# Decomposing coordination: the two operators of coordination

K. A. Jayaseelan

The English & Foreign Languages University (Hyderabad)

<kajayaseelan11@gmail.com>

*Abstract*: In some languages the coordination markers also function as operators (e.g. Japanese, Malayalam), in others not (English). We explain this difference as follows: Coordination is composed of two operators, a concatenation operator and a substitution operator (choice function); and languages typically lexicalize only one of them. English-type languages lexicalize the concatenation operator, whereas Japanese/Malayalam-type languages lexicalize the choice function operator. The coordination markers on the coordinands are copies of the operators. In Japanese/Malayalam, they would then be copies of the choice function operator; and the latter has a range of functions, e.g. that of inducing the distributive reading when applied to a set. This gives rise to the impression that the Japanese/Malayalam coordination markers are doing "double duty" as operators. (The English coordination markers are copies of the concatenation operator, which has only the limited function of concatenating overt elements.)

*Key Words*: **coordination**, **concatenation**, **choice function**, **distributivity**, **Japanese**, **Malayalam**

## 1. Introduction

A long-standing puzzle about the coordination markers of languages is that some of them are plain coordination markers whereas others appear to be both coordination markers and operators. An example of plain coordination markers are English *and* and *or*; they appear to have no operator-like function.

The most well-known example of elements with a "double life" as both coordination markers and operators are Japanese *mo* and *ka*. Kuroda (1965) noted that *mo* and *ka*, besides being coordination markers in Japanese, also have a function in the formation of "indeterminate pronouns"; and *ka* is also a question particle. Since the Malayalam coordination markers *-um* (for conjunction) and *-oo* (for disjunction) completely parallel the behaviour of Japanese *mo* and *ka*, we shall illustrate the "double life" of coordination markers with Malayalam examples:

(1)  <u>*-um*/*-oo* as coordination markers:</u>[1]

    a.  John-**um**,   Bill-**um**,   Peter-**um**   wannu

        John-CONJ  Bill-CONJ  Peter-CONJ  come.PAST

        'John, Bill, and Peter came.'

    b.  John-**oo**,   Bill-**oo**,   Peter-**oo**   wannu

        John-DISJ  Bill-DISJ  Peter-DISJ  come.PAST

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[1] Not only nominal expressions but any category can be coordinated by *-um*/*-oo*, except finite clauses and relative clauses; see Jayaseelan (2014) for an account of these exceptions.

'John, Bill, or Peter came.'

(2)  *-um/-oo* as operators:

    a.    aarǝ e<u>nt</u>ǝ coodicc-aal-**um** , awa<u>n</u> koDukk-um

       who what ask-COND-CONJ he give-FUT

       'Whoever asks for whatever (thing), he will give (it).'

    b.    aar-uDe wiiTT-il-**oo**, kaLLa<u>n</u> kaDannu

       who-GEN house-LOC-DISJ thief enter.PAST

       'A thief entered somebody's house.'

    c.    Mary wannu-**oo** ?

       Mary come.PAST-DISJ

       'Did Mary come?'

In (2a), *-um* as an operator applies to the two *wh*-phrases in its scope and interprets them as universal quantifiers; in (2b), *-oo* applies to the *wh*-phrase in its scope and interprets it as an existential quantifier; and in (2c), *-oo*, generated in C, functions as the question particle that turns the sentence into a question.

It was noted in Madhavan (1988, 1997), Jayaseelan (2001, 2011) that (in fact) any *wh*-word in Malayalam, when suffixed with (or in the scope of) *-um/-oo*, becomes a quantifier.[2] Cf. (3):

(3)    a.    aar-**um**    'everybody'[3]    b.    aar-**oo**    'somebody'

       who-CONJ                who-DISJ

       ent-**um**    'everything'        ent-**oo**    'something'

       what-CONJ              what-DISJ

       eppoozh-**um** 'always'        eppoozh-**oo** 'at some time'

       when-CONJ              when-DISJ

       ewiDe-(y)**um** 'everywhere'       ewiDe-(y)**oo** 'somewhere'

       where-CONJ             where-DISJ

Besides the interaction of *-um/-oo* with *wh*-words, the conjunctive *-um* also figures in the formation of many non-*wh* quantifiers, cf.

