Contiguity and *wh*-intervention

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1   Introduction

- Much work suggests that *wh*-phrases can't scope below certain operators. Scrambling the *wh*-phrase across the intervener seems to generally fix the problem.

- Accounts of this effect differ in a number of ways—such as the exact characterization of what will 'count' as an intervener, or exactly what goes wrong in the interpretive component to cause the effect—but there are generally at least three components to these accounts that all hold in common.

    1. A structural configuration under which the effect arises.
    2. A (usually semantic) reason why this particular structural configuration should cause the effect.
    3. A ban on covert movement to repair the problem.

- Component 3, as far as I can tell, receives relatively little attention in the literature. This talk is going to try to spell out in detail what a theory of component 3 might look like.

☞ **In a nutshell: elements in syntactic Agree relationships have to attain a position of prosodic prominence. Particular configurations of multiple elements in this sort of relationship can keep this from happening.**

- This will end up forcing movement to be overt in *wh*-intervention configurations…

… but we'll also see cases where this phonological licensing requirement forces elements to move independently of where they take scope.

- A roadmap:

    – Spelling out a theory of prominence.
    – Ways of determining how a language will behave.
    – Back to intervention effects.

2   Contiguity

- A point of language variation: overt movement or not?

(1)   a.   **Who** did Minswu see?

    b.   *Minswu-nun*   **nwukwu**-*lul po-ass-ni?*   [Korean]
        Minswu-TOP who-ACC   see-PAST-Q

    c.   *Jean* **voit** *souvent Marie.*   [French]
        John sees often   Mary

    d.   Jean often **sees** Mary

- Richards (2016): there are universal prosodic conditions on (for example) questions, and differences between languages are just prosodic differences.

- One prosodic parameter: location of *prosodic activity* (or *Contiguity-prominence*)

- Two parts for this section:

    – developing two tests for prosodic activity
    – showing what prosodic activity can do for us (Richards (2016); Branan (2018), and subsequent work)

2.1 One test for prosodic activity: downstep

- Experiment: recording speakers saying 10 sentences with branching, indefinite subjects and objects:
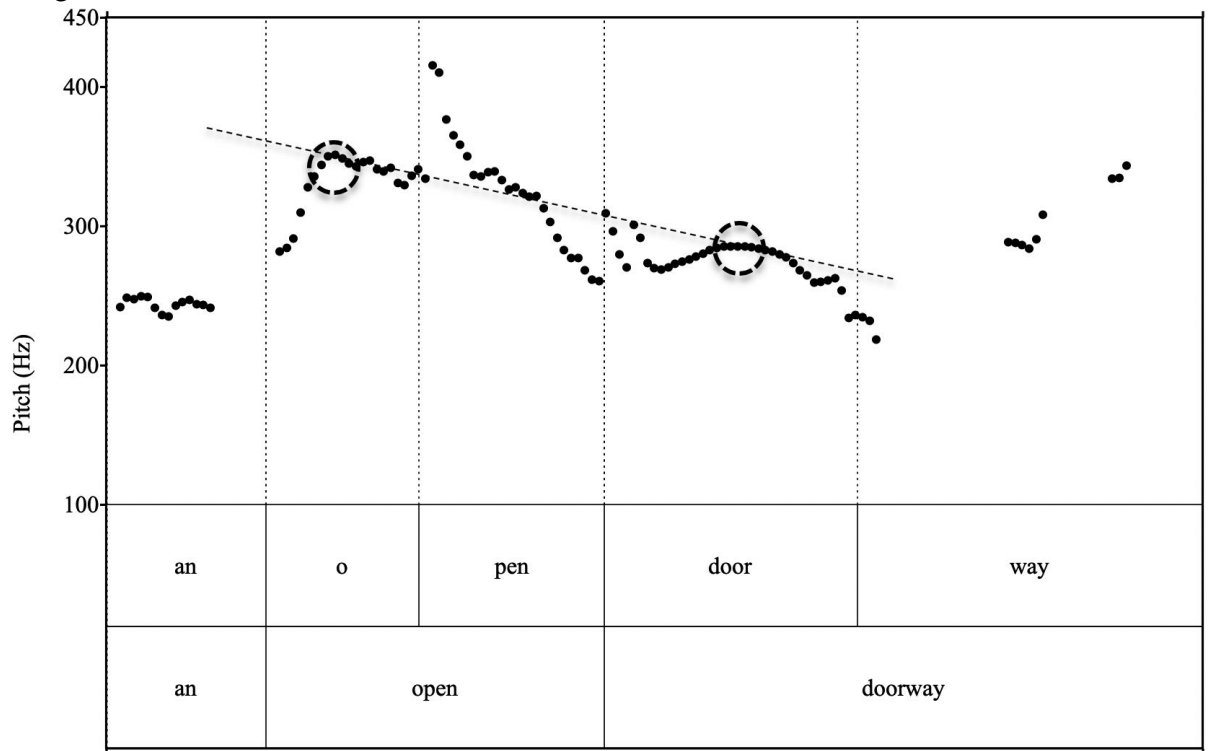
(2) In this novel, a **foolish student** awakens an **evil demon** while camping in the woods.

