conclusion is that referential readings of definite descriptions intrude into propositional content only if they are legitimate readings of linguistic constructions.

effect is to strengthen the proposition that all murderers are crazy. Then such a strengthening would justify the attributive reading.

As I said, despite the interesting things Rouchota says, she does not address the important issue of default interpretations.

Bezuidenhout (1997) too makes the interpretation of definite descriptions heavily context-dependent. She explicitly says that while the level of logical form is obtained through (interpretative) processes which are modular in nature (operations pertaining to what Chomsky and his followers called the 'language' module), the pragmatic interpretation of definite descriptions is obtained through non-modular processes which have access to encyclopaedic knowledge and to various types of information coming from the context. She almost makes it appear that the interpretation of definite descriptions is like the saturation process involved in the pragmatic interpretation of pronouns. While surely there may be differences, Bezuidenhout stresses the analogies. Bezuidenhout opts for the underdetermination view of the meaning of definite descriptions and claims that pragmatic information will determine a referential reading in one context and an attributive reading in another. Her semantic view is based on Kempson's that definite descriptions activate procedural meaning and that the definite article signals a procedure whose final phase is the recovery of a referent which is accessible in context. The underspecified semantics which Bezuidenhout provides for 'Smith's murderer is crazy' is the following (MDD): 'Feature G is instantiated uniquely/accessibly by an x, which is F'. Bezuidenhout interestingly points out that cases which are apparently cases of referential interpretations can also lead to attributive interpretations, as in (5)–(7).

- (5) Sign: You are entering the Grand Canyon.
- (6) Bill Clinton: The Founding Fathers invested me with the power to appoint Supreme Court justices.
- (7) Encountering a huge footprint in the sand: He must be a giant.

According to Bezuidenhout 'You' in example (5) means 'Whoever is entering this place'; by 'me' Bill Clinton intends to say 'whoever is the president'; and in example (7) 'He' means 'whoever made the footprint'. The reader is reminded that similar cases were pointed out in Donnellan's paper.

Bezuidenhout's view is based on Relevance Theory because she too believes that meaning is largely underdetermined and that pragmatics serves to make the proposition intended explicit and she also believes that context plays a pervasive role in interpretation, given that the speaker must always make assumptions coming from background information relevant to the interpretation process.

What is not clear is to what extent Bezuidenhout's view is different from Neale's quantificational analysis. Neale's view of the semantics of definite descriptions is that the quantificational reading is at the basis of the referential reading. But it seems to me that MDD is nothing but a different way of saying that a definite description



is assigned a semantic interpretation which is that of a quantifier and which also includes a uniqueness condition and a procedure pertaining to accessibility. The only difference I can see is that Bezuidenhout adds a procedure pertaining to accessibility and that she writes about explicatures, rather than implicatures.

Powell (2001) is another interesting article written in the framework of Relevance Theory. Powell discusses the literature on the attributive/referential distinction and claims that the issue of whether the attributive and referential interpretations constitute different propositions (having different truth conditions) must be disentangled from the issue of whether a definite description like ‘The murderer’ is semantically ambiguous. Furthermore, Powell neatly distinguishes inferential approaches like the one by Neale (1990) or Kripke (1977), according to which one must distinguish between what is said and what is conversationally implicated (the latter being different from what is said) and inferential approaches aiming at the notion of explicature, a proposition to which both literal meaning and pragmatic inference contribute. The main difference between Powell and the previous theorists is that he relies on the notion of procedural meaning, a notion he derives from Blakemore (2000), in order to account for attributive/referential uses of definite descriptions. According to him, definite descriptions encode procedures for determining either a referent or a descriptive content. Like other Relevance Theorists, Powell assumes that whether a definite description has an attributive or a referential reading must be settled in context. He says that in a context in which the referent that satisfies the description is known, then the referential interpretation comes for free without extra processing efforts. It appears that processing efforts will be essential to the calculation of referential interpretations, assuming that the referential interpretation has greater contextual effects in such contexts. According to Powell, the derivation of the attributive interpretation seems to require a calculation on the basis of possible alternatives. Given that a directly referential expression could be used but was not used, then the referential interpretation is automatically eliminated and the attributive interpretation is the one which has most contextual effects.

#### 4. Jaszczolt on Default Semantics

While Relevance Theorists opt for a theory which is heavily contextual, in that it takes into account the contexts in which the utterances are made, Jaszczolt (1999, 2005) does justice to the idea that the preferred reading of definite descriptions is the referential one. Her theory of definite descriptions derives from a more general outlook on the interpretation of NPs, whether in normal contexts or embedded in intentional contexts. As Jaszczolt says:

Although definite descriptions exhibit an ambiguity of use between the referential reading and the attributive one, these two readings are not on a par in processing; the referential reading is more salient than the attributive one (Jaszczolt 2005, 108).

Jaszczolt discusses the example given below:

- (8) The best architect designed this church.

According to Jaszczolt, the referential reading corresponds to the utterance that is accompanied by the mental state with the default, strong, ‘undispersed’ intentionality. In the case in which the hearer mistakenly thinks that Sagrada Familia was designed, say, by Christopher Wren, the intentionality is dispersed as it reaches the object that was not intended by the speaker; likewise, if the speaker falsely believes that Simon Guggenheim designed the Sagrada Familia, the intentionality is dispersed between the intended person and the object recovered by the hearer.

In general, Jaszczolt thinks that NPs strongly correlate with referential interpretations, as shown by her considerations on belief reports, for which she states that the default interpretation is ‘*de re*’: the believer is taken to believe a proposition about a certain referent.

## Part II

### 1. Modularity of Mind

In this article, I will not adopt modularity à la Fodor, but the notion of massive modularity (Carruthers 2006), which is, however, connected with Fodor’s modularity. The basic idea of modularity is that the brain has a modular organization and that each component of the brain is a module, which is related to other modules in the sense that it can take input from other modules or can give input to other modules. A module is a component of the mind associated with a certain function or with certain functions. A module can be seen as a mechanism of some sort, with inputs and outputs, which is characterized by the type of input it has been designed for. [Carruthers (2006) says that each module is switched on by a characteristic input.] We should not think of modules as specific regions of the brain, even if a module corresponds to a certain neural structure. Since modules can share parts, especially if they are placed at interfaces, it would be wrong to locate a module in a certain area of the brain, as this would not do justice to interconnectedness. Modules are dissociable—and this is perhaps their most important characteristic. Dissociability means that if a certain module is damaged (completely or in part), then the remaining modules can still work autonomously and it is even possible that some other module will try to replicate the processes which were going on in the damaged module. So we shall accept the idea of dissociability, but at the same time we shall admit that the human brain is also characterized by plasticity and that even if certain cognitive processes are best implemented in a certain module, one could nevertheless try to replicate them in a different module (albeit the degree of specialization will be lost). Consider what happens when, due to a stroke, a person loses her ability to read or write. Some authors have agreed that repeated practice has served to shape the reading/writing module, which has then been partitioned off from the module for

object recognition (Carruthers 2006; Karmiloff-Smith 1992). In other words, the reading/writing module is more specialized than the perception module, and although it may certainly share parts with it, it has been partitioned off from that module, forming an autonomous module. When the reading/writing module is damaged, the patient can still make use of other modules and replicate the processes which were operative in the reading/writing module. Nevertheless, the reading/writing competence will never totally recuperate, because the processes occurring in these modules can never become highly specialized as required. They can be a shadow of the previous know-how, but never perfectly suited to the specific task. So now we are encountering another reason for positing modularity. Modules proliferate in order to adapt to the world's complexity and to develop processes that are perfectly suited to the cognitive needs of a human being. The reader will not be surprised to hear that we, humans, are endowed with a double vision system. One system is suited to identifying objects (and surely it also works for referring), while the other system is more specialized for the navigational needs (Carruthers 2006; Perconti 2008). We orient ourselves in motion through the other vision system. The two systems are complementary. One is more suited for object detection, colour detection, the grasping of particulars, etc. The other is less sensitive to detail, but can provide data more quickly and is thus more suitable for navigation, an activity for which colours and small detail matter little, and where it is more important to avoid objects very quickly.

The output of modules must be fast, because functional specialization has as its aim providing data very quickly for the various purposes involved in an activity. Of course, a process can be faster than another if the output it provides is good enough for the purpose for which it is intended. If a faster process involves the loss of detail, such a loss can be tolerated if the purpose for which the process is designed only needs an output involving a lesser amount of detail. The output must also be mandatory. In other words, given an input, a module will obligatorily provide an output. This is especially useful in a world in which we and other animals must defend ourselves from predators. We need fast and, also, obligatory reactions.<sup>5</sup>

---

<sup>5</sup> Here I received a crucial objection from Wayne Davis (personal communication): looking forward from here, given that defaults can be overridden, I am wondering how the notion of a module is going to contribute to your thesis that the referential interpretation of descriptions is the default interpretation. The fact that attributive readings can be grasped just as quickly as referential interpretations is another reason to wonder how the notion of a module is going to play a role in your theory. My reply to Davis is going to be along the following lines: all I am committed to is that default interpretations are accessed at a pre-contextual stage and this is enough to ensure that the modular story is correct. Given an input, a certain output is supplied by the mind-reading module. Surely the inference needs to be tailored to context. The theory of default semantics makes no prediction that the referential reading should be accessed more quickly than the attributive reading. The only prediction I can make is that, outside a specific context, say when an utterance is produced out of the blue, the referential reading is to be preferred.