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[2] In Jayaseelan (2001), I argued that a *wh*-word in Malayalam is illicit unless it is licensed by *-um/-oo*.
[3] In earlier papers (Jayaseelan 2001, 2011), I translated the *wh*-um forms as 'anybody', 'anything' etc., prompted by the fact that these forms are NPIs which also have a free choice use in modal contexts. But this translation is perhaps misleading because 'any' is now considered an existential quantifier.

(4)     ellaa N-**um**             mik'k'a N-**um**             pala N-**um**

        all N                     most N                      many N

The presence of -*um* in these forms is obligatory, cf.

(5)     ellaa  kuTTi-kaL*(-**um**)   too<u>tt</u>u

        all    child-PL-*um*        fail.PAST

        'All (the) children failed.'

The conjunctive -*um* also forms minimizer NPIs:[4]

(6)     oru  kuTTi-(y)**um**   wann-illa

        one child-*um*        come.PAST-NEG

        'Not a single child came.'

It has also been noted that -*um* has an additive meaning:

(7)     John wannu.         Mary-(y)**um**  wannu.

        John come.PAST   Mary-*um*       come.PAST

        'John came. Mary also came.'

In all these matters, -*um*/-*oo* closely track the behaviour of Japanese *mo*/*ka*.

    As I see it, we are confronted with two problems:

A. <u>The parametric difference problem</u>

    Why is coordination so different in English-type languages and Japanese/ Malayalam-

    type languages? What does the parametric difference consist in?

B. <u>The unified explanation problem</u>

    How do we give a unified account of the different uses of -*um*/-*oo* (and *mo*/*ka*)?

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[4] The minimizer NPI reading requires stress on the number word; see discussion of exx. (10)-(12) later.

The second problem has been the focus of researchers and there is a lively and growing literature on it; but as far as I know, the first problem has been neglected.

## 2. The parametric difference problem

Let us begin by asking the question: what does coordination minimally do? In any instance of coordination, the most obvious function of the coordinator is concatenation (linear sequencing): '(and) A, and B, and C, …'. Haspelmath (1997:10) observes that in many languages the conjunction construction is diachronically related to the comitative construction, 'A with B'; we can take this provenance of conjunction as corresponding to the concatenation meaning of coordination.

Another point to note is that a certain degree of FOCUS appears to characterize coordinands. Thus Haspelmath (ibid.) notes that a second diachronic source of the conjunction construction is an additive focus particle, 'A, also B'; and in Jayaseelan (2001) I gave some evidence to argue that in instances of disjunction, every disjunct bears some focus.

But the focusing of elements only indicates the presence of an operator that must apply to those elements. What does the operator – in this context – do? Following earlier research, let us say that it is a choice function that applies to a set and returns (as value) a member of the set (Hagstrom 1998, Cable 2007, Slade 2011). Informally we can think of it as doing the serial substitution of the coordinands for a variable in an open sentence.[5] Thus it applies to (8a) and outputs (8b):[6]

(8)     a.     John, and Bill, and Peter came.

        b.     [John came]    [Bill came]    [Peter came]

Besides the choice function, there must also be an operator that does concatenation, which is the task of coordination that we mentioned first. The two operators must be generated in a position where they have all the coordinands in their c-command domain; this can be either the left periphery of vP (cf. Beghelli & Stowell 1997), or of CP.

So then, coordination is made up of two operations with two corresponding operators: one, a concatenation operation that puts together elements to form a sequenced set; and two, a

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[5] Cf. Rooth (1985:16): "the meaning of the feature F[ocus] in LF is … that a semantic object with variables in the positions of focused phrases is available."

