The semantics-pragmatics interface:
How it works, why we need it, and where it is?[1]

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1. Introduction

During the last decades, linguistic theory has been concerned with the syntax-semantics interface, mainly with issues linked to scope of operators (negation, quantifiers, modals) and with the syntactic or semantic nature of structural representations. One important trend in syntactic theory (for instance the cartographic approach) is devoted to the syntax-pragmatics interface, with strong arguments in favor of the syntactization of pragmatics, that is, a structural explanation of pragmatic issues, such as information structure, topic and focus and their syntactic loci in syntax (Rizzi 2013, Haegeman 2013 to cite only a few).

Even if the Semantics-Pragmatics Interface (SPI) is now in the agenda of formal semantics (Beaver et al. 2013), mainly with the aim to increase the explanatory power of dynamic semantics in accounting for context, implicature, presupposition, etc., the benefit of pragmatic theory (mainly neo- and post-Gricean approaches) has not been seriously taken into account (Moeschler 2015a).

In this article, I would like to make a series of propositions regarding the following issues:

A. How is the SPI supposed to work? Broadly speaking, is pragmatics the output of semantics or is pragmatic meaning systematically intruded onto semantics? I will show that both perspectives (pragmatics as an output and pragmatic intrusion) do not give satisfactory answer to the SPI issue. My main argument will be based on the nature of semantic and pragmatic meanings, their conventional, truth-conditional and inferential aspects. I will show that the S-P border is porous, and that some inferred meanings are more semantic than pragmatic and vice versa. The first contribution of my proposal will be that there is a continuum between semantic and pragmatic meanings.

B. Why do we need an SPI? SPI has as a main function to allow quick and efficient information transfer, from non-linguistic source to linguistic one, and vice versa. Contextual information is generally required to proposition enrichment, as well as to access contextual assumptions, in order to trigger implicit and explicit inferred meaning. On the other hand, linguistically encoded meaning is the starting point to enrichment processes in order to access reference, inferred conceptual representations, as well as implicatures (at least conventional and generalized conversational ones).

C. Where is SPI located? SPI is mainly a linguistic issue: semantic meaning is the locus of pragmatic processes, which implies that its conceptual or procedural nature has some impacts on the way pragmatic meaning derivations are obtained. I will give some examples of SPI location with discourse connectives, and more precisely causal connectives.

This article is organized as follows: Section 2 explains the reason why SPI is required in linguistic theory, and what are the main proposals since the Gricean Turn

in pragmatics. Section 3 discusses the possible SPI from a more general perspective, that is, including the relation between syntax, semantics and pragmatics. Section 4 answers the question of the function of the SPI, mainly with a discussion on scalar implicatures. Section 5 is about the location of SPI, which will be illustrated by causal connectives, their conceptual and procedural meaning at the levels of entailment, explicature and implicature. Finally, section 6 presents a global picture of SPI.

2. The semantics-pragmatics interface

The necessity of a Semantics-Pragmatics Interface (SPI) is due to the following empirical facts: (i) some pragmatic inferences (Conversational Implicatures, CI) are triggered by linguistic items; (ii) pragmatic meaning seems to be more than non-truth-conditional (e.g. explicatures); (iii) pragmatic meaning can be determined by truth-conditional meaning, as causal connectives show.

(i) Linguistic and pragmatic meanings: the case of implicatures.

Generalized conversational implicatures (GCI) raise the issue of the encoding of pragmatic meaning. Are conversational implicatures (CI) parts of the semantic meaning or are they contextually triggered? The first option leads to the 'pragmatic meaning by default' solution: a CI is triggered as a default inference. On the contrary, the second option leads to the 'contextual solution': a CI must be contextually licensed or contextually blocked. For instance, how about (1) and (2)? The default solution predicts that CIs will be triggered (1-2a), whereas the contextual solution predicts that it will not (the logical reading will be inferred in (1-2b)); second, the scalar implicature (2a) in (2) is predicted, the logical reading being not accessible without a specific context (2b):

(1) Some elephants have trunks.

    a. ?? not all elephants have trunks

    b. all elephants have trunks

(2) Some of my students passed the exam.

    a. not all of my students passed

    b. ?? all of my students passed

So, the predictions of these two solutions are not the same. The default approach predicts that CIs should not be costly, since they are default inferences. On the other hand, the contextual approach predicts that CIs are favoured in some contexts and blocked in others. Now, experimental approaches of scalar implicatures demonstrated that the contextual approach makes better predictions than the default one (Noveck 2001, Reboul 2004, Noveck & Sperber 2007, Noveck & Reboul 2010). For instance, the logical inference (1b) is easily triggered by young children, which shows that scalar implicatures are not default inferences, but the results of the development and the maturation of a pragmatic competence.

As a consequence, the apparent advantage of the default approach – CIs are attached to lexical meaning – is ruled out by cognitive evidences. However, the contextual approach is not without disadvantages: pragmatic meaning is not calculable without accessing contextual assumptions. So although SPI is clearly defined in the default approach, it is unclear in the contextual one. In fact, the contextual approach raises the question of what is represented in lexical meaning. To answer this question, one could use the Relevance-theoretical difference between linguistically encoded concepts and communicated inferred concepts (*ad hoc* concepts – Carston 2002, Wilson 2003, Wilson & Carston 2007). But a new question arises: what is linguistically encoded?

(ii) Explicatures vs. Cis

The second empirical fact justifying the SPI is given by pragmatic meanings that are the results of inferences and not implicit, but explicit, that is, *explicatures*. Explicatures pertain to pragmatic meaning, which is not conveyed implicitly: an explicature is an assumption that is a development of the logical form encoded by the utterance (Sperber & Wilson 1986).[2] A classical example is given by the specific meaning of *bachelor* (a young man eligible for marriage):

(3) Mary is happy: she finally met a bachelor.

