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BOOK CHAPTER

The Conceptual–Procedural Distinction: Past, Present and Future

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Abstract

My aim in this paper is to reassess the conceptual–procedural distinction in the light of the last twenty years of research, and to consider some possible revisions or extensions. Section 1 is a brief introduction. In section 2, I outline the rationale for drawing a conceptual–procedural distinction of the type proposed in relevance theory (Blakemore 1987, 2002; Wilson and Sperber 1993). In section 3, I discuss some current issues and objections, looking in particular at whether procedural meaning is properly regarded as semantic, and at whether a single item can encode both conceptual and procedural meaning. In section 4, I suggest some possible revisions and extensions in the light of recent research on lexical pragmatics (Wilson & Carston, 2007; Sperber & Wilson, 2008a). In section 5, I discuss the relation between the conceptual–procedural distinction and the ‘massive modularity’ hypothesis (Sperber, 2005; Carruthers, 2006), and suggest some further revisions or extensions. I conclude that the conceptual–procedural distinction is well founded, and may have much more general application than has previously been thought.

Keywords

CODING, INFERENCE, GRAMMATICALISATION, LEXICAL PRAGMATICS, MASSIVE MODULARITY

1. Introduction

A fundamental question for linguistic semantics is whether all word meaning is cut to a single pattern. Is there some level of analysis at which all words can be seen as encoding the same type of meaning: say concepts (Fodor, 1975, 1998), or instructions to fetch concepts (Pietroski, 2010), or rules for use in performing felicitous speech acts (Austin, 1962)? If so, some other machinery will be needed to explain the contrasting patterns of behaviour that have been used to motivate a wide range of traditional semantic or pragmatic distinctions: between describing and indicating, truth-conditional and non-truth-conditional content, grammaticalised and lexicalised meaning, saying and conventionally implicating, asserting and presupposing, propositional content and illocutionary force, character and content, and so on. On the other hand, the idea that there is more than a single type of encoded meaning – as in the relevance-theoretic proposal that some words encode concepts and others encode procedures (Blakemore, 1987, 2002; Wilson & Sperber, 1993) – might help to explain the contrasting patterns of behaviour underlying at least some of these distinctions.

To take just one illustration, an interesting series of recent cross-linguistic studies suggests that the acquisition and comprehension of linguistic indicators of epistemic modality or evidentiality may pattern differently depending on whether they are grammaticalised or lexicalised. According to Matsui, Yamamoto and McCagg (2006), for instance, three-year-old Japanese children understand the grammaticalised sentence particles *yo* and *kana*, which indicate the speaker’s relative certainty or uncertainty about the truth of her assertion, a year earlier than English children understand the corresponding lexicalised expressions *I think*, or *I know*. Similarly, a study of Japanese and German children by Matsui, Rakoczy, Miura and Tomasello, (2009) suggests that the grammaticalised (un)certainty particles *yo* and *kana* may be processed differently from the corresponding lexicalised adverbials in German.

Comparable results have been found in studies of grammaticalised vs. lexicalised evidential expressions, which encode information not about the speaker's degree of commitment to her assertion, but about the type of evidence she has for it (Aikhenvald, 2004; Papafragou, Li, Choi & Han, 2007; Fitneva & Matsui, 2009).¹

Matsui and Miura (2009) note that these differences in the behaviour of grammaticalised vs. lexicalised expressions may be connected to the relevance-theoretic distinction between conceptual and procedural meaning. On the relevance-theoretic approach, lexicalised expressions such as verbs and adverbs are seen as encoding concepts, constituents of a conceptual representation system, or 'language of thought', whereas grammaticalised sentence or discourse particles are seen as encoding procedural meaning which contributes to the computational rather than the representational side of comprehension. As Matsui and Miura point out, although the notion of conceptual meaning is quite well understood, little is known about how procedural meaning is acquired, or about the cognitive mechanisms involved in processing it. However, a fuller understanding of the conceptual–procedural distinction, and of the nature of procedural meaning itself, might help to explain subtle differences in the acquisition and processing of lexicalised vs. grammaticalised indicators of epistemic modality or evidentiality.

My aim in this paper is to show how a conceptual–procedural distinction of the type drawn in relevance theory can indeed play a role in such explanations. The paper is organised as follows. In section 2, I outline the rationale for the distinction as set out in Blakemore (1987, 2002) and Wilson & Sperber (1993). In section 3, I consider some current issues and objections, looking in particular at whether procedural meaning can be properly described as semantic, and at whether a single word can encode both conceptual and procedural meaning. In section 4, I suggest some possible revisions or extensions in the light of recent research on lexical pragmatics (e.g. Wilson & Carston, 2007; Sperber & Wilson, 2008a). In section 5, I discuss the relation between the conceptual–procedural distinction and the 'massive modularity' hypothesis (Sperber, 2005; Carruthers, 2006). I conclude that the conceptual–procedural distinction is well founded, and may have much more general application than has previously been thought.

2. Rationale for the conceptual–procedural distinction

The conceptual–procedural distinction was introduced into relevance theory by Diane Blakemore (1987) to account for differences between regular 'content' words such as *dog*, *red*, *think* or *know*, on the one hand, and discourse connectives such as *but*, *so*, *also*, and *after all*, on the other. 'Content' words are standardly seen as encoding concepts, constituents of a conceptual representation system or 'language of thought' (Fodor, 1975, 1998; Sperber & Wilson, 1995: chapter 2), which contribute to the proposition expressed by an utterance and make a difference to the conditions under which it is true. It is also widely accepted that discourse connectives make no difference to the truth conditions of utterances, and cannot therefore be seen as encoding concepts (though see Bach, 1999; Potts, 2005 for a contrary view). Still, discourse connectives have arbitrary linguistic meanings which have to be acquired in the course of learning a language, and which therefore belong on the semantic side of the semantics–pragmatics distinction. Blakemore

¹ Although epistemic modals and evidentials have sometimes been grouped together under the general heading of modality (Palmer 1986), they are now more often seen as having distinct communicative functions: epistemic modals convey information about the speaker's propositional attitude (e.g. the strength of her belief in, certainty about or commitment to the truth of her assertion), whereas evidentials indicate not the speaker's degree of commitment to her assertion but the type of evidence she has for it (e.g. visual; non-visual but directly perceived; inferred from perceptual clues; assumed; acquired via testimony, etc.).