[6] If we can think of the coordinands as being in a multi-tiered structure prior to sequencing – cf. Slade (2011:188-189) for a similar idea – , there will be only one variable, and not three, in the open sentence corresponding to (8a).

serial substitution (choice function) operation that serially substitutes the members of the set for a variable in an open sentence to output a set of propositions. Now we are in a position to tackle the parametric difference problem in terms of two proposals. Our first (ancillary) proposal is the following:

- The coordination markers on the coordinands are copies of the operators.

We shall justify this claim more fully in § 3.[7] Now our crucial proposal regarding the parametric difference among the coordination markers of languages is the following:

- Languages lexically realize either one of the operators but not both.

If the coordination markers are copies of the operators (as we claimed), and if there are two operators, we should expect two coordination markers per coordinand; but we see only one. This is because the other coordination marker is 'silent', being the copy of the operator that has no lexical realization in the language. English *and/or*, I suggest, are copies of the concatenation operator; the same appears to be true of Hindi *aur/yaa*. By contrast, Japanese/Malayalam coordination markers are copies of the substitution operator (choice function), and the concatenation operator has no lexical realization. The structures that we assume for English and Malayalam coordination are the following:
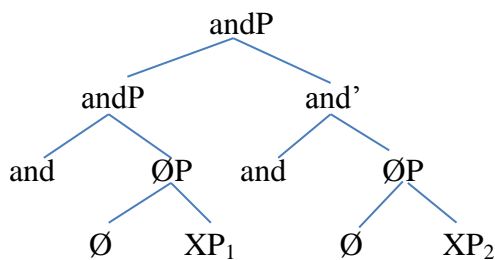
(9)   a.   <u>English</u>                                    b.   <u>Malayalam</u>



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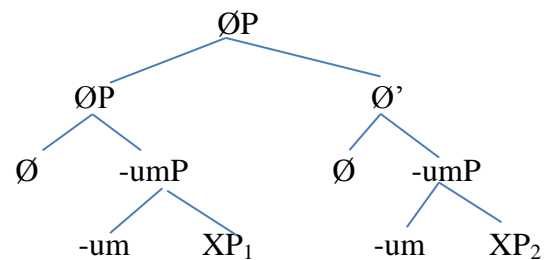
[7] Also see Jayaseelan (2012, fn. 7) as regards the syntax of generating the operator-copy relation. It is proposed there that this can be conceived of as follows: When the operator is a member of the Numeration, a copy of it is merged with each of the coordinands (in a head-complement configuration) as these are being assembled. (The copies on the coordinands could be the result of a single act of across-the-board merge, if we adopt a multi-tiered structure for coordinated phrases prior to sequencing.) Subsequently, a copy will be merged in the operator position also. In this way we can avoid 'downward' copying. (The sequenced phrases will be integrated into the syntax in accordance with the principles of X-bar theory.)

In English the copy of the choice function operator is null, because this is a 'silent' operator in the language; but the copy of the concatenation operator is expressed. In Malayalam (conversely) the copy of the choice function operator is expressed, but the copy of the concatenation operator is null, because this is a 'silent' operator in the language.[8]

Note that we are treating English coordination, like that of Malayalam, as polysyndetic. Thus we propose to generate a three-coordinand sequence like 'John, Bill, and Peter' as '*and* John, *and* Bill, *and* Peter'. Since the coordination marker is not the concatenator in our system – that function is performed by an operator – , we do not give this phrase the structure '[[ John *and* Bill ] *and* Peter ]' or '[ John *and* [ Bill *and* Peter ]]', where *and* concatenates elements pair-wise in imitation of the conjunctive Boolean operator. Treating *and* (or the corresponding forms in other languages) as the Boolean operator creates problems for describing polysyndetic coordination, cf. Kayne (1994:58), Bhat (2014: § 6.1).[9]

Both the operators of coordination need to apply to a set of greater cardinality than one; but there is a difference between them. The concatenation operator, being a sequencer, needs two or more *overt* elements to sequence. On the other hand, the choice function operator can apply to what is overtly a single element if it signifies a nontrivial set.[10] Thus it can apply to a *wh*-word, which signifies a variable, because it can be interpreted as the universal set; cf. *aar-um* (lit. who-*um*) 'everybody' in (3a). This gives rise to the seeming "double life" of the coordination markers of Japanese/Malayalam-type languages: when they are plain coordination markers, like in the sentences of (1), they are copies of the choice function operator; when they take part in the formation of quantifiers like in the sentences of (2) or the forms illustrated in (3), they are the choice function operator itself.[11]