Another characteristic of modular processes is that they are encapsulated. A lot has been written on encapsulation. Massive modularity theorists have weakened Fodor's encapsulation constraint considerably. Encapsulation does not mean (should not mean) that a module has no access to another module, but that it has no access to the operations of another module. It cannot see what is happening in another module, but it can see the result of modular operations, in the form of input (the input of a module is the output of another module). Modules are interconnected and, thus, take inputs from other modules and send inputs to other modules. It is instructive to think of modular interconnectedness through the metaphor of enzymatic processes. According to Barrett (2005), modules communicate through a common bulletin board, where the output of a module is made available to become the input for another module. Every time an operation is made, something is added to the input, but nevertheless, the original input is labelled as having at least the same characteristics as it had before. This is particularly useful when we deal with the relationship between literal meaning and explicatures. We need the assumption that literal meaning receives inferential augmentations, but is nevertheless available for other parallel inferences (we need at the same time to assign referents to pronominals through the perception module and to assign explicatures and implicatures; in order to have all these parallel processes, we need processes which preserve structure. Every transformation is effected in such a way that structure is preserved).

## **2. Capone (2010b) on Pragmatics and Modularity of Mind**

Capone (2010b) is a discussion of modularity of mind as applied to pragmatics. Capone's belief is that a critical discussion of modularity of mind can improve our understanding of the semantics/pragmatics debate. The main points addressed by Capone are the following: (1) merger representations and enzymatic modular processes; (2) fast and frugal heuristics and satisficing strategies; (3) cancellability; and (4) modularity, pragmatics and encapsulation.

Concerning the first point, Capone argues that Jaszczolt's theory of merger representations (Jaszczolt 2005) provides the principles of compositionality for acts of communication. Capone accepts that compositionality is best instantiated at the level of merger representations—representations that combine information coming from different sources: (1) semantics; (2) lexical defaults; (3) socio-cultural defaults; (4) encyclopaedic knowledge. Capone argues that, since merger representations combine outputs of both top-down and bottom-up inferential processes, a modular view according to which modular connections are not pipes must be accepted. Instead, modular connections must be conceived of as enzymatic processes taking input from a common bulletin board and providing output to this very bulletin board. Enzymatic processes explain how outputs of a process can become input to another type of process. Concerning Capone's point (2) (satisficing strategies), he

considers inferential processes (of the unreflective type) as instances of fast-and-frugal heuristics whose aim is not to obtain an optimal result, but only a result that is good enough. As soon as a good enough inferential process is instantiated, the search for pragmatic interpretation stops.<sup>6</sup> Relevance Theorists have drawn attention to these inferential processes. These processes interact with our view of modularity because modular processes are also fast, automatic and finite.

Concerning point 3 (cancellability), Capone argues that one of the main obstacles to a modular view of inferential processes is removed once it is recognized that explicatures are not cancellable [a point discussed at length in Capone (2006, 2009); see also Burton-Roberts' (2005) splendid paper]. The convergence between Capone's previous work on lack of cancellability of explicatures and modularity of mind is not a mere coincidence. Lack of cancellability supports the view that inferential processes are modular in nature, given that they are not optional, but they are mandatory (cancellability of explicatures threatening the idea that inferential processes are mandatory).

Concerning point 4 (encapsulation), Capone argues that pragmatic processes are unlike theory-formation (whereby a theory is continuously revised). They have access to limited information, which is encapsulated through the Principle of Relevance (see the discussion by Capone of modules on the fly). Capone concentrates on inferences which are automatic and belong to the non-reflective type. Much else must be said about non-automatic, reflective inferences, about which Cummings (2009) has much to say. We shall consider Cummings' views in the next section.

### 3. Louise Cummings, Modularity and Pragmatics

Cummings discusses the same issues discussed by Capone (2010b), but arrives at different conclusions. I assume that the main difference between Cummings and Capone's ideas is based on a difference of focus. Cummings uses examples of reflective inferences, in which a speaker embarks on a reflective task using explicit arguments and reasoning in order to calculate the intended point of an utterance.

---

<sup>6</sup> Wayne Davis (personal communication) forced me to explain this assertion. He says that surely I cannot mean that a hearer will not consider how he has interpreted a speaker when new evidence about the speaker's intentions emerges. He thinks this is implausible. He also asks me to consider whether I am saying that when new information is considered, the inferential process becomes reflective. Of course, I grant that reinterpretation processes occur especially when one reads and re-reads literary or legal texts. Things are somewhat different in conversation, where one is under pressure to come to an instantaneous understanding of the interlocutor's words. However, Davis cannot deny that when a lot of information about the world is brought to bear on reinterpretation and one opens up again an interpretation process which, up to some point was judged satisfactory, one goes into a reflective task. Reflection prevails over automatic inference. Wayne Davis may think that this explanation leaves us in the dark on the distinction between instantaneous and reflective inferences; however, I am more optimistic. A reflective inference is always some reasoning of the complex type, in which a thinking subject assigns some intentions to a speaker on the basis of what he takes to be evidence for his attribution of intention. He must be aware of all the logical steps of his reasoning. Relevance mechanisms at the basis of automatic inferences are capable of being explained by the theorist, but need not be available to the mind that actually makes the inferences.

Capone, instead, focuses on unreflective inferences, which are fast and automatic and in which the calculation of the implicature is not available for conscious access. It is not surprising, therefore, that they should arrive at different conclusions. Yet, intuitively, both types of inferential processes are operative in non-logical inference, and thus 'prima facie' both authors say something important. Surely, in discussing conversational implicatures, we must take into account both non-reflective and reflective inferences; yet, it should be clear that unreflective inferences have a privileged status, since they are those which enter into primary pragmatic processes in so far as they contribute to the explicatures, to the explicit contents of utterances and thoughts. Considerations about reflective pragmatic processes surely are important, and yet they cannot be used in isolation to prove Cummings' main point: that is, that pragmatic processes are not modular.

Cummings discusses two views of modularity: she approves of the former and she criticizes the latter. Cummings accepts Kasher's (1991) idea that there is a pragmatic module which processes speech acts and determines the illocutionary force of an act of communication on the basis of some presumptions which are usually triggered by the syntactic form of the utterance. There are rough correlations between declarative form and the force of an assertion; between imperative form and the force of an order or command; between an interrogative form and the force of a question. These correlations are standardly used to calculate the force of an utterance, but they can be overridden and, thus, in context, the force of an utterance can be quite different from the presumptions calculated in the pragmatic module. A central system receives input from the pragmatic module and determines in context the particular illocutionary forces of utterances.

This view is contrasted with the view of Theory of Mind (ToM) theorists, for whom the demarcation of the Theory of Mind module is obtained by certain restrictions on the flow information between the psychology faculty and other cognitive domains. Segal (1996) is the most representative voice in the ToM camp:

In particular there may be a one- or two-way filter to information. In Jerry Fodor's (1983) terminology, intentional modules may be 'informationally encapsulated': some of the information of the subject's mind outside a given module may be unavailable to it . . . And going the other way, intentional modules may exhibit 'limited accessibility'; some of the information within a module may be unavailable to consciousness . . . I suggest that if a set of appropriately related psychological states exhibits either informational encapsulation or limited accessibility, then they constitute an intentional module (Segal 1996, 143).

Cummings dismisses this important theoretical step using a complex reasoning. Cummings considers that in order to calculate conversational implicatures, we must have access to a number of beliefs, some of which are not even beliefs about the speaker's mental state. Furthermore, implicatures can be cancelled, revised, or reinforced, and these processes seem to be the product of general inferential processes. In the light of interaction with a potentially great number of beliefs about the world,

it is difficult to see to what extent inferential processes are encapsulated, as a theory of modularity requires (Cummings 2009).