(1987) made an original proposal about how this non-truth-conditional meaning might be analysed.

Blakemore's proposal was that the function of discourse connectives such as *but*, *so*, *after all*, etc. is to guide the inferential comprehension process by imposing procedural constraints on the construction of intended contexts and cognitive effects. In (1a), for instance, the discourse connective *so* may be seen as indicating that what follows it is a contextual implication of the fact that it is raining; in (1b), *after all* may be seen as indicating that what follows it is intended to strengthen the preceding claim that the grass is wet; and in (1c), *but* may be seen as indicating that what follows it provides evidence against a potential implication of the preceding claim that it's raining:

- (1) a. It's raining, *so* the grass is wet.
- b. The grass is wet. *After all*, it's raining.
- c. It's raining, *but* the grass is not wet.

This approach has been insightfully applied to a wide range of connectives in many languages (see e.g. Blass, 1990; Gutt, 1991; Moeschler, Reboul, Luscher & Jayez, 1994; Takeuchi, 1998, 2009; Iten, 2005; Hall, 2007; Unger, 2007).

In an initial phase of research, the conceptual–procedural distinction was seen as coinciding with the distinction between truth-conditional and non-truth-conditional meaning. Regular 'content' words were analysed as encoding concepts, which were seen as contributing to what the speaker was asserting, and hence to the truth conditions of utterances in which they occur, whereas discourse connectives were seen as contributing only to the derivation of implicatures (i.e. intended contexts or cognitive effects), and hence as making no contribution to truth-conditional content. However, it soon became clear that the parallelism between the conceptual–procedural distinction and the truth-conditional vs. non-truth-conditional distinction breaks down in several ways (Wilson & Sperber, 1993; Wilson, 1998; Blakemore, 2002).

In the first place, illocutionary adverbials such as *seriously* in (2a), which are standardly treated as making no contribution to the truth-conditional content of utterances, have synonymous manner-adverbial counterparts which are regular 'content' words and contribute to the truth conditions of utterances, as in (2b) (Bach & Harnish, 1979):

- (2) a. *Seriously*, Bill is leaving.
- b. John spoke *seriously* to Anne.

Wilson and Sperber (1993) argued that both uses of *seriously* should be seen as encoding concepts, but that the concepts encoded by the illocutionary adverbials contribute not to the truth-conditional content of utterances, but to their so-called 'higher-order explicatures', which carry information about the speaker's propositional or affective attitude or the type of speech act she intends to perform. On this account, (2a) expresses the proposition that Bill is leaving, and indicates that the speaker is seriously asserting this proposition. Since the truth-conditional content of an utterance is generally determined by the proposition it expresses, higher-order explicatures make no difference to truth-conditional content. Hence, illocutionary adverbials such as *seriously* in (2a) are both conceptual and non-truth-conditional.

A second way in which the parallelism between the conceptual–procedural and truth-conditional vs. non-truth-conditional distinctions breaks down is that some clearly truth-conditional items, such as the pronouns *I* and *he* or the indexicals *now* and *then*, are not plausibly seen as encoding full-fledged concepts, since their referents vary from context to context and have to be pragmatically inferred. Accordingly, Wilson and Sperber (1993)

proposed that pronouns, like discourse connectives, should be analysed as encoding procedural constraints on the inferential phase of comprehension, but that unlike discourse connectives, they help the hearer identify what the speaker is asserting (and hence the truth-conditional content of the utterance) rather than what she is implicating. On this account, the pronoun *she* in (3a) constrains the set of potential referents to those appropriately picked out by a feminine pronoun; from these, the hearer is expected to identify the intended referent (e.g. *Jane Smith* in (3b)) based on contextual information and expectations of relevance:

- (3) a. *She* wrote the paper.
- b. Jane Smith wrote the paper.

Hence, *she* is both procedural and truth-conditional. (For procedural approaches to a variety of pronouns, indexicals and demonstratives, see e.g. Hedley, 2005, 2007; Powell, 2010; Scott, 2010, this volume).

Finally, a wide range of non-truth-conditional items such as mood indicators, sentence and discourse particles, interjections and intonation have been analysed as encoding a still further type of procedural constraint, this time on the construction of higher-order explicatures which carry speech-act, propositional-attitude or affective-attitude information (Wilson & Sperber, 1993; Escandell-Vidal, 1998, 2002; Fretheim, 1998; Andersen & Fretheim, 2000; Wilson, 2000; Wharton, 2003, 2009; Wilson & Wharton, 2006). For instance, the addition of an interrogative particle, question intonation or interrogative word order to the utterance in (4) might trigger construction of the higher-order explicature in (5a); use of the interjection *alas* or certain types of affective intonation with the same utterance might trigger the higher-order explicature in (5b); and addition of a confident or hesitant intonation pattern might trigger the higher-order explicatures in (5c):

- (4) Bill was at the party.
- (5) a. The speaker is asking whether Bill was at the party.
- b. The speaker is expressing regret that Bill was at the party.
- c. The speaker is confident / unconfident that Bill was at the party.

Grammaticalised indicators of epistemic modality, such as the Japanese sentence particles *yo* and *kana*, would also fall into this category, triggering higher-order explicatures of the type in (5c).