Does the silent choice function operator of English also take part in the formation of quantifiers? I suggest that it does. Consider the well-known fact that the English quantifier determiner *all* is distributive (Kroch 1974, Dowty 1987, Champollion 2010). The distributivity of this form is now attributed to its lexical meaning. But it is reasonable to

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[8] A caveat: Japanese has in fact two conjunction markers, *mo* and *to*. *To* is homophonous with a particle that means 'with' (Kuno 1973, Kasai & Takahashi 2001), which we can take to indicate that it is a copy of the concatenation operator; and as this predicts, it never functions in the formation of quantifiers. Japanese (then) is a small exception to our claim that languages do not lexically realize both the operators of coordination. But it remains a fact that *mo* and *to* never surface together on a coordinand.

[9] The Boolean operators $\wedge$ and $\vee$ concatenate elements pair-wise; and most work on coordination stays within this tradition, see (e.g.) Winter's (1995, 1998) 'bullet' operator (for conjunction) that takes A and B and forms a pair 'A • B'. But in the way we implement concatenation in this paper, a pair is no more basic to concatenation than (say) a triple or quadruple.

[10] Reinhart's (1997) choice function can apply to a singleton set; but we may need to stipulate otherwise for the choice function operator that figures in coordination in natural language.

[11] Why are there two choice function operators, -*um* and -*oo* in Malayalam and *mo* and *ka* in Japanese? Again, why are there two concatenation operators, *and* and *or*, in English? We answer this question in § 5.

suggest that, just as Malayalam *ellaa* obligatorily requires *-um* after it, cf. (4)-(5), English *all* is subcategorized for the silent choice function operator of the language. I.e., the suggestion is that (e.g.) 'all the boys' is underlyingly 'all-the-boys-Ø' (where 'Ø' is the choice function operator).

We need not expect complete parallelism between languages as regards the uses to which the choice function operator is put. Dutch is a case in point: as noted in Jayaseelan (2012), the Dutch form *of* is both disjunction marker and question particle. (In fact this was true of English 'or' in an earlier stage of the language.) This argues, according to the proposals of this paper, that it is the spell out of the choice function operator. But on the other hand, this form never takes part in the formation of quantifiers (Sjef Barbiers, p.c.). It remains to be understood why this is so.

In concluding this section, we note that the order of merge of the copies of the operators shown in (9) is arbitrary: I cannot think of any evidence that would decide their order, given that they are never lexically realized simultaneously. But we now note a completely different point here as regards the 'height' at which the copies of the operators are merged vis-à-vis the coordinands: If we can maintain that the copies of the operators are merged in the left periphery of the coordinands – specifically, in an operator position in the extended projection of the coordinands – this has an important consequence in the syntax of Dravidian. The clausal left periphery of Dravidian – the 'C domain' – has fewer positions than in European languages: besides ForceP, it allows only one position. In cases of clausal coordination, if the coordination marker occupies this position, it disallows MoodP – which is the realization of finiteness in Dravidian – and also the relativizer. Wherefore, finite clauses and relative clauses cannot be coordinated; see Jayaseelan (2014) for a discussion of these constraints in Dravidian.

## 3. The relation of the coordination markers to the operators

We need to add another piece to complete our solution of the puzzle. We claimed that the coordination markers on the coordinands are copies of the operators of coordination. But we need a further claim:

- A coordination operator is 'silent' (not phonologically realized) when its copies are present on the coordinands.

This would account for why, in the sentences of (1), the coordination operator that interprets the coordinands – which we are claiming is present in Spec,vP or Spec,CP – is 'hidden.' (See Winter (1995, 1998), Szabolcsi (2013) for the 'silent operator in coordination' idea.)

