Coordination of Word Parts is Interpreted at Surface Level*

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1. Coordination of Parts of Words

In this paper I argue that coordination of parts of words, as in (1) below, has to be interpreted at the level of the visible string; as a consequence, the semantics must assign separate meanings to the word parts *ortho*, *perio*, and *dontists* (an orthodontist is a specialist in straightening teeth; a periodontist specializes in gum disease).

(1) ortho and periodontists

The evidence comes from the interpretation of plural morphology. Specifically, the NP *ortho and periodontists* is not synonymous with *orthodontists and periodontists*. Suppose that Bill is an orthodontist and Martha is a periodontist; then sentence (2) below has a reading on which it is true, whereas sentence (3) does not have a true reading.

(2) Bill and Martha are ortho and periodontists.

(3) #Bill and Martha are orthodontists and periodontists.

The relevant structure for the interpretation of *ortho and periodontists* must therefore be different from that of *orthodontists and periodontists*. Notice that the contrast between (2) and (3) is similar to the contrast between (4) and (5) below: only the former receives a coherent reading.

(4) Konishki and Takanohana are heavy and light sumo wrestlers.

(5) #Konishki and Takanohana are heavy sumo wrestlers and light sumo wrestlers.

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The contrast above is the result of a difference in syntactic representation: in sentence (4) the coordinate adjective *heavy and light* modifies the head noun, and the resulting NP is the predicate; sentence (5) has as its predicate a coordinate noun phrase, whose meaning cannot apply to the subject.

Drawing on this parallel, we conclude that in (1) the conjunction *and* operates on the word parts *ortho* and *perio*. The structure relevant to interpretation must therefore be (6), with coordination at the surface level, rather than a structure like (7), where the visible string is the result of deletion at PF (Booij 1985).

(6) [ortho and perio]dontists

(7) [ortho~~dontists~~] and [periodontists]

The challenge, then, is to provide a semantics for word parts that will allow us to interpret structures like (6) with the correct truth conditions. I propose that such a semantics can be formulated through the use of decomposition (Artstein 1999), where the meanings of *ortho* and *dontist* are derived from the meaning of *orthodontist* (this is unrelated to the term "lexical decomposition" as used, for example, in Dowty 1979). In a construction like (6), the conjuncts denote strings of sounds, and the remnant is a function from sounds to word meanings (I use the term *remnant* to mean the part which lies outside the coordinate structure, as in Okada 1999; the same term in Booij 1985 means something else). The ordinary interpretation of conjunction allows the combination of these denotations and results in the correct meanings for the full NPs.

The semantics will be developed in section 3. Before that, in section 2, I will make a much more detailed argument in favor of adopting a surface coordination account rather than a deletion account. Finally, section 4 looks at the phonological constraints on the coordination of word parts; these are important because in numerous cases (for example **straw and cranberries*) coordination is ruled out by the phonology even though the semantics yields a coherent meaning.

2. Against a Deletion Account

The interpretation of number, in particular contrasts such as the one between (2) and (3), suggests that structures like (1) should be interpreted at the level of the visible string. Booij (1985) gives a different account for similar facts in Dutch and German: he proposes that structures that appear as coordination of word parts are the result of a language-particular rule of phonological deletion, which does not affect interpretation. In this section I review his arguments and show why an account of surface coordination is better motivated (the non-English examples below are all in Dutch).

Booij's first arguments come from the observation of the following construction.

(8) het verschil tussen een derde- en een zesdeklasser
the difference between a third and a sixth-former

One problem with a surface interpretation of the above sentence is syntactic: the sentence contains an apparent instance of coordination of non-constituents, *een derde* and *een zesde*. But while many syntactic theories do not recognize these strings as constituents, there are others that

do, for example combinatory categorial grammar with functional composition (Ades and Steedman 1982; Steedman 1985, 1987). And however we allow the syntax to generate sentences like (8), the semantics is capable of interpreting such structures at surface level by means of functional composition or, equivalently, lambda abstraction. Besides, the syntactic problem with (8) is not particular to the coordination of parts of words: suppose we agreed that the NP *a yellow and a red cabinet* involved deletion; would this entail that also the NP *yellow and red cabinets* involves deletion? At best, sentence (8) provides an argument for deletion in this particular construction; no conclusions can be made about coordination of parts of words in general.