The good point that Cummings is making is that a ToM module must integrate different sources of information, some of these pertaining to encyclopaedic knowledge, the beliefs of the hearers, and also the logical inferences made online by the hearers. It is clear that the final result of pragmatic inference must be able to combine different sources of information. The term *merger representations* invented by Jaszczolt (2005) does justice to this idea that pragmatic inference combines different sources of information. For pragmatic purposes, the main sources of information which must be integrated or merged with others are the results of default inferences and the result of genuine pragmatic inference based on rationality principles. But given that a global pragmatic process must incorporate a less global pragmatic process, it is possible that at some stage of the pragmatic process some sort of encapsulation should be posited that is defined, not along the lines of Fodor (1983), but along the lines of theorists of massive modularity (Carruthers 2006). At some point in her most interesting discussion, Cummings says that it is not the case that one throws a net on the information that is accessible to pragmatic processes. She thinks that pragmatic processes are permeable to a whole range of knowledge and deductive inferences. In my discussion I will use the terms 'net-throwing' and 'permeability' as key terms of the discussion of genuine pragmatic processes. Net-throwing is important, because there must be ways to limit the information that can be considered in calculating a conversational inference. Net-throwing mainly consists in obeying the Principle of Relevance which applies not only to the calculation of inferences, but also to the provision of contextual information to the inferential process. Context does not provide an unrestricted flow of information, but provides a restricted flow of information. The only information that goes through the net is relevant information, information promising to interact with linguistic information in interesting and fruitful ways, by incrementing it and making its meaning potential optimal. Furthermore, contrary to what Cummings and Kasher accept, the processing of pragmatic inference is unlike theory formation. In theory formation, theories are developed, challenged, revised, and the process is possibly infinite. Instead, utterance processing must occur in real time, and is usually over when the next utterance occurs and the conversation flows in the direction of what is said next. There is no time, usually, to go back and revise interpretations, following the procedure of theory-formation. If theorists use the notion of cancellability to prove their point that pragmatic processes are permeable to different sources of information, one would have to reply that, yes, pragmatic processes are permeable to different sources of information, but under the constraint that the pragmatic process is finite, fast, circumscribed to the present. Furthermore, while potential implicatures and explicatures are usually cancellable, once intentions are fixed in context it will not do to cancel them. This is an idea which I expressed in Capone (2006, 2009, 2010b) [but also see Burton-Roberts' (2005) important work] and which has been supported by Burton-Roberts (personal

communication). So, I agree that the pragmatic process is permeable, but it is instantaneously permeable, and thus it is completely different from theory formation, which occurs without any time constraints. While theory formation is a collaborative process involving many scientists, utterance interpretation generally involves two speakers (or a limited set of speakers who are located in space relative to one another). So, the main difference between theory formation and utterance interpretation is that the environment of the conversation provides fundamentally crucial (perceptual) input to the pragmatic processes. Such a constraint is obviously not in place in theory formation, where scientists are usually situated in various parts of the world, and the setting does not have a crucial role in anchoring utterances in time and place. The inferential process in ordinary conversation is necessarily circumscribed and encapsulated and the most crucial sort of net-throwing occurring is that due to place and time.

What about the constraint that when optimal relevance is achieved, the interpretation process stops? Is this not a sort of encapsulation? Cummings, in her discussion of schizophrenia, mentions a notion of *praeter-relevance* as advanced in important work by Cram and Hedley (2005). A problem which schizophrenic patients experience is that they process utterances without stopping when the first interpretation that satisfies the Principle of Relevance is obtained, but they go on making further inferences. If Cummings mentions such a problem, surely it must be the case that the inferential process is finite and has stopping rules. And this means it is circumscribed and this is a limit to permeability. Permeability occurs to some extent, but is not unconstrained. I will thus talk of ‘circumscribed permeability’, which is still a modular notion.

As I said, Cummings provides an interesting example of reflective inference, in which a number of pieces of information flow into the interpretation process. An example is the following:

- (9) Sam: Do you come here often for a walk?  
Tom: I hold down two jobs, so what do you think? It's not as nice as it used to be. Owners are letting their dogs foul the pavements and there is litter everywhere. It was local teenagers who vandalized the benches.

Cummings is clearly right in saying that a number of pieces of information flow into the inferential process, as we surely need to take into account certain beliefs such as ‘People who have two jobs have little leisure time’. There is no doubt that a number of beliefs must be involved. Yet, it is the Principle of Relevance which circumscribes the process and prevents one from resorting to unnecessary beliefs. Furthermore, her example is clearly a case of reflective inference, while I said that in order to investigate the issue of modularity it would be best to examine cases of non-reflective, instantaneous inferences.



#### 4. Further Considerations on Modularity and Definite Descriptions

I propose to use the issue of definite descriptions to throw light on the issue of modularity of mind, given that in cases in which a speaker uses a definite description referentially, the hearer infers the correct interpretation automatically, instantaneously and non-reflectively. My view runs counter to what Bezuidenhout (1997) says about the non-modularity of pragmatic processes involved in interpreting definite descriptions. As I said before, default inference is, in itself, a case of encapsulation, since it requires that for an infinitesimal period of time the inference be encapsulated and processed in isolation from contextual information. Contextual information flows in at a second stage, when the speaker or the hearer needs to assess whether it fits the context or whether it should be replaced with a more tailored inference. Both default inference triggering and ‘contextual tailoring’ are processes which involve encapsulation. Contextual tailoring involves encapsulation in that the context considered is circumscribed by the Principle of Relevance. Suppose you hear:

(10) The President of the United States arrived in Italy today.

If the sentence was uttered in 2010, you will tend to think of Obama that he arrived in Italy today.<sup>7</sup> There is a default interpretation which presses to become an actual

<sup>7</sup> Wayne Davis (personal communication) seems to oppose this idea. Davis seems to believe that a hearer need not form the belief that Obama arrived in Italy today, on hearing (10). ‘Without knowing a lot of the context of utterance, I do not see why we should assume that the hearer will conclude that the speaker was using ‘The President of the USA’ referentially rather than attributively; both interpretations are possible; nor do I see why we should assume that the hearer should reach one conclusion faster than another, or that he reached either conclusion very quickly. Indeed, if contextual clues are lacking, the hearer may have to give up trying to determine how the speaker used it. Finally, if the hearer did surmise that the speaker was using the description referentially, he will not be able to infer that the speaker was referring to Obama until he determines that the speaker believes that Obama is the President of the United States. That inference is surely not the output of an encapsulated linguistic module. The knowledge that Obama is President is non-linguistic knowledge. For the same reason, the hearer will not be able to determine that the speaker was using the description referentially until he determines that the speaker knows who the President of the USA is. For all these reasons, I do not see how you can maintain that the referential interpretation is the default interpretation of definite descriptions or in any way mandatory.’

My reply is simple. Examples like (10) can be interpreted either more specifically or less specifically. When a more specific interpretation is intended one will also be able to supply a proper name or a deictic expression and a pointing gesture. Of course, Davis is right that in being able to supply the specific referent we need identifying knowledge (we need to know something about the speaker’s beliefs about politics and history and we need to know whom he believes to be the President of the USA). This surely is not linguistic knowledge and is not information supplied by a module of the mind such as, e.g. the Theory of Mind module. However, the tendency to supply a referent and to identify this referent through non-linguistic knowledge is triggered by the linguistic semantics and the pragmatics of interpretation. If Wayne Davis’ story was all right, we could have non-referential readings of ‘The President of the USA’. In other words, we could be in a position not to bother supplying a value for the referent. Is it not enough that we know that the President, whoever he is, arrived in Italy today? Why don’t we stop here? And my contention is that, however hard we may try, it is not possible to stop here, but it is natural to want to supply a referent. And the reason for this is the mandatory nature of the inference. Of course pragmatic inference can be skeletal and needs to be completed by contextual inference. This is what Davis suggests, and I am happy to say that, in addition to this initial pre-contextual inferential phase, there is a contextual inferential phase, in which beliefs about the world and knowing who is who certainly matter. I did not want to suggest that non-modular pragmatics is not required at some stage. All I wanted to say is that it is not required at this stage of pre-contextual inference.

implicature and the features of the context are such that filter this implicature in. In general, the feature past tense reinforces the default interpretation because it is unlikely that the speaker wants to talk of a past event without having an actor for that event (see Higginbotham 2009). And the actor cannot be whoever is the President, but someone in particular. Example (10) says that there is a president of the USA, which is uniquely identifiable, and Obama, who is the President, arrived in Italy. We could go on to say that, if there is an actor, then the actor fills the denotation of the definite description, and this will give us the referential interpretation by default.

Wayne Davis (personal communication) provides an interesting counterexample here. He thinks my considerations are contradicted by 'The President of the USA in 1820 did not deliver the Gettysburg Address'. But here we have a problem which ought not to be overlooked. Negation has the syntactic purpose to associate 'The President of the USA' with the focus here, and this means that a class of alternatives is provided. This class of alternatives might include Prime Ministers or Presidents of other nations. If a class of alternatives is introduced by negation, then surely it is not important to identify who the President was in 1820. The sentence is like 'It was not the President of the USA in 1820 who delivered the Gettysburg Address', which implies it was someone else; and if it was someone else, why then should we bother to find out who was President in 1820? The search for identifying information will be stopped because it may not ultimately produce anything which we need to know.