- Reporting results today from 11 languages:

    – Basque (4 speakers),
    – Brazilian Portuguese (6 speakers),
    – Bulgarian (7 speakers),
    – English (5 speakers),
    – French (8 speakers),
    – Icelandic (3 speakers),
    – Italian (3 speakers),
    – Korean (2 speakers),
    – Norwegian (3 speakers),
    – Russian (3 speakers), and
    – Zulu (1 speaker).

- We are trying to find out the rules for placement of prosodic prominence in a phonological phrase (ϕ), which is the type of prosodic unit that corresponds to the maximal projection in the syntactic structure.

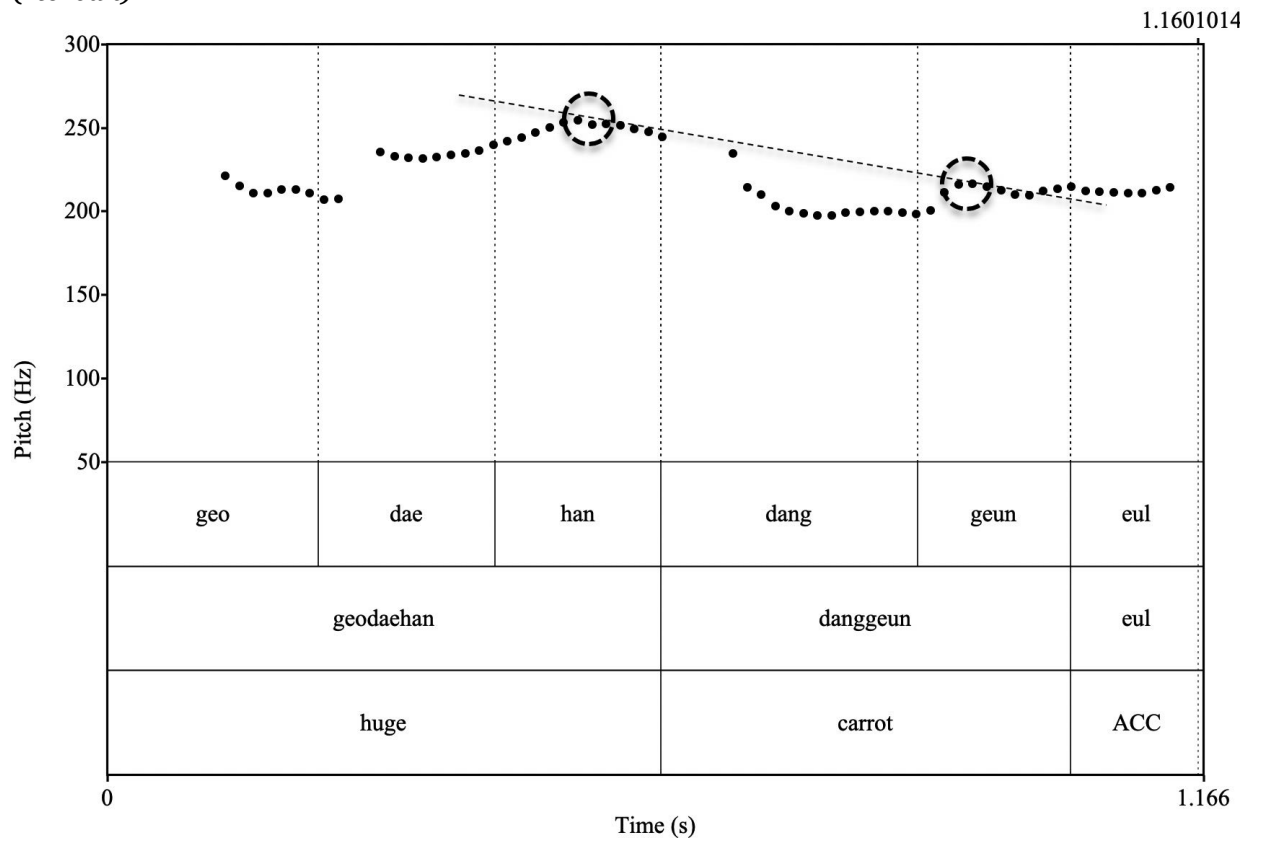- The ϕ we are investigating is the one corresponding to the DP.