A second argument for deletion in (8) has to do with the semantics of number. Booij notes that the preposition *tussen* 'between' requires a plural complement, whereas on a surface interpretation its complement would be interpreted as singular because of the singular head *klasser*. This point is valid; however, I suggest that the reason (8) appears to have a plural interpretation for an NP headed by a singular noun has to do with the fact that 'third former' and 'sixth former' are kind terms. Similar things happen in the purely phrasal domain: sentence (9) is much more readily understood as choosing between kinds of cabinets rather than actual ones; sentence (10), where a kind interpretation is unlikely, is severely degraded.

(9) I must choose between a yellow and a red cabinet.

(10) *I am standing between a yellow and a red cabinet.

I do not have an explanation for why kind terms should behave differently than referring nominals, and allow an NP headed by a singular noun to receive a plural interpretation. Note that if we accept a deletion analysis for sentences like (9) and (10) we will have the opposite problem, of explaining why a referential interpretation is not available. The problem raised by (8) has to do with the interpretation of number on kind terms in general; since number is generally understood better for referential NPs, I think the facts actually support the surface coordination hypothesis, rather than deletion.

Yet another argument in favor of the deletion hypothesis comes from the compositionality of meaning. Booij shows that coordination of parts of words is possible when the relation between the lexical meanings of the morphemes is fairly opaque.

(11) schei- en natuurkunde 'chemistry and physics'
(literally: 'analysis and nature knowledge').

(12) wis- en sterrenkunde 'mathematics and astronomy'
(literally: 'sure and stars knowledge').

A related argument comes from cases where the coordinated parts form lexical items of different categories.

(13) leer- en handboeken 'textbooks and handbooks'
(literally: 'learn and hand books').

Booij argues that the deletion hypothesis predicts the correct meaning for the above constructions, whereas interpretation of the visible structure would result in an incomprehensible

meaning for (11) and (12), and a syntactic violation in (13)—the coordination of a verb and a noun. The argument thus rests on some implicit assumptions of limits on the power and flexibility of the semantics and the syntax.

An alternative view is offered by Moortgat (1987): the conjunct stems are converted into modifier bound morphemes through a category-changing rule; this takes care of the syntactic objection. Moortgat offers a semantics to go with his rule, but it only works for fairly transparent cases. The semantics I propose in this paper yields the correct interpretation even for the most opaque cases, because it treats the conjuncts as parts of words and derives their meanings through decomposition of the words they are parts of.

Booij's final argument for deletion is strictly morphological. Certain Dutch compounds have "linking phonemes": when *wesp* 'wasp' forms a compound with *steek* 'sting', an additional schwa appears between the two morphemes: wesp**e**steek; similarly, zon**s**verduistering 'sun-eclipse' contains a linking [s]. When such morphemes are coordinated, the linking phonemes are retained.

(14) wesp**e**- en bij**e**steken 'wasp and bee stings'

(15) zon**s**- en maan**s**verduisteringen 'solar and lunar eclipses'

The linking phonemes form a unit with the preceding morpheme; Moortgat (1987) incorporates this as part of his morphological operation, which serves to identify the conjuncts as bound forms. Booij argues that it is impossible to have a morphological rule that inserts the linking phoneme in (14) and (15), since coordinated minimal projections (words) are inaccessible to such rules. For example, the cardinal number *drie-en-zestig* 'sixty three' is a coordinate structure; from it we derive the ordinal *drie-en-zestigste* 'sixty third', where the first conjunct retains its cardinal form, rather than **derde-en-zestigste* (cf., *derde* 'third').

This argument shows that the coordinate structures in (14) and (15) cannot be derived from the bare noun coordinations *wesp en bij* and *zon en maan* through a morphological operation like the one that derives the ordinal *drie-en-zestigste* from *drie-en-zestig*. Prosodic facts support this claim: Booij notes that in coordinate structures like (14) and (15), each of the conjuncts receives a pitch accent; this is not the case with *drie-en-zestigste*. Booij also gives examples of compounds like *kat-en-muis-spelletje* 'cat-and-mouse-game', which he claims is an instance of surface coordination; while he does not give prosodic information about this kind of compound, the hyphens in the orthography suggest that the entire compound forms a single pitch domain. I thus agree with Booij, that the morphological and prosodic data show that (14) and (15) are not formed by morphological compounding to a bare coordinate structure.