Davis also takes issue with my presupposition that people will be able to identify the referent associated with 'The President of the USA'. He considers that at least 1% of Americans do not know who the President of the USA is. If we change the example slightly, replacing 'USA' with say Liberia, then he for one will not know who the definite description refers to. He will fully understand the sentence and if he takes the speaker to be as ignorant of Liberia as he is, he will automatically take the speaker to be using the definite description attributively. So interpreted, the speaker makes perfect sense and may be speaking truly. Even if the hearer does not know who the President of Liberia is, he knows that the President of Liberia can act and do things like fly to Italy tomorrow.

All this is fine, but all it shows is that the speaker will intend to get across a referential interpretations only if he can assume that the hearer will be able to supply the referent. This has to do with cognitive effort. If a referential interpretation is more informative, cognitive efforts being relatively small, the search for a referential interpretation will be triggered; things change if cognitive efforts increase. If the search for the referent involves a process of information gathering that is too complicated (one needs to consult books or newspapers or online encyclopaedias, and this may not be feasible in daily conversation), then the referential interpretation is aborted. But surely this is not the normal scenario.

If referential readings are promoted by the past simple, then the case must be extended to non-past progressive as well:

- (11) The President of the USA is flying to Italy today.

Not only does the definite description trigger a referential interpretation by default, but the sentential frame favours this referential interpretation. The sentential frame, by default, can be said to play a role in promoting a default inference. Things are not very different in the future, provided that the time is specified:

- (12) The President of the USA will fly to Italy tomorrow.

The hearer is unlikely to interpret the sentence as meaning that whoever is the President of the USA will fly to Italy tomorrow, since ‘tomorrow’ specifies the time at which the event is located, and if an event is located at a certain time, there must be an actor at a certain time.

Consider now an important example discussed by Powell (2001):

- (13) The President of the United States changes every five years.

Powell thinks that uses of example (13) are meta-representational, because we cannot clearly intend a referential interpretation, nor can we intend that whoever is the President of the United States changes every five years. According to him, example (13) expresses a proposition to the effect that the denotation of the descriptive individual concept corresponding to ‘the President of the United States’ changes every five years. Powell writes:

This interpretation is accessed, as ever, via considerations of relevance: neither the straightforward *de re* or descriptive interpretations achieve optimal relevance, since, for both, the construction of a context in which the interpretation yields sufficient contextual effects puts the hearer to too much processing effort. The proposed interpretation, however, yields sufficient contextual effects (2001: 122).

Something along the lines of what Powell proposes must be true. However, it should be clear that the reason why the meta-representational interpretation occurs here is that the sentential frame is different from examples (11) and (12). We are not confronted with an action located at some point in time, but with a generic sentence. Since a generic sentence has generic validity, which is not limited to a certain period of history, we understand that the sentence cannot be about a particular president, since it is necessary that presidents will be different at different periods, and the possible interpretation ‘Whoever is the President changes every five years’ cannot be the right one, because it would presumably say that ‘whoever is President changes clothes every five years’ (pretty implausible, isn’t it?). The meta-representational interpretation goes through because, as Powell says, it yields sufficient contextual effects. Given that we arrive at the explicature in order to avoid implausible literal meanings, it is clear that it is not easy at all to defeat the inference, intentionality being fixed by the search for plausibility.

Now, in the picture I am proposing, default interpretations are tried first, but if they do not yield sufficient contextual effects, they must be replaced with

interpretations that are more tailored to the context. Sentential frames signal, in general, when default interpretations get through or not.

It may be claimed that certain sentential frames promote, instead, attributive readings. Consider, in fact, examples (14), (15) and (16):

- (14) John wants to become the President.
- (15) John wants to be the President.
- (16) John wants to be appointed Professor of Linguistics.

Clearly, these are not referential uses, but they are attributive ones. In example (14) John wants to have the attribute 'the President' (and wants the transition from not being the President to being the President); in example (15) John wants to have the attribute 'the President', but no mention is made to wanting the transition from not being the President to being the President. In example (16) too John wants to have an attributive 'Professor of Linguistics'.

In none of examples (14), (15) do we have the interpretation 'John wants to become Obama'. The referential interpretation which, as we have seen, usually arises as a default, in this case will be aborted because of the general belief that it is impossible to try and be another person, however hard one may try. Even if I wanted to, I could never be Obama. Would it be reasonable to say that in these cases the default is cancelled? Is it not preferable to say that sentential frames like 'become NP' also have default interpretations, and these are different from the referential interpretations? This issue would not be, clearly, otiose. However, I cannot settle it here. Consider now the following cases, the first of which is discussed in Higginbotham (2009):

- (17) Heimson believes he is Hume.
- (18) Heimson believes he is the President of the USA.

Example (17) has a '*de se*' interpretation and Heimson can believe he is Hume only if he does not believe that he is Heimson (Heimson being different from Hume). It makes sense to utter example (17) if we know that Heimson does not think of himself under the mode of presentation 'Heimson' but only under a first-personal mode of presentation (see also Capone 2010a).<sup>8</sup> If we replace the proper name with a definite description, we obtain a sentence like example (18) whose preferred interpretation is not the referential reading, but the attributive one. In other words, we are charitable enough to use a minimal departure from rationality, and, thus, even on the assumption that Heimson is crazy and believes extravagant things about himself, we assign him the least extravagant belief. Believing oneself to be the President of the

<sup>8</sup> Even this is the result of pragmatic interpretation, since believing to be one person involves a smaller departure from rationality than believing oneself to be two (different) persons at the same time.

United States involves a smaller departure from rationality than believing oneself to be another person (to be Obama, for example). Thus, in interpreting sentences like example (18), we adopt the minimal departure from rationality and we prefer one of two interpretations, if it is the least extravagant thing to believe. This charitable interpretation will be preferred over the least charitable interpretation. So, in interpreting example (18), we first of all try the referential interpretation, but then opt for the more charitable interpretation. In calculating the explicature we go for plausibility and this is why we are reluctant to give up the explicature and to cancel it.

Now, we have seen that there are departures from default interpretations. This means that default interpretations interact with sentential frames or other contextual assumptions. Does this imply that we must give up the modularity hypothesis? My reply is: No way! All that the modularity hypothesis compels us to accept is that pragmatic processes are fast, mandatory, encapsulated. In case (18), it is clear that we do not consider different hypotheses and chose one and then are open to the possibility that the hypothesis is revised. The interpretation process is finite and we utilize for this process only information that is relevant. In particular, we utilize information to the effect that people who believe they are the President of the United States are more normal than people who believe that they are Obama. And why do we utilize this piece of information? We do so because it helps us choose between the referential and the attributive interpretation. Given that our interpretative problem is how to choose the referential or the attributive interpretation, we bring into the process extra information, only on condition that it helps us resolve our original problem. So the basic constraint to follow in bringing in additional information is the Principle of Relevance which induces us to maximize information, to look for interpretations which maximize contextual effects, with minimal processing efforts.

We have seen that definite descriptions usually involve referential interpretations. However, Bezuidenhout (1997) has shown that the question of the attributive/referential distinction arises with pronominals too. Bezuidenhout considers cases like the following:

- (19) Sign: You are entering the Grand Canyon.
- (20) Bill Clinton: The Founding Fathers invested me with the power to appoint supreme Court justices.
- (21) Encountering a huge footprint in the sand: He must be a giant.

Bezuidenhout takes example (19) to plausibly mean that the visitors are entering the Grand Canyon; example (20) plausibly means that the Founding Fathers invested the American President with the power to appoint Supreme Court Justices; example (21) plausibly means that whoever left the footprint in the sand must be a giant.

These examples are of interest because they instantiate cases in which a pronominal is assigned an attributive interpretation due to contextual assumptions. Since we know that it is not the case that the Founding Fathers invested Clinton with

the power to appoint Supreme Court Justices, we assume that what is meant (the *m*-intended point) is that the President, whoever he might be, was given such powers by the Founding Fathers.

Cummings leads us to believe that the informational increments due to contextual processing which enter into the interpretation are cancellable. Cancellability, according to Kasher (1991) and to Cummings (2009), attests to the fact that pragmatic inference is a truly global inferential process, like theory-formation. Yet, is it not clear that, when we settle on the reasonable interpretation of example (21), the other alternative (the referential one) has to be abandoned and the inference is hard to cancel? So, while inferential augmentations seemed to prove Cummings' point, in fact they prove to be the most thorny cases for the claim that explicatures are cancellable [they also prove to be thorny for Bezuidenhout (1997) who claims that the processes involved in interpreting NPs are not modular]. We often resort to explicatures to show that an implausible interpretation is replaced by a plausible one. But it is this need for plausibility which militates against easy cancellation of the inference. And if an inference is not cancellable, then a case can be made for the view that the inferential process which produced it was modular in nature.

