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On the Rigidity of Procedural Meaning

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Abstract

This chapter puts forward the claim that rigidity is one of the central, characterising properties of procedural meaning, which plays a crucial role in accounting for the inferential resolution of a number of linguistic mismatches. Rigidity implies that linguistically encoded instructions have to be obligatorily satisfied in the interpretive process; contrary to conceptual information, they cannot be adjusted to comply with the requirements of other elements, nor can they be cancelled and modified by any pragmatic process. They systematically prevail over conceptual and contextual information whenever a mismatch or a contradiction arises between the meanings of two linguistic expressions or between a linguistic expression and the available contextual information. Three different kinds of mismatch involving procedural items are revised in order to show that the pragmatic processes triggered in the resolution of mismatches are to a large extent predictable. Conflicts between procedural meaning and contextual assumptions give rise to cases of accommodation; conflicts between procedural elements and conceptual content typically generate coercion phenomena; finally, a clash between two procedural items can only be solved, in the cases where this option is available, by means of a special ‘splitting’ mechanism and a reportive or quotative reading. Thus, significant generalisations about reinterpretation

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processes can be obtained if rigidity is taken as the most outstanding feature of procedural meaning.

Keywords: Accommodation, coercion, functional category, mismatch resolution

4.1 Introduction

The distinction between conceptual and procedural meaning has proved to be a very useful tool in the understanding of a large number of phenomena at the semantics/pragmatics interface, such as the contribution of discourse connectives (Blakemore, 1987; Hall, 2007), and nominal and verbal reference (Moeschler, 1998; Saussure, 2003), among many others.

The role of this distinction within grammatical theory, however, has not been discussed in depth, nor have its implications for the understanding of grammatical phenomena been explored in detail. The aim of this chapter is to show how the conceptual/procedural distinction can account for a range of grammatical and interpretive phenomena involved in what we refer to as ‘linguistic mismatches’. We want to argue that the distinction can offer significant generalisations if rigidity is taken as the most outstanding property of procedural meaning – a property that starkly contrasts with the malleability of concepts.

The chapter is structured as follows. Section 4.2 is devoted to introducing the basic aspects of the conceptual/procedural distinction. We propose that the essential property of procedural meaning is rigidity, as already indicated. This entails that procedural meaning will always prevail (i.e. impose its conditions) even when it enters into contradiction with other kinds of information, both linguistically encoded and contextually inferred. In Section 4.3, we will discuss the three basic cases of mismatches in which procedural meaning is involved: clashes with accessible contextual assumptions, with lexically encoded meaning and with other procedural items. Our aim is to show how different interpretive procedures are triggered in order that the instructions specific to each case are obeyed. Section 4.4 will present some consequences and implications of our proposal.

4.2 Instructions and the Conceptual/Procedural Distinction

4.2.1 Basic Assumptions

A central hypothesis in cognitive science from its first developments in the mid 1950s (see Russell and Norvig, 1995; Thagard, 2005 for an

overview) is the idea that human thinking can be accounted for ‘in terms of representational structures in the mind and computational procedures that operate on those structures’ (Thagard, 2005: 10). This view underlies the relevance-theoretic conceptual/procedural distinction (Blakemore, 1987; Blass, 1989; Wilson and Sperber, 1993) according to which an utterance can be expected

... to encode two basic types of information: representational and computational, or conceptual and procedural – that is, information about the representations to be manipulated, and information about how to manipulate them. (Wilson and Sperber, 1993: 1)

The distinction, and the notion of ‘procedural meaning’ in particular, has proved to be a valuable tool in the analysis of several issues at the semantics-pragmatics interface (e.g. how so-called ‘conventional implicatures’ work). However, it has not been free from criticisms. From a linguistic perspective, it has been pointed out that this distinction does not allow a clear-cut classification of linguistic items, since most units seem to contain a combination of both conceptual and procedural meaning (Espinal, 1996a, b; Fraser, 2006): the arguments showing that lexical items encoding concepts also contain some instructions about how to use them in the syntactic composition are compelling. In addition, procedural instructions seem to include some conceptual features as well: in fact, indicating how two pieces of information are to be combined sometimes requires using and manipulating concepts (Espinal, 1996a, b). But if this is the case, an infinite regress would be introduced in the characterisation of instructions, which has led some scholars to suggest that instructions are not encoded in the semantic representation of linguistic elements, but rather are a matter of pragmatics (Bezuidenhout, 2004). The distinction has also been contested from the side of conceptual meaning. It has been suggested that the concept encoded by a lexical item is merely an instruction to construct a specific, *ad hoc* conceptual representation, tailored to suit the (intended) speaker’s meaning (Carston, 2002; see Wilson, this volume, Ch. 1). For some researchers, the distinction is not a categorical one, but rather represents a scale with a continuum of cases (Moeschler, 2002).