The account outlined in this section reflects current views of the status of the conceptual–procedural distinction. According to this account, lexicalised indicators of epistemic modality or evidentiality (e.g. certain uses of English *may*, *must*, *I think*, *I know*, *apparently*, *allegedly*) encode concepts which – like the adverb *seriously* in (3) – fall on the conceptual side of the conceptual–procedural distinction and contribute either to the basic truth-conditional content of an utterance or to its higher-order explicatures (Papafragou, 2000; Ifantidou, 2001). By contrast, grammaticalised indicators of epistemic modality or evidentiality (e.g. the Japanese (un) certainty particles *yo* and *kana*, the interrogative particle *ka* or the hearsay evidential *tte*) are seen as falling on the procedural side. Like their lexicalised counterparts, they typically contribute to utterance interpretation at the level of higher-order explicatures, but they do so not by encoding concepts which figure directly in these explicatures, but by imposing procedural constraints on their construction. It should follow from this approach that one might expect to find quite fine-grained differences among linguistic expressions with similar semantic or pragmatic functions, depending on whether they are lexicalised or grammaticalised. So the conceptual–procedural distinction might well help to explain subtle differences in the acquisition and processing of lexicalised vs. grammaticalised expressions such as those outlined in section 1.

What distinguishes the conceptual–procedural distinction from the traditional semantic or pragmatic distinctions mentioned in section 1 is that it carries definite cognitive

commitments. The claim that a certain expression encodes conceptual or procedural meaning has implications for the nature of the cognitive mechanisms involved. In the next section, I will look more closely at this point while considering some current issues and objections to the way the conceptual–procedural distinction has been drawn.

3. Current issues and objections

3.1 Is procedural information semantic or pragmatic?

In an insightful reflection on the nature of procedural meaning, Anne Bezuidenhout (2004) questions whether it can be properly regarded as semantic. In her view,

Something that lies on the procedural side of the procedural/declarative divide is something inherently pragmatic that belongs to a performance system, and is distinct from the knowledge that is constitutive of a speaker-hearer's semantic competence. (Bezuidenhout, 2004: 1)

In considering whether procedural information is properly regarded as semantic, it is important to distinguish between *what* is encoded – say, a concept or a procedure – and the nature of the encoding relation itself. According to relevance theory, in natural languages such as English and Japanese, the (linguistic) semantics vs. pragmatics distinction coincides with the distinction between decoding and inference. To say that a word encodes a certain concept or procedure is to say that the linguistic system is linked to the rest of the cognitive system in such a way that activating the word will systematically activate the associated concept or procedure, and vice versa. It does not follow that the ability to construct and manipulate conceptual representations is itself properly linguistic: indeed, it has been argued that the evolution, acquisition and use of natural languages depend on a prior capacity for thought (Sperber & Origgi, 2010). To that extent, it is quite right to say that neither concepts nor procedures are part of semantic competence.

However, what *is* part of semantic competence is knowing which word goes with which concept or procedure. For instance, learning a 'content' word such as *dog* or *red*, which is standardly seen as encoding a concept, involves establishing a link between a new word and an available concept. By the same token, acquiring a new discourse connective such as *but* or *so*, which in relevance theory is standardly seen as encoding a procedure, involves establishing a link between a new word and an available procedure. Which word goes with which concept or procedure is an arbitrary matter that has to be learned in the course of acquiring a language: it cannot be inferentially worked out, and therefore falls on the decoding side of the decoding-inference distinction. Thus, although concepts or procedures themselves are not part of the linguistic system proper, the relation between a word and the concept or procedure it encodes is properly regarded as semantic.

What does this reflection on the nature of the encoding relation imply for the analysis of conceptual and procedural meaning? A possible answer is suggested by some remarks in *Relevance* about the different ways in which expressions in a language can be semantically interpreted:

... a language is a set of semantically interpreted well-formed formulas. A formula is semantically interpreted by being put into systematic correspondence with other objects: for example, with the formulas of another language, with states of the user of the language, or with possible states of the world. (Sperber and Wilson, 1995: 172–3)

Here 'language' is intended to cover both natural languages such as English or Japanese and the conceptual representation system or 'language of thought'. A 'formula' in a language is a constituent of that language (e.g. a word of English or Japanese, or a concept in the

language of thought). I want to suggest that all three types of semantic correspondence are exploited in linguistic communication:

- (6) a. Conceptual expressions in natural language (e.g. *dog*, *think*) are systematically linked to concepts (e.g. DOG, THINK), which are constituents of a *language of thought*.
- b. Procedural expressions in natural language (e.g. *but*, *so*) are systematically linked to *states of language users*.
- c. Sentences in the language of thought (e.g. DOGS BARK) are systematically linked to *possible states of the world*.

Hypotheses (6a) and (6c) are fairly standard: it is widely assumed that regular 'content' words get their meanings by encoding concepts, and that thoughts get their content by representing possible states of the world. The hypothesis I want to elaborate on is (6b), the idea that procedural expressions in a natural language are semantically interpreted by being put into systematic correspondence with *states of the language user*.

Among the possible states of the user of a language will be those in which a certain cognitive mechanism or procedure is highly activated. According to the 'massive modularity' hypothesis (Sperber, 2005; Carruthers, 2006), the human cognitive system comprises a large array of domain-specific procedures with distinct developmental trajectories and breakdown patterns, which may be more or less highly activated in different circumstances, and are likely to alter their level of activation in response to different cues. Although some of these procedures are only remotely connected to communication, others – particularly those involved in inferential comprehension, social cognition, language production or parsing, etc. – play a significant role in linguistic communication. According to hypothesis (6b), the function of the procedural expressions in a language is to put the user of the language into a state in which some of these domain-specific cognitive procedures are highly activated (and hence more likely to be selected by a hearer using the relevance-theoretic comprehension heuristic).

A proposal along these lines would help to explain some differences in the behaviour of conceptual and procedural expressions that have been noticed in the literature. For instance, representations in a Fodorian language of thought are generally seen as accessible to consciousness and capable of being reflected on, evaluated and used in general inference. If words such as *dog* or *think* encode representations of this type, this would help to explain why their relation to thoughts appears to be fairly transparent (Wilson & Sperber, 1993: 16). By contrast, domain-specific cognitive procedures are generally seen as formulated in a sub-personal 'machine language' distinct from the language of thought, which is relatively inaccessible to consciousness and resistant to conceptualisation: thus, we cannot discover by introspection the rules of our language, the principles governing inferential comprehension, or the processes involved in mental-state attribution. If the function of procedural expressions such as *but* and *so* is to activate or trigger such procedures, this would help to explain why their meanings are relatively inaccessible to consciousness and are notoriously hard to pin down in conceptual terms (Wilson & Sperber 1993: 16). Moreover, the idea that acquisition of conceptual expressions depends on the availability of the associated concepts while acquisition of procedural expressions depends on the availability of the associated procedures may well shed light on subtle differences between grammaticalised vs. lexicalised expressions such as those noted in section 1.