However, to turn this observation into an argument against surface coordination in general, we must assume that compounding to a bare coordinate structure is the only way to get the surface strings in (14) and (15). An alternative assumption is that the constituents *wesp**e**- en bij**e**-* and *zon**s**- en maan**s**-* are generated as coordinations of bound morphemes; this is expected, since only the bound forms can be interpreted as parts of words, and thus have the right meaning to combine with the meaning of the head.

So far I have shown that the arguments in favor of the deletion hypothesis are not convincing; in turn, I provided one argument—the interpretation of number marking—that supports the surface

coordination hypothesis. But there is a much more fundamental reason for favoring a surface coordination analysis over one of deletion.

Booij's rule of deletion includes two components: on the one hand there are prosodic requirements on the surface conjuncts as well as on the deleted element, and on the other hand the deleted element must be adjacent to a conjunction. Booij notes that prosodic restrictions alone are not sufficient, since they do not predict the following contrast.

(16) de land- en de tuinbouw 'the agriculture and the horticulture'

(17) *de land- met de tuinbouw *'the agriculture with the horticulture'

Booij sees this as evidence for the existence of rules that refer to both syntactic structure and prosodic structure, and thus go against a model like that of Selkirk (1980), which strictly separates the syntactic and prosodic domains. However, a question which is not addressed is why this particular deletion rule should exist and not, say, a rule that allowed phonological deletion, under identity, subject to adjacency to a preposition. Indeed, if the deletion rule has nothing to do with the meaning of conjunction, then we should expect that a language should be possible where constructions like (16) are bad, but constructions like (17) are grammatical! I feel that such a language would be highly unlikely; the deletion analysis does not shed any light on this matter.

The contrast between (16) and (17) follows naturally however from the surface coordination analysis. Coordination operates on a multitude of syntactic categories, and has a semantic interpretation suitable for many semantic types; on the other hand, prepositions like *with* are much more restricted in terms of the syntactic and semantic elements they can combine with. We know this from the phrasal level: it is possible to say *big and small monkeys*, but not **big with small monkeys* (note that the meaning 'big monkeys with small monkeys' is perfectly coherent). The reason is that *big* and *small* supply meanings that can combine with the meaning of *and*, but not with that of *with*. An analysis that explained the contrast by deriving *big and small monkeys* from *big monkeys and small monkeys* through deletion of *monkeys*, stipulating that such deletion is possible in adjacency to *and* but not *with*, would be missing the mark.

The meanings I develop in section 3 interpret coordinate parts of words as strings of sound. These are individual objects, and their conjunction is a plural object. However, there is no way to modify a string of sound using a preposition like *with*, so the contrast between (16) and (17) receives a straightforward explanation. We do not need a stipulative rule that links the phonological constraints on the coordination of word parts to a particular syntactic environment; rather, the availability of free standing word parts in coordinate structures but not in other environments follows from the semantics of coordination.

The semantics I propose eliminates the stipulative syntactic part of the deletion rule. What remains of it are the prosodic requirements on the coordination of parts of words. Here too I will show that this is no different than the phrasal level: the prosodic requirements boil down to general minimality constraints on the size of free standing syntactic elements. All words and phrases are big enough to stand in a coordinate structure, so they satisfy the constraints automatically; parts of words can only enter such a construction if they reach a minimal size. The phonological restrictions will be discussed in section 4.

3. A Decompositional Semantics for Coordination

The semantics I develop will need to interpret structures like (6), repeated below, and assign them a meaning different from (18).

(6) [ortho and perio]dontists

(18) orthodontists and periodontists

The difference between the two NPs is that (6) can denote a pair of people, one of whom is an orthodontist and the other a periodontist, while (18) cannot denote such a pair: it can either denote a pair of people who are each both an orthodontist and a periodontist, or a group of people of whom at least two are orthodontists and two periodontists. The source of the difference is the location of plural morphology—there's one plural morpheme on the entire NP in (6), whereas in (18) there's a plural morpheme on each conjunct. A semantics that explains this contrast thus has to include two distinct components: a theory of meanings for parts of words and an underlying theory of coordination and plurality. I start with an outline of the latter.

Coordination and plurality are treated much the same way as in Artstein (forthcoming). The following two assumptions are crucial in deriving the contrast between (6) and (18).

