Chapter 19
Connectives

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1. Introduction

In this chapter we examine the division of labor between semantics and pragmatics in connectives, integrating considerations on the inferential mechanisms of interpretation with typological and diachronic data, and supporting a dynamic perspective in which what is left to pragmatics in some languages, or at some diachronic stage, may be part of the encoded semantics in other languages, or at successive diachronic stages (cf. Traugott 2004).

By connective we mean a linking device establishing a given relation between two clauses or phrases. In this work we will mainly focus on interclausal connectives, even though some examples of nominal conjunction and disjunction will also be provided. Given the typological perspective that will be adopted, we will take into account clause linkage devices that show considerable differences from English *and, or, if* markers. Also, even though most of the examples will feature syntactically free standing elements, i.e. conjunctions in the Standard Average European sense, the notion of connective is not defined in formal terms. A given interclausal relation may indeed be encoded by an array of morphosyntactic structures, ranging from invariable discourse connectives, to auxiliaries, clitics, pre- and post-positions, case affixes, adverbial affixes and even suprasegmental marking (e.g. Schmidtke-Bode 2009: 73 for purposive clause linkage devices).

1.1 Connectives between semantics and pragmatics

Connectives can be argued to play a central role in the elaboration of Grice's theory of conversational maxims, and, more generally, in the theoretical debate on the identification of the borderline between semantics and pragmatics. Grice's discussion of the Cooperative Principle and of the maxims governing conversation indeed starts from the comparison between certain basic logical operators, such as ⊃, □, and □, and the corresponding connectives in natural languages, namely *if*, *and* and *or* (Grice 1989: 22). His aim is to preserve the semantic parallelism commonly established between Boolean logic and natural languages, by explaining the attested divergences on the basis of principles of conversation. In particular, he dedicates several pages to the interpretation of natural language *or* (1989: 44-48) and conditional implications with *if* (1989: 58-85), showing that the apparent deviations from their truth-functional semantics can be accounted for in terms of pragmatic implications.

Since then, many scholars have focused their attention on connectives with the purpose of identifying and separating the inherent semantic properties (frequently equated to truth-functional meaning) from the 'extra' meaning that derives from the communicative situation. We can identify two major interests in pragmatic approaches to connectives. On the one hand, great attention has been paid to those connectives that look like the direct linguistic counterparts to Boolean operators, focusing on the mechanisms governing their interpretation and deriving non-truth-functional values

from truth-functional ones (Horn 1972, Levinson 1983, Noveck *et al.* 2002, for *or* and *if,* Blakemore and Carston 2005 for *and*). On the other hand, research has also focused on connectives such as *but* and *nevertheless,* which are at best only indirectly related to Boolean operators and which cannot be characterized in terms of truth-functional semantics and have been examined as test-beds for pragmatic theories, with the aim to explain their meaning in terms of pragmatic implications and principles (Anscombre and Ducrot 1976 and 1977, Blakemore 2000, Iten 2000, Blakemore and Carston 2005).

The central role played by connectives in pragmatic theories is basically motivated by their intrinsic procedural nature, which make them crucial devices constraining and inviting inferential processes. Within Relevance Theory (RT), the term 'procedural' is employed in a technical sense, and a distinction is drawn between 'conceptual' and 'procedural' meanings (Wilson and Sperber 1993, Carston 1999, Blakemore 2004). Concepts constitute the mental representations that undergo inferential computations, so conceptual meaning in an utterance makes up its logical form. Procedures instead are not constituents of conceptual representations: they signal and constrain aspects of the inferential process of message interpretation. A further crucial claim within this framework is that a given linguistic form may have either conceptual or procedural meaning, but not both (Carston 2002: 164). Connectives have been argued to belong to both categories, with truth-functional connectives such as *and, or* and *if* having conceptual meaning, and non-truth-functional connectives, such as *so, but, nevertheless,* and discourse markers, having a purely procedural value (Carston 2002: 255-56). In other words, *so* signals that the clause following should be read as a conclusion from the preceding clause, *nevertheless* signals that the following clause bears a message conflicting with some implication or expectation generated by the preceding clause.

However, such dichotomist view of conceptual and procedural meaning has been challenged (cf. Fraser 2006, Hussein 2008). Fraser (2006) argues that most, if not all discourse connectives have some conceptual content, besides a procedural value. A similar position is held by Hussein (2008), who coins the 'conceptuo-procedural' label to denote entities such as *if*, which may both be analyzed in truth-functional and in metalinguistic terms (see a more detailed discussion in section 4). In this chapter, we will not strictly follow the RT approach, and will rather go along with Fraser in considering connectives as provided with both an internal conceptual semantics and a procedural component, signaling to the hearer how to integrate the linked states of affairs.[1]

In the next section, definitions of what we mean by semantics and pragmatics will be provided and the basic assumptions underlying our approach will be described. In section 1.3 a brief overview of the chapter will be sketched.

1.2 The dynamic balance of coding and inferencing: a typological-diachronic perspective

Although in classical works on pragmatics semantic analyses usually start from logical abstractions, as briefly illustrated in the preceding section, this is not a universally shared assumption, especially not in comparative research. As far as connectives are concerned, Dik (1968: 274-277) and Lakoff (1971: 142) have argued that there are two major problems with projecting Boolean semantics into natural language (see also Ohori 2004). First, truth-values cannot be assigned to expressions such as questions, wishes and hypotheses, since these cannot be evaluated in terms of their truth value.

[1] Henceforth, 'state of affairs' will be abbreviated with the acronym SoA. By state of affairs will be meant here the concept of something that can be the case in some world, and can be evaluated in terms of its existence. The term 'state of affairs' will be understood as a hyperonym for the words 'situation', 'event', 'process' and 'action' (see Van Valin 2006: 82-89 for detailed definitions).

Nonetheless, questions, wishes and hypothesis are frequently conjoined, disjoined or contrasted in natural language (e.g. *Are you vegetarian or do you simply avoid eating meat?*). Secondly, there is a discrepancy between the semantic distinctions identified in Boolean logic and those actually coded by natural languages. For instance, the distinction between inclusive and exclusive disjunction appears to be only marginally relevant to natural language. Actually, languages do not seem to encode the distinction between inclusive and exclusive disjunction at all, since no dedicated connectives for the two types of disjunction are attested (Dik 1968: 275, see also Mauri 2008a: ch. 5). By contrast, languages encode semantic distinctions which are not identified within logic, reserving dedicated connectives to e.g. sequential and non-sequential conjunction (cf. Serbo-Croatian *pa* 'and then', Tukang Besi *kene* 'and at the same time', Mauri 2008a: 90, 94), declarative and interrogative disjunction (cf. Albanian *ose* 'or, listing equivalent alternatives' and *apo* 'or, asking for a choice between alternatives'; 'simple' and 'choice-aimed' disjunction according to Mauri 2008a: 157-161 and Mauri 2008b). In such cases, it would be difficult to maintain a semantic analysis in terms of truth-functional values, leaving the rest to pragmatics, because the notions of temporal (non)sequentiality and necessity for a choice are part of the encoded meaning in these connectives.

Furthermore, it is not rare to find languages without any connective meaning 'or' (e.g. Wari', a Chapacura Wanham language spoken in South America, Mauri 2008a: 167) and even without any connective meaning 'and' (e.g. Maricopa, a Hokan Yuman language spoken in Arizona, Gil 1991). Such a discrepancy strongly challenges the plausibility of a direct equivalence between logical connectives and connectives in natural languages, and suggests that a more promising direction of research would be to understand what strategies such languages employ to express conjunction and disjunction: should we assume that in such cases it is all left to pragmatics?

What seems to be more interesting is to examine the division of labor between the part of meaning that is encoded in the connective and the part of meaning that is inferred through pragmatic processes, looking at this borderline as a flexible notch, moving along both a diachronic and a synchronic continuum. In this perspective, we consider as semantics of a connective the portion of meaning that is part of the linguistic form, independent of its possible truth-functionality or logical formalizability, whereas we attribute to pragmatics the portion of meaning that depends on speakers' inferential processes.

