

# Exploring the borderline between procedural encoding and pragmatic inference

Christoph Unger

SIL International and Johannes-Gutenberg-Universität Mainz

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## 1 Introduction

It was the combination of two insights into the nature of verbal communication that gave rise to the claim that natural languages not only encode conceptual information but also procedural information:

1. Verbal communication involves a coding processes that feed into inferential ones.
2. The inference processes involved in verbal communication are powerful enough to cope with a huge 'slack' between what is encoded and what is both explicitly and implicitly communicated.

The first property makes it plausible to expect natural languages to have means of fine-tuning the inferential side of comprehension, and the second one makes it plausible that linguistic expressions may encode mere indications of inferential pathways to the speaker's meaning. Since the initial discovery of these possibilities, the phenomenon of the encoding of procedural information has been widely studied and genuine advancements have been made. (Blakemore, 2002). The focus has so far been to distinguish procedural encoding from conceptual encoding. Blakemore summarises the results of these endeavours in the following words:

If we recall what has been said about procedural encoding so far, we will see that we seem to know more about what procedural meaning is not than what

it is. Specifically, an expression which encodes procedural information encodes information which is not a constituent of the conceptual representations over which inferential computations are performed. (Blakemore, 2002, 82)

I would like to argue that the ostensive-inferential nature of verbal communication predicts yet another dimension of the code-inference relation: Communicators may use linguistic expressions to achieve effects on interpretation quite distinct from the meaning encoded in these expressions or markers. In other words: Communicators may indicate information linguistically without encoding it. If this claim is correct, it follows that the phenomenon of procedural encoding should not only be compared to and distinguished from conceptual encoding, but also from this phenomenon of not linguistically encoded linguistic indication.

## 2 Linguistic communication and encoding

The essence of an inferential theory of communication is roughly this: The communicator produces a stimulus which she intends to provide partial evidence to the audience for understanding the communicator's informative intention. The stimulus—the verbal utterance—does not provide all the evidence for the communicator's intention; the linguistic meaning of the utterance provides only partial evidence, the audience has to draw on available contextual information to infer the speaker's meaning. Moreover, the evidence that the utterance provides can come from any of its properties—not only from linguistic properties. Gutt (1991, 2000b,a) has discussed this point in detail under the name of *communicative clues*: those properties of the stimulus that the communicator intended the audience to use as part of the evidence for her informative intention.

Undoubtedly, it is semantic properties that have the most profound impact on comprehension of all communicative clues. In general, a communicator who uses linguistic expressions and thereby requires her audience to put in the effort for decoding the linguistically encoded meaning would waste her audience's effort if she didn't intend this linguistic meaning be part of the evidence for her informative intention—unless special linguistic or situational contexts are salient.

So, semantic properties are generally among the pieces of evidence that the communicator intends the audience to use in inferring her intention. Does this mean that linguistic expressions are always used to contribute their semantic value, that is, the information they encode? With respect to linguistic expressions encoding concepts, this is clearly not the case. Studies in lexical pragmatics have established that words do not normally communicate the concepts they encode but ad-hoc concepts. But what about words or morphemes encoding procedural information?

Words or morphemes encoding procedural information trigger a certain inference pattern

or restrict the search space for inferential procedures. One may think that because of this nature, these expressions should always be used in virtue of the procedure(s) they encode, otherwise the communicator would waste the audience's processing effort. However, I want to argue that there are in fact cases where procedural markers are being used in verbal communication not in virtue of their linguistic meaning. There are (at least) two scenarios in which this can happen: first, if at a given point in the on-line processing of utterances and inference path is so obvious that automatic triggering is not necessary and would seem redundant but the procedural marker is used nevertheless. I call this *redundant procedural marking*. The second scenario is when a communicator intends to indicate a certain inference path to her audience but the language does not have a marker to indicate this path by procedural encoding; yet the language has a marker that indicates another inferential path that could in turn indirectly trigger the intended inference, then this marker may be used for that purpose. I call this *tangential procedural marking*. I will now discuss examples of redundant and tangential procedural marking.