Whereas CIs are traditionally defined as non-truth-conditional meanings (they do not contribute to the truth-value of the proposition and they are cancellable as in (4)), explicatures are pragmatic truth-conditional meanings playing a role in the determination of the truth-value of the proposition: the truth-conditions of *P and Q* is not identical to those of *Q and P*, as (5) shows:

(4) John fell and Mary pushed him, but not in this order.

(5) It's always the same at parties: either I get drunk and no-one will talk to me or no-one will talk to me and I get drunk.

The consequence of the intrusion of the notion of explicature as a pragmatic meaning is evident: it reduces the area of CIs and it breaks the clear-cut border between semantics and pragmatics. This is because there are pragmatic meanings which are developments of logical forms and which are truth-conditional. Unfortunately, a new issue is raised by the notion of explicature: explicatures should not be defeasible, because this property is restricted to non-truth-conditional meaning, that is, conversational implicatures. In fact, explicatures are cancellable, as

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[2] "An assumption communicated by an utterance *U* is *explicit* if and only of it is a development of a logical form encoded by *U*" (Sperber & Wilson 1996, 182).

(7) and (8) show: (7) shows that the explicature of (6) [together] can be defeated without contradiction:[3]

  (6) Abi and Fée climbed the Roche de Solutré [together]

  (7) Abi and Fée climbed the Roche de Solutré, but not together.

  (iii) Pragmatic meaning determined by truth-conditional meaning

Conversely, there are pragmatic meanings which are dependent on truth-conditional meanings. This is the case with the temporal and causal meanings of connectives like *and* and *because*. First, in order for *P and Q* to mean *P and then/because of this Q*, both conjuncts must be true, as (8) shows; second, in order for *P because Q* to infer that *Q CAUSE P*, both *P* and *Q* must be true (9):

  (8) # Mary pushed John and he fell, but I know that it did not happened.

  (9) # John fell because Mary pushed him, but none of these event happened.

What are the empirical evidences of these constraints? Temporal meaning of *and* can be defeated: in this case, what is evaluated is not the truth vs. falsehood of the propositions, but the temporal relation between them (Wilson & Sperber 2012, chapter 8):

  (10) What happened was not than Peter left and Mary got angry but that Mary got angry and Peter left.

In the case of causal relations, the causal meaning of *because* cannot be defeated: what can be false is either the effect, or the causal relation: (11) can be interpreted as (12) or as (13):

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[3] This raises the question of the criterion defining an explicature. The only possible answer is that what makes the difference between explicature and implicature lays in their truth-conditions. So, it means that the propositions expressed in (6) and (7) are not the same proposition, because the truth-conditionality property of an explicature implies that the proposition expressed and its explicatures should have the same truth-value (Moeschler 2013 for a development).

(11) John did not fall because Mary pushed him

(12) John did not fall, and the reason is that Mary pushed him (he could fall before)

(13) It is not because Mary pushed John that he fell, but because he slipped down.

Hence, *and* and *because* 'presuppose' the truth of the proposition they connect (Blochowiak 2014a, 2014b).

So, what are the provisory conclusions of this section? The first conclusion is that the SPI is more complex than the traditional Gricean pragmatics predicts. Indeed, the Gricean criteria defining the border between Semantics and Pragmatics are ruled out: (a) the truth-conditional vs. non truth-conditional aspect of meaning, (b) the cancelation criterion for implicature and (c) the implicit vs. explicit aspect of meaning.

3. Possible SPIs

What are the possible Semantics-Pragmatics Interfaces? In linguistic theory, there, are at least two classical answers: (A) pragmatics as output of the linguistic system; (B) the pervasive pragmatic intrusion into semantics. But even a superficial analysis of these solutions gives rise to negative results, because both proposals are unsatisfactory: the first solution implies a step by step processing (from syntax to pragmatics), and cannot account for pragmatic intrusion, neither for parallel processing, whereas the second solution cannot account for the relation between explicatures and implicatures, and leads to the Gricean circle. Let examine more in details these two possible, even if improbable, solutions.

A. The linear model

In the linear model (Moeschler & Reboul 1994, Introduction), semantics is the output of syntax, and pragmatics the output of semantics, as Figure 1 shows:

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┌─────────────────────────────┐
│            Syntax           │
└─────────────────────────────┘
               │
               ▼
┌─────────────────────────────┐
│  Structural représentations │
└─────────────────────────────┘
               │
               ▼
┌─────────────────────────────┐
│          Semantics          │
└─────────────────────────────┘
               │
               ▼
┌─────────────────────────────┐
│         Logical forms       │
└─────────────────────────────┘
               │
               ▼
┌─────────────────────────────┐
│          Pragmatics         │
└─────────────────────────────┘
               │
               ▼
┌─────────────────────────────┐
│    Complete interpretations │
└─────────────────────────────┘
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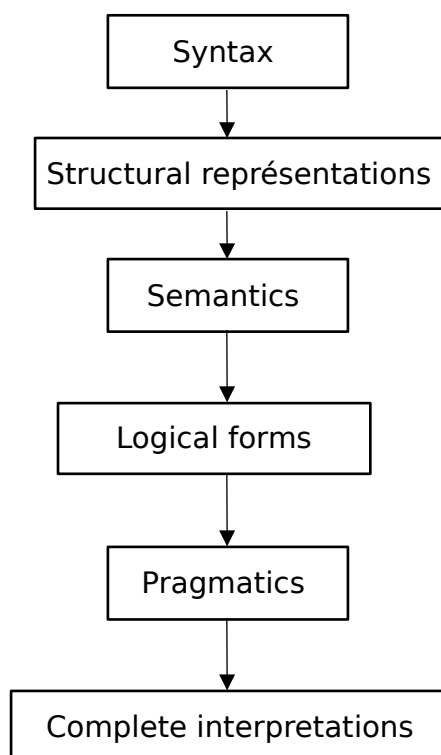
Figure 1: The linear model

