Available online at www.sciencedirect.com
ScienceDirect
Journal of Pragmatics 40 (2008) 1865–1895
journal of PRAGMATICS
www.elsevier.com/locate/pragma

The nature and origins of counterfactuality in simple clauses
Cross-linguistic evidence

An Van linden [b], Jean-Christophe Verstraete [a,b,*]

[a] *Fund for Scientific Research, Flanders, Belgium*
[b] *University of Leuven, Leuven, Belgium*

Received 28 August 2006; received in revised form 17 March 2008; accepted 28 March 2008

Abstract

This paper is a cross-linguistic study of counterfactuality in simple clauses, as in the English construction *The police should have intervened*. On the basis of a representative sample of languages, we investigate (i) how counterfactuality is most commonly marked, and (ii) what these patterns of marking can tell us about the nature and origins of counterfactuality. We first show that counterfactuality is most frequently marked by a combination of elements that have other functions in other contexts, rather than by one single 'dedicated' marker. Contrary to popular belief, neither past tense nor imperfective aspect is a universal feature in the combinations of markers used to signal counterfactuality: the only type of element that is found in every combination is a modal element marking some type of potentiality, which can be combined (i) with past-tense markers, (ii) with a combination of past tense and aspectual (perfect or perfective) markers, or (iii) just with aspectual markers. On the basis of these findings about the marking of counterfactuality, we argue that counterfactuality typically originates as a semanticization of pragmatic information, more specifically an implicature derived from the compositional meaning of a combination of a modal element and a past, perfect or perfective element.

Keywords: Counterfactuality; Modality; Tense; Implicatures

* Corresponding author at: Department of Linguistics, University of Leuven, Blijde-Inkomststraat 21, 3000 Leuven, Belgium. Tel.: +32 16 32 47 75; fax: +32 16 32 47 67.
E-mail address: jean-christophe.verstraete@arts.kuleuven.be (J.-C. Verstraete).

0378-2166/$ – see front matter
doi:10.1016/j.pragma.2008.03.008

1. Introduction

The phenomenon of counterfactuality is probably best known from the linguistic and logical literature on conditional constructions like (1) below (see, amongst many others, Lakoff, 1970; Lewis, 1973; Karttunen and Peters, 1977; Iatridou, 2000; Lazard, 2001; Dancygier and Sweetser, 2005). These conditional structures are counterfactual because they involve a reversal of the polarity marked in the structure: part of the interpretation of the structure with positive polarity in (1a) is that the police troops were not in fact sent in, and that as a consequence people were killed, while part of the interpretation of its counterpart with negative polarity in (1b) is that troops were sent in, and that they were able to prevent the killing.

(1) (a) If they had acted and sent in enough police troops, says the report, the bloody episode could have been prevented.
(b) If they hadn't acted and sent in enough police troops, says the report, the bloody episode could not have been prevented.

In addition to the conditional structures illustrated in (1), many languages also have counterfactual constructions in simple clauses, like the ones in (2) and (3) below, respectively from English and Turkish. As with the conditional constructions, the interpretation of these structures involves a reversal of polarity: the police in (2a) did not do anything to prevent the killing, the victim in (2b) was not killed, and the interlocutor in (3) did not read the book as they should have.

(2) (a) The police should have done something to prevent the killing. ENGLISH
(b) The poor man would have been killed.

(3) oku-ya-y-di-niz! TURKISH
read-OPT-COP-PST-2PL[1]
'You should have read!' (Kornfilt, 1997:372–1289)

One of the central questions in the analysis of these structures is where the feature of polarity reversal comes from, i.e. how constructions with positive polarity like (1a), (2a), (2b) and (3) can include the corresponding negative proposition in their interpretation, and how constructions with negative polarity like (1b) can include the corresponding positive proposition. In the literature on conditional constructions, the answer to this question has focused mainly on pragmatic properties of the conditional protasis, and its relation to the apodosis: the speaker presupposes (Lakoff, 1970) or implicates (Karttunen and Peters, 1977) falsity of the protasis, and thus triggers a counterfactual interpretation for the entire structure. Whatever the value of this type of explanation for conditional constructions like (1), it cannot be a general explanation for

[1] The following abbreviations are used in the glosses: ABS – absolutive; ACC – accusative; AFF – affirmative; ANR – action nominalizer; ANT – anterior; AO – aorist; ART – article; ASSERT – assertedly; AP – absolutive pluralizer; AUX – auxiliary; CJ – conjunction; CL – classifier; COMP – complementizer; COND – conditional; COP – copula; CTF – counterfactual; DAT – dative; DC – declarative; DEB – debitive; DEF – definite; DST – destinative; DX – deixis; ERG – ergative; FUT – future; HAB – habitual; ID – identification clitic; IMPF – imperfective; IND – indicative; INF – infinitive; INTR – intransitive; IOV – indirect object version; IRR – irrealis; LOC – locative; M – masculine; MED – medial; NEG – negative; NOM – nominative; NOML – nominalizer; OBL – oblique; OPT – optative; PERF – perfect; PERFV – perfective; PFP – perfect participle; PLUP – pluperfect; POT – potential; PREV – preverb; PRIV – privative; PRSP – prospective; PRT – particle; PST – past; PTV – partitive; PURP – purposive; QT – quotative; REL – relative; SS – same subject; SUBJ – subjunctive; TC – topic-contrast marker; TEMP – temporal; TS – thematic suffix; VR – verbalizer; VTV – ventive.

polarity reversal in counterfactual contexts, because not all counterfactual constructions are conditional. In addition to the 'canonical' conditional type in (1), there are also simple-clause counterfactuals like (2) and (3) above. Some of these have a fairly straightforward relation with conditional counterparts (see also Lazard, 2001), like the structure in (2b) above, which could be regarded as a conditional construction with an elided protasis (e.g. *The poor man would have been killed if the police hadn't intervened*). Others, however, like (2a) and (3), cannot so easily be analysed as a conditional apodosis with an elided protasis, but still have counterfactual interpretations. In this study, we will focus on the second category, and we will try to develop an alternative interpretation of counterfactuality that does not rely exclusively on conditional constructions. We will come back to conditional counterfactuals in the concluding section of the study, where we will discuss how the model developed for simple counterfactuals could also have some relevance for conditional counterfactuals.

One alternative theory of polarity reversal that goes beyond conditional contexts is proposed in James (1982) and Fleischman (1989), who focus on the morphosyntactic marking of counterfactuality to explain the feature of polarity reversal. Building on an older tradition going back to Joos (1964) and Steele (1975), they claim that counterfactual constructions typically involve some kind of past-tense marking, like the pluperfect in the English structures in (1) and the past tense in the Turkish structure in (3). James (1982) and Fleischman (1989) argue that the use of past tense in these structures is motivated by the fact that it forms a natural metaphorical model for the marking of non-reality: both past and non-reality involve distance from the here-and-now, in one case distance in the domain of time, in the other distance in the domain of reality. Accordingly, they argue, past-tense markers will not only have their basic function of marking past temporal reference, but will typically also have some extensions to constructions that involve non-reality, like the counterfactual ones illustrated above. In this perspective, the polarity reversal in counterfactual constructions could be accounted for as a metaphorical extension from the basic past-tense meaning of remoteness in time to remoteness in reality.

Like the explanation that focuses on conditionals, however, this explanation is not entirely satisfactory. As pointed out by Dahl (1997), the basic problem with the past-tense theory is that past tense hardly ever marks counterfactuality on its own. Except for some uses of the imparfait in French (see Fleischman, 1989; Lazard, 2001:417), there are no clear cases where past tense is the only marker of counterfactuality. Instead, it is usually a combination of a past tense with some other type of marker that signals counterfactuality, like the conditional conjunction *if* in (1), the modal verbs *should* or *would* in (2a) and (2b) or the optative mood in (3). Indeed, if counterfactuality were marked by past tense alone, there would be no way to distinguish between real and non-real utterances about past situations.

How, then, can the feature of polarity reversal associated with counterfactual constructions be explained? In this study, we will try to answer this question with a cross-linguistic study of the marking of counterfactuality in simple clauses like (2a) and (3) above. On the basis of data from a sample of 43 languages (see below for details on the composition of the sample), we will try to answer the following questions:

(i) How is counterfactuality marked in simple clauses like (2a) and (3)?
  (a) With single markers or with combinations of markers?
  (b) In the case of combinations, which functions do these markers have in other contexts?

(ii) What do these patterns of marking tell us about the nature and the origins of counterfactuality?

As to the first question, we will show that in the large majority of languages, counterfactuality is encoded by a combination of markers rather than one single 'dedicated' marker, and that these combinations usually consist of a modal element marking some type of potentiality (epistemic, deontic or dynamic), together with a tense marker (past) and/or an aspectual marker (perfect or perfective). As to the second question, we will argue that the frequent use of a combination of elements with other functions in other contexts points to the hypothesis that counterfactuality typically originates as a pragmatic implicature of the basic compositional interpretation of these combinations, which can subsequently be semanticized as part of their basic meaning. In the case of past-modal combinations, for instance, we will show that counterfactuality can be reconstructed as a Gricean quantity implicature derived from their compositional meaning of past potentiality. In addition, we will argue that our analysis also implies that counterfactual structures are semantically more complex than commonly assumed, because they are double-layered, combining a feature of polarity reversal with the compositional interpretation in which this feature originates.

The sample of languages on which this study is based, was composed using the method of diversity sampling developed by Rijkhoff et al. (1993), and further elaborated in Rijkhoff and Bakker (1998). The basic idea is that linguistic diversity is best represented in a sample of languages if (i) every top-level genetic grouping is represented by at least one language, with isolates representing one group each and pidgins and creoles one group jointly, and (ii) further representatives of these top-level groupings are chosen proportionally on the basis of the internal diversity of the groups (see Rijkhoff and Bakker, 1998 for more details on the definition of diversity—the basic idea is that more diverse groups will have more representatives). For this study, implementation of these principles led to an initial sample of 52 languages,[2] as also used in Rijkhoff (2002), which was subsequently reduced to 43 because of the absence of information on counterfactuality marking for a number of language isolates and extinct languages. Appendix A at the end of this study gives an overview of the 43 languages that were investigated, and the nine languages that were excluded because of lack of information.

The rest of this study will be structured as follows. In section 2, we will present an overview of our basic findings about the marking of counterfactuality in simple clauses in our sample. In section 3, we will try to interpret these findings, focusing mainly on the different types of combinations of markers, and the question how the feature of polarity reversal has become associated with this combination of markers. In section 4, finally, we will draw some more general conclusions about the nature of counterfactuality, and discuss how our findings about

[2] Like Rijkhoff (2002), we use Ruhlen (1991) to identify the top-level genetic groupings to compose the sample. We are aware of the controversies surrounding some of the 'lumping' tendencies in his high-level groupings, like Austric (grouping together Austronesian with Austro-Asiatic and Daic), Indo-Pacific (grouping all non-Austronesian languages of Melanesia), Australian (grouping Pama-Nyungan and non-Pama-Nyungan languages) and especially Amerind (grouping together most of the languages of North and South America, apart from Na-Dene). For the purpose of putting together a diversity sample, however, these 'lumping' tendencies do not threaten the diversity of the sample as such: the more groups are lumped together in higher-level groups, the more internally diverse these higher groups will be, which means that in a diversity sample these higher-level groups will also have proportionally more representatives, usually at least one for each less controversial subgroup. Concretely, for instance, in a 52-language sample like the one used here, the controversial 'Austric' group is represented by members from all its better established subgroups, i.e. one Austro-Asiatic language, one Daic language and two Austronesian languages. The same applies to 'Amerind' and 'Indo-Pacific'.

counterfactuality in simple clauses might be extended to other counterfactual contexts, specifically in conditional constructions.