### 3 Redundant procedural marking

Since the rationale for encoding procedural information has to do with saving the audience processing effort, one should expect procedural markers not to be used where they would be redundant. This is in fact what we generally observe with discourse connectives: they are not used when the intended inferential relations are readily inferable from the context alone. (Or else, special stylistic effects arise). However, there are other types of procedural markers that may not be omitted. Tense, Aspect, Mood (TAM) indicators are a case in point: grammar requires the presence of some marker for these categories. Hence it should be relatively easy to find cases of redundant procedural marking with TAM indicators.

#### 3.1 TAM and the foreground/background distinction

There is a widespread intuition that TAM markers can be used in narratives to indicate whether an eventuality should be treated as contributing to the story main line (foreground) or the background. This phenomenon is reportedly rather widespread. Hopper (1979) is a classic collection of cross-linguistic evidence; more recent studies include Reinhart (1984); Fleischmann (1985, 1990); Abangma (1987); Longacre (1989); Robert E. Longacre (1990); Robert E. Longacre and Shaler (1990); Hooper (1998) and others.

To illustrate the phenomenon, consider the following examples:

- (1) (a) In August, we visited my brother. (b) On the first day, we had a look around the

town where is living. (c) When we saw enough, we got home, had lunch and went fishing.

The main clauses largely present events that happened in sequential order (and ‘carry the narration forward’). However, it is not clear whether the second and third clause in (c) are actually intended to present important information. Intuitively, these events are less remarkable than the others and have a more backgrounded character. In some languages, the verbs of these clauses carry different aspectual or temporal forms. In Classical Hebrew, for instance, may be in the participle or perfect form, whereas the other events would be imperfect consecutive form, the main form in narratives. [Example from Hooper from Polynesian??]

Obviously, the communicator can indicate fore- or backgrounding in narratives through her choice of TAM indicators. In my book (Unger, 2006) I have defended what I believe to be the simplest account, requiring no further machinery than the relevance-theoretic comprehension procedure: Suppose that the effects described by foregrounding-backgrounding are based on the way in which individual utterances in a discourse contribute to overall relevance: whether they contribute mostly to satisfying relevance expectations, that is, contributing cognitive effects (‘foreground’), or whether they contribute mostly to fine-tuning relevance expectations for processing other utterances in the discourse (‘background’). Suppose furthermore that the communicator has just conveyed several utterances describing events in sequential order. The audience is at that point well attuned to expect that the next utterance will likewise convey an event in sequential order. So the temporal and aspectual interpretation is fairly predictable at that point. Suppose that the communicator now uses a TAM indicator that doesn’t meet those expectations. Relevance theory predicts that such a mismatch will not necessarily result in failure; rather, the audience will be able to infer the intended meaning, but the unexpected form will give rise to additional effects to set off the additional processing effort involved. Since it is manifest that narratives are about recounting events in sequential order, if the communicator uses a TAM indicator that is more typical of non-events, then the most obvious additional effect would be to take the communicator as having intended to indicate that the audience should not construe this utterance as contributing directly to cognitive effects but rather to provide a backdrop for the interpretation of other utterances in the discourse.

This account involves neither a notion of discourse foreground or background, nor text type recognition, elements that are crucial in other accounts (see Unger 2006, 2004 for an evaluation of such accounts). Adopting this account can systematically explain the massive cross-linguistic evidence about the use of TAM indicators and foreground-background modulation in narratives in languages all over the world, and this without extra machinery. So with nothing more than taking the predictions of the theory of ostensive-inferential communication about communicating linguistically without encoding seriously, we can account for a widely evidenced phenomenon of verbal communication that has either been left unexplained or has been explained on the basis of more or less questionable foundations. I take it that this

is enough reason to accept the hypothesis that verbal communication does indeed make use of the possibility to use linguistic indicators for purposes other than their encoded meaning (semantic value), and that this phenomenon is fairly widespread.