I have suggested in this sub-section that the function of procedural expressions is to activate or trigger domain-specific cognitive procedures which may be exploited in inferential communication. Standard relevance-theoretic accounts have taken a rather more restrictive view of the type of procedures involved. According to this standard view, the function of procedural expressions is to activate procedures whose main function is to help the hearer

understand an utterance by finding the intended combination of context, explicit content and cognitive effects. In the light of the massive modularity hypothesis, it is worth considering whether procedural expressions may be used to activate cognitive procedures whose primary functions are not intrinsically linked to inferential comprehension. In section 5, I will explore the idea that languages typically contain clusters of procedural expression linked to procedures or mechanisms from several different domains.

3.2. Must all lexical items be EITHER conceptual OR procedural?

There is a fairly widespread view that the conceptual–procedural distinction is intended to be mutually exclusive, so that a single word cannot encode both types of meaning. Thus, Bruce Fraser (2006) comments in a recent paper:

In this article I will challenge the claim put forth by relevance theory ... that a linguistic form – a morpheme, a lexical item, a syntactic structure, or a stress or intonation contour – must be analyzed as having either conceptual meaning or procedural meaning but not both. (Fraser, 2006: 2)

I know of little textual evidence to support this interpretation of relevance theory. For instance, Blakemore (1987) considers the possibility that *but* encodes both a concept (AND) and a procedure, and rejects this analysis on empirical rather than theoretical grounds; this suggests that she did not regard conceptual and procedural meaning as mutually exclusive. More importantly, the development of the conceptual–procedural distinction was strongly influenced by the work of Oswald Ducrot and his colleagues, who were actively pursuing the idea that many or most expressions in a language have not only conceptual content but also an inferential or argumentative orientation (which in relevance theory would be analysed in procedural terms) (cf. Ducrot, 1972, 1980; Anscombe & Ducrot, 1989, 1997).

As evidence for this approach, Ducrot (1972) cites the behaviour of the French equivalents of *few* and *a few* in utterances like the following:

- (7) a. John has *few* friends: he is a bit of a loner.
b. ?John has *a few* friends: he is a bit of a loner.
- (8) a. ?John has *few* friends: he is quite gregarious.
b. John has *a few* friends: he is quite gregarious.

Here, *few* and *a few* carry similar information about quantity, which must be treated as conceptual since it affects the truth conditions of utterances. However, they also seem to impose what Ducrot and colleagues call an ‘argumentative orientation’, which accounts for the differences in acceptability illustrated in (7) and (8). Describing John as having *few friends* orients the hearer towards the conclusion that he is a bit of a loner, whereas describing him as having *a few friends* orients the hearer in the opposite direction. This seems to be a fact about the semantics of *few* vs. *a few*, which must be acquired in the course of learning the language. Thus, *few* and *a few* (and comparable pairs such as *little* / *a little*, *almost* / *barely* and so on) provide some evidence that conceptual and procedural meaning should not be seen as mutually exclusive.

Further evidence might come from utterances of the forms in (9a)–(9c), which have sometimes been seen as logically equivalent although they play different roles in inference:

- (9) a. *If P, Q*
b. *Not-P or Q*
c. *Not (P and not-Q)*

For instance, Grice (1989: chapter 4) argues that *If P, Q* is semantically equivalent to material implication in propositional calculus, from which it follows that utterances of the forms in (9a)–(9c) express identical propositions. However, as Grice points out, a conditional such as (9a) is ‘naturally adapted for (looks towards) a possible employment in modus ponendo ponens’ (1989: 79), whereas the logically equivalent forms in (9b) or (9c) are not. Grice suggests that these differences might be explained on the assumption that the forms in (9a)–(9c) are associated with different linguistic ‘pointing’ or ‘bracketing’ devices. A more common line of explanation appeals to the speech-act distinction between conditions on *use* (or *assertibility*) and conditions on *truth*, and suggests that although (9a)–(9c) are truth-conditionally equivalent, they differ in the conditions on their assertibility or appropriate use (e.g. Jackson, 1987; Recanati, 2004). However, not all expressions that relevance theorists treat as procedural have an obvious analysis in speech-act terms, and the distinction between conditions on truth and conditions on use runs the risk of becoming trivial or non-explanatory when removed from the speech-act framework. Although it is clear why certain acts have felicity conditions (e.g. only someone with the appropriate authority can give an order, perform a baptism, and so on), it is not obvious that expressions such as *it* and *that*, or *even* and *also*, have felicity conditions in any interesting sense. On the other hand, the claim that procedural expressions activate different types of cognitive procedure should have some implications for the conditions on their appropriate use. Thus, some of the similarities and differences among (9a)–(9c) might well be explained on the assumption that they encode both conceptual and procedural meaning.

I have tried to show in this sub-section that conceptual and procedural meaning should not be treated as mutually exclusive. In the next section, I will consider how this idea might be developed in the light of recent research on lexical pragmatics. In section 5, I will return to the notion of argumentative orientation and its relation to procedural meaning.