The borderline between semantics and pragmatics in connectives is dynamic in two senses, a diachronic and a synchronic one, and we will consider both. As far as diachrony is concerned, Grice (1989: 39) himself remarks that "it may not be impossible for what starts life, so to speak, as a conversational implicature to become conventionalized", thus pointing to a diachronic dimension of pragmatics. The role of pragmatics in diachronic change is indeed widely recognized (see Hopper and Traugott 2003, Traugott 2004 and this volume, Bybee 2006 among others), and it is well known that pragmatic inferences may conventionalize, becoming part of the semantics of the changing form, and they may trigger processes of form-function reanalysis. Concerning connectives, one of the most studied examples is the development of the causal value of *since* out of a purely temporal one, as a result of the conventionalization of an invited inference of causality (according to the frequent logic fallacy characterized as *post hoc propter hoc* 'after this, therefore because of this', Hopper and Traugott 2003: 80-83). In the next sections, we will provide further examples of connectives undergoing semantic (and in some case also syntactic) change, with pragmatic inferences becoming part of the semantics of the connective.

In synchronic terms, the delimitation between the two levels can be argued to be dynamic both on the basis of the attested cross-linguistic variation and on the basis of the available intra-linguistic options. The same interclausal relations (combination, contrast, cause, alternative, etc.) can indeed be expressed through different *degrees* of coding: they may either be fully encoded (one connective for one interclausal relation, such as *although* for concessive relations), with little or no room for

ambiguity and inferential enrichment, or they may be undercoded, by means of general connectives that can be employed for a number of further relations (cf. Prandi 2004: 297-302, Mauri 2008a: 76). In the latter case, the part of meaning provided by the connective has to be enriched in order to derive the intended message. The higher the degree of coding of the relation, the less is left to inference. In case of juxtaposition, i.e. absence of coding, Prandi (2004: 299-302) talks about 'inferential bridging', meaning the process whereby the conceptual relation existing between two SoAs is built up completely through inference. Example (1) provides an instance of intra-linguistic variation from English:

(1) a. The plane broke down**,** he decided to take the train to Berlin

b. The plane broke down **and** he decided to take the train to Berlin

c. **After** the plane broke down, he decided to take the train to Berlin

d. **Since** the plane broke down, he decided to take the train to Berlin

In (1a) the two clauses are juxtaposed and on the basis of their semantics it is possible to infer a number of relations between them: co-occurrence, sequentiality, and causality. In (1b) the connective *and* only encodes the co-occurrence of the linked SoAs, and its semantics is further enriched by an implicature of temporal sequentiality, following the Gricean Maxim of Quality 'Be orderly'. In (1c) the temporal sequentiality is encoded by the connective *after*, which is however further enriched by a causal invited inference. In (1d), finally, the causal relation is fully encoded by *since*, which does not leave much to pragmatics.

A clear example of cross-linguistic variation is provided by Ohori (2004: 56-59), who argues that in Upriver Halkomelem, a Salish language spoken in northwestern United States, conjunction and disjunction are underdifferentiated, that is, they are expressed by means of the same connective *qə*. This connective only encodes a link between two entities, leaving further specifications on the nature of the link to inferential enrichments (ex. (2)). As shown in (2a), declarative contexts allow for a conjunctive reading, while interrogative constructions tend to associate with a disjunctive reading (2b). Therefore, it can be argued that in this language the degree of coding of the two relations of combination and alternative is very low, and their disambiguation is left to inferential enrichment deriving from the context (cf. also van der Auwera and Bultinck 2001: 180). An assumption of epistemic uncertainty, such as the ones characterizing interrogative speech acts, induces a disjunctive interpretation, while an assumption of epistemic certainty, such as the one characterizing declaratives, induces a conjunctive reading (more will be said on this topic in section 3).

(2) Upriver Halkomelem (Salish, Ohori 2004: 57)

a. Lə́ ləmə́lstəx^{w}əs tə Bill tə sq'ə́mə́l x^{w}əlɛ́m tə Jim **qə** Bob.
3 throw.3 DEM Bill DEM paddle to DEM Jim and Bob
'Bill threw the paddle to Jim and Bob.'

b. Lí lɛ́m k'^{w}ə Bill **qə** Bob?
Q go DEM Bill or Bob
'Did Bill or Bob go?'

To sum up, we will argue for a dynamic perspective in which connectives are examined in their procedural function, and we will focus on the one hand on what is left to pragmatics (and absent from coding) and on the other hand on what is subtracted from pragmatics because it becomes part of coding. We will focus on conjunctive, disjunctive and conditional connectives, broadening the discussion to include, at least marginally, also temporal, causal, purposive, adversative and concessive connectives. We will integrate general remarks on the main pragmatic features characterizing the connectives under exam with both data on the attested typological variation and data on frequently recurring diachronic paths, in order to analyze (*i*) how the world's languages put the borderline between coding and inferencing at different points along the continuum, and (*ii*) how such borderline may move across time, so that dedicated connectives may arise from undercoded constructions, through pragmatic processes.

1.3 Overview of the analysis

We will classify connectives on the basis of two major semantic parameters: (*i*) the co-occurrence vs non-co-occurrence of the linked SoAs and (*ii*) in case of co-occurrence, its potential or conflicting nature (cf. Mauri 2008a: 48, 80-83, 155-159). Therefore, section 2 will be devoted to the discussion of connectives encoding *at least* the co-occurrence of two SoAs, like conjunctives, with some remarks on temporal, causal and purposive connectives too, which add to the encoded part of meaning the notions of sequentiality and causality, otherwise left to inference. Section 3 takes into account disjunctive connectives, encoding the non-co-occurrence of the linked SoAs, which are presented as equivalent and replaceable possibilities. In section 4 we will discuss conditional connectives, linking potentially co-occurrent SoAs, and in section 5 we will briefly consider adversative and concessive connectives, encoding a conflicting co-occurrence of SoAs. As already mentioned, these types of connectives will be examined both under the lens of traditional pragmatic approaches and from a typological-diachronic perspective.

The discussion will follow a non-random order, along a hypothetical scale going from 'less-coding/more pragmatics' to 'more coding/less pragmatics'. Along this continuum, conjunction is considered as the basis for any clause linkage being very underspecified, leaving a lot to inferential enrichment, and subordinating connectives such as concessives are considered as highly specified devices which leave almost nothing to pragmatics (cf. also Prandi 2004: 297-302).

2. Co-occurrence: conjunctive, temporal, causal connectives

The pragmatic accounts of conjunctive connectives often start from the analysis of English *and* as having the truth-functional value 'p q', focusing on the inferential mechanisms generating the set of further values and relations that *and* may express (Carston 2002: 222-224, Blakemore and Carston 2005, Jaszczolt 2005, Allan, this volume). Let us start with some examples:

(3) a. He took off his boots and got into bed.

b. He got into bed and took off his boots.

c. She shot him in the head and he died instantly.

d. It's summer in England and it's winter in New Zealand.

e. He is very tall AND he cannot play basketball.

If one wants to keep the semantic analysis of *and* to a minimum, without postulating any polysemy, it is necessary to account for the different interpretations of sentences (3a-e) in pragmatic terms. In the first two sentences (3a,b) an inference of temporal sequentiality is generated, leading to two

different readings if the respective order of the clauses is inverted. Grice's suggestion is that the inference of sequentiality is a conversational implicature generated by the manner Maxim of Orderliness. The same account is provided for (3c), where an inversion of the two clauses would lead to a strange sequence of events, whereby death precedes shooting. In (3c) the conjunction is further enriched by a causal invited inference, interpreting the instant death as a consequence of the shooting. The last two sentences may instead be interpreted as somehow conflicting: (3d) conveys a symmetric opposition, while (3e) conjoins two SoAs that are not expected to cooccur, since the second clause denies some expectation generated by the first one (in this case, *and* has to be heavily stressed, as underlined by the use of capital letters, and the sentence has to be characterized by a special intonational pattern, in order for the contrast to be conveyed). Basically, we may argue that *and* only encodes the co-occurrence of the linked SoAs, leaving room for all possible inferential enrichments compatible with its semantics. We will discuss cases like (3d) and (3e) in more detail in section 5, and in the following discussion we will focus on the temporal and causal readings of conjunctive constructions.