### 3.2 Redundant use of evidentials for genre indication

Aikhenvald (2004, 312-3) points out that evidentials are often used in ways other than to indicate information source. Specifically, evidentials may be used as genre indicators in the sense that the use of certain evidentials may be conventionally connected to a certain genre. When evidentials are used as genre indicators, they are often used much more frequently than in other text types where they would be used in virtue of indicating information source. Thus, she points to Floyd's (1999, 135) observation that in a conversational text of 245 sentences in Wanka Quechua, the reported evidential occurs only 16 times, while in folk tales almost every sentence carries this evidential (Aikhenvald, 2004, 313). Apparently, communicators use linguistic indicators of information source only when the source is not clearly evident in context and avoid redundancy. However, when the evidential is used as a genre indicator, redundancy is sought rather than avoided. Apparently, it is this redundant use of the evidential that gives clues to the audience that they need to access genre information relating to folk stories. In other words: the evidential is used for a purposes other than to contribute its semantic value (the procedure it encodes); rather, it is used in virtue of its effectiveness in pointing the audience towards accessing genre information for the processing of this text.

### 3.3 Redundant use of procedural connectives

As I have mentioned earlier, procedural connectives are not often used in contexts where they are unnecessary for saving the audience's processing effort. However, it seems that sometimes connectives may be used in a redundant way to indicate effects other than what they linguistically encode. A case in point is the Konie Greek connective *de* 'but'. As with English *but*, this Greek particle is not easy to analyse. One use that is problematic for all theoretical accounts that I know of, is its use in genealogies, as in this example:

- (2) Abraham fathered Isaak, Isaak *de* fathered Jacob, Jacob *de* fathered Judah and his borthers, Judah *de* fathered Fares ... (The gospel of Matthew 1:2ff)

*De* is used in practically every clause. Whatever its function may be, it should surely be redundant to use it so frequently in successive clauses with obvious parallelisms in form and content. It should be obvious on the basis of content and context alone what the relations

of these clauses are. I suggest that the fact that the connective is used nevertheless may be a clue for the reader to access genre knowledge about genealogies and make sure that the audience uses that cultural well of information to interpret this text.

In this section I have argued that procedural indicators may be used for purposes other than to achieve the effects that the procedures they encode produce. I have done this by pointing to cross-linguistic evidence suggesting that this phenomenon is not only clearly attested but also fairly widespread. However, the data I discussed so far involves only what I have called *Redundant Procedural Marking*: where procedural indicators become ‘free’ to play with because it is contextually fairly predictable what inference paths should be followed. To strengthen the argument that the phenomenon of linguistically indicating inference paths apart from what is linguistically encoded is ubiquitous, I should also give evidence that is varied in kind. Therefore I will provide at least one example of what I have called *Tangential procedural marking*.

## 4 Tangential procedural marking

Tangential procedural marking can be characterised as follows:

Language L doesn’t encode procedure P. But P’ could in some contexts induce inference P as a secondary effect. The communicator could be justified in using P’ to indicate P rather than P’.

An interesting example of this phenomenon can be found in Estonian. This language does not have a morpheme indicating future tense. Utterances providing descriptions of future eventualities use the present tense forms. Explicit time references with temporal adverbials or phrases such as *next monday* of course make reference to the future unambiguous. But even in the absence of such temporal adverbials or noun phrases, communicators can use various strategies to make an unambiguous reference to the future.

Perhaps the most interesting strategy involves the use of different morphological cases in the object:

- (3) a. Mees ehita-b endale suvila  
man(nom) build-3S self(dat) summer.house(gen)  
‘The man will build a summer house for himself’  
b. Mees ehita-b endale suvilat  
man(nom) build-3S elf(dat) summer.house(part)  
‘The man is building a summer house for himself’ (Erelt, 2003, 104)

(3) (a) refers unambiguously to the future, whereas (3) (b) is ambiguous between a present and future interpretation. Note that in Estonian, the direct object may be expressed in either the so-called partitive case ('partial object') or the genitive or nominative case ('total object'). The difference has to do with aspect: if genitive or nominative case is used, the predicate expresses a perfective activity. Otherwise, the predicate expresses an imperfective activity. So the morphological realisation of the structural ACCUSATIVE case indicates aspectual value. This aspectual value can lead to further inferences about temporal interpretation: present activities are typically ongoing and hence imperfective. Activities marked as both non-past and perfective in aspect may therefore be assumed to intend a reference to the future. It is easy to see how a communicator may use the linguistic form encoding perfective aspect not so much for conveying this aspectual value, but to make sure that the audience arrives at the intended future time reference interpretation.