Unfortunately, two big issues arise: first, in linguistic theory, semantics is an interface of grammar, not an output of syntax; and second, pragmatics does not belong to the linguistic system: it is not an input system (Fodor 1983), but belongs to the central system of the mind (Sperber & Wilson 1986).[4]

What does it mean for semantics to be an interface? In a formalist framework (for instance the *Minimalist Program*), logical forms (LF) are the interface of the computational system, as phonological forms (PF) are as represented in Figure 2:

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[4] For the revised version of Relevance Theory (Wilson & Sperber 2012, chapter 12), there is a pragmatic module, consisting of a comprehension and an argumentative module.

Lexicon

Merge and movement

Spell Out
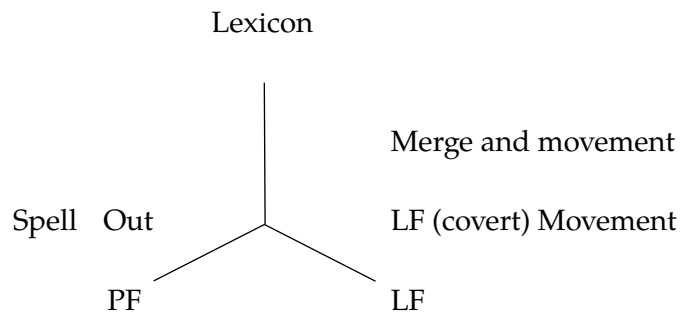
LF (covert) Movement

PF

LF

Figure 2: the architecture of Grammar in the Minimalist Program

In Hauser, Chomsky & Fitch (2002), interfaces are defined as the sensory-motor and the conceptual-intentional interfaces: the assumption is that phonological forms and logical forms are interfaces of the grammar, and belong to the faculty of *language in the broad sense* (FLB), whereas FLN (*faculty of language in the narrow sense*) is restricted to recursion.
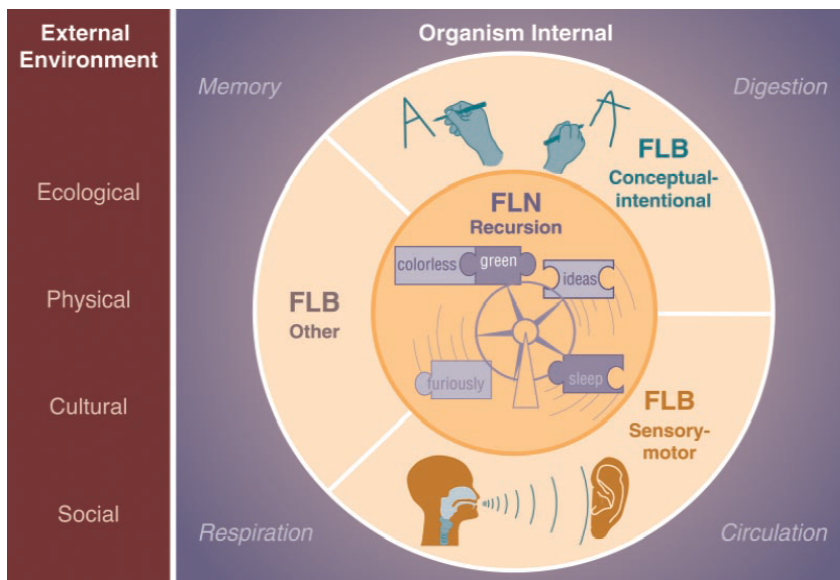

Figure 3: FLN, FLB and the interface of grammar (Hauser et al. 2002)[5]

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[5] This picture contrasts with the definition of language as form-meaning pairs, where no hierarchy between formal or semantic structures dominates (Jackendoff 2005): the flat phonological structures (PS), syntactic structures (SS) and conceptual structures (CS), implying 5 types of interfaces: interface to hearing and vocalization, PS-SS interface rules, SS-CS interfaces rules, PS-CS interfaces rules, and interfaces to perception and action.

B. Linguistics and pragmatics

One strong assumption of pragmatic theory is that pragmatics is not a component of linguistics, but part of the central system of the thought (Sperber & Wilson 1986). In other words, pragmatic is not a module and is not devoted to specific tasks. It brings together information from different sources (linguistic, visual perception, audition, etc.). This means that pragmatics deals with different inputs (supposed to be translated into the same format) processed by the inferential central system. Linguistic information is one among other types of information processed by the central system of thought. The question that rises at this point of the discussion is: what is the relation between linguistics and pragmatics in this approach to pragmatics?

One possible answer is pragmatic intrusion. The concept of *pragmatic intrusion* implies that pragmatic interpretation affects semantic interpretation. Levinson (2000) has given number of well-known data arguing for pragmatic intrusion:[6]

a. conditional perfection (Geis & Zwicky 1971): natural language conditionals are interpreted as bi-conditionals:

(14) If you mow the lawn, I'll give you five dollars
     +> If you don't mow the lawn, I don't give you five dollars

b. conjunction buttressing (Atlas & Levinson 1981): conjunction is interpreted with more specific pragmatic meanings (temporal and causal):

(15) John turned the key and the engine started.
     +> John turned the key and then/ and because of this the engine started

c. bridging (Clark & Haviland 1977): nominal anaphoras are connected with part-whole relations:

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[6] I put aside here the many arguments given by Ross (1970) and Lakoff (1972) in favour of the Performative Hypothesis, mainly because it concerns the syntactic representation of illocutionary force, which is an issue outside the scope what I define here as SPI.