2.1.1 English, Korean, Norwegian

- In English, Korean, and Norwegian, if we look at the pitch peaks associated with the stressed syllables of the adjective and the noun, the first pitch peak (the one on the adjective) is generally higher than the second one (the one on the noun).
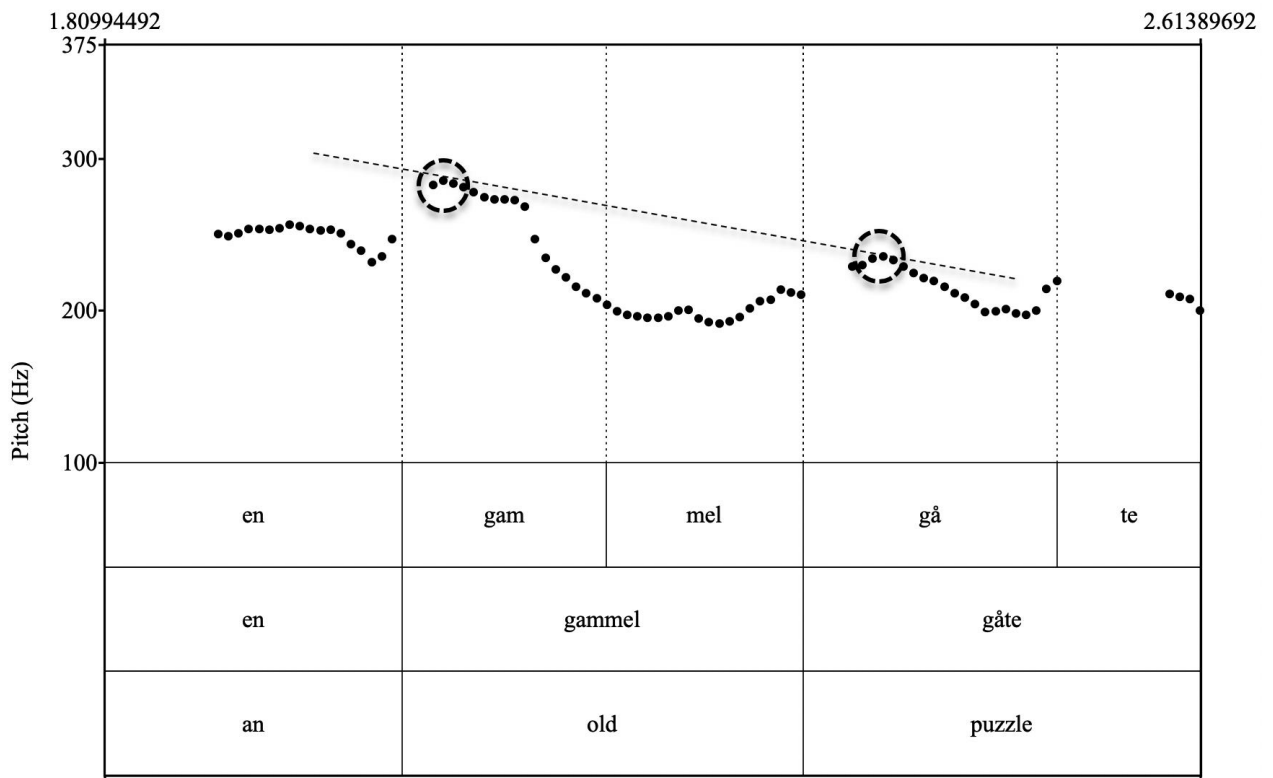
(3) *(English)*