A temporal sequence relation is very often inferred from the conjunction of two SoAs, and this recurrent inferencing process has been the object of several analyses after Grice. According to Levinson (2000), this instantiates a generalized conversational implicature, which has to be kept distinct from particularized implicatures. The former type of implicature normally arises across contexts unless they are blocked by specific salient assumptions, whereas a particularized implicature is dependent on specific contextual assumptions. Therefore, in Levinson's view, unless the sequential inference is blocked, it is activated by default in the interpretation of two conjoined SoAs. A different analysis is provided by Carston (2002: ch. 3), within the Relevance Theory framework, who explains the sequential and causal reading of cases like (3a-c) in terms of inferential enrichments, rather than implicatures.

Carston's analysis relies on the activation of highly accessible narrative scripts, in which these sequential relations are represented. In her approach, the temporal sequence inference is supported by the accessing of contextual assumptions, which increases the ease of processing and provides a script representing events as occurring sequentially (Carston 2002: 378-379). It is indeed widely assumed in cognitive studies that frequently experienced processes and sequences of events are stored as frames or scripts. Such scripts may be highly specific stereotypical scenarios acquired through experience, such as going to a restaurant for a meal, going to the cinema, or two people getting married, or they may be more abstract. In the latter case, we are dealing with frames deeply rooted in the human cognitive ability, such as the fact that events in the world are usually causally connected to other events or that actions are usually made with a purpose (Carston 2002: 226). In either case, inferential enrichment characterizing the occurrences of *and* in (3) is to be connected to narrative chunks readily accessible for the hearer, and not to conversational implicatures.

Blakemore and Carston (1999, 2005) also take into account the non-narrative instances of *and*, i.e. cases in which the linked SoAs are not parts of a temporal sequence, and compare them to the corresponding juxtapositive constructions, highlighting a number of restrictions that *and* imposes on the set of possible inferences. In particular, they show that in a case like (4), the sentence in (4a) can be interpreted as presenting a fact and its explanation, while such an interpretation is not available for (4b) (Blakemore and Carston 2005: 572).

(4) a. Max fell asleep; he was tired.

b. Max fell asleep and he was tired.

Further relations that may be inferred from the juxtaposition of clauses, but which are precluded by the presence of *and,* are evidence, reformulation and certain sorts of elaboration. Blakemore and Carston argue that such restrictions are a consequence of the fact that in explicit conjunction, it is the complex conjoined sentence that carries the presumption of optimal relevance and is therefore elaborated and processed by hearers, not the linked clauses individually (cf. also Mauri 2008a: 37-44). Therefore, relations that imply separate processing for the two clauses, e.g. if the second clause is interpreted as an explanation or elaboration of the first one, are not inferable if an overt conjunctive connective is present. In other words, in the interpretative process, hearers directly look for complex scripts, where the two clauses are relevant together, rather than for individual scenarios for each clause.

If we take a comparative perspective, we see that the behavior of English *and* is but a particular case within a rather complex picture. The world's languages indeed show a great amount of cross-linguistic variation in how they distribute the labor between semantics and pragmatics in conjunctive connectives. First of all, as pointed out by Mithun (1988), in many languages the most common strategy to conjoin two clauses is simply to juxtapose them. The use of simple juxtaposition is especially widespread in languages with a mostly spoken tradition, where the conceptual closeness vs separateness of the SoAs is conveyed by means of different intonational patterns. However, juxtaposition is a frequent alternative option also for languages in which there is some structural device signaling the combination of two SoAs, but this device is not obligatory and in some cases it is at the very beginning of a grammaticalization process, or consists of clause chaining lacking any structural differentiation between coordinating and subordinating constructions (Mauri 2008a: 91-96). In such cases, the burden of communication is all on inferential enrichment.

Maricopa, for instance, has no overt conjunctive connective, and this is what made Gil title his paper 'Aristotle goes to Arizona and finds a language without And' (Gil 1991), highlighting the non-universality of connectives equivalent to *and*. As exemplified in (5), the two linked clauses are simply juxtaposed. The verb form of the first clause bears a switch-reference maker (Different Subject marker), signaling non-identity of the subject of the second clauses (i.e. the first couple of people, denoted by the dual marker, is different from the second couple), but there is no way for such a marker to encode any additional interclausal relation.

(5) Maricopa, Yuman, Hokan (Gordon 1986: 285)

kafe	sish-m	pastel	mash-k
coffee	drink:DU-DS	pie	eat:DU-REAL

'They-2 drank coffee and they-2 ate pie' (They ≠ they)

Besides radical cases as Maricopa, it is not rare to find languages with some overt conjunctive marker which is more specific that English *and*, and is restricted to the expression of either sequential or non-sequential conjunction. Hdi (Afro-Asiatic, Chadic, spoken in Nigeria and Cameroon) and Lango (Nilo-Saharan, Nilotic, spoken in Uganda), for instance, use simple juxtaposition as the main strategy for the expression of clausal conjunction, but they also have the possibility to employ an overt connective for the expression of a sequential combination. In both cases, the connectives derive from verbs and are not fully grammaticalized. In Lango *tɛ̂*, roughly meaning 'and then', is still conjugated in the habitual and takes infinitive complements (Noonan 1992: 193). In Hdi the verb *lá*, originally meaning 'depart, go', is used in its nominalized form to indicate separation and temporal sequentiality of the SoAs it links. As Frajzyngier and Shay (2002: 428-31) argue, the verb *lá* has entered a process of grammaticalization, whereby it has developed a

purely conjunctive sequential function which still synchronically co-exists with its original lexical meaning. In the intermediate stage, during which the conjunctive function arose, the verb 'to go' worked as a bridge between two events, in which a subject had to move to another location in order to continue his action or to begin a new one there. Then, given the high frequency of occurrence in such narrative contexts, speakers reinterpreted the form as signaling a sequential relation.

Example (6) shows the original lexical meaning 'to go' together with the new conjunctive function of *lá*. The original meaning can be observed in *lá-b-ì* 'went away', whereas the following *lá-ghà* has a conjunctive function, which is proved by the fact that its subject (Hyena) that does not move.

(6) Hdi, Chadic, Afro-Asiatic (Frajzyngier and Shay 2002: 429-30)

mbàɗ ká krì kà lá-b-ì **lá-ghà** pákáwghúvì kà mná-n-tá krì
then comp dog seq go-out-ref go-d:pvg hyena seq tell-3sg-ref dog
'Then Dog went away and Hyena said to Dog . . . '

In other words, in Lango and Hdi what is encoded in the connective is not only the co-occurrence of linked SoAs, but also their temporal sequentiality. On the other hand, there are also languages, such as Tuvaluan (Austronesian, Malayo-Polynesian, spoken in the island of Tuvalu, Besnier 2000) and Koromfe (Niger-Congo, Volta Congo, spoken in Burkina Faso and Mali), where the only overt conjunctive connective attested can only be used in non-sequential combination. In these languages, we observe a demarcation line separating sequential (and causal) combination from all the other co-occurrence relations, in that two SoAs linked within a temporal sequence can only be juxtaposed, while any kind of absence or interruption of sequentiality is overtly signaled by *kae* in Tuvaluan and by *la* in Koromfe. The non-sequentiality encoded in these connectives then frequently activates contrastive inferences, as will be discussed in detail in section 5, so that these markers are commonly employed also in adversative contexts.

Finally, there are also languages employing two different dedicated connectives for sequential and non-sequential conjunction, lacking a general undercoded connective comparable to English *and*. Tukang Besi provides a case in point, with the connective *kene* encoding non-sequential conjunction and the connective *maka* encoding temporal sequentiality, as exemplified in (7).

(7) Tukang Besi, Malayo-Polynesian, Austronesian, spoken in Indonesia (Donohue 1993: 427)

a. Te mia no-rato **kene** no-ganta-'e na uwe
CORE person 3R-arrive and 3R-scoop-3OBJ NOM water
'…people keep coming and fetching water…'

b. Jari, sa-rato-no i umbu na Ndokendoke o-sampi-'e-mo a
so when-arrive-3POSS OBL edge NOM monkey 3R-peel-3OBJ-PRF NOM
loka iso **maka** o-manga
banana yon and.then 3R-eat
'So when Monkey arrived at the top he peeled the bananas and then ate them.'