(16) John unpacked the picnic. The beer was warm
   +> The beer of the picnic

d. inference on a stereotype (Atlas & Levinson 1981): stereotype information implies gender presupposed professional specialisation (a secretary is a typically a woman rather than a man):

(17) John said 'Hello' to the secretary and then he smiled.
   +> the woman secretary

e. negative strengthening (Horn 1989): the negation of a contrary will implicate (by R/M implicature) its contrary (*not liking* weakly means *disliking*):

(18) I don't like Alice.

   +> I dislike Alice

f. mirror maxim (Harnish 1976): in (19), the preferred interpretation is that the piano was bought by both Harry and Sue, and not that each of them bought a different piano:

(19) Harry and Sue bought a piano.

   +> Harry and Sue bought a piano together

These facts seem at a first glance convincing: pragmatic meaning seems to interfere with semantic meaning. So what is wrong with the notion of pragmatic intrusion? The answer is straightforward: in a neo-Gricean perspective, pragmatic intrusion implies that pragmatic inferences contribute to truth-conditions. For instance, in bridging, reference resolution (as a pragmatic process) determines the truth-conditions of the full proposition. In other terms, implicatures contribute to truth-conditions, whereas the classical Gricean approach predicts that what is said contributes to what is implicated. This yields the Gricean circle, which can be stated as follows:

(20) The Gricean circle:
   a. Implicatures (what is implicated) are computed on the basis of the

proposition expressed (what is said).

b. Implicatures determine the proposition expressed (truth-conditional meaning).
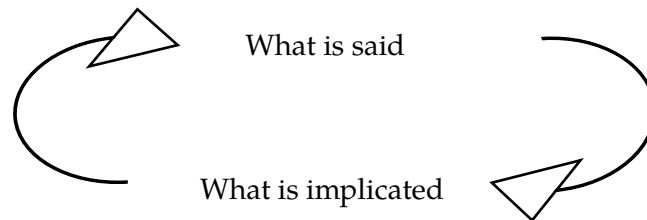

Figure 3: The Gricean circle

What are the repercussions of this discussion on pragmatic intrusion? First, it shows that the border between semantics and pragmatics is porous. Second, it reveals that some aspects of pragmatic meaning are truth-conditional (as explicatures), while other are not (implicatures). And third, it becomes evident that other meaning relations need to be taken into account, as entailment and presupposition, in order to fix the SPI (Moeschler 2013).

4. The function of the S-P interface

Why do we need the SPI? First, the SPI has as a main function to allow quick and efficient information transfer from non-linguistic sources to linguistic ones, and vice versa. For instance, contextual information is generally required for propositional enrichment to trigger implicit and explicit inferred meaning, and it must work in a cooperative way with linguistic information. Second, even if linguistic and non-linguistic information has to be put together, the linguistically encoded meaning is the starting point of the enrichment process to access reference, inferred conceptual representations, and implicatures. In this section, I would like to show how this division of labour can be plugged in an efficient SPI by looking at the case of scalar implicatures. Scalar implicatures (SIs) are a classical case of the SPI, allowing predictions about its function.

SIs are triggered by quantifiers and are closely connected with their logical meaning, as represented by the logical square (Horn 2004):

Affirmation   Negation

Universals **A**   Contraries   **E**

∀x   *all*   *none*   ¬∃x

Contradictories

∃x   *some*   *some…not/not all* ∃x ¬/ ¬∀x

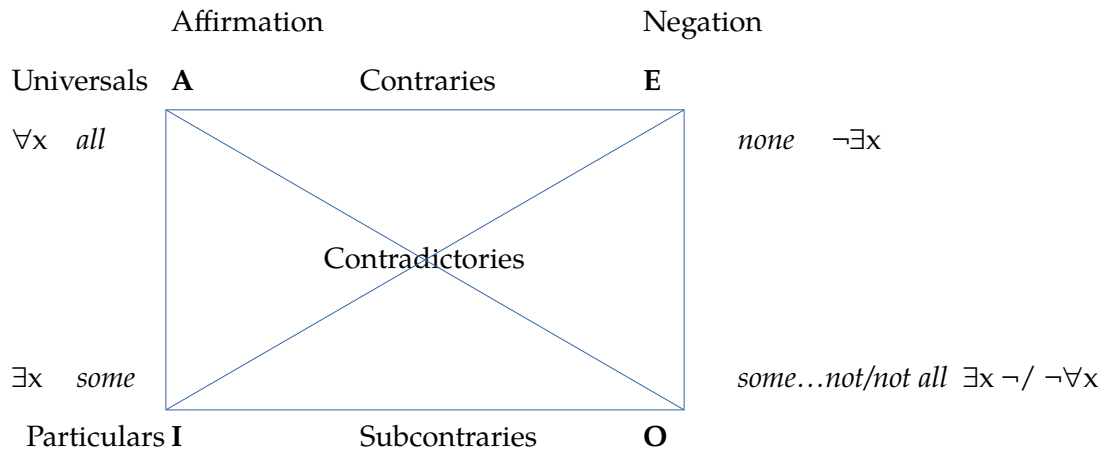Particulars **I**   Subcontraries   **O**

Figure 4: the logical square

Horn's theory of scalar implicature connects a general principle of semantic scales and the principle-Q: a weak form implicates the negation of a strong one, the weak and strong forms belonging to the same semantic scale: so, as <I, A> and <O, E> are semantic scales, the prediction is that I implicates not-A and that O implicates not-E, as stated (21) and (22):

(21) a. I +> not-A = O

b. O +> not-E = I

(22) a. some x +> not all x

b. not all x +> some x

In other terms, subcontraries in the logical square implicates each other.