(4) *(Korean)*

1.1601014

geo	dae	han	dang	geun	eul
geodaehan			danggeun		eul
huge			carrot		ACC

0

Time (s)

1.166

3

(5) *(Norwegian)*

- The average pitch ratios for these languages:

(6)

| Korean	1.24
English	1.19
Norwegian	1.19

2.1.2 French, Portuguese, Italian, Icelandic, Bulgarian, Russian, Basque, Zulu

- These languages do not have a big dip between the first and second words of the noun phrase. They are generally the same height, or sometimes the second word is higher than the first:

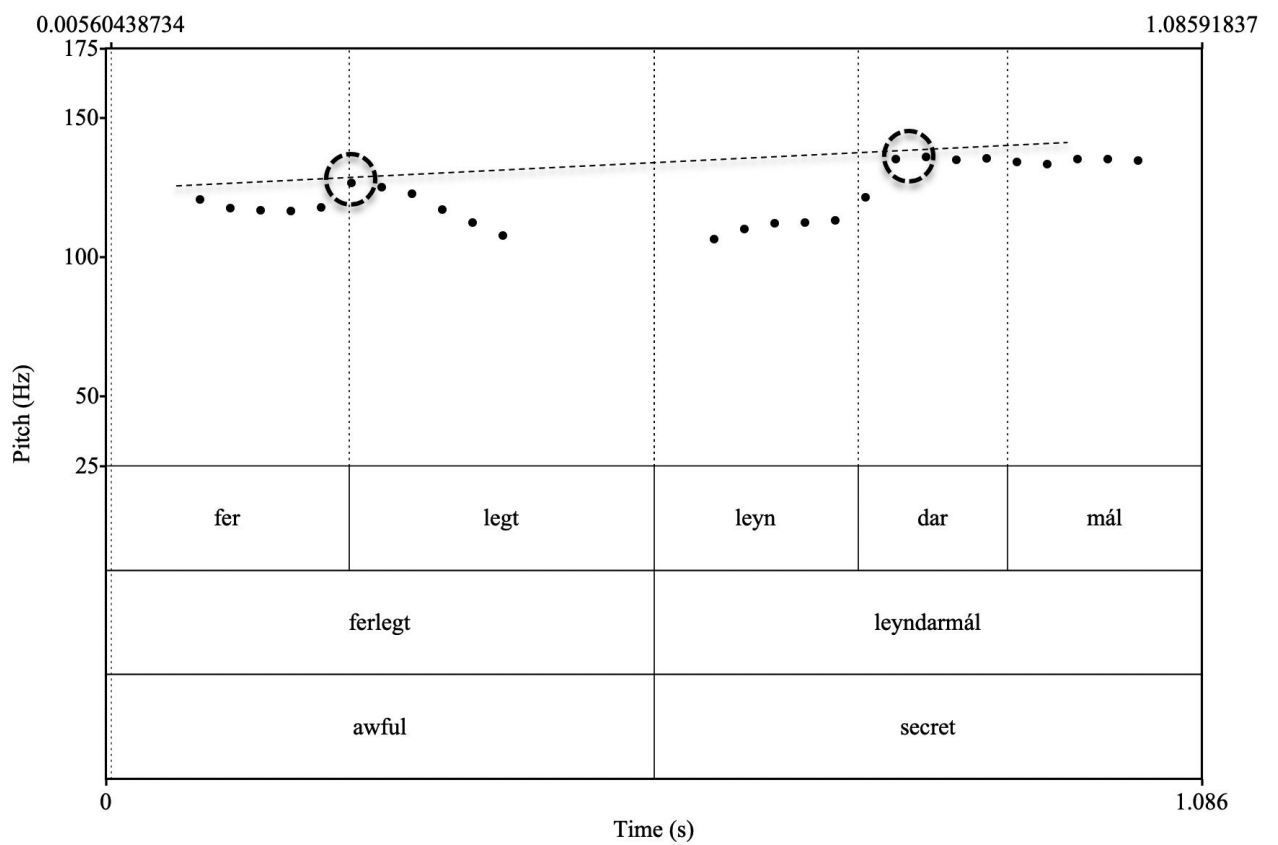- The average ratios for these languages

(7)

Zulu	1.06
Basque	1.06
Italian	1.06
Bulgarian	1.04
Icelandic	1.03
Portuguese	1
French	0.95
Russian	0.87