Cases like Tukang Besi exemplify a division of labor between semantics and pragmatics with a heavier semantics, as compared to English, at least as far as temporal sequentiality is concerned. Of course, sequential and non-sequential connectives may in turn generate a number of further inferential enrichments in particular contexts, such as inferences of causality in sequential contexts or adversative inferences in non-sequential contexts (cf. ex. (3d,e)).

Typological data thus reveal a picture in which conjunctive connectives do not necessarily correspond to English *and*, but may be completely absent, leaving everything to bridging inferences, or they may encode much more than the truth-functional 'p ∧ q' formula, including into the semantics of the connective temporal indications concerning the sequentiality of the SoAs.[2] Let us now have a look at diachronic paths involving conjunctive connectives and see how the borderline between semantics and pragmatics moves across time.

As we have already argued, the main inferential enrichments generated by the co-occurrence of two SoAs are temporal and causal, whereby the two events are interpreted as being parts of a sequence and as being related as cause and consequence. Such pragmatic inferences may become part of the semantics of the connective, which thus develops a sequential meaning out of a purely conjunctive one or a causal meaning out of a temporal one (cf. the case in *since*, section 1.2). Heine and Kuteva (2002: 43) cite the case of Mingrelian *do* 'and' developing a temporal value 'as soon as', but this kind of path does not seem to be very frequent across languages. What can be observed in several unrelated languages is instead the second diachronic change, namely the one deriving causal functions out of temporal ones. Heine and Kuteva (2002: 291) list a number of examples from Indo-European and non-Indo-European languages: Old High German *dia wila so* 'so long as' > German *weil* 'because'; Latin *posteaquam* 'after', 'ever since' > French *puisque* 'since', causal marker; Finnish *kun* 'when', 'while', 'as', 'since', 'because'; Estonian *paräst* 'after', 'because of '. In all these cases an invited inference plausibly became part of the semantics of the connective (cf. Geis and Zwicky 1971: 565–6).

It is to be noted that temporal connectives may be the source for other connectives as well, such as conditionals and adversatives, and these paths will be discussed in sections 4 and 5. The reason why temporal connectives are the source for recurrent diachronic processes is probably rooted in those abstract cognitive scripts described by Carston (2002, see discussion above), which make narrative and causal scenarios easily available during the interpretative process. The frequent activation of causal inferences then determines their systematic association to the connective at issue, determining in turn its functional reinterpretation.

Finally, let us briefly mention purposive connectives, which encode the intentional co-occurrence of two SoAs. Purposive connectives, such as *so that* and *for*, link one SoA, that of the matrix clause, to another SoA, so that the former is performed with the intention of bringing about the latter. The latter SoA is described in the purpose clause (cf. Schmidtke-Bode 2009: 20). Purpose clauses are frequently encoded by means of juxtapositive strategies, in which no explicit connective is used and the purposive relation is expressed through a conjunction of clauses, a serial-verb or quotative construction. As we already argued, two SoAs in immediate succession are indeed likely to be interpreted as being linked in a causal relation, and it is frequently the case that the

[2] It is furthermore to be noted that, as pointed out by Haspelmath (2005), it is rather common to find distinct constructions for conjunction between entities (NP conjunction) and conjunction between events, thus reinforcing the discrepancies between logic and natural languages. For NP conjunction, Stassen (2001) distinguishes between '*and*-languages', showing different strategies from NP combination and accompaniment relations (frequent in northern and western Eurasia, India, northern Africa, New Guinea, Australia and Meso-America), and '*with*-languages', employing the same asymmetric strategy for accompaniment and conjunctive relations (frequent in sub-Saharan Africa, East Asia, Southeast Asia and the Pacific Islands, as well as in northern North America and lowland South America).

causal relation is motivated by an intention to bring about the second SoA. Such pragmatic inferences of causality and purpose may eventually become part of the conventionalized meaning of a construction (cf. Schmidtke-Bode 2009: 201).

To sum up, we can see a cline in the degree of coding of co-occurrence relations, going from simple juxtaposition towards the overt coding of causal and purposive relations. In between, we find overt underspecified conjunctions (as in English *and*) and temporal (sequential and non-sequential) conjunctions. Along the cline, the burden of communication gradually passes from pragmatics to semantics. In diachrony such continuum can be examined as successive stages of change.

3. Non-co-occurrence: disjunctive connectives

Pragmatic accounts of disjunction mainly focus on the distinction between inclusive and exclusive *or* and examine the inferential processes through which one of the two readings is selected over the other in specific contexts. The inclusive reading of disjunction parallels the value of the Boolean operator ∨, so that $p \vee q$ is true if *p*, or *q*, or both are true (8a). The exclusive reading on the other hand requires that either *p* or *q* is true, but not both (8b). There are contexts, such as (8c), in which both readings are possible.

(8) a. To play Bardot the actress needs to be sensuous or seductive.[3]
(having them both would not be a problem)

b. At the moment, Jack is waiting at the airport or he is flying over the Alps
(he can't be in both places)

c. The ideal candidate should have a law degree or a keen awareness of the legal system
(both inclusive and exclusive readings are possible)

The crucial question at issue in most theoretical studies on disjunction is under what conditions the exclusive interpretation is preferred over the inclusive one, and vice versa. The neo-Gricean most widespread view is that the inclusive interpretation of *or* is the basic one and the exclusive one is derived through a scalar implicature (Gazdar 1979; Horn 1973; Levinson 1983). The two connectives *or* and *and* may indeed be analyzed as forming a scale < *and, or* >, in which *and* is the more informative element of the scale, since it provides information on the existence of both *p* and *q*, and *or* is the less informative one, in that it provides information only on the *potential* existence of *p* and *q*. According to this view, *p and q* entails *p or q*. As a consequence, if the speaker utters a disjunctive sentence *p or q*, the hearer will infer that (s)he either has no evidence to argue that *p and q,* i.e. to use the stronger element in the scale, or that (s)he positively knows that *p and q* does not hold. If the speaker had evidence for *p and q* but chose to utter *p or q*, his/her behavior would violate the general Cooperative Principle. Thus, presuming that the speaker is cooperative, the hearer will infer that it is not the case that *p* and *q* both hold, thereby interpreting the disjunction as exclusive. Even if the exclusive reading is derived from the inclusive one, which can therefore be considered as more basic, it is the default interpretation in unembedded contexts (i.e. contexts in which the disjunction in not in the scope of modals or negation, and is not in the protasis of conditional construction, see further discussion below). In case both readings are to be preserved, a formula such as *and/or* is often used.

[3] We thank Keith Allan for suggesting this example.

Slightly different accounts are provided within the RT framework by Sperber and Wilson (1986), and in generative approaches, such as the ones by Chierchia *at al.* (2001) and Crain (2008). Sperber and Wilson argue that scalar implicatures are generated when a weak statement fails to meet the hearer's expectations of relevance. Therefore, in their view the exclusive reading of *or* does not arise as the default, but is rather generated as an effect of the hearer's attempt to identify the most relevant interpretation with the least effort. In the generative approach, the difference is more significant, since scalar implicatures are viewed as grammatical phenomena rather than pragmatic processes. First, an account in terms of informativeness of the two readings in specific contexts is provided (Chierchia *et al.* 2001, Noveck *et al.* 2002), with reference to the distinction between upward and downward entailing contexts; then, it is argued that the ability to recognize the inclusive value of *or* is innate (cf. also Crain 2008: 151).

Chierchia *et al.* (2001: 161-163) start from remarking a clear parallelism between contexts licensing negative polarity items such as *any* and contexts licensing an inclusive interpretation of *or*, exemplified in (9).

(9) a. There aren't people who like John or Bill.

b. Did John or Bill arrive?

c. I forbid you to smoke or drink.

d. If John or Bill go to the gym, Mary is happy.

e. John or Bill could lift this.

These contexts have been characterized as having a downward entailing semantics. An upward entailing semantics characterizes ordinary declarative sentences, where inferences from subsets to sets are licensed, as in (10a). By contrast, a downward entailing context is characterized by licensing inferences from sets to their subsets, as exemplified by sentential negation (10b).