Before ending this section I would like to call attention to an example discussed by Allan (2010) in an important paper in which he considers reference an act of communication. The gist of Allan's view is that reference is an act of communication that exploits contextual clues utilized by the hearers to establish the intended referent. Being immersed in the theory of pragmemes broached by Mey (2001) and discussed further by Capone (2006), it is not surprising that Allan should make us see reference as a process that heavily relies on contextual clues. While discussing Jaszczolt's view that 'intentionality cannot be called a process, it is an instantaneous "firing at", "targeting" objects, it is not an object of passing from sense to the referent' (Jaszczolt 1999, 112) and that definite descriptions trigger, by default, referential interpretations, Allan considers a counterexample. Consider:

- (22) The best architect designed this church.

According to Jaszczolt, this sentence in context means that Antoni Gaudì designed la Sagrada Família because socio-cultural defaults are immediately activated on hearing the sentence. According to Allan, instead, the preferred interpretation in this case is the attributive reading, while he concedes that conversational implicatures are responsible for identifying the referent with Antoni Gaudì. According to Allan, the default interpretation is attributive. The speaker means (something like): 'X designed this church, and he is the best architect'. What should we make of Allan's critical position? Does it seriously militate against Jaszczolt's view that NPs are referential by default? And does this view militate against my modular view of pragmatics, according to which pragmatic interpretations are fast, automatic, mandatory and encapsulated, at least in the case of non-reflective inferences? An easy answer to this question would be to say that even fast, mandatory, encapsulated inferences are

sensitive to contextual information and can evaporate if there are contextual clues that militate against them. However, this is not the point of Allan's objection to Jaszczolt. He claims that in this case the default interpretation is attributive. We should go along with Allan if we recognize that various examples are like (22):

- (23) The worst murderer killed Jones.
- (24) The best butcher sold us the meat for the evening dinner.
- (25) The most beautiful actress was chosen for the party.
- (26) The singer who had the best voice was asked to sing at my wedding.

The use of superlative constructions points to a use of the definite description which is not referential but argumentative. By default the utterance is given an argumentative role (support of another statement) and the hearer is driven to a search for the argumentative relation which serves as the glue for the utterances under consideration. Is this a case in which one default overrides another default? It is not impossible to argue that different sentential frames are associated with different defaults. Another possibility must be considered. The more materials we add to a definite description the more likely it is that it will be interpreted attributively. While we predict referential interpretations for definite descriptions on the assumption that the referential interpretation is more informative, adding descriptive materials gives the dimension of cognitive efforts a greater weight and, in order to counterbalance this weight, the attributive interpretation prevails with the understanding that it has a function in determining the argumentative role of the utterance. It seems to me that the considerations triggered by Allan's ideas on definite descriptions lead us to a position which is very different from the one embraced by Recanati (1989). According to Recanati, in fact, referential interpretations require heavy contextual processing, while attributive interpretations do not [and this is in line with his view that definite descriptions are unmarked with respect to the feature + referential, while directly referring expressions (e.g. proper names, pronominals, demonstratives) are marked with respect to the feature + referential]. In my view, following Jaszczolt, Devitt, and also Allan to some extent, definite descriptions associated with certain sentential frames are marked as + referential by default, while other sentential frames are marked as – referential by default, depending on the amount of processing effort involved by the presence of extra linguistic materials. It is also possible to see things differently, the issue being not a matter of having different defaults, but of showing that the addition of further descriptive materials changes the default. The role played by the Principle of Relevance in triggering the search for argumentative relations seems to attest to the fact that the default interpretation of definite descriptions is determinable through the Principle of Relevance and, thus, the inferential process is encapsulated, as predicted by the modularity hypothesis.

## 5. Default Meanings and Modularization

In the following sections I shall address the problem of modularization in the context of modularity of mind. I argue that default inferences, in the case of referential interpretations of NPs, rest on the Principle of Relevance. Nevertheless, these inferences have become standardized and have been stored as general types in the default semantics archive through a process called modularization. I try to make connections between modularization involved in reading/writing processes and modularization involved in default inferences.

### 5.1. Encapsulation, Default Meanings and Referential Interpretations of NPs

I have previously said that the preferred interpretation of definite descriptions is referential. This is clearly the default reading. The notion of default reading deserves investigation in terms of the theory of modularity of mind. A default interpretation, in fact, seems to have many of the characteristics of modular processes: it is fast; it is mandatory [unless there are heavy contextual clues militating against this interpretation, one cannot but have access to it (for example, the attributive interpretation of definite descriptions is unlikely to be selected unless there are heavy contextual clues that favour it)]; and it is encapsulated, in a sense which I will make more precise. Encapsulation in pragmatics will be of two different types: (1) activation of the inference in a pre-contextual phase; (2) net-throwing on the contextual information available. I will call these two forms of encapsulation Encapsulation\* and Encapsulation\*\*. Encapsulation\* basically means that you will go for the default interpretation unless there are contextual clues that militate against it. Even if there are contextual clues that militate against it, the presumption in favour of default meanings is so strong that one tends to ignore context to start with, one takes it into account when the default interpretation really cannot fit into that context. Encapsulation\* is a sort of isolation of the information available, a recognition that pragmatic interpretation must start with something and that default meanings are the basic building bricks of pragmatic interpretation. One has access to default meanings, in isolation from contextual information. Of course, contextual information is there, before our eyes, but one pretends that it is not there and proceeds in an orderly way. One deliberately ignores information which might be relevant but not as relevant as the information one is now considering.

This account of default readings is quite compatible with what Relevance Theorists say about experimental pragmatics. When a certain default inference is made, it must be made compatible with the context. In other words, a phase of situating the inference in context and of overriding it in case it does not fit the context certainly occurs and we must take this into account.

The inference from definite descriptions to referential readings, I said, is quite standard. Following Jaszczolt (1999, 2005), I accept that there is a strong presumption in favour of referential readings. This is a more general phenomenon of NPs.



In fact, Jaszczolt notices that NPs embedded in belief reports (inside the scope of a belief operator) tend to have *de re*, rather than *de dicto* interpretations. Surely there is a connection between *de re* interpretations and referential interpretations, since what is understood *de re*, must also be understood referentially (although not vice versa).

Now we are at a fork. Should we say that there are cognitive principles of a specialized nature applying to NPs, such that they determine the referential interpretation of an NP in a default context? Or should we say that such default interpretations, which are real, objective enough, can be explained by adopting a more general Relevance Theory perspective? If there are default principles dealing with the referential interpretations of NPs, then we must simply expose these principles. However, if there are general mechanisms of inference, we must explain in what ways the default inferences (in particular the referential readings) are obtained.

I have said before that the RT approaches to definite descriptions were quite *ad hoc* and do not explain the general case, although they could perhaps explain how inferences are operative in particular contexts. We thus need a general treatment of definite descriptions which will produce a default interpretation which is referential.

Things are this way, I assume. The human mind is geared toward maximizing contextual effects, while minimizing processing efforts. Referential interpretations are standardly more informative, because they serve to eliminate a greater number of states of the world. If an interpretation is referential, we know what the speaker is talking about and we understand what the speaker predicates of a subject as applying to a particular person. Levinson (2000) and Huang (2000) explain anaphoric processes in a similar way. Pronominals tend to develop co-referential interpretations, since these interpretations eliminate a greater number of states of the world. They reduce cognitive uncertainty, if we want to use a more pretentious term. A potential objection to this line of thought could be the following.

Objection 1. If I state 'Smith's murderer is crazy', meaning some individual (Jones) is crazy, then I eliminate all the states of the world in which Jones is not crazy. However, if I make this utterance attributively, I eliminate all the states of the world in which any individual simultaneously has the property of being Smith's murderer and not being crazy. It is not immediately clear which of these is more informative. By contrast, in the pronominal case, co-reference is clearly more informative as it relates to a subset of the possible states of the world that are compatible with the non-co-referential interpretation.

Surely, this problem must be addressed. But it must be addressed by bearing in mind that informativity is, among other things, the ability to answer questions in a satisfactory and possibly exhaustive way. Thus my impression is that whenever we are in doubt as to whether one or another interpretation is more informative (in so far as it eliminates a greater number of states of the world), we could use the practical method of posing a question and seeing whether one or the other interpretation has the ability to answer that question in the most satisfactory way. So suppose that a

question asked is: 'Who is crazy in this room?'. The answer 'Smith's murderer is crazy' is clearly more satisfactory and exhaustive if it is interpreted referentially, because if it is interpreted attributively it may require a further inferential step to provide a satisfactory answer. The attributive reading, in order to be relevant, would have to be seen as restricting the set of answers and providing clues which would allow the hearer to proceed towards an answer. The referential reading, instead, immediately provides an answer to this question, on the presupposition that it is known that Jones is Smith's murderer.