Importantly, the coordination markers on the coordinands are *not* operators. They are semantically inert.[12] Their only function is to 'flag' a constituent for the attention of the operator (which is also the function of focal stress). Saying this solves many problems. Firstly it solves a seeming paradox: the coordination operators require a set of greater cardinality than one to apply to; but each coordination marker has just one element in its domain. A related problem is what Szabolcsi (2013) calls the 'too many actors' problem (which was first noted in Slade 2011): every coordinand appears to have an operator on it, when just one operator would do for the whole sentence.

It is important to sort out the copies from the operators. Failure to do this (I suggest) has resulted in seriously complicating the semantics of coordination. Let me illustrate with the 'also' meaning attributed to the coordinator, cf. (7) (repeated below):

(7)  John wannu.         Mary-(y)um  wannu.
     John come.PAST   Mary-*um*       come.PAST
     'John came. Mary also came.'

Our analysis is that the *-um* here is a copy and not the operator. But the copy naturally indicates the covert presence of the operator, which has the semantic requirement of at least two elements to apply to. This gives rise to the *presupposition* (in this context) that there is another individual (or individuals) in the denotation of the predicate 'came,' a fact which is indicated by the English translation 'also.' But *-um* in itself does not mean 'also.'

The advantage of this analysis becomes clear when we look at some proposals about Japanese coordination. Kobuchi-Philip (2009) takes the supposed 'also' meaning of Japanese *mo* to be its basic meaning, and then has a problem in extending this meaning to the occurrence of *mo* in universal quantifiers, e.g. *dono hito mo* (lit. which person *mo*) 'everybody'; she calls it "the conflict between additivity and universality." She also has a problem in accounting for *mo* in straightforward coordination like in *John mo Mary mo hashitta* 'John and Mary ran.' She suggests that the presupposition of *John mo*, namely that someone else ran, is satisfied by Mary; and the presupposition of *Mary mo*, namely that someone else ran, is satisfied by John. But this is problematic if the presupposition of 'also' must be satisfied by something in the *preceding* discourse; while *Mary mo* would be fine, *John mo* cannot satisfy its requirement with Mary. Szabolcsi (2013), adopting Kobuchi-

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[12] The idea of the 'inertness' of the coordination markers is possibly endorsed by Szabolcsi (2014), cf. her statement (p. 6): "MO and KA 'point to' meets and joins, but are not meet and join operators".

Philip's view of the basic meaning of *mo*, proposes a solution for the last mentioned problem: she postulates a new notion of 'postsupposition', which is essentially a presupposition whose satisfaction can be delayed "till the output context is consulted." I wish to submit that all these problems can be obviated if we treat the occurrence of *mo* in *John mo hashitta* 'John also ran' exactly like its multiple occurrences in *John mo Mary mo hashitta* 'John and Mary ran': in both cases, *mo* is a copy and not the operator.[13]

But as we said, it is the operator itself and not a copy that we see in the quantifier forms illustrated in (2) and (3).[14] When *-um* or *-oo* applies to a *wh*-word, the operator apparently first interprets the variable of the *wh*-word as an infinite set in order to satisfy its need for a plurality of elements to apply to; then the choice function applies. In a form like *ellaa kuTTi-kaL-um* (all child-PL-*um*) 'all the children', cf. (4), only the choice function applies.[15]

## 4. The distributivity of *-um*

The 'serial substitution' operation – the choice function – in the interpretation of forms containing *-um* predicts that these forms are strictly distributive; and this prediction is correct. Cf. (10) and (11):

(10)　a.　　ellaa kuTTikaL-**um**　pattaayam　pokki　　(only distributive)

　　　　　　all　children-*um*　　rice bin　　lift.PAST

　　　　　　'All the children lifted the rice bin.'