2. The basic patterns of counterfactuality marking

Of the 43 languages for which we have information about counterfactual constructions, there are 32 grammars that provide information on simple counterfactual constructions like (2a) and (3) above, and 39 that provide information on conditional counterfactual constructions like (1) and (2b) above. Appendix A shows which information is available for which languages. In this study, we will focus on the simple counterfactual constructions, and outline the patterns of marking found in the sample languages. In general, identifying counterfactual constructions in the grammars, and distinguishing simple-clause counterfactuals like (2a) and (3) from full and reduced conditionals like (1) and (2b) is quite straightforward. The first question is a matter of detecting polarity reversal: as soon as a particular structure has a standard interpretation that involves the reverse of the polarity that is formally marked in the structure, we have a case of counterfactuality. The second question, distinguishing between genuine simple-clause counterfactuals and conditional apodoses without a protasis, can either be resolved on the basis of the semantics of the construction, which often does not allow reconstruction of an elided protasis, or on the basis of its structure, which is often structurally distinct from the apodosis of a counterfactual conditional. In case of doubt about the status of a particular structure discussed in this study (typically because of an unclear translation that suggests conditional status), we will explicitly discuss the evidence for the simple-clause status of the structure. The relation between our simple counterfactuals and the much better-studied category of conditional counterfactuals will be discussed in the concluding section of the study.

In general, the languages in the sample show a clear tendency towards using combinations of markers to mark counterfactuality in simple clauses: 7 languages use one single marker for counterfactuality, whereas 25 languages use a combination of two or more markers that have other functions in other contexts. The first type will be discussed in section 2.1, and the second one will be discussed in sections 2.2–2.4. Section 2.2 will be devoted to the dominant pattern in combined marking, viz. the use of a combination of modal elements with past-tense markers. Sections 2.3 and 2.4 will be devoted to two less frequent patterns of combined marking, viz. the combination of a modal marker with an aspectual (perfect or perfective) marker with (section 2.3) and without (section 2.4) past tense.

2.1. Direct counterfactual marking

The use of one single 'dedicated' marker for counterfactuality is clearly a minority case in the sample: only 7 languages of out 32 mark counterfactuality directly rather than with a combination of markers that have other functions in other contexts. This is the case in Chukchi, Hua, Ika, Kolyma Yukaghir, Martuthunira, Mwotlap and Somali. In Hua, for instance, there is an 'irrealis' verbal suffix *–hine* that is used in counterfactual contexts like (4) (Haiman, 1980:160–161). This suffix cannot be analysed further as a combination of other elements, except for the fact that it has different forms depending on the illocutionary frame and the subject involved, like the form *–hine* in (4), which can be used for assertions with any subject except dual, first person plural or second person singular (Haiman, 1980:xl).

(4) kori hu **hine** HUA
fear do.1 **CTF.A**
'I would have run away/I almost ran away'[3] (Haiman, 1980:160)

Likewise, Martuthunira (Pama-Nyungan) has two verbal suffixes labelled ''counterfactual'' and ''unrealized'' mood which are used in counterfactual constructions, as illustrated in (5) (Dench, 1995:150–152). Again, the author does not further analyse these suffixes, except for a voice contrast between an active and a passive form for the counterfactual type.

(5) Ngayu ngalarri-lha-rru warnu. kuliyanpa-**yaangu** MARTUTHUNIRA
1SG.NOM forget-PST-NOW ASSERT think-**UNREAL**
kalika-a-lwa kalyarran-ta nyina-wayara-a.
one-ACC-ID branch-LOC sit-HAB-ACC
''I truly forgot. [I] ought to have thought of that one that always sits on a branch, [but I didn't].'' (Dench, 1995:152)

A similar phenomenon is found in Kolyma Yukaghir (Maslova, 2003:171–172), where counterfactuality is marked by the irrealis pre-verb *−et+*, as in (6).

(6) tudel pud-o-l lebie-ge modo-t KOLYMA YUKAGHIR
he upper-VR-ANR earth-LOC sit-SS:IMPF
m-**et**+l'e-j
AFF-**IRR**+be-INTR:3SG
''He should have lived on the upper earth.'' (Maslova, 2003:172)

2.2. *Combinations of modality with past tense*

For languages that use combinations of markers to signal counterfactuality, one of the elements in the combination is invariably a modal marker, while the other element is a past marker (16 languages), a combination of a past marker and an aspectual marker (six languages), or just an aspectual marker (five languages). This clearly goes against James' (1982) and Fleischman's (1989) generalization that past tense is a universal feature in counterfactuality marking: if anything is a general feature in this domain, it is modality rather than past tense. The nature of these modal elements will be discussed in more detail in section 3, where we will argue that it is the modal element, and specifically the feature of potentiality it marks, rather than just the past tense element that is needed to explain the polarity reversal in counterfactual constructions. As a working definition, we will use the term 'modality' as referring to any element that signals some type of potentiality of an event, either in terms of speaker's judgements of plausibility (epistemic potentiality), speaker's judgements of desirability (deontic potentiality), or agent's intentions (dynamic potentiality).

In this section, we will discuss the combinations of modality with past markers: Cantonese, Icari Dargwa, Fongbe, Gooniyandi, Hdi, Imbabura Quechua, Kham, Korean, Ma'di, Matses, Ndyuka, Slave, Temiar, Turkish, Wardaman and Yimas all use a combination of modality with

[3] This structure could in principle be an apodosis with an elided protasis (Haiman, 1980:185–187), but it can also be interpreted as a genuine simple clause without any conditional interpretation, as reflected in the gloss with 'almost' (see further Haiman, 1980:160–161).

one or more past tense markers. In Cantonese, for instance, a combination of modal verbs of possibility or obligation with adverbs referring to a past time yields a counterfactual interpretation, as in (7) (Matthews and Yip, 1994:231,235).

(7) léih **búnlòih** **hóyíh** sanchíng ni fahn gung ge — CANTONESE
you **originally can** apply this CL job PRT
"You could have applied for this job." (Matthews and Yip, 1994:231)

The same applies to Wardaman, where a combination of a modal irrealis prefix (used elsewhere to indicate undesirable possibilities and prohibitions) with a past tense suffix to the verb signals counterfactuality, as in (8) (Merlan, 1994:188).

(8) **yi**-nga-jejbarla-**rri** wu-munburra-wu — WARDAMAN
IRR-1SG/3SG-ask-**PST** WU-money-DAT
"I should have asked him for money." (Merlan, 1994:188)

In some languages, the labels used for the elements involved in counterfactuality marking at first sight do not clearly point towards modal or temporal status, but their actual functions as described in the grammars usually do. In Imbabura Quechua, for instance, counterfactuality is signalled by a combination of a past tense auxiliary with a conditional suffix on the main verb. In spite of the label used, the 'conditional' suffix in this language is not exclusively associated with complex conditional constructions, as a marker of the apodosis both in standard and counterfactual conditionals (Cole, 1982:64-65; 157), but it can also be used in simple clauses with epistemic meanings: on its own, the conditional suffix can signal epistemic possibility as in (9) (Cole, 1982:154–155). In combination with an auxiliary marked for past tense, on the other hand, the same suffix signals counterfactuality, as in (10), but it does not appear in conditional constructions (Cole, 1982:65, 157), in spite of what the gloss provided by the author seems to suggest.

(9) shamu-y-**man** — IMBABURA QUECHUA
come-1Sg-**COND**
"I would come." (Cole, 1982:154)
shamu-y-**man** ka-**rka**-ni — IMBABURA QUECHUA
come-1Sg-**COND** be-**PST**-1Sg
"I would have come." (Cole, 1982:155)

A similar terminological problem is found in Gooniyandi, where counterfactuality is marked by a subjunctive or potential suffix in combination with an irrealis suffix to the verb, as illustrated in (11) (McGregor, 1990:548–550, 533–537).

(11) ward-**wi**+jadd+i-**rni** — GOONIYANDI
go-**IRR**+(1U)NOM+i-**POT**
"We could have gone." (McGregor, 1990:221)

In spite of the use of the label 'irrealis', the category in question is not exclusively modal but belongs to a system that "conflates modal type meanings with purely temporal meanings" (McGregor, 1990:524). As the irrealis cannot be used on its own, its function cannot be checked

directly, but it is found in the same morphological lot in the structure of the verb where other tense distinctions are marked in the language (McGregor, 1990:516), and it is only found in utterances that refer to past propositions (compare McGregor's (1990:525) use of a feature [+ anterior]). If we add to this that the categories with which irrealis is combined to encode counterfactuality (subjunctive and potential) can also occur in combination with other elements than irrealis to encode various types of non-past modality, like epistemic possibility in the combination of potential with future in (12), we can safely assign a past tense feature to the irrealis suffix in (11) above. Verstraete (2005) provides further arguments for the analysis of this element as containing a past tense feature, in the context of a broader study of mood marking in non-Pama-Nyungan languages.

(12) ward-**bi**+ng+i-**rni** yaningi-yoo GOONIYANDI
go-**FUT**+1Sg+I-**POT** now-DAT
"I could go soon." (McGregor, 1990:537)

2.3. Combinations of modality with past tense and aspectual marking

In addition to the combination of past and modality, some languages also require another element to mark counterfactuality, viz. an aspectual element like perfect or perfective (see below in section 3.3 for the relevance of the distinction between the two). This is the case in Basque, Dutch, Georgian, Malayalam, Nootka and Supyire. In Basque, for instance, counterfactuality in simple clauses is signalled by a combination of past and potential suffixes on the auxiliary and the perfective participle of the main verb, as in (13) (Saltarelli, 1988:235–236). In this language, the potential suffix is a modal element because it is used to mark permission and ability in other contexts.

(13) liburu-ak erama-**n** BASQUE
book-PL.ABS carry-**PFP**
n-i-eza-zk-io-**ke-en**,
1SG.ERG-PST-AUX2(SUB)-3AP-3SG.DAT-**POT-PST**
baina ez n-u-en etxe-tik
but not 1SG.ERG-(PST-ABS)-AUX2-PST house-SG.ABL
atera-tze-ko gogo-rik
leave-NOML-DST urge-PTV
"I could have taken the books to her/him, but I did not feel like leaving the house." (Saltarelli, 1988:235)

A similar pattern is found in Malayalam, where counterfactuality is encoded with a combination of past, debitive and perfect suffixes to the verb stem, as illustrated in (14) (Asher and Kumari, 1997:306–307).

(14) naan pook-**eent**-ata-ay-**irunnu** MALAYALAM
I go-**DEB-**NOML-[linking -ay-] **[PERF.]PST**
(pakse poo-y-i-[i]lla) (our glosses)
but go-[linking -y-]-PST-NEG
"I should have gone (but didn't go)." (Asher and Kumari, 1997:307)

To this category we can also add languages like Georgian, where counterfactuality is marked with a combination of a modal auxiliary expressing obligation and a pluperfect suffix on the main verb, as in (15) (Hewitt, 1995:267–268). A combination of a past and a perfect element, as in Basque in (13), generally yields a pluperfect category, i.e. a perfect relative to a past, but what distinguishes Georgian from the previous category is that the pluperfect is expressed synthetically in one single morpheme in the structure of the verb.