(10) a. Noam bought an Italian car. Noam bought a car.

b. Noam didn't buy a car. Noam didn't buy an Italian car.

According to Chierchia *et al.* (2001, cf. also Noveck *et al.* 2002: 304-305), there is a systematic correspondence between upward entailing contexts and an exclusive interpretation of *or* on the one hand, and downward entailing contexts and an inclusive reading of *or* on the other hand. In their view this distribution is based on the potential informativeness of disjunction, whereby the interpretation having the smallest number of true conditions is considered most informative. In the cases listed in (9), inclusive interpretations make for a more restricted set of possibilities than exclusive ones. Take for instance (9a): an inclusive interpretation in *There aren't people who like John or Bill* allows for one possibility, i.e. nobody likes John and Bill, while an exclusive interpretation would lead to two, i.e. either they like neither or they like them both. Therefore, it can be argued that in downward entailing contexts, an inclusive reading of *or* is more informative than the exclusive one, and the reverse holds for exclusive disjunction in upward entailing contexts. In Chierchia's view, however, such informational computations pertain to grammar, and not to pragmatics. As a consequence, the principles governing the correct interpretation of a disjunctive relation are argued to be *innate* and to be *part of the UG* (Crain 2008: 151).

To sum up, the debate on disjunction and on the mechanisms underlying its interpretation has never challenged two basic assumptions, namely that the exclusive vs. inclusive distinction is relevant to natural languages and that the notion of inclusive-or is basic and universal. Actually, if we look at the variation attested in the world's languages, the picture is once again much more complex and these two assumptions are strongly challenged. Although Payne (1985: 40) argues that "on the whole […] it is rare to find anything unusual in disjunction" and that "the majority of languages appear to possess at least one unequivocal strategy and this is invariably permitted at sentential and at phrasal levels", our data show the opposite.

There are indeed languages without any overt disjunctive marker and in such languages the elicitation of disjunctive constructions can be highly problematic. Kibrik (2004: 547-48), for instance, argues that there does not seem to exist any native way to express disjunction in Kuskokwim (Athabaskan, Alaska), and he reports that one of the consultants, after many attempts to get him to translate a sentence such as *Do you want tea or coffee?* answered "They did not offer you a choice in the old days", thus highlighting the non-truth-functional meaning perceived by speakers and the close connection with the notion of choice. A further example of language without *or* is provided by Wari' in (11), which exemplify the two juxtapositive strategies to express the notion of alternative.

(11) Wari', Chapacura-Wanam, spoken in Brazil (Everett and Kern 1997: 162)

a) ***mo*** *ta* *pa'* *ta'* *hwam* *ca*, ***mo*** *ta*
COND realis.future kill 1SG:realis.future fish 3sg.M **COND** realis.future
pa' *ta'* *carawa* *ca*
kill 1SG:realis.future animal 3sg.M
'Either he will fish or he will hunt.' (lit. 'if he (says) "I will kill fish", if he (says) "I will kill animals".')

b) ***'am*** *'e'* *ca* ***'am*** *mi'* *pin* *ca*
perhaps live 3SG.M perhaps give complete 3SG.M
'Either he will live or he will die.' (lit.'perhaps he will live, perhaps he will die')

It may appear than in cases such as (11), the interpretative burden is fully left to pragmatics, in that no explicit connective is employed. However, if we consider the construction as a whole, we may observe that both strategies are characterized by some overt indication of the potential, rather than truth-functional status of the linked SoAs: in (11a) each clause is introduced by the conditional marker *mo*, while in (11b) each clause contains the dubitative adverb *'am* 'perhaps' (cf. Mauri 2008a: ch.5 and Mauri 2008b). Such indications are necessary for a disjunctive relation to be inferable, because the simple juxtaposition of two SoAs marked (or unmarked) as realis could not generate a disjunctive inference. In other words, the labor is actually divided between coding and inferencing, but the encoded part of meaning does not refer to the interclausal relation, but to a necessary condition for the relation to be inferable. The notion of an alternative relation indeed implies that the linked SoAs are replaceable *possibilities*, and not facts, because if the speaker had some sort of evidence for at least one of them, there would be no need for establishing an alternative (?? *Tonight I will certainly go to the cinema or I will certainly stay at home*).

In a cross-linguistic survey on coordination, Mauri (2008a: 170-182 and 2008b) identifies what she calls the 'alternative irreality implication':

(12) Absence of a disjunctive marker → Presence of some irrealis marker

According to the implicational pattern in (12), in a language where no overt disjunctive marker is present, each state of affairs must display an irrealis marker[4] presenting the event as possible rather than occurring or realized. Therefore, in order for an alternative relation to be conveyed, either a disjunctive marker is present (13b) or an underspecified construction is employed, where a contextual inference based on the irrealis nature of the two juxtaposed SoAs gives rise to the alternative reading (13a). They may also occur together (as (13c)). If neither of the two occurs (13d), however, it is difficult to infer an alternative reading and the construction fails to fulfill an alternative function.

(13) a. *Perhaps the hawk clawed it, maybe the dog bit it.*
(irrealis coded, alternative inferred)
b. *The hawk clawed it or the dog bit it.*
(alternative coded, irrealis implied)
c. *Perhaps the hawk clawed it or maybe the dog bit it.*
(alternative coded, irrealis coded)
d. *The hawk clawed it, the dog bit it.*
(irrealis and alternative not coded) → possible interpretations: sequence of actions, simultaneous actions, opposition, ??alternative??

Thus, what seems to be relevant for natural languages are not truth vs false values of the propositions, but rather their status as *possibilities* rather than as facts and non-facts. Interestingly, in the field of logic, too, increasing attention has been paid to the connection between modality and disjunction (cf. also Ohori 2004 on ex. (2)). In the analyses of Zimmermann (2001) and Geurts (2005), the concept of possibility plays a major role in the definition of disjunction, to the point that they equate disjunction to a list of *epistemic possibilities*, naturally rendered as a conjunction of irrealis propositions. The parallelism between their account of disjunction in modal logic and the cross-linguistic pattern described in (12) is striking.

The key innovation in Zimmermann's and Geurts's work is that natural language *or* is argued to express a *modal* concept, rather than a truth-functional one: someone who utters a sentence of the form 'S1 or. . . or Sn' presents his audience with a list of alternatives which are modal propositions (Geurts 2005: 385–390), namely irrealis ones. To say that 'Brown is either in Lagos or in Harare' is to assert that, as far as the speaker knows, 'Brown may be in Lagos, or Brown may be in Harare, and there are no other places where Brown might be'. The corresponding formalism is reported in (14):

(14) $p \vee q \models \Box p \wedge \Box q$

Before moving on to some diachronic considerations, let us briefly consider a further crucial datum that a typological survey on disjunction reveals: there does not seem to be languages showing

[4] A proposition is said to be realis when it asserts that a SoA is an 'actualized and certain fact of reality' and it is said to be irrealis when 'it implies that a SoA belongs to the realm of the imagined or hypothetical, and as such it constitutes a potential or possible event but it is not an observable fact of reality' (Elliot 2000: 66-67). Irrealis propositions belong to the domains of imagination, possibility, wish, interrogation, necessity, obligation and so on, in which a given SoA is presented as not having taken place, or where the speaker is not sure about its occurrence. An irrealis marker is any morphosyntactic means (adverbs, sentence particles, verb forms) which specifically encodes the irrealis value of a given SoA or which encodes notions that imply the irreality of the relevant SoA within a given clause (such as interrogative, dubitative, etc. cf. Mauri 2008a: 171-172).

distinct strategies for inclusive vs. exclusive disjunction.[5] Since distinctions that are relevant to human communication normally tend to receive overt coding, the fact that no overt marker for inclusive and exclusive disjunction is attested leads us to wonder to what extent this distinction is really relevant to natural languages (cf. also Dik 1968: 274-276, Haspelmath 2007: 25-27). By contrast, a different distinction appears to be frequently encoded in the world's languages, based on the *aim* with which the disjunction is established (see Mauri 2008b: 155-161 for a detailed discussion on the semantic parameter of 'aim'): a disjunction may be established in order to present two SoAs as equivalent possibilities, without the need for any choice (simple disjunction, typically occurring in declarative sentences, e.g. *Tonight I will read a book or watch a movie, I don't know yet*), or it may be established in order to elicit a choice (choice-aimed disjunction, typically occurring in interrogative sentences, e.g. *Are we going to the cinema or are we staying at home?*). This distinction rests upon the highly intersubjective dimension of speaker's expectations regarding the hearer's reaction to his/her utterance (cf. also Dik 1968: 276 and Haspelmath 2007: 25-27).