(8) *(French)*

(9) *(Icelandic)*

5
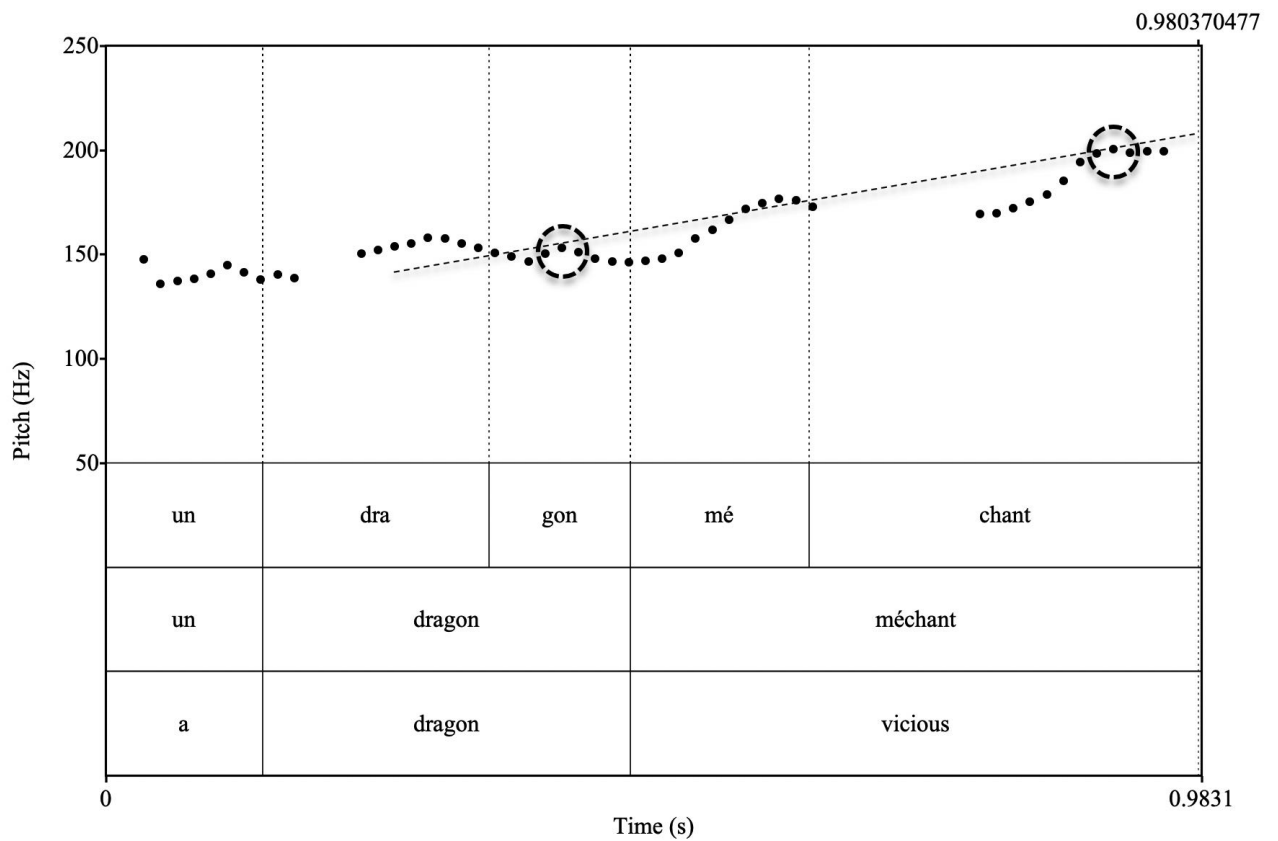
2.1.3 Summarizing the results

- So we have two kinds of languages:

    - the English/Norwegian/Korean kind,
        in which there's a lot of downstep between the first word and the second;

    - and the French/Italian/Portuguese/Bulgarian/Russian/Icelandic/Basque/Zulu kind, in which there isn't

(10)

Korean	1.24
English	1.19