This argument is not very satisfactory, I must admit. Once I grant that informativity is, among other things, the ability to answer questions in a satisfactory and possibly exhaustive way, I will be taken as working with a relative notion of informativeness. Answer A may be more informative than B in relation to one question, and less informative than B in relation to another question. But once I grant this, I will no longer be able to derive from the principle of relevance the claim that the referential interpretation is the default interpretation. I will only be able to claim that it is a default when certain questions are at issue. When other questions are at issue, I will have to say that the attributive interpretation holds.

Consider another example: 'Who is at the lectern?'. If this is the question, the answer 'The President is at the lectern' seems to be at least as informative on its attributive interpretation as on its referential interpretation. Consider finally 'Who is Obama?'. In this case the answer 'He is the President' is highly informative on the attributive interpretation but completely uninformative on the referential interpretation.

Ok. Perhaps the question of relative informativity is not as problematic as this can be taken to imply, but there are compelling reasons to answer the potential Objection 1. This can be easily answered in the following way. If we make the utterance 'Smith's murderer is crazy' attributively, I eliminate all the states of the world in which any individual simultaneously has the property of being Smith's murderer and not being crazy. However, if I make the same utterance referentially (with an intention of referring to John), I eliminate all the states of the world in which any individual has the property of being Smith's murderer, the property of being John, and the property of not being crazy. It appears that in the latter case I am eliminating a greater number of states of the world.

I suppose this reasoning could be resisted by the following considerations. Given that *The President of the US (whoever it is) will visit Italy* and *Obama will visit Italy* are logically independent, we cannot say that one eliminates a greater number of states of the world. Both eliminate an uncountable number of states. The attributive interpretation does not entail the referential interpretation because Obama need not be the President. But for the same reason the referential interpretation does not entail the attributive interpretation.<sup>9</sup>

This possible attack on my idea that referential interpretations are more informative seems to be based on the implicit assumption that informativity and

<sup>9</sup> I should thank Wayne Davis for this potential objection.

entailment go hand in hand. Now, while surely part of the discussion of pragmatic scales is based on the notion of entailment (at least it is clear that if A entails B, then A is more informative than B and that if B is used, rather than A, then a speaker intends to say that A is not applicable), this is not the only possible criterion for pragmatic scales. Scales can be based on rank or on order. Thus if you say that John is a doctor, you imply that he is not a professor, even if there is no entailment in English or in Italian such as ‘X is a Professor. Therefore X is a doctor’. Analogously if you say that John went to Naples (leaving from Palermo by train) you imply that he did not go to Rome, even if there is no entailment from ‘John went to Rome’ to ‘John went to Naples’. The scale is simply based on ordered entities. So informativity need not be judged only by reference to entailment. In particular, the fact that there is no entailment from A to B does not exclude that A is more informative than B (see also Hirschberg 1985).

As I said previously, we have reasons to assume that referential interpretations of definite descriptions are more informative because by applying a predicate P to the definite description we eliminate states of the world in which any individuals which have the property described in the definite description and the property of being the referent of the definite description do not have the property ‘being crazy’. On the attributive interpretation, we only eliminate states of the world in which individuals having the property described in the definite description do not have the property of being crazy.

If this story is accepted, it follows that a view along the lines of Jaszczolt is preferable. According to Jaszczolt, there is no transition from an attributive to a referential reading—a logical step which would be uneconomical according to her and which all scholars who use the notion of conversational implicature must make. Jaszczolt’s position that the NP is directly associated with a referential reading seems to agree with the position that pragmatic inference is computed by calculating cognitive effects as compared to processing efforts and not by letting the attributive reading interact with contextual assumptions. Now, if this explanation based on informativity is accepted, the assumptions vocalized in Jaszczolt’s default semantics could be said to follow from it. They are special cases of a more general case. But then why should we bother with defaults? The same parsimony principle (Modified Occam’s Razor) which Jaszczolt invokes many times could be used to say that we do not any longer need her more specialized principles (in particular her Default *De Re* Principle): the *de re* reading of sentences ascribing beliefs is the Default reading. Other readings constitute degrees of departure from the Default, arranged on the scale of the strength of intentionality of the corresponding mental state.

Now, there are two ways to respond to such a criticism. One could be to say that the principle whereby an NP is assigned a referential meaning by default originally derived from more general principles of cognition, but has now become a shortcut for the interpretation of NPs. One could even claim that we need a Reference module and that Jaszczolt’s principles are part of that innate module. This idea is interesting of course, instantiating the general idea that when the mind needs specialized

principles to deal more efficiently with certain types of information, it develops a module that can deal with that type of information.

A more modest idea is that of modularization. We posit modules or archives that store information derivable from pragmatic processes as routinely implemented and transform it into generalizations. Jaszczolt's Default *De Re* Principle could be such a generalization. Is there evidence that the mind can work in this way? Certainly there is. I mentioned earlier the case of modularization in connection with the writing/reading systems. The writing/reading systems may derive originally from the perception module, but then while these processes became specialized, and were dedicated to a special problem (how to write or read), the specialized information connected with this ability (the know-how) became modularized and a new module developed. This is not to say that the module dedicated to writing and reading is innate. What are innate are the predisposition to develop such a module, the neural structures which give hospitality to the module and the principles for partitioning an existing module from a module that is being developed thanks to information coming from the environment. The possibility of connections between the original module and the new partitioned module must also be innate. What I am saying is that, by learning how to write and read from the environment (our teachers, our parents, etc.), we store this specialized information in a module that is specialized to receiving and storing this type of information.

Could this work for referential readings too? Is it possible that they become standardized and that, when this happens, a module for reference is generated through modularization, the interaction between innate resources and data coming from the environment?

I favour the idea that there must be a module for reference which is the result of modularization and that Jaszczolt's Default *De Re* Principle and the principle relating to referential interpretations of NPs (definite descriptions in particular) must reside in this module. This module is not innately built, but is the result of interaction with the environment.

## 5.2. Karmiloff-Smith and Griffiths and Stotz on Modularization: The Case of Default Semantics

I assume that the issue of default inferences and of definite descriptions ties in very closely with Karmiloff-Smith's discussion of modularization. Karmiloff-Smith substantially alters the picture of modularity à la Fodor. While Fodor believes that there are input systems (e.g. vision) which are modular and which provide input to central intelligence, Karmiloff-Smith argues that development is the key to understanding the human mind. She says:

Fodor takes as demonstrated that modules for spoken language and visual perception are innately specified. By contrast, I wish to draw a distinction between the notion of pre-specified modules and that of a process of modularization (which, I speculate, occurs repeatedly as a *product* of development). Here I differ

from Fodor's strict nativist conception. I hypothesize that if the human mind ends up with any modular structure, then, even in the case of language, the mind becomes modularized as development proceeds. My position takes into account the plasticity of early brain development (1992: 4).

The modularization thesis allows us to speculate that, although there are maturationally constrained attention biases and domain-specific predispositions that channel the infant's early development, this endowment interacts richly with, and is in return affected by, the environmental input (1992: 5).

Karmiloff-Smith's theory is a bridge between theories of innatism and theories like Piaget's, who argues that the human mind of the infant is a *tabula rasa* and grants only some domain-general processes like assimilation, accommodation and equilibration. Karmiloff-Smith hopes to salvage aspects of Piaget's epistemology by arguing that there is far more to cognitive development than the unfolding of a genetically specified programme (1992: 11). Crucial to Karmiloff-Smith's programme is the idea of Representation Re-description which involves a 'cyclical process by which information already present in the organism's independently functioning special purpose representations, is made progressively available, via re-descriptive processes, to other parts of the cognitive system' (1992: 18). Conceptual re-descriptions are what allow the human mind to make connections between domains of experience which, before the re-descriptive process, were unconnected. Karmiloff-Smith provides the example of the re-description of the concept 'zebra' as 'striped animal' which allows the child to make a connection between the animal 'zebra' and the road sign for a zebra crossing. Re-descriptions are of three types: E1 are not available to conscious access and to verbal report; E2 are only available to conscious access; E3 are available both to conscious access and to verbal report.

