

56. Conjunctions and Universal Quantifiers

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1. Introduction

Conjunctions are forms with meanings similar to that of English *and*. **Universal quantifiers** are expressions with meanings resembling those of English *every*, *each*, and *all*.

Logicians, as well as logically-minded linguists, have suggested that there is a close affinity between conjunctions and universal quantifiers. For example, in the context of a class consisting of five students, Alice, Bill, John, Mary and Susan, sentence (1) with the conjoined NP *Alice, Bill, John, Mary and Susan* is logically equivalent to sentence (2) with the universally quantified noun phrase *every student*.

(1) *Alice, Bill, John, Mary and Susan passed the exam.*

(2) *Every student passed the exam.*

Based on observations such as these, some semanticists have proposed deriving the interpretations of universal quantifiers from those of conjunctions. For example, in the Boolean Semantics of Keenan and Faltz (1986), conjunctions and universal quantifiers are both represented in terms of set-theoretic intersections.

How well do such semantic representations correspond to the observable lexical and grammatical patterns of languages? On the basis of examples such as (1) and (2) above, one might suspect that they do not correspond at all well. Thus, in English, the conjunction *and* and the universal quantifier *every* are distinct words with quite different grammatical properties.

However, a broader cross-linguistic perspective suggests that there are indeed widespread lexical and grammatical

resemblances between conjunctions and universal quantifiers, thereby lending support to the logicians' analyses. The purpose of this map is to portray some of these connections, and, in doing so, to show how the cross-linguistic study of such lexical and grammatical patterns can be of relevance to logicians and their theories of formal semantics.

2. Feature values

For the purposes of the map, conjunctions are taken to include not only forms with meanings similar to that of *and*, but in addition expressions that are sometimes characterized as **conjunctive operators** or **focus particles**, with meanings resembling those of *also*, *even*, *another*, *again*, and in addition the restrictive *only*. As for universal quantifiers, these are assumed to encompass not only forms with meanings such as those of *every*, *each* and *all*, but also expressions that are sometimes referred to as **free-choice**, with meanings corresponding to that of *any* in constructions such as *Any student can pass the exam* (but not constructions such as *Alice didn't see any students*, where *any* has a so-called negative polarity interpretation).

@	1. Formally different	40
@	2. Formally similar, not involving interrogative expression	33
@	3. Formally similar, involving interrogative expression	43
	total	116

The map distinguishes between three types of languages. The first type contains languages in which there is no formal resemblance between any of the conjunctions and any of the universal quantifiers. The second type contains languages in which such resemblances, which may be of variegated kinds, do

exist. The third type, a specific subtype of the second type involving a specific kind of resemblance, contains languages in which universal quantifiers are formed from a combination of conjunctions and interrogative expressions.

The first type of language is exemplified by French. In French, the inventory of conjunctions consists of *et* 'and', *aussi* 'also', *même* 'even', *autre* 'other', *encore* 'again', *seulement* 'only' and others. And the inventory of universal quantifiers consists of *tout* 'all', *chaque* 'every', *n'importe quel* 'any' and others. There are thus no observable resemblances between these two classes of words. Other languages belonging to this type include Lango, Brahui, Jaminjung, Kutenai and Panare.

The second type of language is of a heterogeneous nature, due to the many different ways in which conjunctions and universal quantifiers may be formally related. The most obvious way is through complete identity. For example, in Supyire, the form *mú* has a range of meanings that includes the conjunctive 'also' and the universal quantifier 'all' (Carlson 1994: 686). In Yidiny, the suffix *-bi* has a range of meanings that includes the conjunctive 'another' and the universal quantifier 'all' (Dixon 1977: 147–148). And in Coast Tsimshian, the prefix *max-* has a range of meanings that includes the conjunctive 'only' and the universal quantifier 'all' (Boas 1911: 317).

In a larger number of cases, the formal resemblance between conjunctions and universal quantifiers is partial rather than complete. In a few cases, conjunctions and universal quantifiers contain a common root plus some additional material specific to each of the two. For example, in Malagasy, the common root *na* 'or' may combine with *aza* 'even' to yield the conjunction *na ... aza* 'even', or with *iza* 'who' plus reduplication to yield the universal quantifier *na iza na iza* 'anybody' (Fanja Nawalone Hanitry Ny Ale–Gerull p.c.).

In a few other instances, a universal quantifier forms part of a larger conjunction. An example of this is provided by English,

in which the universal quantifier *all* is at least diachronically part of the conjunction *also*.

Considerably more common, however, is the opposite state of affairs, in which a conjunction forms part of a larger universal quantifier. For example, in Iraqw, *hleemee* 'also' suffixed with feminine *-r* and "background" suffix *-o* yields the universal quantifier *hleemeero* 'all' (Maarten Mous p.c.). Similarly, in Chukchi, *əmə* 'and' plus the nominalizing suffix *-lʔo* produce the universal quantifier *əməlʔo* 'all' (Michael Dunn p.c.). And in Taba, *le* 'only' combined with the classifier *ha* and the numeral *so* 'one' results in the universal quantifier *hasole* 'all' (Bowden 2001: 183).