(15) dro-ze **unda** ga-g-e-k'et-eb-**in**-a GEORGIAN
time-on **should** PREV-you-IOV-do-TS-**PLUP**-it
"You should have done it on time." (Hewitt, 1995:267)

2.4. Combinations of modality with aspectual marking

A final set of five languages leave out past tense altogether in the marking of counterfactuality, and mark the category with a combination of modality and aspectual elements, specifically perfect or perfective: this is the case in Kashmiri, Nakanai, Nootka, Pipil and Slave. Kashmiri, for instance, uses a combination of conditional mood marking on the auxiliary with a perfect participle of the main verb, as in (16) (Wali and Koul, 1997:237–238). Again, it should be noted that the conditional marker in this language is not exclusively associated with conditional constructions, but can also be used in independent clauses with a modal meaning of epistemic likelihood (see Wali and Koul, 1997:237).

(16) tse a:si-he:th por-**mut** akhba:r KASHMIRI
you.ERG be-**COND**.3M.SG.2SG read-**PFP**.3M.SG newspaper.3M.SG
"You would have read the newspaper." (Wali and Koul, 1997:238)

A similar situation is found in Slave, which uses a combination of a future particle with perfective marking on the verb, as in (17) below (Rice, 1989:414–419). It is important to note in this case that the future particle does not just denote futurity, but also has the dynamic modal meanings of signalling the agent's intentions (Rice, 1989:418–419).

(17) dú náhkale eghálaiidá **woléni** SLAVE
now morning 1SG.work**ed**[4] **FUT**
"I should have worked this morning" (Rice, 1989:419)

2.5. Conclusion

To conclude our survey of counterfactuality in simple clauses, we can say that there are a number of clear patterns that emerge from the patterns of marking found in the sample. First of all, direct marking of counterfactuality is rare: only 7 languages out of 32 use one single marker in counterfactual constructions, while 25 languages use a combination of markers that have other functions in other contexts. Second, if we look at combinations of markers it is not the feature of past tense that is most typical, as predicted in James (1982) and Fleischman (1989), but the feature of modality. Every single combination of markers contains at least some type of modal marker.

[4] Perfective aspect is glossed as past tense (*work<u>ed</u>*) in this example.

Table 1
The marking of counterfactuality in the sample

Language	Direct	Combination		
		Modality	Past tense	Perfect/perfective aspect
Chukchi	■			
Hua	■			
Ika	■			
Kolyma Yukaghir	■			
Martuthunira	■			
Mwotlap	■			
Somali	■			
Cantonese	■			
Dargwa		■	■	
Fongbe		■	■	
Gooniyandi		■	■	
Hdi		■	■	
Imbabura Quechua		■	■	
Kham		■	■	
Korean		■	■	
Ma'di		■	■	
Matses		■	■	
Temiar		■	■	
Turkish		■	■	
Wardaman		■	■	
Yimas		■	■	
Slave		■	■	
Basque		■	■	■
Dutch		■	■	■
Georgian		■	■	■
Malayalam		■	■	■
Supyire		■	■	■
Nootka		■	■	■
Kashmiri		■		■
Nakanai		■		■
Nootka		■		■
Pipil		■		■
Slave		■		■

Third, if we look at the types of markers that are used in combination with modal markers, the most frequent type is past tense marking, either just past tense (16 languages) or past tense combined with perfect or perfective aspect (6 languages), or just perfect or perfective aspect (5 languages). Table 1 summarizes the patterns found in the sample. Shading of cells indicates which types of markers are used in the counterfactual construction in each language. The use of more than one line for a particular language indicates that there are two distinct counterfactual constructions in that language.

3. Explaining the patterns: the origins of counterfactuality

The most remarkable characteristic of counterfactuality to emerge from the sample is that it is relatively rarely encoded by a single 'dedicated' marker, and is instead most commonly

associated with a combination of markers that have other functions in other contexts, like the frequently found combination of elements that otherwise have modal and temporal functions. What do these patterns of marking tell us about the nature and origins of counterfactuality? If we add up the meanings contributed by each of the elements in the combinations, this does not lead to an interpretation that includes the feature of polarity reversal: the combination of modality and past tense, for instance, just yields past modality (i.e. 'something was possible, desirable, intended'), but not necessarily the feature of non-occurrence ('but it did not happen'). In more general terms, therefore, the combined meanings of the markers does not correspond to their actual interpretation. From a theoretical perspective, one interpretation of this discrepancy could be that we are dealing with constructions in the sense of Goldberg (1995), the defining feature of which is that a combination of elements has a meaning that goes beyond the combination of their individual meanings. From a semantic perspective, however, the fact that this discrepancy is found in the majority of languages in our sample, suggests that there is something more to it than just an idiom-like mismatch between compositional and construction-level interpretation. The very systematicity of this mismatch across languages suggests that there must be some motivated relation between the two levels of interpretation, which more or less systematically leads from the compositional interpretation to the eventual counterfactual interpretation.

In this section, we will argue that the relation can be motivated in pragmatic terms: the discrepancy between the compositional semantics of the combinations and their actual counterfactual interpretation points towards an origin of counterfactuality as an implicature. We will show that a combination of an element that has a modal function with an element that has a past-tense or perfect(-ive)-aspect function is ideally suited to trigger a generalized implicature of polarity reversal, based on the Gricean maxim of quantity (see also Ziegeler, 2000:32–34), a scenario that is supported by the fact that such combinations are found with counterfactual interpretations across the genetically diverse set of languages investigated here. Sections 3.1, 3.2 and 3.3 will outline the general theoretical arguments, focusing on the role of modality, tense and aspect respectively. Section 3.4 will adduce further evidence from the sample in favour of this analysis. Section 3.5, finally, will discuss the pattern of marking in the sample that is not captured by this generalization, i.e. those languages that mark counterfactuality directly with one single 'dedicated' marker.

3.1. The role of modality

At the most schematic level, the modal expressions found in the patterns of counterfactual marking in the sample can be defined in terms of a semantic feature of potentiality (see further Verstraete, 2001 on the definition of the modal notions used here). What all these expressions have in common is that they mark the occurrence of an event as potential rather than actual, either because the speaker regards it as plausible (epistemic potentiality), because the speaker regards it as desirable (deontic potentiality), or because a clausal participant intends to realize it (dynamic potentiality). The first category can be illustrated with the modal verb *hóyih* in Cantonese, which on its own marks epistemic possibility, as in (18), and in combination with a past-tense adverb marks counterfactuality (see example (7) above). The second category can be illustrated with the debitive mood in Malayalam: on its own, this serves to mark deontic modality, as in (19), and in combination with past perfective it marks counterfactuality (see example (14) above). The third category can be illustrated with the modal verb *willen* ('want to') in Dutch, which marks agent's

intention as in (20), and in combination with a pluperfect tense[5] serves to mark counterfactuality, as in (21).

(18) léih **hóyíh** daap bāsi heui Màhnfa Jūngsām CANTONESE
you **can** catch bus go Cultural Centre
"You can take a bus (to get) to the Cultural Centre." (Matthews and Yip, 1994:231)

(19) avan nallava am pa hikk-**a am** MALAYALAM
he well study-**DEB**
"He must study well." (Asher and Kumari, 1997:306)

(20) Ik **wil** naar de vergadering komen DUTCH
1Sg **want** to the meeting come-INF
"I want to come to the meeting."

(21) Ik **had** naar de vergadering **willen** komen, maar ... DUTCH
1Sg **AUX-PST** to the meeting **want-INF** come-INF, but ...
"I had wanted to come to the meeting, but ..."

As already mentioned, the cross-linguistically frequent use of such modal categories in the marking of counterfactuality suggests that there may be some systematic relation to the feature of polarity reversal. Following a suggestion in the work of Ziegeler (2000:32–34) on the diachrony of English conditional constructions, we will argue that the link with polarity reversal lies in (i) the scalar relation between modal expressions and their corresponding non-modal structures, and (ii) the quantity implicatures that can be derived from this scalar relation.

In general, a scalar organization of expressions uses the relative informational strength of these expressions to order them, with strength being measured in terms of such traditional criteria as entailment relations (stronger expressions entail weaker ones), cancelling and suspending expressions (Horn, 1989:234; weaker and stronger expressions can be ordered with expressions like *even* or *if not*, as in *warm, even hot*), or less traditional ones like partially ordered sets (Hirschberg, 1991; to deal with discursively defined scales). The classic example of such scalar organization comes from the domain of quantifiers (Horn, 1989), illustrated in (22a), where the quantifiers *some* and *all* form the weaker and stronger points of a scale: *all* entails *some*, and the two can be ordered as *some, {if not/even} all*.

(22) (a) *some* < *all*
(b) *some* → ¬*all*

One of the reasons for organizing expressions in terms of scales is that it allows one to make generalizations about implicature mechanisms within the set of expressions being studied. If the expressions are ordered in terms of informational strength, this implies that a mechanism of quantity implicature can be invoked to calculate relations between them on the basis of the first Gricean maxim of quantity: "make your contribution as informative as is required" (Grice, 1975:45). In the classic example of quantifier scales, for instance, use of a weaker element from

[5] The pluperfect in Dutch is normally formed by an auxiliary in the past tense (like *had* [have-PST] in (21)) combined with a perfect participle. The only category to which this does not apply are modal verbs like *willen*, which diachronically shifted from use of the perfect participle to use of the infinitive (*wil-en* [want-INF] in (21)) in the pluperfect when combined with a main verb.

the scale, like *some*, will be interpreted as meaning that the informationally stronger element *all* was not applicable in the context, i.e. it will implicate 'not all' (as in (22b)).

This type of scalar mechanism is relevant for the problem of counterfactuality because (i) modal expressions can equally be analysed in terms of scalar organization, and (ii) the associated implicature mechanisms can be used to explain the link with polarity reversal. Traditionally, the study of modal scales has focused on relations between different degrees of modality, especially necessity and possibility (see Horn, 1989; Van der Auwera, 1996; Levinson, 2000). There is another aspect of modal scales that is particularly relevant for counterfactual expressions, however: the relation between modal structures and their corresponding non-modal counterparts, i.e. the corresponding 'bare' assertions. As shown in Ziegeler's analysis of the diachrony of conditional constructions in English (Ziegeler, 2000:32–34), modal structures like *would (have) q* can be regarded as the middle point of a scale with the corresponding non-modal structure *q* as its strongest point, and the corresponding conditional structure *if p, would (have) q* as its weakest point. This scale is represented in (23a) below. If this scale is correct, the non-applicability of the bare assertion of q follows by application of the Gricean maxim of quantity (23b), as in the case of the quantifiers.