4. Lexical pragmatics and the conceptual–procedural distinction

Relevance theorists have been exploring the idea that lexical comprehension typically involves the construction of an ‘ad hoc concept’, or occasion-specific sense, which may be narrower (more specific) or broader (more general) than the encoded concept (e.g. Carston, 1997, 2002; Sperber & Wilson, 1998, 2008a; Wilson & Sperber, 2002; Wilson & Carston, 2006, 2007). On this approach, the speaker of (10a) is seen as communicating not the encoded concept MONEY, whose denotation includes any amount of money, however small, but the narrower ad hoc concept MONEY*, whose denotation includes only amounts of money big enough to allow someone to pay for dinner; similarly, the speaker of (10b) is seen as communicating not the encoded concept EMPTY, whose denotation includes wine bottles entirely lacking in content, but the broader ad hoc concept EMPTY*, whose denotation includes not only wine bottles that are strictly speaking EMPTY, but also those that are close enough to EMPTY to justify ordering more wine:

- (10) a. John can pay for dinner. He has *money*.
b. We need some more wine. The bottle is *empty*.

In developing this approach, relevance theorists explicitly distance themselves from the ‘literal first’ hypothesis, according to which the encoded (‘literal’) meaning is the first to be tested, and is abandoned only if it fails to satisfy expectations of relevance. (For experimental evidence against the ‘literal first’ hypothesis, see e.g. Gibbs, 1994). Their ground for rejecting this hypothesis is that words are merely ‘pointers to’ or ‘pieces of evidence about’ the speaker’s meaning. As Sperber and Wilson (1998) put it,

Quite generally, the occurrence of a word in an utterance provides a piece of evidence, a pointer to a concept involved in the speaker’s meaning. It may so happen that the intended concept is the very one encoded by the word, which is therefore used in its strictly literal

sense. However, we would argue that this is no more than a possibility, not a preferred or default interpretation. (Sperber & Wilson, 1998: 196)

This idea fits well with the basic claim of relevance theory that the function of the linguistic meaning of an utterance is not to encode the speaker's meaning but to provide evidence of it (Wilson & Sperber, forthcoming). However, the suggestion that words are 'pointers to', or 'pieces of evidence about', the speaker's meaning might be worked out in several different ways, and is in need of some clarification.

One way of justifying the rejection of the 'literal first' hypothesis would be to show that words typically encode not full concepts but schematic concepts, or 'pro-concepts'. A full concept is semantically complete, and can figure directly as a constituent of thoughts. By contrast, a schematic concept, or 'pro-concept', is semantically incomplete and has to be further fleshed out in order to act as a constituent of thoughts. For instance, the word *my*, in the phrase *my N*, is plausibly seen as encoding a pro-concept which indicates that the speaker (or more generally the referent of *my*) stands in a certain relation to the referent of N, but leaves the hearer to infer exactly what that relation is. Gradable adjectives such as *tall* and *short*, *near* and *far*, *expensive* and *cheap* are also standardly treated as semantically incomplete. According to Christopher Kennedy (2007), for instance, positive gradable adjectives (e.g. *expensive*) have been fruitfully analysed as involving

a relation between the degree to which an object possesses some gradable concept measured by the predicate and a context dependent STANDARD OF COMPARISON based on this concept. For example, *expensive*, on this view, denotes the property of having a degree of cost that is at least as great as some standard of comparison of cost, where the value of the standard is not part of the lexical meaning of *expensive*, but is rather determined 'on the fly'. (Kennedy 2007: 3)

While the assumption that some words encode pro-concepts is quite plausible, the idea that all of them do is unlikely on its own to justify the claim that words are merely 'pointers to' or 'pieces of evidence about' the speaker's meaning. For one thing, it should be an empirical question for semantics which words encode full concepts and which do not. For another, words that are plausibly seen as encoding pro-concepts are regularly broadened and narrowed in ways that go beyond merely saturating a parameter by supplying a missing argument – metaphorical uses of *cheap* and *expensive* (as in *To a martyr, life is cheap*, or *That was an expensive mistake*) are good examples. Moreover, words such as *Hoover* or *Kleenex*, which clearly start out encoding full concepts with determinate, legally definable denotations, also undergo historical processes of broadening or category extension (cf. Wilson & Carston, 2007; Sperber & Wilson, 2008). This suggests that lexical narrowing and broadening apply independently of whether a word encodes a full concept or a pro-concept. As Sperber and Wilson (1998) put it,

We believe that pro-concepts are quite common, but the argument of this chapter does not depend on that assumption (or even on the existence of pro-concepts). What we will argue is that, quite commonly, all words behave as if they encoded pro-concepts: that is, whether or not a word encodes a full concept, the concept it is used to convey in a given utterance has to be contextually worked out. (Sperber & Wilson, 1998: 185)

So relevance theorists reject the 'literal first' hypothesis on the ground that words are merely 'pointers to' or 'pieces of evidence about' a concept involved in the speaker's meaning, or (to echo another frequent comment) that the concept encoded by a word is *activated* during comprehension, but not necessarily *deployed*. According to the relevance-theoretic comprehension heuristic, a hearer interpreting an utterance should follow a path of least effort in looking for implications (or other cognitive effects), testing possible interpretations in order of accessibility and stopping when he has enough effects to satisfy his expectations of

relevance (Sperber & Wilson, 2002). Which raises the following question: Why should a hearer using the relevance-theoretic comprehension heuristic not simply test the encoded ('literal') meaning first? What could be easier than plugging the encoded concept² into the proposition expressed, and adjusting it only if the resulting interpretation fails to satisfy expectations of relevance? In other words, what is there to *prevent* the encoded concept being not only activated, but also deployed?

A possible revision to the theory envisaged by Dan Sperber in a discussion on the relevance e-mail list (Relevance e-mail Archives, 3.12.2007) might go some way towards answering these questions. Responding to Ducrot's proposal that all words should be seen as having at least some procedural content, Sperber remarks that it 'would not be inconsistent' for relevance theorists to accept this proposal, or at least to adapt it along the following lines:

- (11) a. Assume that all lexical items encode procedures (whether or not they also encode conceptual content, as most of them do).
- b. When a conceptual content is encoded, so is an instruction to inferentially construct an ad hoc concept using the encoded conceptual content as a starting point.
- c. Other instructions of the type familiar from Diane Blakemore's work may be encoded by any word, whether or not it also encodes conceptual content.