To summarise the argument so far: I have argued that linguistic expressions may be used to provide evidence for the communicator's intention not in virtue of the information they linguistically encode. This phenomenon is generally in evidence with words encoding conceptual information: words generally communicate concepts other than the one they encode, as has been amply demonstrated in lexical pragmatics. But also expressions encoding procedural information may be used to indicate effects on interpretation other than those they encode. I have provided examples of this phenomenon showing that it is indeed rather widespread and varied in kind. I would now like to explore what we could learn for the theory of procedural encoding by contrasting procedural encoding with un-encoded linguistic indication. This will lead us to think in more detail about the cognitive processes that give rise to these different aspects of verbal communication.

## 5 Cognition and linguistic indication

Notice that the cases of un-encoded linguistic indication that I have presented involve an element of convention. These linguistic forms reliably lead to the described effects, if used in the respective types of contexts. It appears that these phenomena involve *Pragmatic routines* in Moreno's (2007) terms. Vega-Moreno argues that pragmatic inferences that are often repeated may become so easily accessible that it takes very little processing effort to execute them. Accessing the premises involved and arriving at the conclusions they warrant is staking less and less effort and eventually becomes almost automatic as the representations involved become accessible together as a chunk.

Vega-Moreno developed her theory of pragmatic routines in the context of accounting for the processes of conventionalisation of metaphors and idioms. Therefore it is easiest to illustrate the idea by looking at metaphor. Consider the following example:

- (4) Peter: Lisa sang very well last night.  
 Mary: She's a nightingale.

Relevance theory explains metaphors like this: Peter expects Mary's utterance to be relevant by expressing consent (or dissent) to what he has said before. Mary's utterance warrants implications amounting to consent if Peter attributes to Mary the intention to convey the concept NIGHTINGALE\* rather than the concept NIGHTINGALE that is encoded by the word 'Nightingale':

	NIGHTINGALE	NIGHTINGALE*
logical entry	X-BIRD-Y	X-SINGER-Y
encyclopaedic entries	sings nicely	sings nicely
	sings in a natural way	sings in a natural way
(5)	singing belongs to her nature	singing belongs to her nature
	has a colourful song	has a colourful song
	flies high into the air for singing	
	...	

When communicators regularly use the word *nightingale* in similar contexts, communicating ad-hoc concepts similar to NIGHTINGALE\*, their audience will repeatedly access similar premises and draw similar conclusions. Repeated access of premises with similar content and conclusions of similar content in similar linguistic or situational contexts will raise the activation level of these assumptions together. Hence the whole argument will eventually be readily accessible upon recognition of the expression alone. As a result, the word *nightingale* may become conventionally used in the metaphorical sense.

I would like to argue that uses of procedural indicators to achieve effects on interpretation other than what they encode can become conventional as pragmatic routines in the same way.

Pragmatic routines are a way of enhancing efficiency in verbal communication. They make sure that the right constellation of premises and conclusions are easily accessed in one go. In other words: pragmatic routines are a way of making sure that a certain interpretive hypothesis is accessed immediately and tested for relevance before others.

Procedural indicators are also a means of enhancing efficiency in verbal communication. Blakemore (1987) argued that the efficiency-oriented nature of cognition and comprehension processes in verbal communication predicts that languages may have means to save the audience processing effort, thereby increasing the efficiency of the inferential comprehension procedure. However, we have established that linguistic indication may be achieved not

only by procedural encoding but also by conventional exploitation of pragmatic inferences associated with linguistic expressions but not encoded in them. This means that the argument from the relevance-oriented nature of cognition and communication merely motivates the existence of some conventional means to enhance efficiency. It does not univocally lead to the phenomenon of procedural encoding, nor does it seem to give us any further insight into how linguistic means of enhancing the efficiency of the inferential comprehension procedure may achieve their effects.