Norwegian	1.19
Zulu	1.06
Basque	1.06
Italian	1.06
Bulgarian	1.04
Icelandic	1.03
Portuguese	1
French	0.95
Russian	0.87

(11)
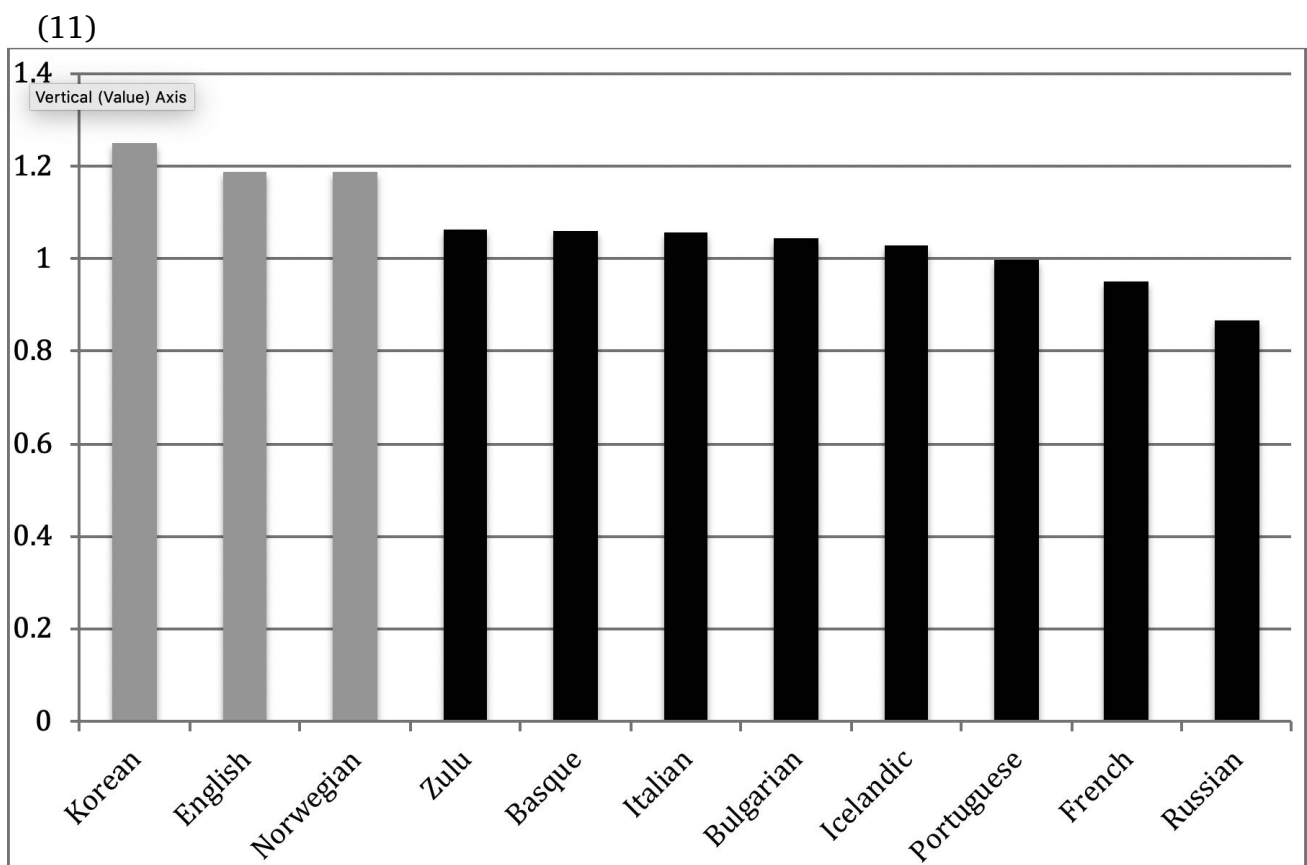
- I'll call the languages with the higher ratios Left-prominent languages, and the ones with the lower ratios Right-prominent. Statistical analysis verifies that the contrast is statistically significant ($p < .0000001$); see Appendix A for details.