Karmiloff-Smith applies her ideas to various domains. However, I propose to focus on her chapter entitled 'The child as a notator' since these ideas connect closely with what I said before as the reading/writing module, which appears to be a model for my idea of modularization as I intend to apply it to inferential processes of the default type. Karmiloff-Smith's main idea is that reading/writing and drawing belong to different modules, as they imply different ideas about what should be done. Even small children are able to distinguish between a drawing and an instantiation of writing. Surely the products may not be neatly differentiated, but they would, nevertheless, clearly insist that this is a drawing and that is an instance of writing. So they have clear in their minds what the constraints on writing and drawing must be. They know that writing involves sequentiality, directionality and 'spatial frequency or periodicity' (1992: 143). Karmiloff-Smith (1992: 143) believes that preliterate children distinguish between drawing and writing even if their drawings are somewhat confused and their writings are merely horizontal lines. Yet they are adamant that there is a distinction between the products of their writing and drawing. She also reports that children lift their pens more frequently when they are writing, which means that they have conceptualized writing and drawing as different things. The

child conceives the processes of writing and drawing differently, even if the end products sometimes turn out similar. Children who have been asked to distinguish between writing and drawing do not confound drawing with notation as they make clear-cut distinctions between the two notational domains. Drawings are rejected for written language and single elements are accepted for number notation, but rejected for writing; linkage between elements is accepted for writing but not for number notation. Karmiloff-Smith rejects the idea that these constraints are innate, while she accepts the idea that there are such constraints and that they are organized in modules (she furthermore says that the modules for writing/reading and drawing are in different hemispheres). Her reason for rejecting innatism and embracing modularization, in the case of the reading/writing module, is that reading/writing, unlike verbal production, are relatively recent in terms of evolutionary time. She says that hundreds of thousands of years of evolution were needed for spoken language to become biologically constrained, but the use of cultural tools for writing dates back only 5,000 or 6,000 years. So it is implausible to invoke an innately specified bias for writing (1992: 147). Karmiloff-Smith argues that they are due to a process of modularization that is the product of learning during childhood.

Griffiths and Stotz (2000) also deal with the complex relation between innatism and a developmental perspective. Griffiths and Stotz recognize the importance of Karmiloff-Smith's approach to cognition. Like Karmiloff-Smith, they assume that there are connections among the modules of the mind and that it is possible to utilize the highly specialized mechanisms of a module for the purpose of executing a sufficiently similar task. Following Karmiloff-Smith (1992), Griffiths and Stotz say that re-descriptions of the processes occurring in a module can be used for distinct purposes. This possibility of re-describing mental processes allows a certain flexibility of the human mind. Griffiths and Stotz, following Simon (1986), argue that rationality is not only based on innate resources but depends on social constraints, which need to be learned. An interesting example they provide is the following. Suppose you are offered a slice of cake. In the case when there is only one slice of cake left, you will have the tendency not to accept it. However, if there are two slices available, you tend to accept one. From the perspective of rationality of decision taking, this decision is irrational, as the behaviour violates the rule of internal consistency of choice. Choosing  $x$  from the set  $\{x,y\}$  but choosing  $y$  from the set  $\{x,y,z\}$  is irrational in decision theory. But we surely do not count someone as irrational for simply showing consideration for the social situation. The point of this example is that there are social constraints, which surely must be learned, to complement the constraints that are innate predispositions of the mind. Griffiths and Stotz also argue that the behaviour of adults provides some scaffolding against which learning takes place. Children, for example, learn intentional behaviour from adults who guide their hands in the culmination portion of the event of grabbing objects. According to Griffiths and Stotz, constraints intended in this way are soft because they act probabilistically rather than deterministically. They are also soft in the deeper sense that the constraints themselves emerge as part of the developmental process.

My necessarily brief treatment of Karmiloff-Smith's (1992) and Griffiths and Stotz's (2000) ideas on modularization paves the way for my ideas about modularization of inferential processes. In my previous paper on Default Semantics and the architecture of mind (Capone 2011), I proposed that a Default Semantics archive is built to store regularities of inferential results. Jaszczolt's Default *De Re* Principle and the tendency to interpret definite descriptions as referential expressions may be due specifically to the standardization process which short-circuits an inferential process to a cell in a memory system (a default semantics archive) which directly produces the result of the inferential process. We may propose that cells in the Default Semantics archive do not simply supply the results of inferential processes one by one, but may be organized in principles of a more general nature, such as the following: for any NP, go to a referential interpretation first. Such principles are the result of modularization, of learning, even if, obviously, they interact with more general principles of cognition such as Sperber and Wilson's Principle of Relevance, according to which relevance is a positive function of contextual effects and a negative function of processing efforts. I argue that referential interpretations of NPs are default because they obey the Principle of Relevance. In fact, a referential interpretation eliminates a greater number of states of the world, while an attributive interpretation is compatible with a certain number of referents (The President of USA: Clinton, Obama, Kennedy, . . .). In my view, fully identifying information is to be preferred to descriptive information (only) and, thus, the referential interpretation prevails at least in those cases in which the hearer is interested in knowing specifically who did the thing in question, who acted in such and such a way.

Furthermore, modularization, according to Karmiloff-Smith, involves re-description and, in particular, re-descriptions of the type E1, E2, E3. In the case of modularization involved in the creation of a default semantics archive, we certainly have the phase of re-descriptions E2, E3, since the default semantics archive allows access both to consciousness and to verbal report. Re-description is clearly involved in the modularization process of referential interpretations of NPs. Before modularization, in fact, an NP must be considered as a semantic structure allowing interpretative ambiguities. Instead, after re-description, interpretative ambiguities are eliminated. Something has occurred to change linguistic knowledge. The NP has been marked as +referential after re-description.

Furthermore, if we follow Griffiths and Stotz, default readings of NPs conform to the picture of modularization because they act probabilistically and not deterministically—these inferences can be defeated in particular contexts.

### 5.3. Analogies between Modularization Processes in Reading/Writing and in Default Inferences

I have hypothesized that the default semantics mechanisms of inference and the Principle of Relevance may share some common mechanism. This idea is not extraneous to the idea of modularization, nor is it extraneous to the standard view of

massive modularity which accepts that modules share parts, especially if they correspond to neural structures which are close to one another. It is now my aim to investigate the similarity between modularization involved in reading/writing and the modularization involved in default inferences.

I have proposed that the default semantics archive is the result of modularization. Modularization is understood in this article as the creation of know-how through a constructed module that contains information on how to execute a certain procedure by following instructions more or less automatically. The best example of the modularization process which I have discussed is that of the abilities connected with reading and writing. I have proposed, following Carruthers (2006) and Karmiloff-Smith (1992), that reading and writing abilities are collected in a module that results from modularization and which shares at least some abilities with the object-recognition module. At least some of the know-how which is used for the recognition of objects is recruited for the purpose of distinguishing the letters of the alphabet. Reading, however, involves more than distinguishing the letters of the alphabet, as it often involves recognizing words as wholes in reconstructing missing letters or badly executed letters. Holistic principles may be at work in reading and writing and these can be presumably borrowed from the object recognition module. If I see the front part of a desk, I usually have no doubts as to whether there is a back of the desk [I do not bother to check with my hands; a famous example by the philosopher Price (1932)]. Analogously, when I read 'The dor opened', I immediately recognize a missing letter as part of the word or the sentence written down. I easily reconstruct 'The door opened'. However, if more than a letter is missing in a word, the word reconstruction process becomes more complicated.

It appears that analogies between reading/writing and default inferences as products of modularization are numerous and a fruitful topic for discussion. For the sake of space, however, I must keep the discussion short. Suffice it to say that modularization processes are subject to functional pressures from the kind of tasks the individual must execute. Modularization is proportional to the importance which a certain task has in the life of a person. Reading and writing were not considered important in, for example nineteenth century rural Italy; however, they became important skills in the twentieth century, as nowadays most people can read and write in a literate society. Reading and writing involve a cognitive effort both in terms of learning through practice and in terms of memorization. It is therefore reasonable that these efforts must be offset by cognitive benefits or rewards which make them worth-while. Reading and writing offers people the tools for learning about the world and having access to information not available otherwise. In the case of default inferences too the efforts involved in modularizing this type of know-how must be offset by cognitive effects or rewards which make modularization processes worth-while. It can be assumed that default inferences alleviate the inferential burden by diminishing the number of inferential steps involved in the calculation of explicatures.

Finally, I assume that modularization is a positive function of the frequency of the data memorized in an archive. Reading and writing are modularized activities which



are learned through repeated practice. Default inferences too are memorized in abstract form in memory cells of the default semantics archive through repeated practice. Memorization is triggered after such a practice has exceeded a certain number of times  $n$ ,  $n$  being a compromise between cognitive effects and the cognitive efforts involved in memorization.