As can be observed in (15), Marathi employs different connectives for simple disjunction (15a) and choice-aimed disjunction (15b), whereas English only has *or* for both relation types. We can say that in English the types of disjunction are undercoded, in that the semantics of the connective only conveys a set of mutually replaceable possibilities, leaving the eventual need for a choice to inference. The pattern of Marathi is rather frequent across languages and it is attested, among others, in Finnish (choice-aimed disjunction: *vai*, simple disjunction: *tai*), Georgian (choice-aimed disjunction: *tu*, simple disjunction: *an*), Polish (choice-aimed disjunction: *czy*, simple disjunction: *lub/albo*), Somali (choice-aimed disjunction: *misé*, simple disjunction: *ama*), Albanian (choice-aimed disjunction: *a/apo*, simple disjunction: *o/ose*), and Vietnamese (choice-aimed disjunction: *hay(là)*, simple disjunction: *hoặ*). If we wanted to employ the traditional lenses in examining the two sentences in (15), we would end up classifying them as two cases of exclusive disjunction, without grasping the difference motivating the use of two distinct markers (for further data and discussion, see Mauri 2008a: ch.5).

(15) Marathi, Indo-Iranian, Indo-European, spoken in India (Pandharipande 1997: 162–163)

a. *madhū āītSyā śuśruṣesāṭhī suṭṭī gheīl* ***kĩmwā*** */*kī*
Madhu mother:GEN looking.after.for leave take:FUT:3sg **DISJs**
tilā hɔspiṭalmadhe ṭthewīl
3SG.ACC hospital:in keep:FUT:3SG
'Madhu will leave to take care of his mother or keep her in the hospital.'

b. *to bādzārāt gelā* ***kī/*kĩmwā*** *gharī gelā?*
3SG market.LOC go:PST:3SG.M **DISJc** home:LOC go:PST:3sg.M
'Did he go to the market or did he go home?'

[5] An example employed to illustrate the inclusive vs exclusive distinction is Latin, where *aut* is argued to have an exclusive value, and *vel* an inclusive one. However, it has been shown by many scholars (see Kühner and Stegmann 1914: 107-108, Dik 1968: 274-76, Jennings 1994, Jennings and Hartline 2009) that the Latin distinction has to be understood as a pragmatic or stylistic difference, not a logical one. Take for instance the sentence *Tantum superantibus aliis ac mergentibus malis nemo tribunos* ***aut*** *plebem timebat* 'So greatly did other evils overtop and threaten to engulf them, that no one feared the tribunes or the plebeians' (Livy, Ab urbe condita, Book III, XVI): in this occurrence *aut* may only be interpreted inclusively. Likewise, Jennings (1994: 245) quotes the sentence ***vel*** *dies est* ***vel*** *nox* 'it is either day or night', where *vel* is used with an exclusive reading. According to Dik (1968:275), *vel* indicates that the choice between the two alternatives "is left to the interpreter, or is immaterial to the argument", while *aut* indicates more urgency for a choice. A similar proposal had already been made by Kühner and Stegmann (1914: 108), who argue that *vel* is used when the speaker does not decide between the alternatives and leaves the choice open.

The typological picture just described underlines two major phenomena: (*i*) there are languages completely lacking an *or* connective and showing some overt indication of the irrealis status of the SoAs, and in such cases the part of meaning that is encoded concerns the non-factuality implied by the notion of disjunction, while their mutual replaceability is left to inferential enrichment; (*ii*) languages having two different disjunctive connectives employ them to encode the distinction between choice-aimed vs simple disjunction, not that between inclusive vs exclusive. Therefore, besides confirming the fact that different languages put the borderline between coding and inferencing at different points, this picture also highlights the crucial anchorage of disjunction on the one hand in the modal dimension of epistemic possibility, and on the other hand in the discourse dimension of speakers' expectations regarding hearers' reactions to their utterance, which may or may not result in a choice. These two poles implied in the notion of disjunction nicely emerge also from a diachronic analysis of disjunctive connectives (cf. Giacalone and Mauri, forthcoming).

Disjunctive connectives frequently develop from underspecified constructions, where the disjunctive relation was originally inferred from the overt indication of the potential nature of the linked SoAs, like the one exemplified in (11). Such pragmatic inferences then trigger a form-function reanalysis (cf. Croft 2000: 120 ff.), through which speakers reinterpret irrealis markers, such as dubitative adverbs, hypothetical forms, or interrogative markers, as the overt indicators of the notion of alternative, thus reanalyzing them as disjunctive connectives. Interrogative markers typically develop into disjunctive connectives in contexts where the speaker asks for a choice between two equivalent possibilities, i.e. in questions (instrumental form of Common Slavic **ch'to* 'what' > Czech, Polish: *czy,* Belorussian *ci* 'choice-aimed or'). Free choice constructions, on the other hand, grammaticalize as connectives in declarative sentences, where each alternative is overtly stated as a possible choice for the hearer. Examples of this path are provided by Latin *vel* 'want'> 'simple or', and French *soit…soit* 'be it' > 'either …or'. Dubitative epistemic markers and conditional constructions encode the speaker's doubt on the actual occurrence of the two alternatives, and are typically reanalyzed as connectives of simple disjunction. Examples are attested both in Indo-European languages (Russian, Bulgarian, Serbo-Croatian: *i* ('and') + *li* (dubitative particle) > *ili* 'or'; Italian *sennò* 'otherwise' < *se* 'if' + *no*) and non-Indo-European languages. Two still transparent instances of these two latter paths are attested in Cavineña (a Tacanan language spoken in Bolivia), where the construction *jadya=ama ju-atsu* 'thus=NEG be-SS' (lit. 'being not thus, if it is not so') is reinterpreted as being a disjunctive connective meaning 'or' (Guillaume 2004: 114), and in Lezgian, where *taxâjt'a* 'or' derives from the conditional form of the negated aorist participle of *xûn* 'be', meaning 'if it is not' (Haspelmath 1993: 332).

4. Potential co-occurrence: conditional connectives

Let us now come to potentially co-occurring SoAs, linked by conditional connectives. Part of the debate has focused on tracing the borderline between the part of meaning that is encoded in *if* and the part of meaning that is left to inference, mainly discussing whether *if* is truth-functional or not. A good deal of pragmatic work has also revolved around the explanation of the recurrent interpretation of conditional *if ... (then)* as a biconditional *if and only if*, i.e. so-called 'conditional perfection' (Geis and Zwicky 1971). Let us address the two issues separately, starting from the identification of the semantic value of *if.*

As Grice (1989) puts it, natural language *if* can be considered semantically identical to material implication in logic '⊃', which is a truth-functional connective according to which $p \supset q$ is true on all possible combinations except when *p* is true and *q* is false. However, this assumption is not universally shared and has been discussed widely in the literature. Scholars working in the RT framework tend to maintain such a truth-functional characterization of *if* (Sperber and Wilson 1986, Carston 2002), arguing that the connective has a conceptual meaning, thus contributing to the truth-functional representation of the sentence (see section 1.1). By contrast, there is another view,

followed among others by van der Auwera (1986) and Sweetser (1990), according to which *if* is not translatable into truth tables, but rather encodes non-truth-functional relations such as causal and consequential ones. For instance, a sentence as (16) semantically encodes that the president's resignation is the cause for the vice president to assume the presidency.

(16) If the President resigns, the Vice President shall immediately assume the presidency.