In the meantime, recent research in relevance theory highlighted the heuristic nature of the relevance-theoretic comprehension procedure (Allott, 2008; Wilson and Sperber, 2004; Wilson and Wharton, 2005). Heuristic procedures are a way of efficiently solving complex inferential tasks: by making simplifying assumptions and building them into the procedure, heuristics are quick to solve the most typical cases that the cognitive system encounters. The better the simplifying assumptions approximate the typical inputs and the better integrated they become into the procedure, the more efficient the heuristic. In the case of the relevance-theoretic comprehension procedure, some important simplifying assumptions are the following: first, the most easily accessible interpretive hypotheses are likely to be right; second, to test whether the accessed interpretive hypothesis is right cognitive effects need to be computed only against the background of the mutual cognitive environment. Enhancing the success rate—that is, the efficiency—of this procedure, there are in principle two options: first, to make sure the right interpretive hypotheses are accessed first; and second, to improve the sub-procedures that compute cognitive effects. Pragmatic routines enhance efficiency in the first way: they make sure the right interpretive hypotheses are accessed first. I propose that procedural indicators enhance the efficiency of the comprehension procedure in the second way: they improve the sub-procedures that compute cognitive effects.

Wilson and Wharton (2006) report a suggestion by Dan Sperber: procedural indicators may instantiate *meta-heuristics*, that is, “switches” that activate or demote certain sub-heuristics that the comprehension procedure makes use of. The idea is not well-spelled out yet, so the following explanation is largely my attempt of understanding this suggestion. Consider the following example:

- (6) (a) The apple trees are full of fruit. (b) It’s been a good summer.

The addressee of this utterance will have to find out whether clause (b) is meant as a conclusion of (a) or a consequence of (a). The interpretive hypothesis that gets access does not yet include assumptions about the relation. When processing (b), the comprehension procedure checks for relevance and computes cognitive effects. Presumably, this is carried out by dedicated sub-procedures as follows:

*Procedure A:* Assume, U is a premise. Find other assumptions, see whether they can be

used as premises, and compute conclusions.

*Procedure B:* Assume U is a conclusion. Find other assumptions that can be used as premises in an argument supporting U as conclusion.

One of these procedures will deliver cognitive effects that match the addressee's expectations, at which time the process stops.

An indicator such as *so* arguably acts as a switch by activating procedure B and demoting procedure A. As a result, the overall comprehension procedure becomes more focussed: more simplifying assumptions are being built into the procedure (by activating some sub-process and demoting others), and the procedure as a whole is more efficient.

Summarising the discussion so far, I have argued that the more recent explanations of the pragmatic comprehension procedure as a heuristic process in a mind that makes liberal use of heuristic procedures of different scales and is geared towards enhancing efficiency of processing actually leads us to expect two ways in which linguistic resources could help enhance efficiency: one is to make sure that the right interpretive hypotheses are accessed first. Pragmatic routines in Vega-Moreno's sense have this function. The other way is to enhance the efficiency of the procedures that compute cognitive effects. The encoding of procedural information has this function: procedural indicators (markers) act as switches to activate some sub-routines and demote others, hence focussing the comprehension procedure in certain directions.

## 6 Conclusion

My claim was that the nature of verbal communication as ostensive-inferential communication predicts that linguistic expressions may be used to indicate effects on interpretation other than conveying the information they linguistically encode. I have substantiated this claim by discussing different kinds of such phenomena. Next, I have argued that pragmatic routines provide the cognitive mechanism behind the various kinds of un-encoded linguistic indication that I have discussed. Finally, I argued how recent insights into the role of heuristics in pragmatics and cognition help to come to a better understanding of the role that both pragmatic routines and procedural indicators play in the relevance-theoretic comprehension heuristic. This also substantiates my second claim that contrasting procedural indicators with the phenomenon of un-encoded linguistic indication may help us to understand the nature of procedural encoding better, and that this should complement the more familiar practice of contrasting procedural encoding with conceptual encoding.

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