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Detecting Contiguity-prominence

Contiguity Theory Richards (2016) offers a theory of the syntax-phonology interface that incorporates the condition in (1):

(1) a. *Contiguity*:
Goals must be *contiguity prominent* within a ϕ dominating their Probe.

b. *Contiguity-prominent*:
A Goal is *Contiguity-prominent* within a ϕ, F, just if no complete ϕ linearly intervenes between the Goal and the prosodically active edge of F.

For a head-initial Probe, for instance, (1) determines whether the Goal must move overtly to the Probe:

(2) [ϕ *Probe* [ϕ] [ϕ] [*Goal*]]

In (2), Probe and Goal are separated by several linearly intervening maximal projections which project their own ϕ. If the ϕ dominating Probe and Goal has a prosodically active *right* edge, then the Goal can remain in situ, adjacent to the right edge of that ϕ. On the other hand, if this ϕ has a prosodically active *left* edge, then the Goal must move past the intervening ϕ to become adjacent to the prosodically active left edge of the containing ϕ.

Richards (2010, 2016) uses (1) to account for the distribution of overt wh-movement. Richards (2016) extends the account to other kinds of movement, including verb movement to T. Richards (2017a) demonstrates that the same account can deal with cross-linguistic differences in the conditions on pied-piping. Branan (2018) shows how to use Contiguity to predict whether a language allows raising across an intervening experiencer. Taken together, the accounts predict a clustering of syntactic properties: depending on the position of prosodic activity, a language either will or will not permit wh-in-situ, require verb raising to T, allow pied-piping by wh-expressions which are not initial in the moved phrase, and ban raising across experiencers. Richards (2016) accounts for a number of apparent counterexamples to the predicted clustering of these properties; Icelandic, for example, is prevented from allowing wh-in-situ just because it is a V2 language, and (for reasons he discusses), such languages never have wh-in-situ.

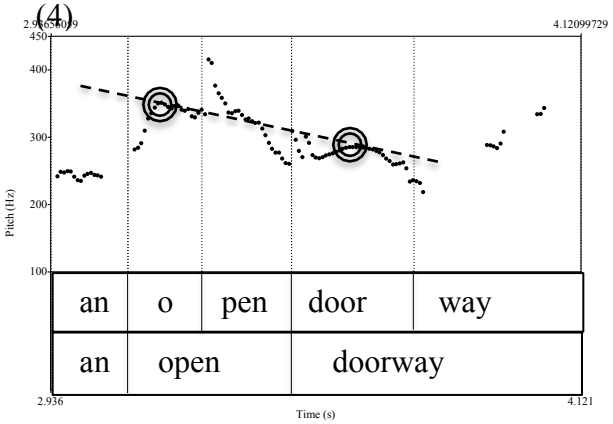
Detecting prosodic activity The important parameter distinguishing languages, on this account, is a prosodic one: some languages have prosodic activity on the left, and others on the right. Richards (2010, 2016) is quite vague about how prosodic activity is to be detected; he suggests that prosodic activity might consist of any prosodic behavior that makes reference to a syntactic edge, including boundary tones, conditions on tone spreading, and so forth. In this paper, I will improve on this definition.

Pitch boosting Speakers of English (4 speakers), Norwegian (3 speakers), Korean (1 speaker), Brazilian Portuguese (5 speakers), Italian (1 speaker), Bulgarian (7 speakers), Icelandic (2 speakers), and French (5 speakers) were given 10 sentences to read in which subjects and objects were both indefinite, branching noun phrases, in all-new contexts, separated from the edges of the utterance by overt material. (3) is an example from the English materials:

(3) At the zoo yesterday, a **clever penguin** discovered an **open doorway**
and escaped from her enclosure.