On this approach, most words would encode some procedural content. Some would also encode conceptual content, whereas others (e.g. *however*) would not. Among words with both procedural and conceptual content, some (e.g. *giraffe*) would automatically trigger a procedure for constructing an ad hoc concept on the basis of the encoded concept,³ whereas others (e.g. *unless*) might encode a more specific procedure of the type familiar from Blakemore's work. Sperber adds that he does not have a clear view of the merits of this proposal, and is not advocating it, but merely recommends it as worth thinking about.

It seems to me that a revision along these lines might have several advantages. On the theoretical side, it would explain why utterance interpretation does not proceed according to the 'literal first' hypothesis, and why the encoded concept is activated during lexical comprehension, but not necessarily deployed. It would also make sense of the claim that the occurrence of a word in an utterance is a 'pointer to', or a 'piece of evidence about', the speaker's meaning, and leave it open to empirical investigation which words encode full concepts and which do not.

On the descriptive side, the proposed revision would shed some light on historical processes such as grammaticalisation, where a lexical item loses some or all of its conceptual content and acquires a purely grammatical function (Traugott & Heine, 1991; Hopper & Traugott, 2003; Wharton, 2009). In the current framework, where much of the conceptual vocabulary is seen as entirely lacking procedural content, the historical process by which (say) a verb becomes a complementiser must be analysed as involving a switch at some point from conceptual to procedural status. The framework offers no obvious way of explaining why such a switch should take place, or why it systematically goes in one direction (i.e. from conceptual to procedural) rather than the other. In the revised framework, where all 'content'

² Or, more precisely, the conceptual address of the encoded concept (see Sperber & Wilson 1995: 85–86).

³ Recall that on the account proposed in section 3.1, procedures themselves are not part of the meaning of a word, but are merely activated or triggered by the occurrence of that word in an utterance. When a procedure is triggered by a general class of items (e.g. regular 'content' words), the triggering mechanism would presumably be formulated at the level of the class rather than the individual word, so that new items added to the class would automatically trigger the procedure.

words would start out with at least some procedural content, it is easy to see how this procedural content might become more specific over time, to a point where the original conceptual content becomes entirely redundant.

Ducrot's examples (e.g. *few / a few, little / a little, barely / almost*) would fit naturally into this framework, as intermediate cases with the same conceptual content but different procedural orientations. Sperber and Wilson (2008b) suggest a similar approach to gradable adjectives, on which *X is tall* and *X is short* encode the same rather minimal conceptual content (i.e. that X has some value on the height scale), but differ in procedural orientation. This approach fits well with Grice's suggestion that many of the intuitions that semantic accounts are designed to explain could be better handled by combining a simpler semantics with a well-developed pragmatics.

I have tried to show in this section that the assumption that some items encode both conceptual and procedural meaning has definite advantages for lexical pragmatics. I have also tentatively suggested that the assumption that all conceptual items encode procedural meaning might bring further advantages, and is worth investigating further. In the next section, I will look more closely at the relation between argumentative orientation and procedural meaning, and discuss some further possible revisions or extensions.

5. Massive modularity and the conceptual--procedural distinction

5.1 Varieties of procedural meaning

A massively modular mind is characterised by a wide array of special-purpose cognitive mechanisms or modules adapted to regularities in different domains (e.g. naïve physics, naïve biology, naïve mathematics, etc.). I suggested in section 3 that the function of the procedural expressions in a language may be to activate such domain-specific procedures. In principle, these could be of any type at all, although in practice they are likely to be drawn from modules which play a significant role in linguistic communication: these include the modules (or sub-modules) involved in mindreading (Baron-Cohen, 1995), emotion reading (Wharton, 2003, 2009), social cognition (Malle, 2004; Fiske & Taylor, 2008), parsing and speech production (Levitt, 1993), inferential comprehension (Sperber & Wilson, 2002), and so on. One consequence of this suggestion is that we might expect to find *clusters* of procedural items linked to different domain-specific capacities. And indeed, this seems to be just what we find.

For instance, most languages have a cluster of procedural items (e.g. affective intonation, interjections such as *wow!*, attitudinal particles such as *alas!*) associated with procedures for emotion reading. The capacity to read emotions from facial and vocal cues is known to be present very early, and its outputs are particularly hard to analyse in conceptual terms (Wharton, 2003, 2009). Expressions of this type are therefore particularly suitable for procedural treatment. Most languages also have a cluster of procedural items (e.g. mood indicators, which may be realised by grammaticalised particles or morphemes, by word order or simply by intonation) associated with procedures for attributing mental states such as beliefs, desires or intentions on the basis of behavioural cues. A naïve capacity for mindreading is also thought to be present very early, although its outputs may not be available to introspection or general inference until much later (Onishi & Baillargeon, 2005; Surian, Caldi & Sperber, 2007; Southgate, Chevallier & Csibra, 2010). Languages with grammaticalised honorific systems contain a further cluster of procedural expressions which might be seen as linked to the capacity for social cognition. Notice that the capacities for mindreading, emotion reading and social cognition are not intrinsically linked to ostensive communication: for instance, we attribute mental states to others whether or not they are communicating with us (although speakers frequently exploit these capacities in conveying their intended meanings) (Wilson & Wharton, 2006).

Most languages also have a cluster of procedural items (e.g. punctuation, prosody and various types of discourse particle) which are indeed intrinsically linked to communication, and whose function is guide the comprehension process in one direction or another. For instance, the presence of a comma in the written version of (12), or of 'comma intonation' in the spoken version, would encourage disambiguation as in (13a) rather than (13b):

- (12) Sue didn't sign the petition(,) because Mary did.
(13) a. Because Mary signed the petition, Sue didn't sign it.
b. It was not because Mary signed the petition that Sue signed it.

As noted in section 2, the standard relevance-theoretic account of procedural meaning treats discourse connectives such as *but*, *so* and *after all* as guiding the comprehension process by constraining the construction of contexts and/or the derivation of cognitive effects. I will argue, following Sperber (2001), that logical and discourse connectives may have more to do with a capacity for argumentation and persuasion than with inferential comprehension itself. In the next sub-section, I will look briefly at the speaker's capacity for argumentation and persuasion and the hearer's capacity to protect himself from mistakes or deliberate deception by the speaker. In section 5.3, I will consider how logical and discourse connectives, on the one hand, and linguistic indicators of epistemic modality or evidentiality, on the other, might be reanalysed from this perspective.