## 6. Conclusion

In this paper, I have subordinated the discussion of the attributive/referential distinction to the discussion of pragmatics and modularity of mind. In particular, I have responded to a number of concerns voiced by Cummings (2009) in connection with a theory of pragmatics that rests on modularity. It seems to me that on the basis of arguments grounded in a discussion of the attributive/referential distinction, inferential processes as triggered by utterance types can be seen as encapsulated provided that a reasonably weak and adequate notion of encapsulation is used, say the one advocated independently by theorists of massive modularity. Massive modularity can be seen as the idea that the number of modules must be multiplied in order to ensure greater flexibility and functional specialization aimed at providing quicker responses to environmental problems. At the same time it must be seen as the idea that there are multiple interactions among the numerous modules. Theorists of massive modularity go to great length in explaining connections among modules. Great importance is conferred in this picture on the practical reasoning module, which clearly makes use of general intelligence in order to answer complex questions. I propose that Cummings' considerations about modularity should be made sense of in the context of massive modularity, which, on the one hand allows for a Theory of Mind module, and on the other hand allows for interactions with other modules, including the practical reasoning module, which, of course, rests on the exploitation of general intelligence, as pointed out very cogently by Cummings. It is honest to point out that Cummings is certainly right in saying that some inferential processes are not automatic, fast, encapsulated and obligatory and these processes are of the reflective type. But this is another story which must be discussed in another paper [see Zielinska (2010) on how this story should proceed].

In this paper I also reflected on the notion of modularization in connection with default readings of NPs as referential. Modularization is an important concept as it presupposes a view of cognition in which both innate constraints and learned constraints are operative in language acquisition and production. It seemed to me that the default inferences proposed by Jaszczolt have various features of modularization, as it is possible that a default semantics archive is being constructed in order to store short-circuited inferences (the product of standardization, as I argued in my paper on default semantics and the architecture of the mind). Interestingly, default inferences à la Jaszczolt display three characteristics: they can be seen as re-descriptions of processes occurring through the Principle of Relevance; they act probabilistically rather

than deterministically; it is in principle possible to standardize default inferences by learning them (or by creating a default semantics archive).

It is not unusual to end a paper by voicing further questions which the discussion has served to raise. Why is it that the human mind is programmed to store and use 'default interpretations'? I think this has to do with the number of simplification principles which the mind uses in order to reduce the complexity of the reality with which it is ordinarily confronted. Default interpretations can be seen as an attempt to model reality in a more simplified way. Contextual augmentations have the potential to calibrate inferences, to make them suited to particular contexts, to add richness to the schematic nature of basic pragmatic inference.

## References

- Allan K 2010 'Referring as a pragmatic act' in A Capone (ed.) 'Pragmemes. Special Issue' *Journal of Pragmatics* 42: 2919–2931.
- Bach K 1981 'Referential/attributive' *Synthese* 49: 219–244.
- Bach K 2004 'Descriptions: points of reference' in M Reimer & A Bezuidenhout (eds) *Descriptions and Beyond* Oxford: Clarendon Press. pp. 189–229.
- Barrett CH 2005 'Enzymatic computation and cognitive modularity' *Mind and Language* 20(3): 259–287.
- Beyer C 'A neo-Husserlian theory of speaker's reference' *Erkenntnis* 54: 277–297.
- Bezuidenhout A 1997 'Pragmatics, semantic underdetermination and the referential/attributive distinction' *Mind* 106(423): 375–407.
- Blakemore D 2000 'Indicators and procedures: *nevertheless* and *but*' *Journal of Linguistics* 36: 463–486.
- Bontly T 2005 'Conversational implicature and the referential use of descriptions' *Philosophical Studies* 125: 1–25.
- Burton-Roberts N 2005 'Robyn Carston on semantics, pragmatics, and "encoding"' *Journal of Linguistics* 41: 389–407.
- Capone A 2006 'On Grice's circle' *Journal of Pragmatics* 38: 645–669.
- Capone A 2009 'Are explicatures cancellable?' *Intercultural Pragmatics* 6(1): 55–83.
- Capone A 2010a 'Between Scylla and Charybdis: the semantics and pragmatics of attitudes "de se"' *Intercultural Pragmatics* 7(3): 471–503.
- Capone A 2010b 'What can modularity of mind tell us about the semantics/pragmatics debate?' *Australian Journal of Linguistics* 30(4): 497–522.
- Capone A (ed.) 2010c 'Pragmemes. Special Issue' *Journal of Pragmatics* 42.
- Capone A 2011 'Default semantics and the architecture of the mind' *Journal of Pragmatics*.
- Carruthers P 2006 *The Architecture of the Mind* Oxford: Oxford University Press.
- Cram D & P Hedley 2005 'Pronouns and procedural meaning: the relevance of spaghetti code and paranoid delusion' *Oxford working papers in linguistics, philology and phonetics* 10: 187–210.
- Cummings L 2009 *Clinical Pragmatics* Cambridge: Cambridge University Press.
- Davis WA 1998 *Implicature: intention, convention, and principle in the failure of Gricean theory* Cambridge: Cambridge University Press.
- Devitt M 2003 'The case for referential descriptions' in A Bezuidenhout & M Reimer (eds) *Descriptions: semantic and pragmatic perspectives* Oxford: Oxford University Press.
- Devitt M 2007 'Referential descriptions and conversational implicatures' *European Journal of Analytic Philosophy* 3(2): 7–32.
- Donnellan K 1966 'Reference and definite descriptions' *Philosophical Review* 75: 281–304. Reprinted in: Davis S (ed.) *Pragmatics. A reader* Oxford: Oxford University Press. pp. 52–63.

- Fodor JA 1983 *The Modularity of Mind* Cambridge, MA: MIT Press.
- Fodor JA 2000 *The Mind Doesn't Work That Way: the scope and limits of computational psychology* Cambridge, MA: MIT Press.
- Griffiths P & K Stotz 2000 'How the mind grows: a developmental perspective on the biology of cognition' *Synthese* 122: 29–51.
- Higginbotham J 2009 *Tense, Aspect and Indexicality* Oxford: Oxford University Press.
- Hirschberg J 1985 *A theory of scalar implicature* Unpublished dissertation, University of Pennsylvania.
- Huang Y 2000 *Anaphora. A crosslinguistic study* Oxford: Oxford University Press.
- Jaszczolt K 1999 *Discourse, Beliefs and Intentions* Oxford: Elsevier.
- Jaszczolt K 2005 *Default Semantics. Foundations of a compositional theory of acts of communication* Oxford: Oxford University Press.
- Karmiloff-Smith A 1992 *Beyond Modularity. A developmental perspective on cognitive science* Cambridge, MA: MIT Press.
- Kasher A 1991 'On the pragmatic modules' *Journal of Pragmatics* 16: 381–397.
- Kripke S 1977 'Speaker's reference and semantic reference' in P Fench, T Uehling & H Wettstein (eds) *Contemporary Perspectives in the Philosophy of Language* Minneapolis: University of Minnesota Press. pp. 6–27.
- Levinson S 2000 *Presumptive Meanings* Cambridge, MA: MIT Press.
- Linsky L 1971 'Reference and referents' in D Steinberg & L Jakobovits (eds) *Semantics. An interdisciplinary reader in philosophy, linguistics and psychology* Cambridge: Cambridge University Press. pp. 76–84.
- Mey J 2001 *Pragmatics* Oxford: Blackwell.
- Neale S 1990 *Descriptions* Cambridge, MA: MIT Press.
- Perconti P 2008 *L'autocoscienza. Cosa è, come funziona, a cosa serve* Bari: Laterza.
- Powell G 2001 'The referential-attributive distinction—a cognitive account' *Pragmatics and Cognition* 9(1): 69–98.
- Predelli S 2003 'Russellian description and Smith's suicide' *Acta Analytica* 18(31): 1–17.
- Price HH 1932 *Perception* London: Methuen.
- Recanati F 1989 'Referential/attributive: a contextualist proposal' *Philosophical Studies* 56: 217–249.
- Rouchota V 1992 'On the referential/attributive distinction' *Lingua* 87: 137–167.
- Salmon N 1982 'Assertion and incomplete definite descriptions' *Philosophical Studies* 42: 37–45.
- Searle J 1979 'Referential and attributive' in J Searle (ed.) *Expression and Meaning. Studies in the theory of speech acts* Cambridge: Cambridge University Press.
- Segal G 1996 'The modularity of theory of mind' in P Carruthers (ed.) *Theories of Mind* Cambridge: Cambridge University Press. pp. 141–157.
- Simon H 1986 'Rationality in psychology and economics' *The Journal of Business* 59(4), Part 2: 209–224.
- Soames S 1994 'Donnellan's referential/attributive distinction' *Philosophical Studies* 73: 149–168.
- Strawson P 1951 'On referring' in *Logico-Linguistic Papers*. London: Methuen.
- Wettstein H 1981 'Demonstrative reference and definite descriptions' *Philosophical Studies* 40(2): 241–257.
- Wettstein H 1983 'The semantic significance of the referential-attributive distinction' *Philosophical Studies* 44: 187–196.
- Wettstein H 2010 'Having in mind' MS.
- Wilson D & D Sperber 2002 'Truthfulness and relevance' *Mind* 111: 583–632.
- Zielinska D 2010 'Prepositions and explicature from the perspective of the selective mode of language use in the quantized c-field (SMLU) approach' in A Capone (ed.) *Perspectives on Language Use and Pragmatics* Muenchen: Lincom. pp. 181–210.