(19) Plural morphology is interpreted literally as semantic plurality: morphologically plural expressions only include pluralities in their extension.

(20) The conjunction *and* can receive a cumulative (plural-forming, "non-Boolean") interpretation.

The literal interpretation of the plural morphemes ensures that each conjunct in (18) will be instantiated by at least two individuals. I assume a structured domain of individuals, where plural objects are of the same type as singular individuals, namely type *e* (Leonard and Goodman 1940; Link 1983); the domain of individuals has the structure of a free *i*-join semilattice (in the terms of Landman 1991), which is isomorphic to a structure where plurals are freely formed sets of individuals. My claim is that expressions that bear plural morphology only include plural objects in their extensions. The word *orthodontists* is thus the closure under plural formation of singular *orthodontist*, minus the singular individuals (21). I use direct interpretation and set notation in my representation; in the metalanguage AT is a function which returns the set of atomic individuals that make up a plural object, and PL is the set of all plural objects (individuals that are not atomic).

(21) [[orthodontists]] = {α| α PL α′ AT(α) [α′ [[orthodontist]]]}

The claim that plural expressions only include plural objects in their denotation is not uncontroversial; due to the lack of space, I refer the reader to Artstein (forthcoming) for further discussion (a similar claim is made by Chierchia 1998).

As for the interpretation of coordination I will assume, following Link (1983), that when *and* coordinates individuals of type *e* it can denote the join operation on the domain of individuals. The NP *Bill and Martha* can thus denote a plural object, the join of Bill and Martha; I use the symbol in the metalanguage to stand for the join operator.

(22) [[Bill and Martha]] = [[Bill]] [[Martha]]

This plural-forming conjunction is argued to apply in the nominal domain, at least for referring nominals (Hoeksema 1988). We also need plural-forming conjunction for common nouns, which are of type *et*: an object α is in the denotation of a coordinate common noun if it is the join of two objects α_1 and α_2, where α_1 is a member of the first conjunct and α_2 is a member of the second (Link 1983, Krifka 1990, a set-theoretic analog is the set product operation of Heycock and Zamparelli 1999, 2000). The meaning of (18) will thus be as follows.

(23) [[orthodontists and periodontists]] =
$\{\alpha | \alpha = \alpha_1 \quad \alpha_2 \quad \alpha_1$ [[orthodontists]] α_2 [[periodontists]]$\}$

Given our previous assumption about the interpretation of plural morphology, we see that there must be at least two orthodontists and two periodontists in any group denoted by (23); it may be the same individuals who are practitioners of both kinds, or different individuals, in which case the size of the group must be larger than two.

We now turn to the coordinate NP *ortho and periodontists*. In order to interpret it we must assign an interpretation to the morphemes *ortho*, *perio* and *dontist*. I believe that the lexical or etymological meanings of these morphemes are largely irrelevant. Many speakers can identify the morpheme *ortho* in words like *orthodontist*, *orthopedics*, *orthography* and *orthodox*, without knowing the etymological meaning of the root and what it contributes to each of these words (this also applied to me, until I checked the root in a dictionary). What matters, then, is the ability to recognize *ortho* as part of a bigger word, whose meaning is known.

The meanings for the word parts will be derived from the meanings we already have for *orthodontist* and *periodontist* through decomposition, in a manner similar to that proposed in Artstein (1999): the denotations of the morphemes will form a function-argument structure that, when put together, will retrieve the meanings of the original words. The singular common nouns *orthodontist* and *periodontist* denote properties of individuals (type *et*). I will assume that *ortho* and *perio* simply denote strings of sounds, which are individuals of type *e*.

(24) [ortho] D_e: the string *ortho*.

(25) [perio] D_e: the string *perio*.

That strings of sound are objects in our model, which are referred to by their own mention, is no great innovation. Roger Schwarzschild (personal communication) points out that there exist predicates that apply exclusively to such meanings, as in the sentences *ortho is disyllabic* and *perio ends in a tense vowel*. My claim is that this is the same denotation that we see in *ortho and periodontists*.

Given the denotations of *ortho* and *perio*, the semantics will have to give *dontist* a functional meaning of type *eet*: it will take as its first argument an object whose meaning is a string of sounds, and return the meaning of the word which is the concatenation of that string with the string *dontist*.