In what follows, I will assume a strong connection between particulars, but I propose a different analysis (cf. Moeschler in press and under review for developments). I will insist on what is linguistically encoded (*semantics*) and what is inferred (*pragmatics*). The results of my analysis will be that the pragmatic meanings of *some* and *some…not* have to be interpreted as explicatures, and not as implicatures.

Let us begin with the semantic and pragmatic meanings of particulars. What could be the semantics and pragmatics of *some* and *some…not*? I will make here three assumptions. First, there is a strong connection between both particulars, this relation being expressed by a complement operation. Second, their semantics is defined as what is truth-conditionally incompatible with each particular: *some* is logically incompatible with *no*, as they are contradictories, and *some…not* is logically incompatible with *all*, since they are also contradictories. Third, their pragmatics is given by their incompatibility with their upper-bound correlates: *some* is pragmatically incompatible with *all*, and *some…not* with *none*.

So, in a nutshell, a Boolean semantics and pragmatics for *some* and *some…not* can be given:

(23) Semantics of *some X are Y* [7]
    a. the intersection between *X* and *Y* (the sets denoted by *X* and *Y*) is not empty
    b. *some X are Y* is semantically incompatible with *no X is Y*
    c. $[\![X]\!] \cap [\![Y]\!] \neq \varnothing$

(24) Pragmatics of *some X are Y*
    a. X is not included in *Y*, because there must be a sub-set of *X* which is not in *Y*
    b. *some X are Y* is pragmatically incompatible with *all X are Y*
    c. $[\![X]\!] \not\subset [\![Y]\!]$

So, *some X are Y* has as pragmatic meaning its explicature *only some X are Y.* The same analysis stands for *some…not*:

(25) Semantics of *some X are not-Y*
    a. the complement of the intersection between *X* and *Y* (the sets denoted by *X* and *Y*) is not empty
    b. *some X are not Y* is semantically incompatible with *all X are Y*
    c. $\mathsf{C}([\![X]\!] \cap [\![Y]\!]) \neq \varnothing$

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[7] This semantics is not incompatible with a proper inclusion of *X* into *Y* (its pragmatics is) or with the proper inclusion of *Y* into *X*. This is the case when (i) an inclusion of *X* into *Y* is not possible, and (ii) *Y* is specifically a property attached to *X*. For examples, whereas *all women have children* is a false statement, *some women have children* is true, and illustrated the proper inclusion of *Y* into *X*. In this case, the SI of *some* $([\![X]\!] \not\subset [\![Y]\!])$ is blocked because of the specific semantic relation between *X* and *Y*, which satisfies the general semantics of *some* $([\![X]\!] \cap [\![Y]\!] \neq \varnothing)$.

(26) Pragmatics of *some X are not Y*

    a. the intersection between *X* and *Y* is not empty

    a. *some X are not Y* is pragmatically incompatible with *no X is Y*

    c. $[\![X]\!] \cap [\![Y]\!] \neq \varnothing$

Hence, *some X are not Y* has as pragmatic meaning its explicature *only some X are not Y.*

This first analysis is not very difficult to sum up: the relation between subcontraries, that is *some* and *some…not*, is not an implicature, but an entailment. Since their pragmatics excludes the upper-bound reading (*all* and *no*), the pragmatics of subcontraries is restricted to the truth of each of them, and not to the truth of one of them as the logical definition of subcontraries states (cf. Figure 5 and 6). So each subcontrary entails the other one, since they both must be true.

P	Q	P ∨ Q
1	1	1
1	0	1
0	1	1
0	0	0

Figure 5: the logical truth-conditions of subcontraries (inclusive disjunction)

P	Q	P ∧ Q
1	1	1
1	0	0
0	1	0
0	0	0

Figure 6: the pragmatic truth-conditions of subcontraries (logical conjunction)

To sum up, Table 7 shows that the semantics *of Some X are Y* is the pragmatics of *some X are not Y*, and vice versa.

	Semantics	Pragmatics
Some X are Y	$\{X\} \cap \{Y\} \neq \varnothing$	$\{X\} \not\subseteq \{Y\}$
Some X are not Y	$\complement(\{X\} \cap \{Y\}) \neq \varnothing$	$\{X\} \cap \{Y\} \neq \varnothing$

Table 7: the semantics and pragmatics of *some* and *some…not*

So, what is the difference between this analysis and the implicature analysis? The main difference lays in the truth-conditional vs. non-truth-conditional pragmatic meaning. In other words, the pragmatic meanings of subcontraries are explicatures. This raises a new question: what is the role of explicatures in utterance comprehension? Our answer is that the interpretation of particulars is directly dependent on their truth-conditional meanings, which are crucially context-dependent: the *not-all* and *not-none* interpretations can or cannot be triggered, depending on what the context is.

Now, how is the pragmatic meaning of subcontraries obtained? The assumption is that the relation with their semantics is based on an *exclusion condition*, triggering the processing of the semantics and pragmatics for *some* and *some…not*:

(27) The exclusion condition
1. exclude the incompatible semantic meaning
2. exclude the incompatible pragmatic meaning
3. enrich the pragmatic meaning by explicature.