5.2 Understanding and believing

A speaker producing an utterance has two distinct goals: to get the hearer to understand her meaning, and to persuade him to believe it. The hearer has two corresponding tasks: to understand the speaker's meaning, and to decide whether to believe it. The first task involves the pragmatic ability to infer the speaker's meaning from linguistic and contextual cues. The second involves what Sperber et al. (2010) call a capacity for 'epistemic vigilance' which enables hearers to avoid being accidentally or intentionally misinformed.

Understanding an utterance is clearly a prerequisite to believing it. What further cognitive mechanisms are involved in the move from understanding to believing? In recent work, Sperber et al. (2010) survey a range of experimental results which suggest that epistemic vigilance mechanisms fall into two broad groups: there are procedures for assessing the reliability of the *source* of communicated information (i.e. deciding who to believe) and procedures for assessing the reliability of its *content* (i.e. deciding what to believe). I will suggest that linguistic indicators of epistemic modality and evidentiality are linked to the first type of mechanism, and logical and discourse connectives to the second.

A reliable speaker must meet two conditions: she must be competent, and she must be benevolent. In other words, she must possess genuine information (as opposed to misinformation or no information), and she must intend to share that information with her hearer (rather than making assertions that she does not regard as true, whether mistakenly or in an attempt to deceive). There is a growing body of research which suggests that even at a very early age, children do not treat all communicated information as equally reliable (for reviews, see Koenig & Harris, 2007; Heyman, 2008). At 16 months, they notice when a familiar word is inappropriately used. By the age of two, they often attempt to contradict and correct assertions that they believe to be false. Given the choice, three-year-olds seem to prefer informants who are both benevolent and competent (e.g. Mascaro & Sperber, 2009; Clément, Koenig & Harris, 2004). In preferring benevolent informants, they take into account not only their own observations but also what they have been told about the informant's moral character, and in preferring competent informants, they take past accuracy into account. By the age of four, children not only have appropriate preferences for reliable informants, but also show some grasp of what this reliability involves: for instance, they can

predict that a dishonest informant will provide false information, or that an incompetent informant will be less reliable. Moreover, they make such predictions despite the fact that unreliable informants typically present themselves as benevolent and competent.

Children also have some capacity to compare the reliability of different sources of information. In a recent series of experiments, a majority of three-year-olds trusted their own perceptions in preference to a series of consistently false judgments made by confederates of the experimenters (Corriveau & Harris, in press). They can also take account of an informant's access to information (Robinson, Haigh & Nurmsoo, 2008; Nurmsoo & Robinson, 2009). They attribute to others lasting dispositions for greater or lesser reliability, and may do so on the basis of an understanding that different people are more or less knowledgeable (Koenig & Harris, 2007; Corriveau & Harris, 2009). Children's epistemic vigilance thus draws on – and provides evidence for – distinct aspects of their naïve epistemology: their understanding that people's access to information, strength of belief, knowledgeability, and commitment to assertions come in degrees.

The development of epistemic vigilance targeted at the content of communicated information has been less well studied. Although some communicated contents (e.g. tautologies or contradictions) are intrinsically believable or unbelievable, in general, the reliability of communicated contents has to be assessed in the context of background beliefs which provide evidence for or against them. Assessing the content of communication presupposes a logical or argumentative capacity: the hearer must have a set of procedures for evaluating the internal consistency of the speaker's assertion and its logical or evidential relations to background information which may support or disconfirm it. Sperber et al. (2010) note that according to relevance theory, the search for a relevant interpretation, which is part and parcel of the comprehension process, automatically involves the making of inferences which may turn up inconsistencies or incoherences between the communicated content and background information. Some of these inconsistencies or incoherences may be resolved at a sub-attentive level (e.g. by the sort of automatic procedure for resolving contradictions discussed in *Relevance*: 114–115), whereas others may involve a conscious decision based on higher-order reasoning wholly dedicated to epistemic assessment (cf. Mercier & Sperber, 2009, 2011). Thus, comprehension, the search for relevance, and epistemic assessment may be seen as interconnected aspects of a single overall process whose goal is to make the best of communicated information.

I have suggested in this sub-section that there are two broad types of epistemic vigilance mechanism: those targeted at the content of communicated information, and those targeted at its source. In the next sub-section, I will argue that logical and discourse connectives are linked to the first type of epistemic vigilance mechanism, and linguistic indicators of epistemic modality or evidentiality to the second.

5.3 Procedural information and epistemic vigilance

As noted above, the speaker's goal in producing an utterance is not only to be understood, but to be believed. I have given some evidence that hearers are equipped with epistemic vigilance mechanisms which protect them from being accidentally or intentionally misinformed. What resources do speakers have for getting past the hearer's epistemic vigilance mechanisms and convincing him after all?

Suppose I want you to believe a certain proposition, but I realise that it conflicts with some background assumption you have in mind. One way to get past your vigilance mechanisms would be to produce an argument showing that this proposition follows logically from, or is strongly supported by, other background information you have available that you would be reluctant to give up. Producing an argument of this type would involve the use of logical or

discourse connectives to display the intended logical or evidential relations. As Sperber (2001) puts it,

Displaying [logical/evidential relations] requires an argumentative form, the use of logical terms such as *if*, *and*, *or* and *unless*, and of words indicating inferential relationships such as *therefore*, *since*, *but*, and *nevertheless*. It is generally taken for granted that the logical and inferential vocabulary is – and presumably emerged as – a tool for reflection and reasoning. From an evolutionary point of view, this is not particularly plausible. The hypothesis that such terms emerged as tools for *persuasion* may be easier to defend. (Sperber, 2001: 410)

This opens up a possible alternative to the standard relevance-theoretic account, on which the main function of discourse connectives is to guide the hearer's path in inferential comprehension. On this new account, the main function of discourse connectives would be not so much to guide the comprehension process as to trigger argumentative procedures which yield intuitions about evidential relations, and form part of the capacity for epistemic vigilance directed at the content of communicated information. In the light of recent work on the argumentative theory of reasoning (e.g. Mercier & Sperber, 2011), this possibility seems well worth exploring further.