(26) [[dontist]] D_{eet}: the function h: $D_e \rightarrow D_{et}$ such that for all α D_e, h(α) = [[αdontist]] if αdontist is a word and [[αdontist]] D_{et}, undefined otherwise.

With the above definition, the composition of *dontist* with *ortho* and *perio* yields the expected results.

(27) [[dontist]]([[ortho]]) = [[orthodontist]]

(28) [[dontist]]([[perio]]) = [[periodontist]]

We need not worry about the fact that the function denoted by *dontist* is undefined for many objects in the model that it could take as an argument. In this respect *dontist* is like any other function: the expression *Bill-dontist* is incoherent, because it is impossible to concatenate a person with a sound in order to form a word. This is similar to what happens with the expression *kissed democracy*, which is incoherent because democracy isn't something that can be kissed, even though it is of the right semantic type for objects of *kiss*.

We now have the building blocks that derive the meaning of *ortho and periodontists*. Starting with the constituent *ortho and perio*, we notice that *and* operates here between two objects of type *e*, so the meaning of the coordinated constituent is a plural object of type *e* (just like *Bill and Martha*).

(29) [[ortho and perio]] = [[ortho]] [[perio]] D_e

Now *dontists* has to apply to this object—it is, after all, of the right type. The meaning of plural *dontists* will be built on the meaning of singular *dontist* by restricting its subject (the outer argument) to plurals, in a manner analogous to (21). Additionally, since *dontists* is transitive, its semantics will allow a cumulative relation between the two arguments, much like transitive verbs allow an inference from *Bill likes Martha* and *John likes Sue* to *Bill and John like Martha and Sue* (Scha 1981). We get the following meaning for plural *dontists*.

(30) [[dontists]] = { αβ | α PL α′ AT(α) β′ AT(β) [[[dontist]](α′,β′)]
β′ AT(β) α′ AT(α) [[[dontist]](α′,β′)]}

Applying the meaning of *dontists* in (30) to the meaning of *ortho and perio* in (29) will give us the meaning of the NP *ortho and periodontists*.

(31) [[dontists]]([[ortho]] [[perio]])
= {α| α PL α′ AT(α) β′ AT([[ortho]] [[perio]]) [[[dontist]](α′,β′)]
β′ AT([[ortho]] [[perio]]) α′ AT(α) [[[dontist]](α′,β′)]}
= {α| α PL α′ AT(α) [[[dontist]](α′,[[ortho]]) [[dontist]](α′,[[perio]])]
α_1 AT(α) [[[dontist]](α_1,[[ortho]])]
α_2 AT(α) [[[dontist]](α_2,[[perio]])]}
= {α| α PL α′ AT(α) [[[orthodontist]](α′) [[periodontist]](α′)]
α_1 AT(α) [[[orthodontist]](α_1)]
α_2 AT(α) [[[periodontist]](α_2)]}

We find that *ortho and periodontists* denotes the set of all plural objects that are composed of singular individuals where each such individual is either an orthodontist or a periodontist, and at least one such individual is an orthodontist, and one is a periodontist. In particular, one such plural object is the join of the orthodontist Bill and the periodontist Martha. So our semantics succeeds in interpreting the NP *ortho and periodontists* at surface level.

Decomposition, coupled with certain assumptions on plurality and conjunction, renders our semantics powerful enough to interpret the coordination of parts of words at the surface level. But if our semantics is so powerful, why are there so many examples where coordination of parts of words is impossible? We cannot say **straw and cranberries*, **geri and pediatrics*, and many more. Indeed, the theory of semantic decomposition predicts that these should be interpretable, and I believe that they are. There is nothing wrong with the semantics of such examples. However, they are ruled out by the phonology.

4. Phonological Constraints

Coordination of parts of words is subject to phonological constraints, which are independent of the semantics. Okada (1999: 350) discusses these constructions in detail, and gives minimal contrasts such as the following:

(32) a. *physio and psychologies
b. physio and psychological

The contrast between the above examples does not come from the semantics, since the intended meaning of (32a) is clear and the acceptability of (32b) shows that the semantics is capable of interpreting similar structures. Nor is the contrast a matter of morphological structure: *physio* and *psycho* are identifiable morphemes in both examples. The unacceptability of (32a) is due to a phonological property, namely prosodic (metrical) structure: the coordinated elements *physio* and *psycho* form prosodic units in (32b) but not in (32a).