In other words, this procedure yields a specification reading through narrowing the semantics of the particulars, following the heuristics given in Figure 5:

Figure 5: an informal heuristic for the computation of the pragmatics of *some* and *some… not*

Figure 6 gives a new version of the logical square by implementing semantic and pragmatic incompatibility:

O false   A   *all X are Y*   *no X is Y*   I   I false

pragmatically   semantically   pragmatically

incompatible   incompatible   incompatible

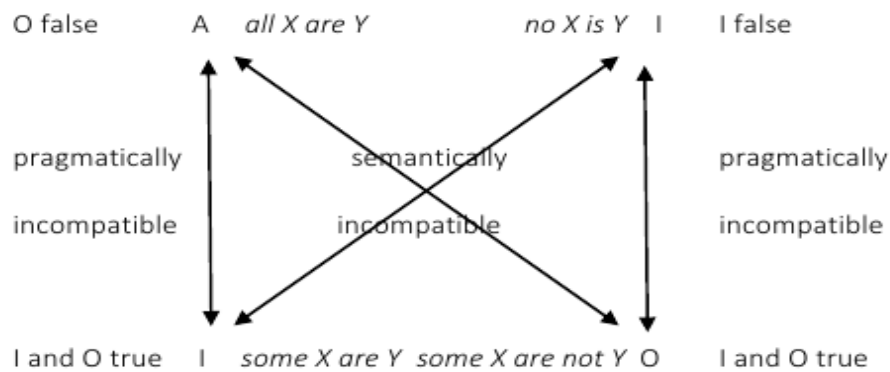I and O true   I   *some X are Y*   *some X are not Y*   O   I and O true

Figure 6: a new semantic and pragmatic logical square

We are now ready for a general explanation. Specification readings through narrowing of particulars (*only some*, *only some…not*) can receive a cognitive and communicative explanation. From a communicative point of view, two complementary explanations can be given: (i) in a Gricean perspective, it would be a violation of the first maxim of quantity in saying *some* while meaning *all*; (ii) from a Relevance-theoretical point of view, saying *some* while meaning *all* would conduct the addressee to unjustified inferences, giving rise to false conclusions, and therefore minimising the relevance of the utterance. The cognitive explanation is somehow more specific as regards the SPI: the partition reading for *some* and *some not* allows an efficient and rapid processing, avoiding useless cognitive processes. Interestingly, the prediction of this analysis is that negative particulars are not more costly cognitively than positive ones, even if they are semantically more complex (cf. Horn's conjecture[8] on negative particulars, Horn 2004 and Moeschler 2007).

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[8] "Given that languages tend not to lexicalize complex values that need not to be lexicalized, particularly within closed categories like quantifiers, we predict that *some…not* will not be lexicalized, and this is precisely what we find" (Horn 2004, 11).

5. The location of the SPI

The last question I would like to address is where is the SPI located? Let us start with the following assumption: the SPI is mainly a linguistic issue, because semantic meaning is the locus of pragmatic processes. So, in order to understand where the SPI is, we have to address the question of where conceptual and procedural meaning is located in semantic meaning. In order to answer this question, I will give some arguments from causal connectives and their semantic and pragmatic properties.[9]

How to explain the differences in semantic and pragmatic meanings between *parce que, donc,* and *et* (*because, therefore, and*)? Indeed, they can all have causal meanings, as in (28)-(30):

(28) Jean est tombé parce que Marie l'a poussé.
      'John fell because Mary pushed him.'

(29) Marie a poussé Jean, donc il est tombé.
      'Mary pushed John, therefore he fell.'

(30) Marie a poussé Jean, et il est tombé.
      'Mary pushed John, and he fell.'

My hypothesis is that the difference is not in the meanings encoded by these connectives, but in the layers of meaning they encode. At some level, all connectives encode a CAUSE relation and allow inferring the factive vs. non-factive status of the propositions connected.

More precisely, in all cases, causal inferences are obtained, but with different semantic and pragmatic paths: (a) some contents are the result of entailments (Blochowiak 2010, 2014a); (b) others are the result of explicatures or implicatures:[10]

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[9] See Moeschler (2015b) for a deeper analysis.

[10] When a proposition is entailed, it must be true. When a proposition is developed as an explicature, it allows assigning a truth-value to the propositional form. When a proposition is an implicature, it can be cancelled.

(31) Jean est tombé parce que Marie l'a poussé

 'John fell because Mary pushed him'

a. John fell & Mary pushed him

b. Mary pushed John CAUSE John fell

(32) Marie a poussé Jean, donc il est tombé. 'Mary pushed John, so he fell'

 a. Mary pushed John

 b. POSSIBLE (Mary pushed John CAUSE John fell)

(33) Marie a poussé Jean, et il est tombé.   'Mary pushed John, and he fell'

 a. John fell & Mary pushed him

 b. POSSIBLE (Mary pushed John CAUSE John fell)

First, what has to be explained at the level of entailment is why *donc* does not entail the consequence (John fell), that is, the sentence it introduces. First, the truth of the consequence is not guaranteed (✗) when the cause is an event, whereas it is the case (✓) with a state (Moeschler 2011 for extended evidences):

(34) a. ✗ Marie a trop mangé, donc elle est malade.
    'Mary ate too much, so she is ill'
    b. ✗ Marie a poussé Jean, donc il est tombé.
    'Mary pushed John, so he fell'

(35) a. ✓ Marie est mineure, donc elle ne peut pas boire d'alcool.
    'Mary is a minor, so she cannot drink alcohol'
    b. ✓ Axel est malade, donc le médecin le soigne.
    'Axel is ill, so the doctor is treating him'

Second, the consequences in (36) (Mary is sick, John fell) are not warranted. A modal operator can be introduced in the second sentence, what shows that the consequence can be false:

(36) a. Marie a trop mangé, donc elle doit être malade.
    'Mary ate too much, so she might be sick'
    b. Marie a poussé Jean, donc il a dû tomber.
    'Mary pushed John, so he might have fallen'

The same story works for *et*: it is compatible with situations where the cause relation is explicitly given as possible, but not certain:

(37) Marie a poussé Jean, et il est peut-être tombé.
    'Mary pushed John, and he may have fallen.'

But this is not possible with *parce que*: neither the consequence (38) nor the cause (39) can be modified by a modal[11], which demonstrates the factive properties of both the cause and the consequence in the content uses of *parce que* (Sweetser 1990):

(38) # Jean est tombé parce que Marie l'a peut-être poussé.
    'John fell because Mary may have pushed him.'