We cannot address all these criticisms here, but we believe that the distinction is categorical and an essential one for linguistic theory: we will argue that there are a number of linguistic phenomena that can be accounted for only if a neat distinction between encoded concepts and encoded instructions is maintained. In our view, the key properties of each kind of meaning must be related to their role within linguistic

theory and the relations between encoded meaning and grammatical computation. Our main assumptions can be summarised as follows:

1. Instructions are operational: they specify a set of algorithms or logical operations, such as search, retrieval, matching, attribute-assigning and combination, among others.
2. Instructions operate on conceptual representations. An instruction takes a set of representations – linguistically encoded or not – as its input, applies some rules to them and yields a modified set of representations as its output. Instructions can also include formal or semantic conditions on the representations they take as arguments and on the resulting outputs. Even if these conditions can be expressed in conceptual terms, this does not make the instruction itself conceptual in any relevant sense. We assume that concepts included in the description of an instruction are encapsulated in the instruction, so no interpretive process can extract them and use them independently, as (see [Curcó \(this volume, Ch. 2\)](#) and [Saussure \(this volume, Ch. 3\)](#)) convincingly show.
3. Instructions can operate at two different levels: that of syntactic computation and that of interpretation. We can expect to find instructions specific for each of these levels. Some instructions, such as those encoded in agreement features or structural case-marking, are ‘combinatorial’, that is, relevant to syntactic computation only; they are erased after the instruction is completed and are not ‘visible’ at the interpretive interface (here we follow basic ideas of minimalist syntax, cf. [Chomsky, 1995](#)). Other instructions, in contrast, are ‘interpretive’; in addition to their role in syntactic structure building, they are crucial for the interpretive component. What is usually called ‘procedural’ meaning in relevance-theoretic terms corresponds to interpretive instructions.
4. Linguistic items can encode concepts and instructions. Conceptual representations are linked to encyclopaedic knowledge, but instructional meanings lack such connections. Instructions thus represent linguistic meaning in its purest form. In fact, it is this kind of purely grammatical meaning (instead of conceptual meaning in major word classes) that underlies most cross-linguistic and parametric variation.
5. A strong connection can thus be established between the ‘lexical/functional’ distinction in grammatical theory and the conceptual/procedural distinction ([Escandell-Vidal and Leonetti, 1999](#); [Cann, 2001](#); [Leonetti and Escandell-Vidal, 2004](#)). Though the two are not strictly equivalent, it seems reasonable to assume, as a null

hypothesis, that functional items encode instructions only. In his exposition of the ‘lexical/functional’ dichotomy, *Cann (2001)* mentions a number of characteristic properties of functional items: as we’ll see, some of them concern semantically driven aspects of interpretation and provide evidence for their procedural nature (*Muysken, 2008: 42–50*). They will play a major role in our proposal (see below).

Functional expressions tend to form closed classes; to be phonologically and morphologically reduced; to appear in a restricted range of often idiosyncratic syntactic environments; to appear in general categorial domains from which they cannot be shifted; to have meanings which may be fully suppressed in certain environments; and to allow the possibility of syntactically and semantically coercing lexical expressions. Lexical expressions, on the other hand, seem not to have these properties, but to form open classes, to be morphologically free, to appear in a wide range of syntactic environments, and to be categorially and semantically coercible. (*Cann, 2001: §2.6*)

Among functional categories, we can use ‘procedural’ as a shorthand term to refer to those that encode interpretive instructions. Thus, procedural items can be defined as a sub-class of functional categories whose instructions ‘survive’ syntactic computation and thus enter the interpretive component.