(33) a. ***physio** and **psy**(**cho**lo)(gies)
b. (**physio**) and (**psycho**)(logi)cal

Okada explains the unacceptability of (32a) by noting that the final vowel of the conjunct *psycho* in *psychologies* is stressed, hence the following consonant is ambisyllabic: it forms the coda of a syllable (*chol*); the entire structure violates a requirement that the right edge of the conjunct should align with the right edge of a syllable. This requirement, while accounting for the data, remains otherwise unmotivated.

The analysis above makes no reference to prosodic structure above the level of a syllable. We may note, however, that effects attributed to ambisyllabicity have been argued to reflect foot structure, to the extent that it is no longer needed to assume ambisyllabicity at all: segments appear to be ambisyllabic in the middle of a metric foot (Kiparsky 1979, Harris and Kaye 1990, Harris 1999). We can thus state Okada's generalization in a more compact and insightful way: a single foot may not span segmental material from both the coordinate part and the remnant. An alternative way of looking at this is as a positive constraint on conjuncts and remnants—they should form complete prosodic units of a certain minimal size, for instance feet or prosodic words.

This is the line taken by Booij (1985) in his account of Dutch and German: he formulates a rule (stated as a deletion rule) which allows coordinate structures when the remnant (the element outside the conjunction) forms a prosodic word, and the conjuncts are prosodic constituents capable of receiving stress (this implies that each conjunct must be at least a foot). The following are some of Booij's examples from Dutch.

(34) Remnant is a prosodic word:
  a. zicht- en tast**baar** 'visible and tangible'
  b. ont- en ver**wikkelingen** 'developments and complications'
  c. **regel**ordening en -toepassing 'rule ordering and [rule] appreciation'

(35) Remnant is not a prosodic word:
  a. *blauw- en rod**ig** (blauwig en rodig = 'blueish and reddish')
  b. ***be**varen en -rijden (bevaren en berijden = 'sail and ride')
  c. ***ge**hijg en -puf (gehijg en gepuf = 'gasping and puffing')

Booij thus argues that words that allow coordination of parts must have an internal structure of a prosodic word within a word. The question remains, why should there be a minimal size requirement on coordination in the first place.

The size restrictions should follow from the general theory of mapping between syntactic and prosodic structure. Let us assume that free standing morphemes are generally mapped to prosodic words (Liberman and Prince 1977, Prince and Smolensky 1993, and references therein). We should expect, then, that the independent conjunct should form a prosodic word. The bound conjunct will also have to form a prosodic unit, either as a means of delimiting the coordinate structure, or through some requirement of parallelism; however, it does not have to be a prosodic word in its own right.

Through an independent test we can verify that in the coordinate structures in (1) and (32b), the free standing conjunct forms a prosodic word while the bound one does not. The "stem final tensing" rule of English (Chomsky and Halle 1968, Halle and Mohanan 1985) states that non-low vowels at the end of a word are tense, and thus do not reduce to schwa; this has been analyzed by Booij and Rubach (1987) as applying in the domain of a prosodic word. The free standing conjuncts in (1) and (32b) (*ortho-* and *physio-*) must be pronounced with a tense [o], so they must have acquired prosodic word status; on the other hand, the bound conjuncts (*perio-* and *psycho-*) may end with a schwa, so they are not prosodic words.

Unfortunately, I do not know of an independent test that can verify that the remnants in (1) and (32b) form prosodic words. We can, however, use the stem-final tensing test to explain the difference between the legitimate coordinate structure *microbiological and physical* and the ungrammatical **microscopic and graphic*: in the former but not the latter, *micro* ends in a tense [o], so it forms a prosodic word. I thus agree with Booij's empirical observation, that the remnant should form a prosodic word; the theoretical reason behind this is a matter for further investigation.

We see that the coordination of parts of words in English is subject to phonological constraints similar to the ones proposed by Booij (1985) for Dutch and German. While the underlying reason for these constraints still deserves further explanation, their existence explains

the ungrammaticality of coordinate structures like **straw and cranberries*: the semantics is capable of assigning this structure a coherent meaning, but the string is phonologically ill-formed. Coordination of word parts is thus not a language-particular construction. The reason it is more prevalent in Dutch and German than in English has to do with differences in the internal prosodic makeup of words, not with a specific phonological rule or with the grammar of coordination.

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