In his analysis of conditionals, van der Auwera (1986: 200, 1997a) proposes a Sufficiency Hypothesis, according to which *if p then q* means that *p* is a sufficient condition for *q*. For instance, in (16), the President's resignation is a sufficient condition for the Vice President to assume the Presidency. The Sufficiency Hypothesis is also retained by Sweetser (1990), in her account of conditionals at the three levels of content, epistemic and speech-act domains. Content conditionals are established between SoAs, indicating that the reality of one SoA is a sufficient condition (or cause) for the reality of a second SoA, as in (16). In the epistemic domain, conditionals link epistemic states, giving rise to a relation that may be paraphrased as 'If I know *p,* I conclude the *q*', as in (17). If the hearer knows that the windows are all closed, (s)he will process this as a sufficient condition for concluding that they are out for dinner. In the speech act domain, conditionals link a SoA to a speech act, so that the truth of the antecedent is a sufficient condition for the speaker's uttering the consequent speech act. Example (18) is thus equivalent to 'if it is true that *p*, then I utter *q*'.

(17) If the windows are all closed, they are out for the evening.

(18) If you are hungry, there are some biscuits on the table.

Hussein (2008: 77-78) proposes a different account, which looks like a compromise between the two approaches described so far, employing the distinction between conceptual and procedural elaborated in the RT framework. According to his analysis, conditionals can be classified as hybrid cases, having what he calls 'conceptuo-procedural' semantics. In the conceptual use, *if* has a truth-functional value and contributes to the semantic representation of the sentence. By contrast, in the procedural use, *if* is not truth-functional and plays a role in the inferential part of the conditional interpretation. In this perspective, example (16) would be classified as conceptual, while examples (17) and (18) would be classified as procedural. In this work, however, we will follow the approach proposed by van der Auwera and Sweetser, providing typological and diachronic data in support.

The second issue, 'conditional perfection', is illustrated in (19), the example originally due to Geis and Zwicky (1971) (see van der Auwera 1997b for an overview of the literature). The pragmatic phenomenon under exam generates from (19a) the invited inferences in (19b,c,d), so that hearers infer a biconditional reading from simple conditional constructions. This inferential process has been explained by van der Auwera (1997a) in terms of scalar implicatures (Horn 1972; Gazdar 1979).

(19) a. If you mow the lawn, I'll give you five dollars.

b. If and only if you mow the lawn will I give you five dollars.

c. I'll give you five dollars just in case/only if you mow the lawn.

d. If you don't mow the lawn, I won't give you five dollars.

Jacszcolt (2005: 217) challenges the undisputed step from conditional to biconditional, and instead interprets the invited inferences illustrated in (19) as "a restriction of the domain of discourse, or, alternatively, a restriction (specification) of the topic of discourse". In other words, in her view 'mowing the lawn' is established as the *topic* of the discourse and issuing a conditional request is the purpose of the speech act. What Jaszczolt suggests is to limit the analysis to such a topic restriction, without translating it into an equivalence to biconditional relations. She argues that "conditional perfection is just too strong a tool to account for the restriction of the domain of discourse that takes place when the conditional is used", because it is not demonstrated that mowing the lawn and obtaining five dollars are bi-uniquely linked, although the latter is a strong incentive for the former. As will be argued below, cross-linguistic data seem to confirm Jaszczolt's account of conditionals protases in terms of topics.

If we have a look at the cross-linguistic variation attested in the coding of conditionals, the picture we are faced with is similar to that of disjunction, and at the end of this section we will argue for purely semantic explanations of such a similarity. Two issues are in focus. On the one hand, the question is how languages lacking an overt *if*-connective express the conditional relation, with special attention to the conditions of inferability, i.e. what elements are necessary in order for the relation to be inferable. On the other hand, we will consider cases in which conditionals are marked in the same way as other relations or notions, resulting in underspecified constructions.

As pointed out by Mauri and Sansò (2009), it is not infrequent to find languages lacking an overt conditional connective and expressing conditional relations by means of juxtapositive or highly underspecified strategies. However, as we saw for disjunction, in such cases not all is left to inferential processes; rather, coding and inferencing divide their labor, with the latter carrying more of the burden than the former. We can indeed identify the following restriction on inferability: if no conditional connective is present, *at least* one of the linked SoAs has to be marked as *potential* (irrealis) in order for the conditional relation to be inferrable. Let us examine the two cases in (20) and (21). Example (20) from Nuylnyul shows a construction with an extremely general connective, *ikarr*, whose function is to signal subordination, and in which the verb forms in both protasis and apodosis (condition and conclusion of the conditional reasoning, respectively) are overtly marked as irrealis. Given the underspecification of the subordinator (which is employed for all subordination relations), in (20) the conditional relation can be argued not to be overtly coded. However, in order for it to be inferable, it is necessary that the two verb forms are overtly marked as irrealis, otherwise the hearer could interpret the construction [verb-subordinator-verb] as a purely temporal or causal relation (according to the inferential mechanisms already described in section 2).

(20) Nyulnyul (Australian, Nyulnyulan, spoken in Australia; McGregor and Wagner 2006: 360-61)

Mi-li-jid-ikarr	kinyingk-ung	bur	i-li-rr-ar-juy
2:min:nom-irr-go-sub	this-all	camp	3:nom-irr-aug-spear-2:min:nom

"If you go into that country, they might spear you." → irrealis markers in each clause, no conditional connective

Example (21) from Caodeng rGyalrong shows a similar situation, in which however the overt irrealis marker only occurs in the protasis. Here again, the absence of such a marker would easily lead to temporal or causal interpretations.

(21) Caodeng rGyalrong (Sino-Tibetan, Tibeto-Burman, rGyalrong, spoken in China; Sun 2007: 805)

nɐɟi? təci?-naŋ *ɐ-nɐ-tə-nə́mder-nə?* *ɐɟi?-ntʃʰon* *nəmder-aŋ*

2SG water-inside IRR1-IRR2:DOWN-2-jump-SUB 1SG-also jump-1SG

'If you jump into the water, I will jump too.' → irrealis marker in the protasis only, no conditional connective

What distinguishes conditional relations from temporal and, especially, causal ones is indeed the uncertainty of the condition, which makes the whole co-occurrence of the two SoAs a possibility, rather than a fact (or a non-fact). If we thus analyze conditionals as conveying a potential causal relation, we may easily understand why many languages basically employ the same underspecified strategy both for conditional and causal clause linkage, crucially distinguishing the two by means of modal operators. A cooccurence that is overtly marked as irrealis invites the inference of a conditional reading, while a co-occurrence that is unmarked with respect to reality status invites an inference of temporal and causal sequence.[6]

The pattern just discussed recalls the typological implication described in (12) for disjunction, with a small, but crucial, difference, i.e. for disjunction, if no connective is attested, both clauses have to be explicitly marked as irrealis, while for conditionals it is sufficient that either the protasis or the apodosis be irrealis (by means of irrealis, dubitative or hypothetical elements). Two SoAs linked in a disjunctive relation indeed typically stand in a symmetric semantic contrast, whereas two SoAs linked in a conditional relation do not stand in a semantic contrast and are typically conceivable as different stages within a causal sequence. As a consequence, in *disjunction*, both SOAS have to be internally marked as irrealis: the juxtaposition of two SoAs that are presented as possibilities, rather than facts, and stand in a semantic contrast invites the inference of their equivalence and reciprocal replaceability as alternatives, leading to a disjunctive interpretation. If only one of the SoAs was overtly presented as a possibility (irrealis), it would be harder to infer their equivalence and hence their alternative status. In *conditional* relations, on the other hand, it is sufficient that at least one SOA be marked as irrealis: the juxtaposition of two SoAs that do not stand in a semantic contrast invites the inference of temporal/causal sequentiality between two SoAs, and a causal sequence in which one of the linked SoAs is marked as irrealis may easily be interpreted as a conditional relation, because, within a conceived sequence of events, if one of two SoAs is irrealis it is highly probable that the other one is irrealis too (see Mauri and Sansò 2009).

The attested cross-linguistic variation further reveals another interesting phenomenon, first analyzed by Haiman (1978). In case the strategy employed for conditionals may also be used for other functions, such functions frequently include polar interrogatives and topics. For instance, in example (22) from Hua, a Trans New Guinea language spoken in Papua New Guinea, the protasis of a conditional relation is conveyed by means of a polar interrogative construction.

(22) Hua (Haiman 1978:)

E -si -ve baigu -e.