6. Not only words encode instructions (as discourse markers and personal pronouns do); sub-lexical and grammatical features also do: features, such as [definite], [perfective] or [focus], encode instructions that are linked to specific morphs or syntactic positions. Thus, an item could encode conceptual meaning and at the same time convey some instructions, but these two kinds of meaning remain perfectly distinct and are not mixed together. Conceptual and instructional features can thus appear in variable proportions in linguistic items, without this making the distinction a gradual one: even if they co-exist within a single unit, instructions and concepts have always their own specific properties.
7. Instructional features can also be associated with lexical items encoding concepts in the course of syntactic derivation (e.g. when a constituent receives focal stress marking), but again both kinds of meanings (i.e. conceptual and instructional) are different.
8. The distinction between representation and computation, or between conceptual and procedural meaning, concerns encoded meaning and hence is a semantic distinction. The fact that procedural instructions guide interpretive processes carried out by means of

inference outside the language system does not make them a matter of pragmatics (see Curcó, *this volume*, Ch. 2; Wilson, *this volume*, Ch. 1, for a convincing discussion of this point). This is a crucial aspect of the distinction: procedural meaning is a class of encoded linguistic meaning that plays a decisive role in triggering pragmatic inference, but it is not itself a part of pragmatics.

4.2.2 Rigidity

When the conceptual/procedural distinction is envisaged in the terms presented above, rigidity becomes the crucial dimension for grammar, since it makes it possible to predict a significant and systematic difference in the way in which mismatches involving procedural meaning are solved.

As pointed out in the previous quotation from Cann (2001), lexical items happen to be semantically coercible, while *functional/procedural* items are typically able to coerce the meanings of lexical expressions, as we will discuss later. We take this crucial asymmetry to be an effect of the rigidity of procedural meaning in contrast to conceptual meaning. In the cognitive pragmatic tradition, it is common to assume that conceptual representations are flexible and malleable, which means that they can be enriched, elaborated on and adjusted in different ways to meet the expectations of relevance. All the interpretive phenomena that are usually considered as instances of meaning modulation and *ad hoc* concept formation stem from this basic property (Wilson, 2003; Wilson and Carston, 2007). We claim that instructions, in contrast, are rigid: they cannot enter into the mutual adjustment processes, nor can they be modulated to comply with the requirements of conceptual representations, either linguistically communicated or not. The instructions encoded by an item must be satisfied at any cost for interpretation to succeed.

We consider rigidity as an intrinsic property of encoded instructions (both computational and interpretive). As a reviewer has pointed out, the fundamental reason for the non-adjustability of procedural meaning would seem to follow from the fact that it encodes constraints on inference, and therefore, unlike conceptual content, does not appear as a constituent of the explicature. This could be the reason why it cannot be modulated or elaborated on. Viewed in this light, rigidity appears just as a side effect of the basic property of encoding constraints on inference. Nevertheless, we still believe that rigidity deserves a main role in the characterisation of procedural meaning. Our idea is this. The instructions encoded by many categories, such as

definite articles and verbal tenses, do contribute to the propositional content of the explicature by encoding constraints on how to identify nominal and temporal reference. The result of following the instruction encoded is a component of the propositional content. What we claim is that the representation introduced in the explicature by following an inferential instruction cannot be adjusted or elaborated on to better match that of other components. Rigidity is thus a property not only of the operational nature of procedural meaning (i.e. a consequence of it being an algorithm) but also a property inherited by the representation obtained by following it. In other words, rigidity shows both in the process and result. The rigidity of instructions is a major property of the architecture of grammars, which will prove decisive for explaining interface phenomena and, in particular, to understand how compositionality works.

Instructions are rigid, but nonetheless can give rise to a series of different interpretive effects (e.g. different values of tenses, different interpretations of pronouns): this is because there can be different ways of satisfying the instructions, according to the data and assumptions available, which can vary from one context to another. The rigid nature of procedural meaning has interesting consequences: no pragmatic process can cancel or modify encoded instructions, so any possible mismatches between meaningful elements will always be solved obeying the constraints imposed by procedural ones. In the next sections, we intend to analyse certain cases of linguistic mismatches and their resolution in utterance interpretation to show how procedural meaning always imposes its conditions on conceptual representations. This gives rise to systematic, partially predictable and linguistically mandated interpretations.

4.3 Mismatches

There has been a growing interest in the notion of ‘mismatch’ in linguistics in the last decade, as proved by collective volumes like Francis and Michaelis (2003), the literature on ‘coercion’ phenomena (Pykkänen, 2008; de Swart, 1998, 2003, 2011) and the recent Moravcsik (2010). Here we will use the term *mismatch* in a restricted sense, to refer to conflicts and incompatibilities between the meanings of two linguistic items, or between the meaning of a linguistic item and the context where it is inserted (i.e. to refer to interpretive conflicts). Mismatches are interesting for linguistic theory in two senses at least: on the one hand, we need to ascertain under what conditions they can – or cannot – be solved (thus giving rise to ungrammatical or ill-formed

strings and combinations); and on the other hand we have much to gain from investigating the ways in which speakers and hearers manage to solve interpretive mismatches in the course of their communicative interaction. With respect to the first set of questions, we follow the standard view that true ungrammaticality results from mismatches involving grammatical categories or features, where no reinterpretation process is available; in the rest of cases, semantic ill-formedness (anomaly) is obtained, unless some kind of reinterpretation process restores compatibility and solves the mismatch.