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[13] Another meaning attributed to *mo* (besides 'also') is 'even' or 'as many as', cf. (i) (Kobuchi-Philip 2008):
　　(i)　　　[ *20-nin-mo*-no gakusei ]-ga hashit-ta.
　　　　　　　20 CL MO GEN student NOM ran PAST
　　　　　　'As many as 20 students ran.'
In Malayalam, the 'even/as many as' meaning requires another morpheme *pool*-:
　　(ii)　　irupatu kuTTikaL pool-um ooDi/ ooDi-(y)illa
　　　　　　twenty children　*pool-um*　ran　　ran-NEG
　　　　　　'As many as twenty children ran./ Even twenty children did not run.'
Can we speculate that there is a silent morpheme in Japanese – corresponding to the *pool-* of Malayalam – that contributes the 'even/as many as' meaning?
[14] Richard Kayne (p.c.) asks why the *-um/-oo* of the quantifier forms also cannot be treated as copies. This would (I guess) enable us to uniformly generate the operators in Spec,CP or Spec,vP and never lower down. I cannot readily see what would be the other advantages, and the possible disadvantages, of this proposal and wish to leave the question open. But note that our distinction between copy and operator – which is crucial for our main analysis – is unaffected by this contemplated change.
[15] Kobuchi-Philip (2008) draws a distinction between 'presuppositional' *mo* and 'quantificational' *mo* and says that only the latter is "semantically substantial." But this is not quite like our distinction between copy and operator; also, she includes 'additive' *mo* in the class of quantificational *mo* and in fact takes this meaning to be the primary meaning of *mo* (as we said).

b.      muunnə kuTTikaL**-um**    pattaayam pokki    (only distributive[16])

        three      children-*um*     rice bin     lift.PAST

        'All the three children lifted the rice bin.'

(11)    a.     cila    kuTTikaL   pattaayam  pokki           (distributive or collective)

        some children     rice bin      lift.PAST

        'Some children lifted the rice bin.'

    b.     muunnə kuTTikaL    pattaayam pokki          (distributive or collective)

        three     children     rice bin     lift.PAST

        'Three children lifted the rice bin.'

As indicated, (10a,b) can only have the reading that the children individually lifted the rice bin (an extremely heavy object). But (11a,b) can have the reading that the children jointly lifted the rice bin, although it also allows the reading that each of them individually lifted it.[17]

       We note that the operator *-um* induces stress (i. e. focus) on the cardinality-indicating word in the *-um* phrase: using capitalization to show stress, the *-um* phrases in (10a,b) are pronounced as *ELLAA kuTTikaL-um* and *MUUNNə kuTTikaL-um*. Interestingly, if the stress is not on the cardinality word but on the head noun *kuTTikaL* in the last-mentioned phrase in (10b), the *-um* is interpreted as the copy *-um* that induces the (presuppositional) 'also' meaning; it can occur in a context like (12):

(12)     (striikaL pattaayam pokki.)   muunnə KUTTIKAL-um    pattaayam pokki

        women rice bin lift.PAST three      children-*um*        rice bin lift.PAST

        '(The women lifted the rice bin.) Three children also lifted the rice bin.'

Here (of course) *muunnə KUTTIKAL-um* – just like the 'bare' *muunnə kuTTikaL* of (11b) which does not have any *-um* – allows the collective reading.

       We also note that the distributive reading induces a definiteness meaning on the distributed-over phrase. Thus *MUUNNə kuTTikaL-um* in (10b) is interpreted as 'all (or each

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[16] But see below: the obligatorily distributive reading depends on stress on the number word.

[17] If we test *-um* phrases, and corresponding phrases without *-um*, in the context of well-known anti-distributive (obligatorily collective) predicates, we get the expected results:

     (i)      pattu simhangaL aana-ye      waLaññu

        ten   lions      elephant-ACC  surround.PAST

        'Ten lions surrounded the elephant.'

     (ii)    # pattu simhangaL-um aana-ye      waLaññu

        ten   lions-*um*      elephant-ACC  surround.PAST

        # 'All the ten lions surrounded the elephant.'`

of) the three children', while *muunnə kuTTikaL* in (11b) and *muunnə KUTTIKAL-um* in (12) do not have an obligatory definiteness meaning. (The definiteness meaning appears to be a requirement of the distributive operation, see Balusu & Jayaseelan (2013).)[18]

But Malayalam does allow a collective reading in a sentence containing plain coordination like (13):[19]

(13)   John-um  Bill-um pattaayam  pokki                          (distributive or collective)
       John-*um* Bill-*um* rice bin  lift.PAST
       'John and Bill lifted the rice bin.'