In a variation on the above pattern, a conjunction may combine with a simple lexical universal quantifier to create a more complex universal quantifier expression. For example, in Amele, *cunug* 'all' frequently cooccurs with *ca* 'and', 'with' (Roberts 1987). Similarly, in Haisla, *ag-* 'all' often combines with *-am* 'just', 'really' (Bach 1996). And in Hebrew, *kol* 'all', *va* 'and', plus a reduplicated head noun yield a construction of the form *kol N va-N* with the interpretation 'every N' (own knowledge).

One of the ways in which a conjunction may form part of a larger universal quantifier is of sufficient importance to merit the positing of a third type of language: in such languages, conjunctions combine with interrogative expressions to produce universal quantifiers. For example, in Kanuri, *yayé* 'even if' combines with interrogative forms such as *ndú* 'who' to produce universal quantifiers such as *ndú yayé* 'everybody' (Cyffer and Hutchison 1990: 189). Similarly, in Colloquial Singaporean English (also known as Singlish), *also* 'also' combines with interrogative expressions such as *which* 'which' to yield discontinuous universal quantifiers such as *which ... also* 'any' (Gil 1994c). And in Jaqaru, the suffix *-psa* 'also' attaches to interrogative stems such as *kaw* 'where' to create universal quantifiers such as *kawpsa* 'anywhere' (Hardman 2000: 34–35).

In some other cases, the conjunction and the interrogative expression combine with an additional marker or markers to form the universal quantifiers. For example, in Mosestén, the suffix *-nä* 'and' attaches to the interrogative form *jäen'* 'how' plus the associative marker *-tyi'* to produce the universal quantifier *jäen'-tyi'-nä* 'anybody' (Jeanette Sakel p.c.). Often, the additional marker in question involves reduplication. For example, in Sesotho, *le-* 'and', 'with' occurs between two copies of the interrogative form *ofe* 'which' to yield the universal quantifier *ofe le-ofe* 'every' (Guma 1971). And in Begak-Idaan, *ja?* 'only', 'just' occurs after reduplicated interrogative expressions such as *nu-nu* 'what' to yield universal quantifiers such as 'any' (Nelleke Goudswaard p.c.).

Finally, it should be noted that languages of the third type overlap to a considerable degree with languages characterized as having interrogative-based indefinite pronouns in Map 46. However, the overlap between these languages is far from complete, for at least the following reasons: (i) not all interrogative-based indefinite pronouns contain a conjunction (some consist just of a bare interrogative expression); (ii) not all interrogative-based indefinite pronouns are universal quantifiers (some are existential); and (iii) not all combinations of conjunctions and interrogative expressions forming universal quantifiers are pronouns (some occur only in attributive or determiner position).

3. Geographical distribution

As is evident from the map, languages of the first two types occur all over the world, without any significant geographical patterning. Given the many different ways in which conjunctions and universal quantifiers may be formally related to each other, the absence of such patterns is hardly surprising. Nevertheless, the fact that formal resemblances between conjunctions and universal quantifiers can be found across the globe, in

geographically, genealogically and typologically unrelated languages, vindicates the logicians' analyses, providing cross-linguistic support for semantic representations which relate conjunctions and universal quantifiers.

In contrast, languages of the third type, in which conjunctions combine with interrogative expressions to form universal quantifiers, exhibit rather striking geographical patterning. Such languages can be found in a number of hotbeds throughout the world, in central western Africa, the Caucasus, and South America. More saliently, though, such languages are the rule in a large contiguous swath encompassing South, South-East, and East Asia. In Emeneau (1980) the construction in question is argued to be one of the characteristic features of the South Asian linguistic area; however, as shown in Gil (1994b) and in the present map, the isogloss is actually much larger, extending far to the east of the South Asian subcontinent. A vivid example of how languages coming into the region undergo typological adaptation is provided by the Singaporean variety of English, which, as mentioned above, has acquired the construction, presumably under the influence of Tamil, Malay and Chinese substrates. Thus, in the following example, interrogative *which* combines with conjunctive operator *also* to form a free-choice universal quantifier meaning 'any':

- (3) Colloquial Singapore English (Singlish)
Which student also can pass the exam.
 'Any student can pass the exam.'

4. Theoretical issues

While the connection between conjunctions and universal quantifiers is well-motivated semantically, it is still necessary to work out the detailed mechanisms by which the relevant complex expressions derive their meanings from those of their

constituent parts. In particular, the construction involving the combination of a conjunction and an interrogative expression to produce a universal quantifier has been the focus of a number of recent analyses, attempting to explain how the construction acquires its resulting meaning; see, for example, König (1991), Gil (1994a,b,c), Haspelmath (1997) and others.