Our second reason for studying mismatches concerns the identification of possible patterns and strategies of mismatch resolution. This is the issue we would like to concentrate on, basically because there are grounds to believe that mismatch resolution is a quite systematic process that can reveal crucial aspects of how grammar and interpretation interact.

In what follows, we will assume that the grammar only rules out mismatches involving syntactic categories or syntactic features: in that case, the derivation crashes. Strings with mismatches involving semantic features, in contrast, are detected by the grammatical system, but the mismatch is tolerated. The output of grammatical computation then feeds into a bundle of other cognitive systems (including mind reading, attention, memory ...) that combine information from different sources and that are responsible for the interpretation. It is in this inferential phase where mismatches are solved: thus, their resolution is not undertaken by the grammar, but by pragmatic processes. The fact that the results of these processes are – at least, to a great extent – predictable means that semantic features are combined with each other and with contextual assumptions in a systematic way.

In order to throw some light on the systematic nature of resolution and reinterpretation processes, we will consider three possible types of mismatch involving procedural meaning: (1) the conflict between procedural meaning and ‘contextual assumptions’ (i.e. the set of assumptions that play a role in the interpretation of an utterance), (2) the clash between procedural meaning and conceptual meaning (i.e. linguistically encoded conceptual representations), (3) the mismatch between two procedural expressions.

4.3.1 Procedural Meaning and Contextual Assumptions

Consider the following situation. Mary is visiting a small town to which she had never been before. At the door of a house garden she sees the following sign:

- (1) Beware of the dog.

Before encountering the sign, Mary was not aware of the existence of any particular dog, nor would anyone be who sees the sign for the first time; moreover, the sign is meant precisely to warn those who were not previously aware of the existence of a potentially dangerous dog. And yet, the linguistic form used includes a definite article, a form that presupposes that the hearer can identify the referent of the noun phrase it heads. In the relevance-theoretic tradition, definite articles are procedural items that contribute to the explicit content of an utterance by encoding instructions concerning the accessibility of conceptual representations (Leonetti, 1996; Žegarac, 2004; see Gundel, *this volume*, Ch. 9; Lucas, *this volume*, Ch. 7; Scott, *this volume*, Ch. 8). Definiteness guarantees that a representation that uniquely identifies the intended referent is accessible:

... the definite article contributes to utterance comprehension by indicating that the individual concept denoted by the NP is available in a context immediately accessible to the hearer. (Žegarac, 2004: 197)

What we have in (1) is a mismatch between the meaning encoded in an interpretive instruction (which takes for granted the availability of the assumption that there is a dog) and accessible contextual assumptions (that do not necessarily contain that information). Interpreting (1) obviously entails explicitly adding a new assumption to one's current representation of the world, namely that there is a dog in the premises. This process is known as 'accommodation' (Beaver and Zeevat, 2007), and the article here is used as a 'first mention definite' (cf. also Lucas, *this volume*, Ch. 7).

One could argue that there is no mismatch at all, since the theory does not assume that contextual assumptions have to be represented and entertained beforehand; instead, they are recovered when needed to build an interpretation. There is a difference, however, between retrieving or bringing to the foreground an assumption that the individual could have entertained before and building a new assumption for the first time just to comply with the requirements of a procedural item, as in the present example.

Several aspects of this case are important to our discussion. To begin with, accommodation is an interpretive process that involves the explicit addition of new material to the context, so it is radically different from processes of concept modulation, which develop, enrich and adjust an existing conceptual content. Second, the addition of a particular class of assumptions is compulsory: there is no alternative. Of course, one can later conclude that there was no dog after all, but

the explicit assumption that the person who puts up the sign wants to communicate necessarily presupposes it. Therefore, the interpretive process is not free, but linguistically mandated and constrained. There is no option for mutual adjustment among procedural content, explicatures and implicatures: it is not possible, for instance, to construct an interpretation in which the requirement of the definite article is in some sense broadened or ‘relaxed’ to encompass both accessible and non-accessible dogs. Third, and most important, the interpretive process is biased in a particular direction: it is the procedural content that imposes its conditions on contextual assumptions and not the other way round. This is so even to the extent of forcing the hearer to create a new assumption when necessary, with the only guaranty of the encoded instruction itself.