Returning to linguistic indicators of epistemic modality and evidentiality such as the particles *yo*, *kana* and *tte* in Japanese, I want to suggest that they may also be linked to epistemic vigilance mechanisms, this time geared to assessing the reliability, honesty and trustworthiness of the speaker. As noted in Sperber et al. (2010), it is in the interest of speakers to appear generally reliable, honest and trustworthy. If we regularly interact with the same people, giving them false or inaccurate information, even if it is to our own immediate advantage, may damage our reputation and end up being costly in the long run. Conversely, doing our best to be systematically trustworthy may cost us some extra effort in the short term, but may be beneficial in the long run. The trade-off between the short term costs and long term benefits of a policy of trustworthiness may vary from person to person, so that different speakers may end up following different policies. However, speakers who opt for a policy of systematic trustworthiness would stand to benefit from a reputation for being highly trustworthy, which would be fed by common knowledge of their past actions, and might be advertised by their everyday public behaviour and demeanour.

Suppose, now, that I want you to believe some proposition, but I am not sure you will take my word for it in the absence of information about the type of evidence I have available or my reliability on that topic. An obvious way to get past your epistemic vigilance mechanisms would be to display openly the type of evidence I have, or my degree of confidence in the truth of my assertion, by using linguistic indicators of epistemic modality or evidentiality. On this account, the function of evidentials and epistemic modals would not be to guide the comprehension process (the proposition expressed by the utterance would have been understood just as well without them), but to display the communicator's competence, benevolence and trustworthiness to the hearer.

Some support for this suggestion comes from comments by speakers of languages with grammaticalised evidential systems in which the use of an appropriate evidential expression is obligatory. According to Alexandra Aikhenvald (2004: 336), in languages of this type, 'getting one's evidentials right is important for one's status and credibility':

Ignoring evidentiality in a language with evidentials gets you marked as unreliable or a liar. (Aikhenvald, 2004: 344)

Accuracy in getting one's information source right is crucial for successful communication, and for the speaker's reputation. (ibid.: 335)

Or, as Silver and Miller (1997: 37) put it,

In the use of evidentials, the issue is not morality, or truth, it is accuracy.

These comments support the view that evidentials have more to do with getting the audience to trust the speaker than with helping them to understand her.

In this section, I have suggested briefly (following Sperber 2001) that the use of (conceptual) logical connectives such as *and*, *or* and *if...then* and (procedural) discourse connectives such as *but*, *so* and *after all* may be more closely linked to the capacity for epistemic vigilance targeted at communicated contents than to pragmatics proper. I have also suggested that the use of lexicalised (conceptual) indicators of epistemic modality or evidentiality such as English *think*, *know*, *allegedly* or *reportedly* and their grammaticalised (procedural) counterparts such as Japanese *yo*, *kana* or *tte* may be more closely linked to the capacity for epistemic vigilance targeted at the source of communicated information than to pragmatics proper. Returning to the question raised at the start of the paper, what difference does it make to language acquisition or processing that some expressions are grammaticalised, whereas others are lexicalised?

According to my account, it should be possible to acquire a grammaticalised (hence procedural) indicator (e.g. a discourse connective, a grammaticalised indicator of epistemic modality or evidentiality) on two conditions: first, that the associated procedures are already available, and second, that the child can work out which indicators go with which procedures. In order to acquire a lexicalised expression with a similar semantic or pragmatic function (e.g. logical connectives such as *or* and *if*, lexicalised indicators of epistemic modality such as *certain*, *sure*, *allegedly*, *reportedly*), the child must also have access to the associated concepts. Moreover, these concepts must be capable of figuring directly in an interpretation of the speaker's meaning at the level of either the basic assertion or a higher-order explicature, along lines discussed for the adverbial *seriously* in (2) above. By contrast, grammaticalised indicators such as Japanese *yo* and *kana* encourage the construction of appropriate higher-order explicatures without encoding concepts which figure directly in an interpretation of the speaker's meaning. One way of capturing these differences is to say that conceptual expressions *describe*, whereas procedural expressions *indicate*. It should follow that a conceptual expression may be used to make a secondary assertion with its own truth-conditional content and relevance, whereas the information conveyed by a procedural expression is generally backgrounded. Thus, the choice of a conceptual as opposed to a procedural expression may have important effects not only on the content of an utterance, but also on its information structure and style.

6. Concluding remarks

I have tried to show that there is good reason to draw a conceptual–procedural distinction of the type proposed in relevance theory, and to clarify what it means to say that some words encode conceptual content and others encode procedures. In particular, I have argued that just as conceptual expressions correspond systematically to constituents of a language of thought, so procedural expressions correspond systematically to cognitive procedures formulated in a sub-personal ‘machine language’ distinct from the language of thought.

In developing these suggestions, I have made two main points. The first is that conceptual and procedural meaning should not be seen as mutually exclusive, and that there may be some advantages to the idea that most or all ‘content’ words also carry procedural meaning. The second is that although procedural expressions do indeed guide the comprehension process in one direction or another, this is not always their *raison d'être*. Some procedural expressions appear to be linked to capacities which are not intrinsically linked to comprehension, including mindreading, emotion reading, social cognition, parsing and

epistemic vigilance. On this account, what all procedural expressions have in common is not necessarily their cognitive function, but only their triggering role.

I have also suggested that because of its cognitive commitments, the conceptual–procedural distinction may help to explain the contrasting patterns of behaviour that have been used to motivate a variety of traditional semantic or pragmatic distinctions, including the distinction between grammaticalised and lexicalised meaning. There is clearly much more work to be done on this topic, and I look forward to the next phase of research.

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