(23) (a) *if p, would (have) q* < *would (have) q* < *q*
(b) would (have) q → ¬q

As already mentioned, one of the traditional criteria used to determine whether a set of elements really forms a scale in the technical sense is the presence of an entailment relation between the items, e.g. *all* entailing *some*. We think that there are good arguments to posit a similar scale between modal utterances and their non-modal counterparts, but unlike Ziegeler (2000:33), who analyzes modalization as quantification over propositions, we would not draw a strong analogy between the quantifier case and the modal case. Instead, we argue that the basis of the scale between modal utterances and their non-modal counterparts is a matter of epistemic strength rather than quantification. Specifically, the contrast between the modal structures found in the sample[6] and their non-modal counterparts can be described in terms of potentiality versus certainty: a non-modal proposition like *John is coming* is a statement of certainty, while modalized alternatives like the epistemic *John may be coming* or the deontic *John must come* are statements of potentiality, and therefore essentially statements of uncertainty. Unlike the certainty involved in non-modal propositions, which is always epistemic, the potentiality involved in modal propositions is of course not necessarily epistemic, but can also be deontic (as in (20) above) or dynamic (as in (21) above). At first sight, the existence of non-epistemic types of potentiality in the sample may seem to imply that such structures cannot form a scale with the corresponding bare propositions, which are epistemic. Still, even non-epistemic types of potentiality have epistemic implications: if an event is desirable for one of the speech act participants (deontic), or if a clause participant has the intention to realize an event (dynamic), realization of this event also becomes more likely in an epistemic sense. The reality of these links between non-epistemic and epistemic modality is amply supported by diachronic and typological work on modality (see, for instance, Bybee et al., 1994; Van der Auwera and Plungian, 1998), which has shown (i) that there are typical paths of development for modal expressions leading

[6] It is important to note that it is the schematic potential meaning of modal expressions that is crucial here, and not the entire range of meanings associated with modal elements. It is obvious that modal elements in some languages also have non-potential meanings, like some expressions of ability which entail realization.

from deontic and dynamic interpretations to epistemic ones, and (ii) that the driving forces behind such developments are precisely the type of epistemic implications of non-epistemic modals described here (Traugott and Dasher, 2001).

In this perspective, we can say that modal utterances and their non-modal counterparts generally form scales of epistemic strength, as represented in (24a), with the non-modal utterances as the stronger expression of certainty, and the modal utterances as the weaker expressions of potentiality, and therefore also uncertainty.[7] The same applies to the corresponding negative structures, as shown in (24c): because we are dealing with internal negation here, negation does not reverse the scale but preserves it (see Horn, 1989:236–237 on scale reversal with external negation).

(24) (a) potential p $<$p
(b) potential p $\rightarrow \neg$p
(c) potential $\neg$p $<$ $\neg$p
(d) potential $\neg$p $\rightarrow \neg(\neg$p$)$ $\rightarrow$ p

If the scales in (24a) and (24c) are correct, they can explain the link between modality and polarity reversal observed in our sample, by simple application of the Gricean maxim of quantity. Given that a modalized version of p is weaker than an unmodalized version, using the modalized version implicates the negation of its unmodalized counterpart, as shown in (24b) and (24d). Thus, the scalar quantity implicature can generate the feature of polarity reversal that is needed to explain the counterfactual interpretation of modalized structures: using modalized p implicates the negation of p, and therefore leads to the counterfactual interpretation of a potential event that is not actualized.

3.2. The role of tense

If we go back to our data with this hypothesis, it is obvious that this cannot be the full story about polarity reversal. The analysis of the sample has shown that counterfactuality is not associated with modality as such, but most typically with combinations of modality and past tense. This suggests that scalar organization and the associated implicature mechanism are sensitive to features of tense.

As an example of this temporal sensitivity, we can compare future-oriented and past-oriented versions of the same modal proposition, like the English structures in (25a) and (25b) and the Gooniyandi structures in (26a) and (26b).

[7] There is one type of modal expression that is problematic for this scale, viz. necessity, which is often placed higher on the modal scale than the corresponding bare assertion (see, for instance, Burton-Roberts, 1984). This is not necessarily problematic for our account, however, for two reasons. First of all, the higher position of necessity is not entirely self-evident. It may be true for the logical operator □, which is closely related to quantifiers and analytic statements, but if we look at natural-language instantiations like *must*, for instance, there may also be reasons not to assume that they are higher than the corresponding bare assertions. In the epistemic domain, orderings like *he must have come, in fact he did come* are natural, and in the deontic domain, orderings like *he must come, and in fact he is coming* are equally natural, which points towards a scale 'necessary p $<$ p'. And secondly, the modal expressions we are dealing with here are mainly expressions of potentiality rather than of necessity: even the closest candidates like strong deontic modality (see examples (14) and (15)) do not entail the bare assertion (*he must come* does not entail *he is coming*) and are therefore not stronger.

(25) (a) Jack **should** come to the party. ENGLISH
Interpretation ≠ ¬p ('Jack is not coming to the party')
(b) Jack **should have** come to the party.
Interpretation = ¬p ('Jack did not come to the party')

(26) (a) Jack-ngga mila-**ya**-**wingga** GOONIYANDI
Jack-ERG see-**SUBJ**-**FUT**+(2Sg)A+A
'Jack wants to see you.' (McGregor, 1990:547)
Interpretation ≠ ¬p ('Jack will not see you')
(b) dirib-**ja**-**yoondi** yoowayi nirdganoo-woo
enter-**SUBJ**-**IRR**+CL he:was:afraid he:sticks-DEF
'He wanted to go inside but was afraid of getting stuck.' (McGregor, 1990:549)
Interpretation = ¬p ('He did not go inside')

Both the (a)- and the (b)-structures are modal propositions: *should* has a deontic interpretation in (25), and the subjunctive mood has a dynamic interpretation in (26). Still, it is only in the (b)-structures, i.e. the combinations with past tense, that the negation of the non-modal counterpart is included in the interpretation. The structure with *should* with present infinitive in (25a) is not typically interpreted as meaning that Jack is not coming, and the structure with subjunctive future in (26a) is not typically interpreted as meaning that Jack will not see the interlocutor, whereas the corresponding structures with past tense in (25b) and (26b) are (remember that the category labelled 'irrealis' in Gooniyandi has past-tense features, along with modal features, see McGregor's (1990) analysis quoted in section 2.2). This divergence suggests that features of tense play a crucial role in scalar organization and the associated quantity implicatures: modal structures include the negative of their non-modal counterpart when they are in past tense (b-structures), but not when they are in a present or a future tense (a-structures).

The reason behind this divergence, we argue, is that different temporal domains have different epistemic implications: the past domain is inherently knowable, whereas the other domains are not inherently knowable.[8] If we look at the relation between modal and non-modal utterances from this perspective, this implies that it is only in the past that a non-modal utterance is necessarily a statement of certainty. For structures like (25a) and (26a), the corresponding non-modal structure is not a statement of certainty, because it involves a projected event and therefore is inherently unknowable, while for past structures like (25b) and (26b), the corresponding non-modal structure is a statement of certainty.

The crucial point about the scalar organization discussed in the previous section is precisely that a non-modal structure should be a statement of certainty in order to form a scale of epistemic strength with the corresponding modal structure that marks potentiality. This is the case in the past-tense domain, which explains why the mechanism of scalar implicatures works with past modal combinations like (25b) and (26b), but not with future modal combinations like (25a) and (26a). In the past, a non-modal structure is a statement of certainty, and is therefore epistemically stronger that the corresponding modal statement of potentiality, as shown in (27a). By the Gricean maxim of quantity, use of such a past potential statement implicates that the

[8] In principle, the same can apply to some instances of the present domain, but use of present-modal combinations to mark counterfactuality seems to be much rarer cross-linguistically than past-modal combinations, presumably because the past domain is the most inherently 'knowable' one. What usually happens is that past-modal combinations are extended to cover present counterfactual contexts. There are no examples of constructions using present-modal combinations for present counterfactuality in our sample, but readers can find a discussion of one example, from Marrithiyel, in Verstraete (2005).

epistemically stronger non-modal statement did not apply in the situation in question, as shown in (27b). Again, the same applies to internally negated structures, as shown in (27c) and (27d). In the other tenses, the corresponding non-modal statement is not necessarily a statement of certainty, which means that the modal and non-modal structures do not form a scale, and that use of the modal structure does not implicate that the modal structure does not apply.

(27) (a) potential (past p) < past p
(b) potential (past p) → ¬(past p)
(c) potential (past ¬p) < past ¬p
(d) potential (past ¬p) → past p

It is important to note at this point that the certainty associated with the past domain is independent of the temporal location of the actual event described in the statement.[9] As pointed out by a reviewer, structures like (28) seem to present a challenge to our argument, since the adverbial *tomorrow* clearly indicates that the event referred to in (28) is located in the future, while the interpretation still includes polarity reversal.

(28) John should have left tomorrow.

What is special about this structure, however, is that it invokes a pre-existing arrangement rather than a simple prediction about the future: in other words, the corresponding non-modal structure is not the standard predictive structure *You will leave tomorrow*, but rather a structure encoding pre-arranged futures like *You were leaving tomorrow*. The link with the pre-arranged structure is demonstrated by the fact that (28) can be used in any situation indicating that the arrangement is broken, not just when the interlocutor has already left, but also, for instance, when the interlocutor is still around but has made alternative arrangements, e.g. has bought a ticket for another day. This shows that what really matters for the mechanism of scalar implicatures is not the time of the event described, but the time of certainty about the event: tense with scope over the event does not influence counterfactuality, while tense with scope over the modal does. In this sense, instances like (28) are a limiting case to show the working of the scalar mechanism and its interaction with tense. What matters for a modal structure to trigger counterfactual implicatures is that its non-modal counterpart is a statement of certainty, and this is independent of the time of the event described.

In this sense, structures like (28) illustrate a general point, which can be demonstrated a fortiori with structures like (29) and (30), both of which vary the time of the event described without influencing the counterfactual nature of the structure. Counterfactuality is only influenced by the temporal domain of the modal: the past modal judgement of desirability in (30) receives a counterfactual interpretation, irrespective of the temporal location of the event, while the present modal judgement of likelihood in (29) does not receive a counterfactual interpretation, again irrespective of the temporal location of the event.

(29) (a) Possibly John left.
(b) Possibly John is leaving now.
(c) Possibly John will leave.

[9] We are grateful to a reviewer for confronting us with examples like (28)–(30), which forced us to re-think our analysis of tense, and to distinguish more clearly between the tense of the modal and the tense of the event.

(30) (a) You should have left yesterday.
(b) You should have left right now.
(c) You should have left tomorrow.

To summarize the argument so far, we have shown that the cross-linguistically frequent association of counterfactual interpretation (i.e. polarity reversal) with combinations of past and modal elements marking potentiality can be reconstructed on the basis of scalar quantity implicatures. Marking a structure with a modal element invokes a link with the corresponding non-modal structure, and locating the modal in the past domain ensures that this link is scalar, in the sense that a past non-modal structure as a statement of certainty is epistemically stronger than its potential counterpart. By the Gricean maxim of quantity, use of such a past potential structure as the weaker element on the scale implicates that there were reasons not to use the stronger one in the circumstances. In other words, if the speaker knew the event had actually taken place, they would have used the non-modal expression ('it was the case that p') rather than the modal one ('it was possible, desirable, intended that p would happen'). As we will show in section 3.4, in some languages these counterfactual implicatures have remained implicatures, in the sense that they can still be cancelled, whereas in other languages have become semanticized, as a fixed part of the interpretation of past-modal combinations.