Definite articles are responsible for the retrieval of representations corresponding to noun phrases. If tenses are responsible for the location of events in time, one can expect to find similar accommodation phenomena when a temporal instruction clashes with accessible contextual assumptions. This is in fact what we find. The regular coordinates that work as the starting point for temporal interpretation of deictic tenses are represented by utterance time, so we understand past tenses as referring to events that have already taken place and future-tensed sentences as referring to events to come. Now, consider the following narrative excerpt, taken from Parsons (2002: 694):

- (2) He prepares for battle, unaware of what lies in wait for him. He attacks the dragon. His hand will be bitten off, but it will grow back.

The example in (2) is about past events, though no past tense occurs in it; what we find is present and future tenses instead. How does the interpretive process deal with this situation? According to our proposal, tenses encode instructions that must be satisfied at any cost. If we assume that the present indicates that the event overlaps with time of utterance and future tense encodes an instruction according to which the event is to be located later than the speech time, then the only possible interpretation in (2) amounts to ‘moving’ the speech coordinates to the past, to an interval overlapping with the events that are narrated in the present and prior to the events appearing in the future. This is exactly what we do: we place ourselves at a moment in the past, which explains the well-known effect of vividness obtained by means of so-called narrative present. Similarly, the future-tensed sentences induce the interpretation that the character had no access to

the verification of the eventuality (cf. Escandell-Vidal, forthcoming), which is consistent with our story. In fact, the future-tensed fragment was followed by one more clause: *though he doesn't know that yet*, a clause that simply makes explicit an assumption that had already been made manifest to the reader. All these effects are obtained as the result of readjusting contextual assumptions to fit the instructions encoded by procedural items. Narrative uses of tenses, as illustrated by this excerpt, are thus particular instances of a more general interpretive process triggered by a mismatch.

The domain of discourse connectives provides further evidence of this sort of processes. Discourse connectives have been treated as procedural expressions at least since Blakemore (1987), and they exhibit the same behaviour already observed in determiners and tenses: they can trigger accommodation processes whenever the instruction they encode cannot be satisfied by information already available in the context (as 'old', 'given' or 'familiar' information). The presence of items like *but* and *though* should signal the existence of some kind of contrast or contradiction holding between two different assumptions. As has often been pointed out in the literature (cf. Hall, 2007: 169), even if two assumptions do not represent *prima facie* contrasting situations, the mere occurrence of *but* or *though* is sufficient to force the hearer to entertain a proposition that justifies an incompatibility between them and that he possibly didn't hold before, as in (3) (a funny example from a Spanish literature exam):

(3) Bécquer was born in Seville, though he was an orphan.

There is no obvious contradiction between being born in Seville and losing one's parents at a very early age, but the connective requires that the odd assumption that 'Orphans are not born in Seville (as they have no parents . . .)' is retrieved from the context even if it does not fit in with any assumptions in the hearer's cognitive environment, nor is it an acceptable assumption given our world knowledge. Nevertheless, the connective forces the hearer to consider it, by constructing it *ad hoc*. Again, the procedural element triggers accommodation. This explains why this is a marked example and why it has a humorous effect.

The examples discussed in this section show that instructions encoded by functional categories have to be satisfied at any cost and cannot experience any sort of modification. Rather, they impose modifications on contextual assumptions (such as adding and re-locating). As a consequence, when the mismatch involves procedural meaning

and contextual assumptions a systematic and predictable process is triggered: we can predict the kind of interpretive operation that will be induced – namely the addition of new assumptions – and the directionality of the fitting strategy – procedural meaning, being linguistic in nature, always wins. The rigidity of processing instructions ensures that the right assumption will be either activated or built *ad hoc* to yield to their demands. This supports our view that procedural meaning cannot be adjusted to comply with the requirements of contextual assumptions. From a broader perspective, it is no surprise that processing instructions should be rigid, whereas lexical content is flexible; if both kinds of meaning were equally adjustable, it would be quite hard to construct interpretations. Thus, the notion of mismatch plus the rigidity of procedural meaning make it possible to draw a number of predictions that otherwise will not be possible to formulate.¹

4.3.2 Procedural vs. Conceptual Meaning

Let's consider now mismatches between procedural and conceptual meaning. The cases we want to discuss involve tense and grammatical aspect, on the one hand, and lexical aspect (*Aktionsart* or actionality), on the other.