(39) # Jean est peut-être tombé parce que Marie l'a poussé.[12]
    'John fell because Mary may have pushed him.'

Finally, with *parce que*, the causal relation can be denied:

(40) Jean n'est pas tombé parce que Marie l'a poussé, mais parce qu'il a manqué une marche.
    'John did not fall because Mary pushed him, but because he missed a step'.

These data support the assumption that the causal relation is a conversational implicature with *donc* and *et*, and an explicature with *parce que*.

As a summary, these three connectives trigger different degrees of speaker's commitment regarding the truth of the propositions expressed:

a. *P* is entailed by all connectives – *parce que, donc, et*.

b. *Q* is entailed by *parce que* and *et*.

c. The CAUSE relation is an explicature with *parce que*, and an implicature with iconic order under the scope of a modal operator (*et, donc*) – it can be cancelled.

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[11] This is not the case with epistemic uses of *parce que* : *Jacques doit être au bureau parce que sa voiture est le parking* 'Jacques must be at work because his car is in the parking slot'.

[12] The only reading for (39) is POSSIBLE_CAUSE[Mary pushed John, John fell] and not CAUSE[Mary pushed John, POSSIBLE[John fell]] (Blochowiak 2010)

Hence, the same informative content is semantically and pragmatically distributed in different ways, as Table 8 shows:

	Entailment		Implicature	Explicature
parce que	P	Q		CAUSE (P,Q)
donc	P		POSSIBLE_CAUSE (P,Q)	
et	P	Q	POSSIBLE_CAUSE (P,Q)	

Table 8: semantic and pragmatic contents of causal connectives[13]

6. Accessibility and strength

The last issue I would like to address is the question of the impact of the type of inference on utterance interpretation. This is a relevant issue, since I made very strong proposals: SIs are not implicatures, but explicatures, and the meaning of causal connectives is shared in different layers of meaning (entailment, explicature and implicature). If these proposals make sense, then we should explain why some contents are semantic and others pragmatic, and why they are distributed as they are.

The type of answer I will give to this issue in based on two concepts: *accessibility* and *strength* of meaning (Moeschler 2013). The assumption is that entailment, implicature and explicature are distributed on two scales: accessibility and strength. Accessibility defines how much a meaning is accessible to consciousness, that is, necessary to be made explicit in order to be obtained. Entailments cannot be made explicit, but pragmatic meaning as explicature and implicature can, even if

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[13] In Moeschler (2015b), I propose that entailment, explicature and implicature are conceptual meaning, distributed in semantic (entailment) and pragmatic (explicature, implicature) ones. Procedural meaning is restricted to the causal direction, iconic for *donc* and *et*, non-iconic for *parce que*.

explicatures are more accessible than implicatures: some implicatures are not triggered as in (1) and (2), but generally speaking, GCIs are:[14]

(41) # I bought a Chow, so I bought a dog
     entailment: Chow(x) $\rightarrow$ dog (x)[15]

(42) Abi and Fée climbed the Roche de Solutré, and they did it together
     explicature: Abi and Fée climbed the Roche de Solutré [together]

(43) Anne has three children, I mean no more than three.
     Implicature: Anne has no more than three children

(44) gives the accessibility scale:

(44) Accessibility scale

     explicature > implicature > entailment

The second criterion is strength: strength defines the type of speaker's commitment. Semantic meanings, as entailment, but also presupposition[16], imply a stronger commitment than pragmatic ones, and explicatures are stronger than implicatures, because they are truth-conditional:

(45) Strength scale:

     entailment > explicature > implicature

If we put together these two scales, we obtain an interesting result:

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[14] Here is clear case that show that a GCI is generally triggered: Jacques: How is my salad ? Anne: Good. Jacques: You mean, not very good? Anne: It lacks vinegar.

[15] For a general theory of conceptual hierarchy, see Reboul (2007).

[16] See Moeschler (2015a).

+ ⬅———————— Accessibility ————————➡ –

explicature   implicature   entailment

+ ⬅———————— Strength ————————➡ –

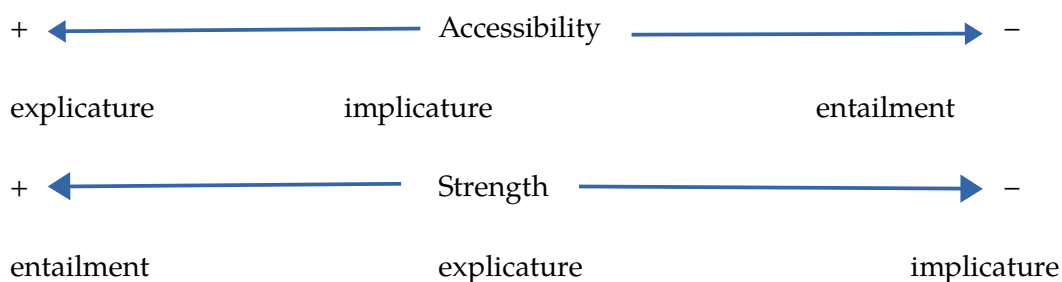entailment   explicature   implicature

Figure 7: Accessibility and strength scales

Explicature and entailment are the most accessible and the strongest, entailment and implicature the less accessible and the weakest, whereas implicature and explicature are mid-ranked for accessibility and strength respectively.

What are the consequences of this picture of meaning relations? First, it shows that whatever the meaning type, lexical items are the main locus of the SPI: all my arguments have been given from lexical meaning, dispatched between semantics and pragmatics. The second consequence is that SPI, the topic of this paper, can be made visible by the continuum of semantic and pragmatic relations as entailment, explicatures and implicatures. Quantifiers as *some* and *some…not* have shown how basic semantic relations (inclusion, intersection) are distributed at the semantic and pragmatic level, whereas causal connectives have demonstrated how propositional meanings are distributed in the semantics-pragmatics continuum.