3.3. The role of aspect

Although the combination of past and modality is the most frequent one in our sample to signal counterfactuality, it is not the only one. In addition to the 16 languages that use a past-modal combination, there are also 6 languages that add an aspectual marker to this combination, and 5 languages that combine modal markers directly with aspectual markers (perfect or perfective), without past tense. Upon closer inspection, the role of these aspectual categories is in fact much the same as that of past tense. Past tense was important in the implicature mechanism to make sure that the utterances were located in a 'knowable' domain, and that the non-modal utterance is a statement of certainty. From this perspective, perfect and perfective marking can play a very similar role in the implicature mechanism.

Perfect aspect generally serves to establish a relation between a particular point in time (often expressed by one of the tense categories) and an event that took place before that point in time. As long as perfect aspect is not combined with a future tense, therefore, its effect in terms of the implicature mechanism is the same as that of a past-tense category: it locates a structure before the moment of speaking, and therefore locates it in a 'knowable' domain. It can play this role independently of other differences between past and perfect, which may relate to features like the continuing relevance of the past event but otherwise do not affect 'knowability'. Thus, for instance, in Kashmiri and Pipil, which combine perfect marking directly with modal marking, perfect aspect takes over the role played by past tense in the other languages: in neither language is the perfect marker combined with a future element in counterfactual contexts, which means that the perfect marker locates the structure before the moment of speaking. The same principle applies even more clearly to the 5 other languages that combine perfect marking with a modal-past combination, i.e. Basque, Dutch, Georgian, Malayalam and Supyire: in these languages, perfect aspect locates the structure before a moment in the past (marked by the past-tense element) rather than before the moment of speaking, thus effectively creating a pluperfect, which can either be expressed synthetically, as in Georgian (see (15)), or analytically, as in the four other languages.

The role of perfective marking, found in Nootka and Slave, is at first sight less clear than that of perfect. Perfective aspect generally indicates that an event is viewed from an outside perspective as a complete whole rather than from an inside perspective. Although this is not intrinsically related to tense and some languages allow a perfective–imperfective contrast in all tense categories, there is a strong pragmatic link with past situations, in the sense that construal as a complete whole is more natural for past structures than present ones (Comrie, 1976:71–73). In some languages, this link is a strict one, as in Nootka where "the speaker, by choosing the perfective, includes all situation boundaries in the assertion, and thereby asserts its completeness, [thus leaving] little room for the situation to be interpreted as ongoing at the time of speaking" (Davidson, 2002:226). In this sense, a combination of the conditional mood with perfective aspect in Nootka, as in (31), has the same effect as a combination with past tense as far as scalarity is concerned, and also leads to a counterfactual interpretation. The same applies to Slave, where perfective is restricted to past structures and "marks completed actions" (Rice, 1989:486).

(31) wa'='al=we' in K^{w}atjat aqi-s**=qu:**=s naq-(y)u al NOOTKA
say=TEMP=QT Kwatyat what–do**=COND**=1SG see–perceive.**PERFV**
"Kwatyat said, "How could I have seen him?"" (Davidson, 2002:278)

Thus, both perfect and perfective aspect can play the same role as past tense in the derivation of counterfactual implicatures. From the perspective of the existing literature on counterfactuality, it is remarkable that there is no single language in the sample that uses imperfective rather than perfect or perfective aspect in simple counterfactual constructions, in spite of the fact that imperfective aspect has been claimed to a typical feature of counterfactuality just like past tense (see, for instance, Fleischman, 1995).

3.4. Further evidence

In the previous two sections, we have tried to make a plausible case to show that the counterfactual feature of polarity reversal can be analysed as originating in a Gricean quantity implicature derived from the compositional semantics of the combinations found in the sample. The basic argument in favour of the proposal so far is that the recurrence across languages of specific combinations of elements to mark counterfactuality suggests that the link with counterfactuality is not fortuitous, and must have some functional motivation. In this section, we will discuss some additional, more specific evidence for the plausibility of the proposed analysis, by showing how the data in the sample have two further characteristics that are typical of an origin in pragmatically derived implicatures. On the one hand, we will show that the basic compositional meaning of the elements in the combinations still plays a role in the interpretation of the structures, in other words, that the feature of polarity reversal is simply an extra layer of interpretation added to the basic compositional layer. On the other hand, we will also show that in some languages the feature of polarity reversal still shows traces of an origin as implicature because of its cancellability.

If we look at the counterfactual utterances in our sample, the interpretation of these structures is never just that something did not happen, but that it did not happen in spite of indications to the contrary. In other words, counterfactual structures do not just reverse polarity (indeed, languages have negation to do this job), but always combine this with another layer of meaning: (i) an event was potential in some way, but (ii) in the end it did not occur. The latter component can of course be identified with the feature of polarity reversal (negative if the clause is marked positively, and

vice versa), while the former component can be identified with the modal markers of potentiality (epistemic, dynamic or deontic) that are found in all combinations of elements that mark counterfactuality. What this shows is that the feature of polarity reversal is not the only aspect of meaning associated with these combinations, but that the original compositional semantics of the combinations continues to play a role: counterfactual structures combine polarity reversal with modal meanings of potentiality.

Specifically, if we look at the counterfactual structures in our sample in terms of modal aspects of interpretation, we can easily classify them according to the three basic types of potentiality described in section 3.1. First, there are counterfactual structures with a basic meaning of epistemic modality, as in the Gooniyandi structure in (32) where the subjunctive marks the speaker's epistemic uncertainty about actualization. Second, there are also counterfactual structures with a basic meaning of dynamic modality, as in the Ndyuka structure in (33) where the future marker has a dynamic-modal feature of clause participant's intention. Finally, there are counterfactual structures with a basic meaning of deontic modality, as in the Korean structure in (34), where the debitive marker (somewhat confusingly glossed with 'if only' in this example) marks the speaker's desire.

(32) yoowooloo-ngga marni-wa gard-**ja**-yooni GOONIYANDI
man-ERG sister-his hit-**SUBJ-IRR**+CL
''The man might have hit his sister (though I know he didn't)'' (McGregor, 1990:548)

(33) da Fofi **be** **a** naki en, ma a di an lon NDYUKA
Father Fofi **ANT FUT** hit 3sobl but BE since 3S run
''Mr Fofi was going to hit her, but given that she ran away [then he didn't]''
(Huttar and Huttar, 1994:495)

(34) ne-nun ecey ttena-**ss-eya** hay-**ss**-ta KOREAN
you-TC yesterday leave-**PST-if only** do-**PST**-DC
''You should have left yesterday.'' (Sohn, 1994:347)

These examples clearly show that polarity reversal is simply an extra layer of interpretation added onto the basic compositional interpretation of potentiality and pastness.

A second argument in favour of the implicature approach is the fact that the semantic status of the feature of polarity reversal is variable in the languages in the sample. In many languages, polarity reversal has become part of the basic meaning of the past-modal combination, and is in no way cancellable. This is the case, for instance, in the Gooniyandi structures discussed in (26b). In other languages, however, the feature of polarity reversal is still cancellable, allowing variation between the counterfactual interpretation, and the basic compositional meaning without polarity reversal. One example of this is Dutch, where the deontic modal verb *moeten* in a past perfect structure generally receives a counterfactual interpretation, as in (35), but in some cases can also be used with a basic meaning of past deontic modality without polarity reversal. This is the case in an example like (36), which is structurally the same as (35) but indicates that David had been obliged to sell the car and in the end did sell it.

(35) David **had** de wagen moet-en verkop-en. Hij had DUTCH
David **have.PST** the car **must-INF** sell-INF he have-PST
veel geld kun-en krijg-en.
much money can-INF get-INF
''David should have sold the car. He could have made a lot of money.''

(36) David **had** de wagen **moet-en** verkop-en. Daarom was
David **have.PST** the car **must-INF** sell-INF that's.why be.PST
hij niet kun-en kom-en.
he not can-INF come-INF
"David had been obliged to sell the car. That's why he hadn't been able to come."

Detailed discussion of such nuances is rare in the grammars we consulted, but there are partly parallel examples that point in the same direction. In Ndyuka, for instance, the combination of relative past marker *be* with relative future marker *o* that is typically found in the apodosis of counterfactual conditionals, can also be used in simple clauses, in which context the counterfactual feature seems to be variable. Apart from examples that include polarity reversal, like (33) above, there are also examples that do not include it, like the structure in (37) where the proposition marked with *be o* is known to be actualized.

(37) ne den poti mi na opalani fee me te a foto. NDYUKA
CJ 3Pl put 1S LOC airplane fly 1S until LOC city
Da meke u taki a waka bun gi me,
CJ make 1/2pl talk 3S walk good give 1S
bika a seefi dei de me **be** **o** go a foto kaba tu
because the-Sg same day there 1s **ANT** **FUT** go LOC city already too
"Then they put me on an airplane and flew me to Paramaribo. In other words, it turned out well for me, since I had already been planning to go to town that same day anyway." (Huttar and Huttar, 1994:495)

Another relevant example comes from Basque, where one of the ways to form counterfactual apodoses (apparently not used in simple clauses) is to combine a past indicative auxiliary with a future participle (again with modal uses), as in (38). Although the counterfactual interpretation is the default one, the same combination can also be used without polarity reversal in complement structures like (39), where it just expresses past intention or likelihood (from the perspective of the agent in the past main clause) and does not include polarity reversal.

(38) Patxi etorri balitz Maddik ikusiko zuen BASQUE
Patxi come if.AUX Maddi.ERG see.**FUT** AUX.**PST**
"If Patxi had come, Maddi would have seen him." (Hualde and de Urbina, 2003:269)

(39) esan zidan egingo zuela BASQUE
tell AUX.PST do.**FUT** AUX.**PST**.COMP (our glosses)
"S/he told me s/he would do it" (Hualde and de Urbina, 2003:267)

Taken together, the fact that the basic compositional meaning is always part of the interpretation of counterfactual structures, and the fact that in some cases the feature of polarity reversal can be cancelled, provide additional support for the analysis of this feature as originating in an implicature based on the basic meaning of past/perfect/perfective modality. As already mentioned, not all structures still allow interpretations without polarity reversal (the English construction with *should have* in (2) is a good example), but this is not necessarily an argument against an implicature analysis. Elements of meaning that originate as pragmatic implicatures can easily become semanticized if they are frequent and typical

enough, as shown by the work of Traugott and Dasher (2001) on the evolution of other types of modal elements.

3.5. What about the other patterns?

The proposal we have outlined so far accounts for the majority of the patterns of counterfactual marking found in the sample, but it does not cover the seven languages where counterfactuality is marked by one single element that need not be combined with anything else to signal counterfactuality. Does this mean that counterfactual marking has developed along a different path in these languages, without an intervening stage of implicatures deriving from a more basic meaning? Although this cannot be excluded, we will argue in this section that there is some, admittedly rather tentative, evidence that points towards a link with modal markers as with the other types of marking in the sample.

For one language that marks counterfactuality directly, there are relatively straightforward indications of a link with modality. In Mwotlap, counterfactual structures typically contain the 'prospective' marker *so*, as is the case in (40). Apart from such counterfactual uses, however, the same element can also be used in a deontic sense, to mark speaker's desire as in (41), and in a dynamic sense, to mark agent's intention as in (42).