Lexical aspect is an inherent property of eventualities; according to Vendler (1967), predicates fall into four different categories with respect to *Aktionsart*: 'activities' [+dynamic] [–telic], 'accomplishments' [+dynamic] [+telic], 'achievements' [–dynamic] [+telic] and 'states' [–dynamic, –telic]. The features that characterise each category can be conceived as formal linguistic traits, and they are clear instances of conceptual meaning, involved as they are in the description of situation classes in the world. Grammatical aspect, in contrast, is not related to inherent properties of the situation; it rather expresses the speaker's point of view on it. Grammatical aspect is formally marked in many languages by some functional category (verbal inflection, affixes, particles...) that contains procedural information about how to construct the internal representation of the state of affairs: for instance, a progressive marker in English indicates

¹The complexity of presupposition accommodation certainly requires an in-depth analysis that would exceed the limits of the brief presentation we offer in this section. It is true that not all presuppositional items trigger accommodation in the same way (cf. Beaver and Zeevat, 2007 for an accurate review of the problem), but we cannot discuss the issue in detail here. We simply assume that, in so far as procedural elements are involved, accommodation will take place following the encoded interpretive instructions.

that the event has to be viewed as an incomplete action in progress at a specific time.

When the progressive is combined with a dynamic eventuality, the inherent features of the *Aktionsart* of the predicate and the instructions encoded by the aspectual marker match; the interpretation proceeds by building a mental representation of a dynamic event in progress. In the most standard perspective, we would expect the progressive to be excluded with stative predicates, given that their features are not compatible. However, it is not uncommon to find constructions where lexical and grammatical aspect apparently collide: for instance, one can combine the progressive (*be+ing*) with a stative predicate (*silly*) and obtain a string like the one in (4):

(4) John is being silly

(4) may seem anomalous out of context, but it is usually given a straightforward interpretation: rather than viewing (4) as representing an incoherent state of affairs, speakers assign it a reading where John's silliness – a property, a state – is presented as an action in progress, that is, as a dynamic situation. Briefly, (4) means that John is behaving as a silly person in a particular situation. What is significant here is (a) that the aspectual mismatch does not give rise to strict, bare ungrammaticality, (b) that the only possibility is to reinterpret the stative lexical predicate as dynamic, (c) that the reinterpretation of *be+ing* as stative is completely excluded and (d) that this process is common and systematic for stative predicates under the scope of the progressive.

The phenomenon illustrated in (4) is well known and has been extensively investigated under the label of 'aspectual coercion' (cf. de Swart, 1998, 2003, 2011; Escandell-Vidal and Leonetti, 2002; Egg, 2005; Pylkkänen, 2008; Vicente, 2010, among others). The basic idea is that the mismatch arising between two items is solved by 'coercion', that is, by imposing the requirements of one of them on the other. What is relevant here is that it is the progressive marker that forces a reinterpretation of the predicate according to its requirements.

This approach can shed light on other well-known phenomena, such as the variety of uses of certain past tenses in Romance languages. For example, Spanish has two forms for the simple past: one is perfective (*pretérito simple*, or *pretérito indefinido*), the other, imperfective (*pretérito imperfecto*). The imperfective past encodes the instruction to view the eventuality as atelic or unbounded, so it naturally combines with states and activities. When *pretérito imperfecto* is combined with telic predicates (accomplishments,

achievements), a mismatch occurs between the imperfective nature of the grammatical tense/aspect marker and the telic lexical aspect of the predicate. The examples in (5) illustrate this latter situation:

- (5) a. *Se levantaba a las siete.*
 CL get up.IMPF.3SG at the seven
- b. *El avión despegaba, cuando de repente...*
 The plane take.off.IMPF.3SG when suddenly...

In these examples, the imperfective past is combined with predicates denoting achievements (*levantarse*, ‘get up’ and *despegar* ‘take off’). The mismatch systematically gives rise to special interpretive effects, as shown in the English translations in (6):

- (6) a. She used to get up at seven o’clock.
 b. The plane was taking off, when suddenly...

The habitual reading is a means to change an achievement into a state, that is, into an atelic situation, as in (6a); the ingressive, or inchoative, reading in (6b) represents a way to turn an achievement into an ongoing process, as in progressive readings. In both cases, the imperfective past forces this sort of readings as a means to make the telic predicate compatible with the requirement that the situation be represented as atelic. All the interpretive effects are a consequence of the need to solve the mismatch in a particular direction, namely, by adjusting the features of the eventualities to meet the requirements of the imperfective tense (cf. Leonetti and Escandell-Vidal, 2003).