[6] It is to be noted that characterizing a conditional relation as potential or irrealis is an oversimplification, for languages regularly distinguish between indicative or open conditionals (*If the vase falls, it will break in small pieces*), subjunctive or hypothetical conditionals (*If I could meet him, I would tell him the truth*) and counterfactual ones (*If had met him, I would have told him the truth*). Furthermore, the notion of 'potentiality' characterizing conditionals is not so straightforward. In counterfactuals, for instance, potentiality is located in the past and therefore, in the perspective of the speaker, the chance of the condition being true is zero. Finally, potentiality may relate to a speaker's uncertainty or to a notion of contingency (as expressed by English *whenever*).

Come-3SG.FUT-INT will stay 1SG.

'Will he come? I will stay; If he will come, I will stay.'

The same tendency is attested in a number of unrelated languages, such as Russian, Turkish, Mayan languages and Germanic languages (e.g. English *Should you need any help, let me know*, where the subject inversion in the protasis is the same as in polar questions). The complex account provided by Haiman for such cross-linguistic patterns cannot be examined in detail here, for reasons of space. However, the crucial argument he brings forward is that polar questions and conditionals share the topical status of the antecedent, with respect to the consequent (in polar questions, the antecedent is the question, and the consequent is the answer), which motivates the multifunctionality patterns he describes. In his view (Haiman 1978: 586), at the NP level, the topic presupposes the existence of its referent, while at the sentence level, it is the truth of the described proposition (in particular, the existence of the SoA described in the conditional proposition) which is presupposed.

The data and arguments discussed by Haiman seem to provide evidence for Jacszcolt's (2005: 217) account of conditionals, in that both argue that speakers tend to interpret the protasis as the topic of the discourse and the apodosis as conveying the purpose of the speech act (see above). The recurrent interpretation of the condition as the topic of discourse indeed plausibly motivates the cross-linguistic tendency to express the two functions (conditionals and topics) by means of the same strategies.

Diachronic data on the origin of conditional constructions further support the synchronic picture just discussed, starting from underspecified strategies in which the conditional relation is inferred through pragmatic processes and ending in the form-function reanalysis of pivotal elements of the sentence as conditional connectives. As Heine and Kuteva (2002: 94) point out, conditional markers frequently develop from copula constructions, which originally indicate the presupposition of existence of a SoA and then get reanalyzed as conditions, in full accordance with Haiman's and Jaszczolt's argument on the topical status of protases (e.g. Swahili *i-ki-wa* 'it being that' > 'if', Japanese *nara* 'be' > 'if). Another frequent source for conditional connectives is interrogative markers (2002: 249), as exemplified by Russian *est' li* 'is it?' > *esli* 'if ' and by subject inversion strategies employed in questions and then extended to conditional protasis in Germanic languages. Again, the development of interrogative strategies into conditional connectives goes in the direction of Haiman's analysis. The third main set of diachronic sources for conditionals are temporal markers expressing duration (Heine and Kuteva 2002: 293), which in sequences of events may invite conditional inferences of the type 'when *p*, then *q*' > 'if *p*, then *q*' (see section 2), thus confirming analyses of conditionals giving pride of place non-truthfunctional notions such as sufficiency and cause. Examples of this path are provided by Tagalog (Austronesian, Malayo-Polynesian, spoken in Philippines) *(ka)pag(ka), kung* 'if ', 'then', 'while', Indonesian *djika* 'if ', 'when' and *kalau* 'if ', 'when', 'as for' (topic).

5. Conflicting co-occurrence: adversatives, concessives

In this final section, we will briefly address some issues concerning the semantics and pragmatics of adversative and concessive connectives. Adversatives (e.g. English *but*) and concessives (e.g. English *nonetheless*) have received great attention in the pragmatic literature, since Grice's analysis of *but* as characterized by a *p* *q* semantics, together with a conventional implicature of conflict. In the RT framework, adversatives and concessives are taken to represent prototypical procedural elements (Blakemore 2000 and 2002), in that they do not contribute to the truth-functional representation of the sentence, but constrain the inferential processes underlying its interpretation. The borderline and, at the same time, the division of labor between semantics and pragmatics in adversative connectives have been nicely described by Lang (2000), with special focus on the

'denial of expectation' value (cf. German *aber*, Spanish *pero*, English *but*, although *but* may have a number of further contrastive functions, see Mauri 2008a: 120-126).

In Lang's view, "adversative (and probably also concessive) connectors inherently contain pointers to previous information available from the context" (Lang 2000: 245). Adversative connectives thus link two SoAs on the basis of a common topic, or in Lang's terms, a 'common integrator' (Lang 1984: 69-79, i.e. the ground on which the two SoAs are pertinently combined), and further signal that the assertion rendered by the second clause is in contrast to an assumption that either may be read off, or must be inferred from, previous information (cf. (23)).

(23) Paul is very tall, but he does not play basketball.

→ ASSUMPTION: very tall people often play basketball.

However, Lang argues that linking the two SoAs to an assumption is not completely dependent on pragmatic mechanisms, but rather involves both a part of meaning that is encoded (semantics) and a part that has to be inferred (pragmatics). The part of meaning functioning as a pointer and indicating a contrast between the assertion of the second clause and some assumption is part of the semantics of *but*. On the other hand, the identification of the assumption in the sentence or in the context is left to pragmatics. Yet, for a correct interpretation of an adversative connective, both dimensions necessarily come into play and complement each other.

A look at the cross-linguistic variation attested in the degree of coding of adversative and concessive relations, we see a lot of variation. A connective like *although* fully encodes the notion of concessivity and does not leave anything to pragmatics, to the point that in a contradictory context, the relation encoded by the connective forces a concessive reading. However, in many languages contrast is conveyed by means of conjunctive strategies, leaving to inference the identification of a conflict between the linked clauses (see Mauri 2008a: ch. 4, for a survey). It is to be noted, though, that in languages lacking overt adversative connectives, these are very easily borrowed.

In general, connectives tend to be borrowed along a specific order. Matras (1998: 301-305) has identified the following borrowing cline: 'but' > 'or' > 'and'. According to this cline, in bilingual contexts languages replacing conjunctive connectives also replace disjunctives, and languages replacing disjunctive connectives also replace adversative connectives. According to Matras (1998: 305-325), this implication mirrors the different degrees of "intensity with which the speaker is required to intervene with hearer-sided mental processing activities" in establishing the relations of combination, alternative and contrast. The more the relation implies a contrast, the more the speaker has to maintain assertive authority despite the denial of the addressee's expectations. To do so, bilingual speakers tend to adopt connectives of the pragmatically dominant language.

In diachronic terms, there is one recurrent source for adversative connectives that further confirms the cline along which the burden of communication gradually passes from pragmatics to semantics. Adversative connectives frequently derive from sources denoting temporal values, such as the relation of simultaneity 'while' and the meaning of continuity 'always' (e.g. English *while* 'temporal' > 'concessive'; French *alors que* 'when' > 'whereas'; Italian *tuttavia* and French *toutefois* 'always, continuously' > 'nonetheless', see Giacalone, Ramat and Mauri, forthcoming). In both cases, the co-existence over time of two events comes to be perceived as a surprising one, as a consequence of the fact that the differences existing between the two events are foregrounded at the expense of their temporal relation.

6. Conclusion

In this chapter we reviewed analyses of conjunctive, disjunctive and implicative connectives, and more briefly temporal, causative, purposive, adversative and concessive connectives. We focused on the dynamic balance between semantics understood as coded meaning and pragmatics as the meaning that is left to be inferred from context, and we demonstrated what cross-linguistic as well as diachronic studies can reveal about what is universal and language-particular and we compared this perspective to the logico-philosophical one.

List of abbreviations

ACC = accusative; ALL = allative; AUG = augmented number; COMP = complementizer; COND = condictional; D:PVG = distal extension:point of view of goal; DEM = demonstrative; DISJc = choice-aimed disjunction; DS = different subject; DU = dual; FUT = future; GEN = genitive; INT = interrogative; IRR = irrealis; LOC = locative; M = masculine; MIN = minimal number; NOM = nominative; OBJ = object; OBL = oblique; POSS = possessive; PRF = perfective; PST = past; R = realis; REF = referential; SEQ = sequential; SG = singular; SUB = subordinator.

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