(40) Kê **so** ni-van Amot MWOTLAP
3SG **PRSP** AO-go Mota
''He should have gone to Mota'' (François, 2001:853; our translation)

(41) Nêk **so** lep me na-tan anen MWOTLAP
2SG **PRSP** take VTV ART-bag DX2
''You should bring me that bag there.'' (François, 2001:845; our translation)

(42) Imam mino **so** ni-et nêk MWOTLAP
father my **PRSP** AO-see 2SG
''My father wants to see you.'' (François, 2001:840; our translation)

The difference between the counterfactual sense in (40) and the deontic and dynamic modal senses in (41) and (42) depends on whether the utterance is in a past or a non-past context (François, 2001:851–852): the prospective particle receives a counterfactual interpretation in a past context and a dynamic or deontic interpretation elsewhere. This pattern may seem similar to the combinations of markers discussed in previous sections, but what distinguishes this language is that the difference between past and other tenses is not marked in the clause: Mwotlap does not grammaticize tense distinctions (François, 2001:697), and the distinction between past and other tense domains is entirely a matter of context. In this perspective, the situation in Mwotlap can be regarded as intermediate between direct marking and combined marking: there is only one marker to which counterfactuality can be assigned, but like with the combinations of markers discussed in the previous section, this marker also has modal uses in other constructions, and it is use in a past-tense domain that serves as a trigger for counterfactual interpretations.

In this perspective, Mwotlap is probably similar to Cantonese, another language from the sample that does not grammaticize tense distinctions. As mentioned, there is no fundamental difference between the situation in Mwotlap and the past-modal combinations described for other languages, except for the grammatical marking of tense. The reason why Cantonese was included in the category of explicit past-modal combinations in section 2.2 is that the most typical examples of counterfactuality as described in Matthews and Yip (1994:231, 235) combine modal

verbs with adverbial elements referring to a past tense. From the information at our disposal, it is not clear whether purely contextual past domains can have the same effect of triggering counterfactual interpretations for the modal elements, as is the case in Mwotlap. More generally, however, it does not seem unreasonable to suspect that the apparently 'exceptional' counterfactual construction in Mwotlap is actually representative of counterfactual constructions in a wider set of languages that do not grammaticize tense distinctions, like the languages of mainland Southeast Asia (Bisang, 1996). In such cases, the functional load of the grammatical marking of counterfactuality may fall entirely on a modal marker that can trigger counterfactual implicatures in past contexts, and that has pure modal uses in other contexts.

The six other languages that mark counterfactuality directly do not show any other uses apart from the specifically counterfactual ones, but there is some indication that at least diachronically some of them may be related to modal marking. If we look at the semantics of these dedicated markers, for instance, their interpretation is double-layered just like that of the combinations of markers discussed in the previous section: they do not simply indicate that something did not occur, but they signal that (i) some event was potential and (ii) in the end did not occur. Crucially, the potentiality involved can again be linked up with modal features, and shows a similar variation in types of modality as found with combinations of markers. Thus, for instance, the dedicated counterfactual suffix *-et* in Kolyma Yukaghir has a deontic feature, as in (43) (example repeated from (6) above), while the dedicated suffix *–hine* in Hua seems to be restricted to epistemic interpretations, as in (44).

(43) tudel pud-o-l lebie-ge modo-t KOLYMA YUKAGHIR
he upper-VR-ANR earth-LOC sit-SS:IMPF
m-et+**l'e**-j
AFF-**IRR**+be-INTR:3SG
"He should have lived on the upper earth." (Maslova, 2003:172)

(44) dmi-ro-ka va-**sine** HUA
1Sg.give-PERF-2Sg.MED go-2Sg.**CTF** (our gloss)
"You would have given it to me and gone." (Haiman, 1980:406)

While these semantic facts as such are far from conclusive as evidence for a diachronic relation with modal markers, there are in fact some languages, both within our sample and beyond, where there are some indications that a dedicated marker diachronically derives from a modal markers or a combination of past and modal markers.[10] In Martuthunira, for instance, the counterfactual suffix appears to be diachronically complex, incorporating an element *-ma*/*-nma* that is probably related to a form with an imperative function in a number of neighbouring languages (Dench, 2000), though not formally related to the imperative suffix in Martuthunira itself. In two of these neighbouring languages (Nyamal and Jiwarli), moreover, there are functional equivalents of the counterfactual affix that also incorporate this same element (Dench, 2000). While it is not certain that the ultimate reconstruction of this element at the Pama-Nyungan level will also be an imperative, mainly because it also surfaces as an aspectual (imperfective) form elsewhere (Dench, 2000; see also Alpher, 1990), from the perspective of this study the systematic formal relation with elements with imperative function in these languages is at least suggestive of a diachronic relation between dedicated counterfactual markers and modal categories. Beyond our sample, another instance of a diachronic relation with a past-modal

[10] We are grateful to Peter Austin for suggesting this, and to Alan Dench for providing further details on this hypothesis.

combination can be found in Rembarrnga, which has a dedicated counterfactual morpheme that is suffixed to the finite verb (McKay, 1975), as illustrated in (45). In spite of the use of a dedicated marker, this language is genetically related to languages that systematically mark counterfactuality with a combination of a modal irrealis prefix and a past-tense suffix to the verb, as Wardaman (see (8) above) or Nunggubuyu, illustrated in (46) (note that irrealis marking is fused with pronominal prefixes, thus creating a distinction between a realis and an irrealis series of bound pronouns).

(45) kuwa nga-tharl-**m** kar pulut-t REMBARRNGA
PURP 1min.S-go.hunting-**PST.CTF** but bullet-PRIV
'I was going to go hunting, but I have got no bullet' (McKay, 1975:244)

(46) yagimaga **bamba:**-'=bi-**ni** **bamba:**-'=ga:ru:-' NUNGGUBUYU
NEG **IRR**.2>3-hit-PST **IRR.**2>3-leave-**PST**
'You should not have hit him, you should have left him.' (Heath, 1984:345)

This suggests that the dedicated marker in Rembarrnga may derive from modal-past combination in a prefix–suffix pattern, via (i) a specialization of tense suffixes for realis and irrealis contexts, which results in distinct suffixes for realis past and irrealis past (something we find in Gooniyandi, see the discussion of example (11) above), and (ii) loss of the irrealis prefix set, of which Rembarrnga still has remnants in the form of a general subordinate prefix. Verstraete (2005) provides further arguments for this scenario.

4. Conclusions

4.1. Summary

The basic purpose of this paper was twofold: first, to find out how counterfactuality is marked in simple clauses across languages, and second, to discuss what these patterns of marking tell us about the nature and origins of counterfactuality. In the empirical part of the study, we used a broad sample of languages to determine how counterfactuality is marked in simple clauses. We showed that in the majority of languages, counterfactuality is not signalled by 'dedicated' markers, but rather by combinations of markers that have other functions in other contexts, typically a combination of a modal element marking potentiality with past tense and/or perfect or perfective aspect. These findings go against a number of commonly accepted views in the literature, especially concerning the role of past tense and imperfective aspect. Neither category is universal in the combinations used to mark counterfactuality: the only element that is found in all combinations is a modal element rather than a tense or aspect marker. The other element that is combined with this modal element is typically past tense if it is a tense marker, but it can also be an aspectual marker, in which case it is typically a perfect or a perfective marker rather than an imperfective one.

On the basis of these patterns, we argued that the defining feature of polarity reversal in counterfactual constructions typically originates as a scalar quantity implicature derived from a combination of past and modal features. Past potential constructions are statements of potentiality, and are therefore epistemically weaker than the corresponding past non-modal constructions, which are statements of certainty. On the basis of the Gricean maxim of quantity, therefore, use of the epistemically weaker past modal construction implicates that the stronger past non-modal construction does not apply. In other words, stating that something was possible,

desirable or intended at some moment in the past is weaker than stating that it did occur, which means that the speaker who uses the weaker structure implicates that it did not in fact occur (and vice versa when starting out from negative polarity). We showed that this is not just a plausible way to account for the cross-linguistically frequent association of counterfactuality with certain tense-aspect-modality combinations, but that there is also additional evidence for an implicature analysis. The basic meaning of past modality still plays a role in the interpretation of counterfactual structures, and in some languages the feature of polarity reversal can still be cancelled in some contexts, thus leaving just the basic compositional meaning.

It will be noted that in spite of our argument against the universality of past tense in counterfactual constructions, the feature of tense still plays a crucial role in our proposal about the nature of counterfactuality. Indeed, even aspectual markers were shown to be relevant only insofar as they as they have temporal implications, i.e. insofar as perfect and perfective markers are restricted to the past domain. In spite of this similarity, however, in our proposal past tense has exactly the opposite role it had in the traditional metaphorical model that regards distance in time as a metaphor for distance in reality. We argue that past tense does not lead to counterfactuality by virtue of its closeness to non-reality, as in Fleischman's (1989) metaphorical model, which maps distance in reality to distance in time, but rather by virtue of its closeness to reality. In our proposal, it is only because past tense ensures that a past non-modal construction is a statement of certainty that it can form a scale with past modal constructions and thus trigger counterfactuality implicatures. In this sense, our proposal about the origins of counterfactuality as an implicature can be seen as a reversal of the traditional role assigned to tense and aspect categories in counterfactual marking: past tense is there to ensure reality rather than irreality, and the combination of this feature of reality with the feature of potentiality contributed by the modal element is what creates the scalar organization and the corresponding implicature of polarity reversal.

4.2. Implications

The analysis in this study has focused exclusively on counterfactuality in simple clauses. A question we have not yet addressed is how the patterns of marking in simple clauses and the proposed explanatory model relate to counterfactuality in conditional constructions like (1) above. To round off this study, therefore, we will briefly touch upon the relation with conditional counterfactuals, and some of the implications of our proposals for the analysis of these constructions. As already noted in the introduction, the relation between simple and conditional counterfactuals is not straightforward: counterfactual constructions in simple clauses are not necessarily the same as conditional counterfactuals with an elided protasis. In a number of languages for which we can compare counterfactual marking in the two contexts, a simple counterfactual construction is structurally different from the apodosis of a conditional counterfactual construction. In Cantonese, for instance, a simple counterfactual uses a combination of a modal verb and a past-tense adverb (see (7) above), while a counterfactual apodosis uses an optional perfective marker, as shown in (47). A similar situation is found in Georgian, where a combination of the pluperfect with a modal auxiliary marks counterfactuality in simple clauses (see (15) above), while a counterfactual apodosis can be marked with just the pluperfect, as in (48).

(47) yùhgwó móuh ngóh, léih yíhging séi-**jó** hóu loih la!
if not-have me you already die-**PERFV** very long PRT
"If it was't for me, you would have been dead long ago!"
(Matthews and Yip, 1994:304)

(48) sen rom ar c'ar-g-e-kez-eb-in-e,
you(DAT) if not PREV-you-IOV-encourage-TS-PLUP-IND(1SG)
i+kn+eb(+a) ar ga-m-e-k'et-eb-**in-**a
perhaps not PREV-I-IOV-do-TS-**PLUP**-it
"If you had not encouraged me, perhaps I would not have done it."
(Hewitt, 1995:268)

Differences like these indicate that simple counterfactuals cannot always be equated with conditional counterfactuals with an elided protasis, and that our findings about counterfactuality in simple clauses cannot be extrapolated to counterfactuality in conditionals in any simple way. One approach that could be taken is to regard the conditional protasis as the equivalent of a modalizing element for the apodosis, because the protasis states a possible world in terms of which the apodosis is evaluated (see, for instance, Lazard, 2001:421). In this perspective, it is not the counterfactual apodosis as such that should be compared with the simple counterfactual, because such a comparison ignores the modalizing effect of the protasis. If we take into account this effect by counting the presence of a protasis as a type of modal element for the apodosis, the counterfactual conditionals in the sample show very similar patterns of marking to simple counterfactuals (though not necessarily on a language-by-language basis): the Georgian construction in (48) combines a modalizing protasis with a pluperfect apodosis, and the Cantonese construction in (47) combines a modalizing protasis with a perfect apodosis.