The generalisation arising from these facts seems straightforward: grammatical aspect always prevails over lexical aspect. The representation of the event has to comply with the interpretive instructions encoded by the procedural element, irrespective of the inherent lexical aspect of the predicate. The process is unidirectional: the procedural element always imposes its requirements, not the other way round. It is impossible to build an interpretation by modifying the procedural instruction to match the content of conceptual items. Once more we find that the procedural instruction has to be satisfied at any cost.

This is precisely the result we expect from our view on interpretive instructions: they are rigid and cannot be modified to satisfy the requirements of other items. What we have, then, is a further case of linguistically driven interpretation induced by the existence of a linguistic mismatch.

As mentioned before, aspectual coercion has been discussed at length in the literature on formal semantics. According to de Swart (1998) grammatical aspect coerces the interpretation of lexical aspect and a semantic process inserts a covert operator in the semantic representation to change the aspectual class of the eventuality in order to comply with the selectional requirements of the tense/aspect marker. The most significant difference between her approach and the one taken here is that we see the process of mismatch resolution not as a semantic operation, but as a pragmatic process guided and constrained by linguistic meaning. In our view, coercion takes place in the inferential construction of the propositional explication. Therefore, we understand coercion as both linguistically constrained and as an inferential operation.

4.3.3 Procedural vs. Procedural

In the previous section, we have examined mismatches involving procedural meaning, contextual assumptions and lexical content. We have shown that the operations solving the mismatch between procedural meaning and contextual assumptions (accommodation), and between procedural meaning and lexical content (coercion), involve the adjustment of conceptual representations. A further logical possibility still remains: that of a mismatch between two procedural elements.

Given that procedural content is rigid, if two procedural instructions collide, the prediction is that the contradiction should be unsolvable. In fact, it is extremely difficult to find clear cases of a clash between procedural items. This may not be just a random fact, given the syntactic properties of functional categories. Most probably, the architecture of grammatical systems tends to exclude configurations where this kind of mismatch can arise.

There are, however, a few cases where the meanings of two procedural elements seem to clash. Consider the Spanish example in (7):

- (7) *Ahora Juan viene mañana.*
 Now Juan come.PRS.3SG tomorrow
 ‘Now Juan comes tomorrow’

In (7) we have a case of double adverbial modification, with a clash between two incompatible deictic adverbials. We assume that deictics are procedural: *ahora* (‘now’) and *mañana* (‘tomorrow’) encode instructions for inferentially building the explicit content by pointing to

the identification of two particular time spans. We are interested in maintaining a restrictive assumption on temporal representation, namely that there can only be one temporal deictic adverbial for each event, so the acceptability of (7) represents a problem for this generalisation. If we also want to maintain the assumption that procedural content is rigid, we need to account for how the mismatch is solved.

Our proposal is that the instructions contained in the two procedural elements must both be satisfied at the same time. The only way to do so and avoid any contradiction is by assuming that they do not modify the same event. This result can be obtained by introducing an additional event in the representation, so that each adverbial can modify a different eventuality. This is in fact what we find. The interpretation of (7) can be rendered as in (8):

(8) [Now [someone says that]] Juan comes tomorrow.

In (8) an event of saying related to the present has been added. The resulting interpretation contains two different events – one of saying, the other, an event of coming–, though only one has been overtly encoded. Most remarkably, this is the only possible reading for (7). The result is a ‘reportive interpretation’ (Wilson, 2000), a sort of covert quotation in which the information conveyed is presented as attributed to a different speaker. Thus, if each adverbial modifies a different event, their respective instructions can both be satisfied in the interpretation. In this way the clash between the two deictic adverbials with conflicting instructions is solved, whilst keeping the assumption that a single event cannot be modified by more than one temporal adverbial and maintaining the rigidity of procedural content.

As the only way out seems to be the addition of a new piece of information, namely a previous event of communication from which the speaker got the information she is transmitting, the reinterpretation process yields an evidential reading (Aikhenvald, 2004) and bears a clear resemblance to accommodation. What we find again is a linguistically driven constraint on the interpretation of a sequence with non-matching items: the process is systematic and predictable.