The languages chosen, for Richards (2016), differ in position of prosodic activity: English, Norwegian, and Korean have prosodic activity on the left, and Portuguese, Italian, Bulgarian, Icelandic, and French have prosodic activity on the right. As we will see, we find comparatively higher pitch peaks in the direction of prosodic activity. We can thus detect prosodic activity quite straightforwardly: ***a given language will tend to boost the pitch of stressed syllables either on the left or on the right edge of ϕ, and this edge is the "prosodically active edge".*** We will see that the consequences of this parameter are not completely symmetric, because of the well-known phenomenon of *declination*; there is a universal tendency for pitch to drift downward in the course of the utterance. In the Left-active languages, this general tendency will be exaggerated, with the first pitch peak in the branching noun phrase much higher than the second; in the Right-active languages, by contrast, the effects of declination will tend to be erased in the branching noun phrase, yielding pitch peaks of roughly equal sizes.

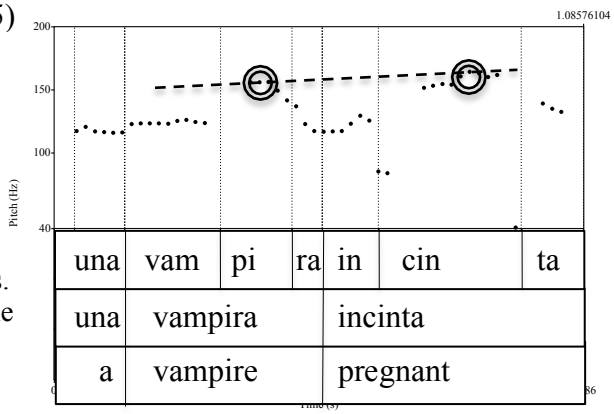
(4)



Left-active languages In English, Norwegian, and Korean, the highest pitch associated with the stressed syllable of the first content word in the DP (the adjective, in this case) tends to be higher than the highest pitch associated with the stressed syllable of the second content word (the noun). In the English pitch track in (4) , for example, the pitch peaks on the adjective and the noun are circled, and a dotted line emphasizes the degree of downstep between them. ***These left-active languages seem to have a pitch boost on the left side of ϕ***. Speakers of several different Norwegian dialects participated; all exhibited the behavior described. Other left-active languages discussed by Richards (2016) include Irish, Tagalog, and Japanese. Elfner (2012) argues that Irish branching DPs have a single pitch peak just after the stressed syllable of the ***first*** word; Richards (2017b) argues the same for Tagalog; on Japanese downstep, see Poser (1984), Kubozono (1989), among others.

Right-active languages These languages, by contrast, lack a pitch boost on the left side; the Italian example in (5), for instance, has pitch peaks on the adjective and the noun of roughly the same height. ***These right-active languages seem to have a pitch boost on the right side of ϕ***, which counteracts the effects of declination, yielding pitch peaks of around the same height.

(5)



Summary Praat was used to measure the highest points in stressed syllables in all recorded languages. The table in (6) shows the average ratios between the first and second pitch peaks in the branching NPs:

(6)

Norwegian	1.118713766
Korean	1.113702829
English	1.109119484
Portuguese	1.035982528
Italian	1.015359069
Bulgarian	1.01127682
Icelandic	0.989461589
French	0.932300284

As the table shows, the Left-active languages (Norwegian, Korean, and English) show an average ratio around 1.11, while the Right-active languages (Portuguese, Italian, Bulgarian, Icelandic, and French) have an average ratio around 1. A linear mixed effects model confirmed that the pitch ratios in Left-active languages were significantly different from those in Right-active languages ($p<.001$), and that none of the languages in these groups differed significantly from the other languages in their group with respect to pitch ratio. Subjects and objects were shown not to behave significantly differently in this respect, nor did the subject/object split interact significantly with the choice of language.

Conclusion

Richards (2010, 2016) proposed that a number of syntactic parameters could be done away with, replaced with a single phonological parameter (direction of *Prosodic Activity*) together with the universal condition on the interaction of syntax and phonology described in (1). Here we have seen evidence for a detectable phonological difference between languages, which divides them as Richards' theory predicts.

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