While many languages structurally distinguish simple counterfactuals from conditional counterfactuals with an elided protasis, there are also some instances in our sample where the two are structurally identical. There may in fact be some systematicity in which types of simple counterfactuals are structurally identical to conditionals with an elided protasis, especially if one looks at the type of modality involved. In our analysis, we treated the three basic subtypes of modality (epistemic, deontic and dynamic modality) in the same way, since all three types can lead to counterfactual implicatures when combined with the right temporal or aspectual features (see especially section 3.4). From the perspective of the relation with conditional counterfactuals, however, there is one type that stands out: it is mainly simple counterfactuals with epistemic modality that are structurally identical to conditionals with elided apodoses. In Hua, for instance, the counterfactual construction, expressed by allomorphs of the dedicated marker *–hine*, has a clear epistemic interpretation in simple clauses, expressing a past likelihood that did not eventuate, glossed by 'almost' (see example (4) above). This construction is not limited to genuine simple counterfactual contexts, but can also be used in the apodosis of conditional constructions, as illustrated in (49), where both the protasis and the apodosis use allomorphs of *–hine*.

(49) korihu-**hipa**-na via ta-**sine**
run.away-REL.**CTF**.A-thing tears shed-**CTF**.B
'If I had run away, you would have cried.' (Haiman, 1980:185)

If we look at this similarity in terms of what we suggested above about the modalizing effect of a protasis, the dominance of epistemic modality in such cases can probably explained along similar lines. The way a protasis modalizes an apodosis is essentially epistemic, because it presents a possible world from whose perspective the likelihood of the apodosis is evaluated (see, for instance, Akatsuka, 1985 on the basically epistemic nature of conditionals). From this perspective, the difference between languages that have similar or distinct simple and

counterfactual conditionals may be a matter of the type of modality involved in marking counterfactuality, and of how the modal information is distributed over the protasis and apodosis. Epistemic modality is semantically compatible with the basically epistemic orientation of conditionals, while other types of modality are not. Semantically, therefore, it would not be surprising if some simple counterfactual types with epistemic markers are similar to conditional apodoses, while most other types with deontic and dynamic markers are not. Apart from the type of modality, another factor that may turn out to be relevant is the distribution of modal information in the construction. In some languages, the mere presence of a protasis can be sufficient as epistemic modalization for the conditional as a whole, as is the case in the Georgian structure in (48) above, where the apodosis does not itself contain any modal element, epistemic or non-epistemic. In others, however, the epistemic value of the presence of a protasis can be replicated with an additional modalizing element in the apodosis, as in Hua.

The 'bridging' status of epistemic modality between simple and conditional counterfactuals raises a final question, viz. in how far our argument about the origins of polarity reversal as an implicature could be extended from simple counterfactuals to conditional ones. It is beyond the scope of this study to answer this question in any detailed way, but there are at least two indications that our analysis might be useful. First, there is evidence from the types of marking found in conditional counterfactuals. Lazard's (2001) study of counterfactuality in conditionals shows a very similar distribution of marking patterns to the types we find for counterfactuality in simple clauses: a majority pattern of combined marking (mainly tense and some kind of modal marking), and a minority pattern of dedicated markers (Lazard, 2001:421). Secondly, there is evidence from the semantic structure of counterfactual conditionals. It has been noted by a number of authors working on counterfactual conditionals that the canonical forms associated with them, like (50), can occasionally receive interpretations without polarity reversal (see Karttunen and Peters, 1977; Comrie, 1986; Dancygier and Sweetser, 2005:72–73). The standard interpretation of (50) is counterfactual, i.e. that the prisoners did not receive outside help, and that the guards did not notice intruders. In addition, however, an interpretation without polarity reversal is not excluded: (50) can also be interpreted as simply being uncertain about polarity reversal, for instance when it is continued with *the guards didn't report anything suspicious, but they may have been bribed*.

(50) If the prisoners had received help from outside, the guards would have noticed the intruders.

The fact that the feature of polarity reversal can be removed is remarkably similar to what we observed for simple counterfactuals in section 3.4, where we used the occasional variability of polarity reversal as an argument to further support our hypothesis about its origins as an implicature. Moreover, if we look at what aspects of interpretation remain in a conditional counterfactual once the feature of polarity reversal is removed, the similarity with simple counterfactuals becomes even more pronounced. In the non-counterfactual interpretation of (50), what remains is a meaning of past epistemic modality, describing the likelihood of the guards' actions in the possible world introduced by the protasis. In other words, the semantic structure of conditional counterfactuals seems to be similar to the simple counterfactuals studied here: there are two layers of interpretation, one of past modality, which is present in all interpretations, and another of polarity reversal, which is present in standard interpretations but can occasionally be dropped. Such similarities in semantic structure at least give some indication that a scenario

deriving polarity reversal by a similar type of implicature could be set up for the counterfactual conditionals, although a detailed analysis of this hypothesis is far beyond the scope of this study.

Acknowledgements

An earlier version of this study was presented at the 2004 meeting of the *Australian Linguistic Society*. We would like to thank the members of the audience, especially Peter Austin, Alice Gaby, Anna Gladkova, Ian Green, Bill McGregor and Rachel Nordlinger, for very helpful comments. Special thanks to Peter Austin and to Alan Dench for a detailed discussion of the diachrony of counterfactual markers in Martuthunira and other Pilbara languages, and to Gilbert Lazard for drawing our attention to his typological study of counterfactual conditionals. We are also grateful to two reviewers for very detailed and useful comments on a previous draft. We are of course solely responsible for any errors of fact or interpretation. Authorship of the paper is shared equally: Van linden analysed the bulk of the data, Verstraete provided the basic hypothesis, analysed additional data from half a dozen languages and wrote the text.

Appendix A. Languages used in the sample

Family	Language	Source	Counterfactuality	
			Simple	Conditional
Afro-Asiatic, Chadic	Hdi	Frajzyngier (2002)	■	■
Afro-Asiatic, Cushitic	Somali	Saeed (1999)	■	
Altaic	Turkish	Kornfilt (1997)	■	■
Amerind, Central	Pipil	Campbell (1985)	■	■
Amerind, Ge-Pano-Carib	Matses	Fleck (2003)	■	■
Amerind, Northern, Wakashan	Nootka	Davidson (2002)	■	■
Amerind, Northern, Penutian	Koasati	Kimball (1991)		■
Amerind, Equatorial-Tucanoan	Mekens	Galucio (2001)		■
Amerind, Chibchan-Paezan	Ika	Frank (1990)	■	
Amerind, Andean	Imbabura Quechua	Cole (1982)	■	
Australian, Bunuban	Gooniyandi	McGregor (1990)	■	■
Australian, Gunwinyguan	Wardaman	Merlan (1994)	■	■
Australian, Pama-Nyungan	Martuthunira	Dench (1995)	■	
Austric, Austro-Tai, Austronesian	Mwotlap	François (2001)	■	■
Austric, Austro-Tai, Austronesian	Nakanai	Bugenhagen (1993)	■	
Austric, Austro-Tai, Daic	Thai	Noss (1964)		■
Austric, Austroasiatic	Temiar	Benjamin (1976)	■	
Austric, Miao-Yao	Hmong Njua	Harriehausen (1990)		■
Basque (isolate)	Basque	Saltarelli (1988)	■	■
Burushaski (isolate)	Burushaski	Berger (1998)		■
Caucasian	Icari	Sumbatova and	■	■
	Dargwa	Mutalov (2003)	■	■
Chukchi-Kamchatkan	Chukchi	Dunn (1999)	■	■

Appendix A (*Continued*)

Family	Language	Source	Counterfactuality	
			Simple	Conditional
Elamo-Dravidian	Malayalam	Asher and Kumari (1997)		
Eskimo-Aleut	West Greenlandic	Fortescue (1984)		
Etruscan (isolate)	Etruscan	Rix (2004)		
Gilyak (isolate)	Gilyak	Gruzdeva (1998)		
Hurrian (isolate)	Hurrian	Wilhelm (2004)		
Indo-Hittite, Indo-European	Dutch	(Native speakers)		
Indo-Hittite, Indo-Aryan	Kashmiri	Wali and Koul (1997)		
Indo-Pacific, East Papuan	Lavukaleve	Terrill (2003)		
Indo-Pacific, Sepik-Ramu	Yimas	Foley (1991)		
Indo-Pacific, Torricelli	Bukiyip	Conrad and Wogiga (1991)		
Into-Pacific, Trans-New-Guinea	Hua	Haiman (1980)		
Indo-Pacific, West Papuan	Abun	Berry and Berry (1999)		
Kartvelian	Georgian	Hewitt (1995)		
Ket (isolate)	Ket	Werner (1997)		
Khoisan	Nama Hottentot	Hagman (1977)		
Korean-Japanese-Ainu	Korean	Sohn (1994)		
Meroitic (isolate)	Meroitic	–		
Nahali (isolate)	Nahali	Kuiper (1962)		
Niger-Kordofanian, Niger-Congo, proper, Central Niger-Congo	Supyire	Carlson (1994)		
Niger-Kordofanian, Niger-Congo, proper, West Atlantic	Fongbe	Lefebvre and Brousseau (2002)		
Niger-Kordofanian, Niger-Congo, Mande	Vai	Welmers (1976)		
Niger-Kordofanian, Kordofanian	Krongo	Reh (1985)		
Na-Dene	Slave	Rice (1989)		
Nilo-Saharan, East-Sudanic	Lango	Noonan (1992)		
Nilo-Saharan, Central-Sudanic	Ma'di	Blackings and Fabb (2003)		
Pidgins and Creoles	Ndyuka	Huttar and Huttar (1994)		
Sino-Tibetan, Sinitic	Cantonese	Matthews and Yip (1994)		
Sino-Tibetan, Tibeto-Karen	Kham	Watters (2002)		
Sumerian	Sumerian	Michalowsky (2004)		
Uralic-Yukaghir	Kolyma Yukaghir	Maslova (2003)		

References

Akatsuka, Noriko, 1985. Conditionals and the epistemic scale. Language 61, 625–639.

Alpher, Barry, 1990. Some proto-Pama-Nyungan paradigms. A verb in the hand is worth two in the phylum. In: O'Grady, Geoffrey, Tryon, Darrell (Eds.), Studies in Comparative Pama-Nyungan. Pacific Linguistics, Canberra, pp. 155–171.

Asher, Ronald, Kumari, T.C., 1997. Malayalam. Routledge, London.

Benjamin, Geoffrey, 1976. An outline of Temiar grammar. In: Jenner, Philip, Thompson, Laurence, Starosta, Stanley (Eds.), Austroastiatic Studies, vol. II. University Press of Hawaii, Honolulu, pp. 129–187.