The question that arises at this point is what the nature of this extra information is, that is, at what level of representation it should be inserted. One possibility is to consider that the saying event is added inferentially to the context, by creating a new assumption, as in accommodation processes. A second possibility is to suppose that the syntax of those sentences is actually more complex than it appears at

first sight, in the sense that it already contains two different sentential domains,² each with its own temporal adverbial. Rather than add new assumptions to the interpretation, what the hearer does, in this view, is to abandon the first, simpler syntactic parsing and to replace it by a two-layered sentential structure. If this option is adopted, then one has to explain how the saying event is represented in the syntax. Notice that, in this case, there would be no real mismatch, since the two conflicting elements would appear in separate sentential domains. We cannot discuss this issue in depth here, but it seems clear that, no matter what solution is adopted, the interpretive strategy for (7) always involves a kind of ‘splitting’ mechanism, either inferential or syntactic, to avoid the clash between the two deictic elements. The crucial point is that neither of them is reinterpreted or adjusted to comply with external requirements. It is always the other way round: the sentential context has to satisfy the interpretive instructions encoded by deictics.

4.4 Conclusions and Implications

We have tried to offer a principled account for some productive and systematic aspects of a whole range of interpretation processes by identifying linguistically driven constraints on them. We have proposed that the conceptual/procedural distinction should be taken as a distinction between flexible and rigid semantic meaning. This allows us to explain why certain kinds of linguistically encoded meaning can be adjusted, while others can't. When a mismatch involving procedural meaning is found, instructions always impose their requirements. Procedural meaning has always priority over contextual information and gives rise to systematic processes of accommodation, by introducing new assumptions in order to meet the conditions imposed by the procedural element. The same can be said of conflicts between a procedural item and conceptual features associated with semantic classes: procedural meaning coerces the interpretation of the lexical features so that its own requirements are satisfied. When two procedural items clash, the interpretive solution involves splitting the representation in two different domains by introducing an additional saying event in the representation (whenever possible); in this way,

²This is the proposal adopted to explain mismatches between intonation and sentential modality, as in ‘echo interrogatives’, sentences with declarative or imperative syntax and with interrogative, rising intonation (cf. Escandell-Vidal, 2002).

both instructions can be satisfied and the mismatch is avoided. Thus, instructions conveyed by procedural elements are always given priority over contextual and lexical information in the interpretive process. The occurrence of the mismatch, its interpretive effects and the direction of resolution are, therefore, systematic and predictable.

The proposal we have put forward makes predictions not only about specific interpretation processes but also, and most significantly, about processing effort and processing domains. As for processing effort, the prediction is that speakers view sentences with non-matching elements as marked expressions that require extra processing effort in order to solve the mismatch. This triggers the expectation that the extra processing effort should be balanced by with some extra interpretive effects. This prediction is in fact borne out: mismatch resolution gives rise to extra effects that are perceived as marked interpretations that can take longer in reading experiments (Piñango et al., 1999; Brennan and Pykkänen, 2008; Pykkänen, 2008; Scheepers et al., 2008). As for processing domains, we have argued that, even when mismatches are of a linguistic nature (involving encoded features only), mismatch resolution is not a semantic, but a pragmatic process that involves the integration of linguistic (decoded) and non-linguistic information. Some experimental results seem to confirm the adequacy of our hypothesis that mismatch resolution is a pragmatic operation:

The MEG [magnetoencephalography] studies discussed above have revealed that type-mismatch in complement coercion and hypothesized sortal mismatch in aspectual coercion both affect brain activity in inferior midline regions of the prefrontal cortex. Although this region is somewhat exotic from a neurolinguistic point of view, it plays a major role in theories of the neural bases of social cognition – for a recent review, see Amodio and Frith (2006). For example, the medial prefrontal cortex is engaged in various theory of mind tasks, requiring reasoning about the mental states of others. (...) If we discovered that type-mismatch is resolved somehow ‘outside’ the grammar, such a finding would have fundamental consequences for linguistic theory. (...) [If so,] this just might mean that there is something very right about the view in which type-shifting is not part of the grammar. (Pykkänen, 2008: 22)

An approach along the lines we have suggested has thus many advantages. First, it reduces the complexity of the grammar: the role of syntax is to restrict the combination of syntactic categories; thus, strings containing semantic mismatches are not ungrammatical, but merely (semantically) anomalous. Many of them can get an acceptable

reading by means of an inferential reinterpretation process. Second, it accounts for the systematic and predictable nature of the adjusting processes. Finally, it explains when and how a marked reading will arise as the result of a reinterpretation strategy. These generalisations, we think, have not been accounted for in other proposals.

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