The collective reading may need a 'type shifting' operation like that proposed in Winter (2001:§ 2.3).

## 5.  What distinguishes conjunction and disjunction?

We proposed two operations as taking place in coordination, namely concatenation of phrases and serial substitution of the concatenated phrases in the position of a variable (by a choice function). But these operations ought to be the same in conjunction and disjunction. So what distinguishes them? Or to put it differently: why does English have two concatenation markers, *and* and *or*? And why are there two choice function markers, *-um* and *-oo* in Malayalam and *mo* and *ka* in Japanese?[20]

But of course our analysis needs to take on board the fact that conjunction and disjunction have different truth conditions. What signals that meaning? Are there 'silent' elements that signify just the two truth conditions, and do they perhaps syncretize with the choice function operator, giving rise to the two forms *-um* and *-oo* in Malayalam and *mo* and *ka* in Japanese? In an English-type language where the choice function operator has a null realization, these silent elements will have to be syncretic with the concatenation operator,

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[18] The choice function operator (then) – at least as it figures in the syntax of coordination – has the following requirements on the set it applies to: either (i) the members of the set should be explicitly mentioned, like in 'John, Bill, and Peter;' or (ii) the set should be definite and its cardinality indicated. In the second case, there is heavy stress on the cardinality word. (The choice function of Reinhart 1997 that applies to indefinite noun phrases obviously does not have these requirements.)

[19] I note that many native speakers disagree; for them, a collective reading is possible only if we add a word meaning 'together':
(i)       John-um Bill-um orumiccə pattaayam pokki                          (collective)
          John-*um* Bill-*um* together rice bin      lift.PAST
          'John and Bill together lifted the rice bin.'
But this of course is a forced collective reading, as in 'All the boys together carried the piano upstairs.'

[20] Thanks to Anna Szabolcsi (p.c.) for asking this very pertinent question!

giving rise to the two forms *and* and *or* – because after all the truth conditions will have to be overtly signalled.

Regarding the truth conditions of conjunction and disjunction, let us note a position – argued for by Zimmermann (2000), Geurts (2004) – that the function of disjunction is only to make a set of alternatives available; the implication that one of the alternatives is true is brought about by other factors.[21] On the other hand, conjunction seems to assert that each of the conjuncts is true. Therefore it might be the case that just conjunction has an assertion operator, which syncretizes with the choice function operator in Malayalam/Japanese-type languages. This gives rise to the 'special' form *-um* in Malayalam – which is therefore distinguished from the *-oo* of disjunction; and in Japanese this gives rise to the form *mo*, which is distinguished from *ka*. In English, the assertion operator should syncretize with the concatenation operator, giving rise to the form *and*, which is distinguished from *or*.

## 6. Conclusion

In this paper I have offered a solution to the parametric problem mentioned in the beginning of this paper. I suggested that coordination is actually composed of two operators, namely a concatenation operator that puts together elements in a sequenced set, and a choice function operator that applies to this set to output a set of elementary propositions that can be evaluated for meaning. I also suggested that the coordination markers on the coordinands are copies of the operators. English-type languages lexically realize one operator, namely the concatenation operator; and Japanese/Malayalam-type languages realize the other operator, namely the choice function operator. Now the choice function operator can apply to any set-denoting expression, e.g. a *wh*-word, and interpret it as a quantifier. This gives rise to the seeming "double life" of the coordination markers of these languages: when these forms are seen on coordinands, they are actually copies of the operator; but when they are functioning inside a quantifier, what we are seeing is the operator itself.

I also suggested an analysis which hopefully will help sort out many of the problems in giving a unified meaning to the different occurrences of the coordination particles of Japanese/Malayalam-type languages.

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[21] This means that there might be no existential closure accompanying the choice function.

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