Berger, Hermann, 1998. Die Burushaski-Sprache von Hunza und Nager. Harrassowitz, Wiesbaden.

Berry, Keith, Berry, Christine, 1999. A Description of Abun: A West Papuan Language of Irian Jaya. Pacific Linguistics, Canberra.

Bisang, Walter, 1996. Areal typology and grammaticalization: processes of grammaticalization based on nouns and verbs in East and mainland South East Asian languages. Studies in Language 20, 519–597.

Blackings, Mairi, Fabb, Nigel, 2003. A Grammar of Ma'di. Mouton, Berlin.

Bugenhagen, Robert, 1993. The semantics of irrealis in Austronesian languages of Papua New Guinea. A cross-linguistic study. In: Reesink, Ger (Ed.), Topics in Descriptive Austronesian Linguistics. Vakgroep Talen en Culturen van Zuidoost-Azië, Leiden, pp. 1–39.

Burton-Roberts, Noel, 1984. Modality and implicature. Linguistics & Philosophy 7, 181–206.

Bybee, Joan, Perkins, Revere, Pagliuca, William, 1994. The Evolution of Grammar: Tense, Aspect, and Modality in the Languages of the World. University of Chicago Press, Chicago.

Campbell, Lyle, 1985. The Pipil Language of El Salvador. Mouton, Berlin.

Carlson, Robert, 1994. A Grammar of Supyire. Mouton, Berlin.

Cole, Peter, 1982. Imbabura Quechua. Amsterdam, North Holland.

Comrie, Bernard, 1976. Aspect. Cambridge University Press, Cambridge.

Comrie, Bernard, 1986. Conditionals: a typology. In: Traugott, Elizabeth, ter Meulen, Alice, Reilly, Joan, Ferguson, Charles (Eds.), On Conditionals. Cambridge University Press, Cambridge, pp. 77–99.

Conrad, Robert, Wogiga, Kepas, 1991. An Outline of Bukiyip Grammar. Pacific Linguistics, Canberra.

Dahl, Östen, 1997. The relation between past time reference and counterfactuality: a new look. In: Athanasiadou, Angeliki, Dirven, René (Eds.), On Conditionals Again. Benjamins, Amsterdam, pp. 97–114.

Dancygier, Barbara, Sweetser, Eve, 2005. Mental Spaces in Grammar. Conditional Constructions. Cambridge University Press, Cambridge.

Davidson, Matthew, 2002. Studies in Southern Wakashan (Nootkan) Grammar. Unpublished doctoral dissertation, State University of New York at Buffalo.

Dench, Alan, 1995. Martuthunira: A Language of the Pilbara Region of Western Australia. Pacific Linguistics, Canberra.

Dench, Alan, 2000. An internal reconstruction of verbal inflectional morphology in the Pilbara languages of Western Australia. Manuscript, University of Western Australia.

Dunn, Michael, 1999. A grammar of Chukchi. Unpublished doctoral dissertation, Australian National University.

Fleischman, Suzanne, 1989. Temporal distance: a basic linguistic metaphor. Studies in Language 13, 1–50.

Fleischman, Suzanne, 1995. Imperfective and irrealis. In: Bybee, Joan, Fleischman, Suzanne (Eds.), Modality in Grammar and Discourse. Benjamins, Amsterdam, pp. 519–551.

Fleck, David, 2003. A Grammar of Matses. Unpublished doctoral dissertation, Rice University.

Foley, William, 1991. The Yimas Language of New Guinea. Stanford University Press, Stanford.

Fortescue, Michael, 1984. West Greenlandic. Croom Helm, London.

Frajzyngier, Zygmunt, 2002. A Grammar of Hdi. Mouton, Berlin.

François, Alexandre, 2001. Contraintes de Structures et Liberté dans l'Organisation du Discours. Une Description du Mwotlap, Langue Océanienne du Vanuatu. Unpublished doctoral dissertation, Paris IV-Sorbonne.

Frank, Paul, 1990. Ika Syntax. Summer Institute of Linguistics, Dallas.

Galucio, Ana, 2001. The Morphosyntax of Mekens (Tupi). Unpublished doctoral dissertation, University of Chicago.

Goldberg, Adele, 1995. Constructions. A Construction Grammar Approach to Argument Structure. University of Chicago Press, Chicago.

Grice, H.P., 1975. Logic and conversation. In: Cole, Peter, Morgan, Jerry (Eds.), Syntax and Semantics Vol. 3: Speech Acts. Academic Press, New York, pp. 41–58.

Gruzdeva, Ekaterina, 1998. Nivkh. Lincom, München.

Hagman, Roy, 1977. Nama Hottentot Grammar. Indiana University Press, Bloomington.

Haiman, John, 1980. Hua: A Papuan Language of the Eastern Highlands of New Guinea. Benjamins, Amsterdam.

Harriehausen, Bettina, 1990. Hmong Njua. Niemeyer, Tübingen.
Heath, Jeffrey, 1984. Functional Grammar of Nunggubuyu. AIAS, Canberra.
Hewitt, Brian, 1995. Georgian: A Structural Reference Grammar. Benjamins, Amsterdam.
Hirschberg, Julia, 1991. A Theory of Scalar Implicature. Garland, New York.
Horn, Laurence, 1989. A Natural History of Negation. University of Chicago Press, Chicago.
Hualde, José Ignacio, Ortiz de Urbina, Jon (Eds.), 2003. A Grammar of Basque. Mouton, Berlin.
Huttar, George, Huttar, Mary, 1994. Ndyuka. Routledge, London.
Iatridou, Sabine, 2000. The grammatical ingredients of counterfactuality. Linguistic Inquiry 31, 231–270.
James, Deborah, 1982. Past tense and the hypothetical: A cross linguistic study. Studies in Language 6, 375–403.
Joos, Martin, 1964. The English Verb: Form and Meanings. University of Wisconsin Press, Madison.
Karttunen, Lauri, Peters, Stanley, 1977. Requiem for presupposition. Berkeley Linguistics Society 3, 360–371.
Kimball, Geoffrey, 1991. Koasati Grammar. University of Nebraska Press, Lincoln.
Kuiper, Franciscus, 1962. Nahali: A Comparative Study. Koninklijke Nederlandse Academie van Wetenschappen, Amsterdam.
Kornfilt, Jaklin, 1997. Turkish. Routledge, London.
Lakoff, George, 1970. Linguistics and natural logic. Synthese 22, 151–271.
Lazard, Gilbert, 2001. L'expression de l'irréel: Essai de typologie. In: Etudes de linguistique générale: Typologie grammaticale, Peeters, Leuven, pp. 413–424.
Lefebvre, Claire, Brousseau, Anne-Marie, 2002. A Grammar of Fongbe. Mouton, Berlin.
Levinson, Stephen, 2000. Presumptive Meanings. The Theory of Generalized Conversational Implicature. MIT Press, Cambridge, MA.
Lewis, David, 1973. Counterfactuals. Harvard University Press, Cambridge, Mass.
Matthews, Stephen, Yip, Virginia, 1994. Cantonese: A Comprehensive Grammar. Routledge, London.
Maslova, Elena, 2003. A Grammar of Kolyma Yukaghir. Mouton, Berlin.
McGregor, William, 1990. A Functional Grammar of Gooniyandi. Benjamins, Amsterdam.
McKay, Graham, 1975. Rembarrnga: A language of Central Arnhem Land. Unpublished doctoral dissertation, Australian National University.
Merlan, Francesca, 1994. A Grammar of Wardaman. Mouton, Berlin.
Michalowsky, Piotr, 2004. Sumerian. In: Woodard, Roger (Ed.), The Cambridge Encyclopaedia of the World's Ancient Languages. Cambridge University Press, Cambridge, pp. 19–59.
Noonan, Michael, 1992. A Grammar of Lango. Mouton, Berlin.
Noss, Richard, 1964. Thai Reference Grammar. Foreign Service Institute, Washington, DC.
Reh, Mechthild, 1985. Die Krongo-Sprache (Niino Mo-Di). Reimer, Berlin.
Rice, Keren, 1989. A Grammar of Slave. Mouton, Berlin.
Rijkhoff, Jan, 2002. The Noun Phrase. Oxford University Press, Oxford.
Rijkhoff, Jan, Bakker, Dik, 1998. Language sampling. Linguistic Typology 2, 263–314.
Rijkhoff, Jan, Bakker, Dik, Hengeveld, Kees, 1993. A method of language sampling. Studies in Language 17, 169–203.
Rix, Helmut, 2004. Etruscan. In: Woodard, Roger (Ed.), The Cambridge Encyclopaedia of the World's Ancient Languages. Cambridge University Press, Cambridge, pp. 943–966.
Ruhlen, Merritt, 1991. A Guide to the World's Languages. Hodder & Stoughton, London.
Saeed, John, 1999. Somali. Benjamins, Amsterdam.
Saltarelli, Mario, 1988. Basque. Routledge, London.
Sohn, Ho-Min, 1994. Korean: A Descriptive Grammar. Routledge, London.
Steele, Susan, 1975. Past and irrealis: Just what does it all mean? International Journal of American Linguistics 41, 200–217.
Sumbatova, Nina, Mutalov, Rasul, 2003. A Grammar of Icari Dargwa. Lincom, München.
Terrill, Angela, 2003. A Grammar of Lavukaleve. Mouton, Berlin.
Traugott, Elizabeth, Dasher, Richard, 2001. Regularity in Semantic Change. Cambridge University Press, Cambridge.
Van der Auwera, Johan, 1996. Modality: The three-layered scalar square. Journal of Semantics 13, 181–195.
Van der Auwera, Johan, Plungian, Vladimir, 1998. Modality's semantic map. Linguistic Typology 2, 79–124.
Verstraete, Jean-Christophe, 2001. Subjective and objective modality. Journal of Pragmatics 33, 1505–1528.
Verstraete, Jean-Christophe, 2005. The semantics and pragmatics of composite mood marking: the non-Pama-Nyungan languages of northern Australia. Linguistic Typology 9, 223–267.
Wali, Kashi, Koul, Omkar, 1997. Kashmiri. Routledge, London.
Watters, David, 2002. A Grammar of Kham. Cambridge University Press, Cambridge.
Welmers, William, 1976. A Grammar of Vai. University of California Press, Berkeley.

Werner, Heinrich, 1997. Die ketische Sprache. Harrassowitz, Wiesbaden.
Wilhelm, Gernot, 2004. Hurrian. In: Woodard, Roger (Ed.), The Cambridge Encyclopaedia of the World's Ancient Languages. Cambridge University Press, Cambridge, pp. 95–118.
Ziegeler, Debra, 2000. Hypothetical Modality. Grammaticalization in an L2 Dialect. Benjamins, Amsterdam.

An Van Linden is a researcher in the Department of Linguistics at the University of Leuven. Her interests include English historical linguistics, linguistic typology, diachronic semantics, mood and modality, and complement constructions.

Jean-Christophe Verstraete is a postdoctoral fellow of the Fund for Scientific Research – Flanders and a lecturer in the Department of Linguistics at the University of Leuven. His interests include linguistic typology, the semantics and pragmatics of mood, modality and complex sentence constructions, and descriptive work on Australian languages.