Figure 9 sums up the different proposals for the location of the SPI:

– ⬅   ACCESSIBILITY   ➡ +

entailment   implicature   explicature

+ ⬅   STRENGTH   ➡ –

entailment   explicature   implicature

– ⬅   EXPLICITNESS   ➡ +

entailment   implicature   explicature

+ ⬅   TRUTH-CONDITIONALITY   ➡ –

entailment   explicature   implicature

– ⬅   CONTEXTUALISATION   ➡

+

entailment   explicature   implicature

– ⬅   INFERENCE   ➡ +

entailment   explicature   implicature

SEMANTICS ⬅   ➡ PRAGMATICS

entailment   explicature   implicature
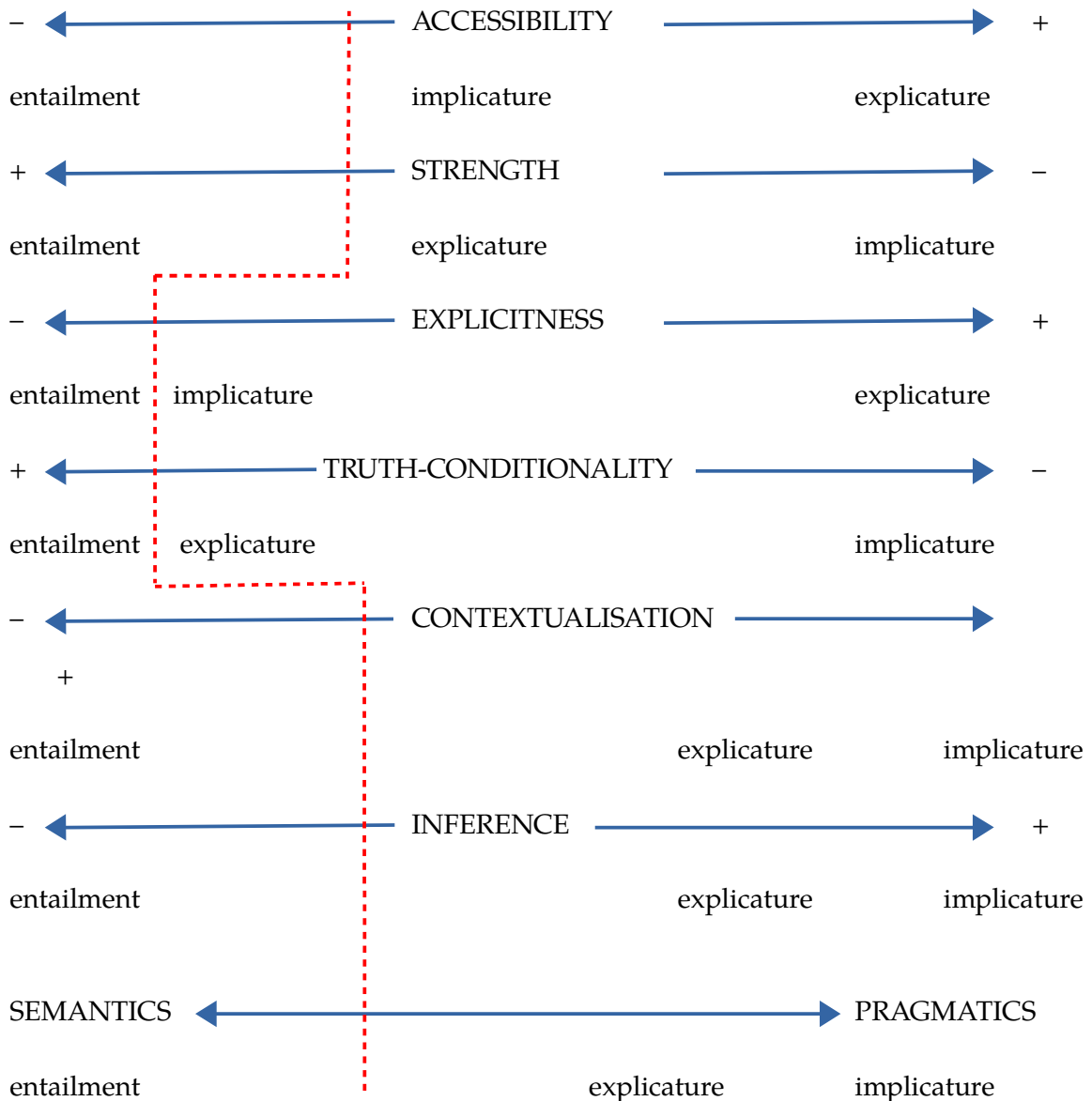
Figure 9: Properties of semantic and pragmatic meanings:

the red line describes the S-P 'border'

7. Conclusion

In this paper, I addressed the issue of the SPI interface, and tried to give an edge to the border between semantic and pragmatic meaning. Figure 9 shows that the truly pragmatic properties (contextual, inferential accessible) are not all informative: inference is not specific to pragmatic meaning (logic is the theory of inference), context is not specific to meaning (action have to be contextualized for instance), and that accessibility is not specific to meaning either (objects can be more or less

accessible for instance). So, it means that what is more informative is not straightforward specific to semantic and pragmatic meaning: pragmatic meaning is strong and weak, explicit and implicit, truth-conditional and not-truth-conditional. Hence, the border between semantics and pragmatics definitively resembles a geographic border, shaped by landscape, instead of a linear desert border![17]

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[17]A good geographical illustration is given by the border between two Swiss canton, Vaud and Fribourg, which includes enclaves, and mix geographical and linguistic border.

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