- I'll make the simplifying assumption[1] that what holds for DP, for a given language, holds for ϕ more generally.

- With this result in mind, we can look for cases of downstep in descriptions of other languages.

- Japanese downstep between adjectives and nouns is well-documented (Poser (1984), Pierrehumbert & Beckman (1988), Kubozono (1989), Selkirk & Tateishi (1991)…):
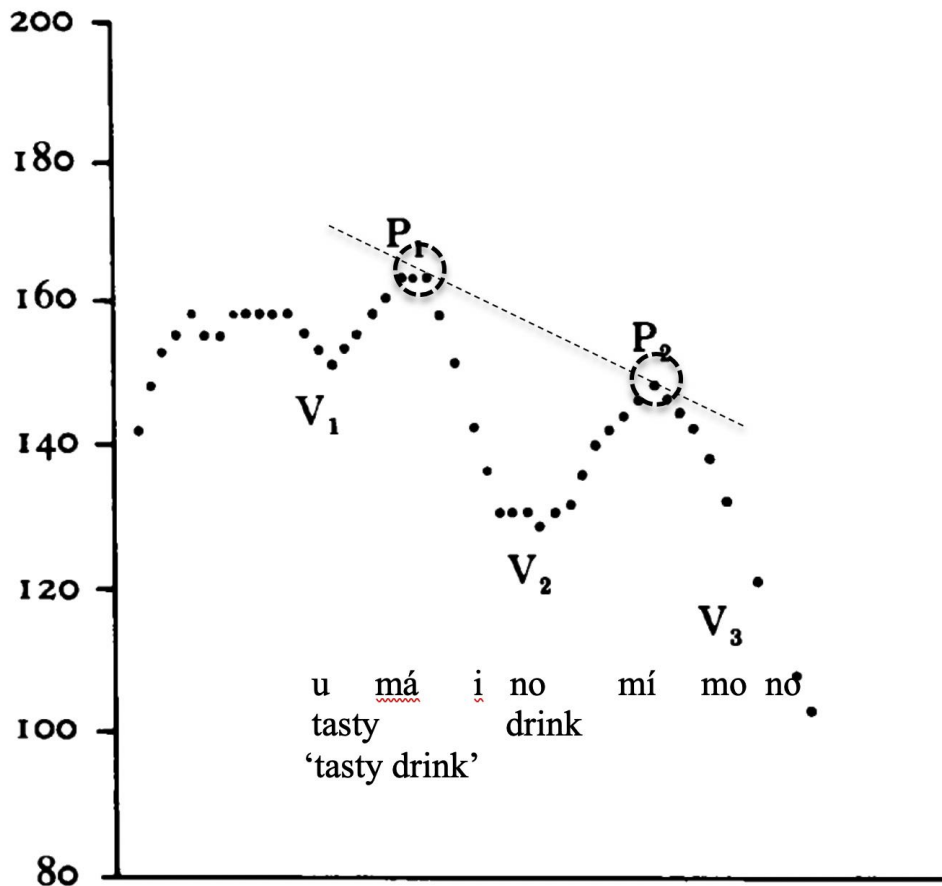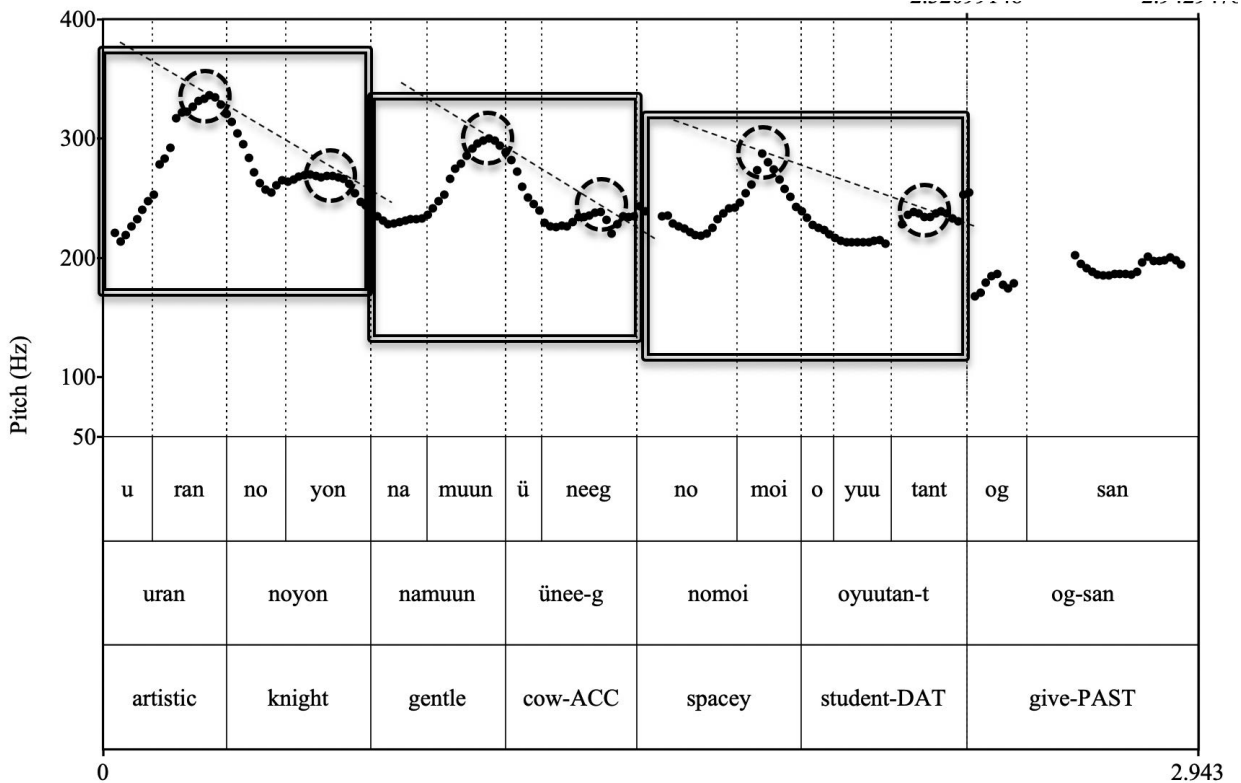
(12)

Figure 1

- Japanese, then, is like English, Korean, and Norwegian: "activity" is on the Left edge of ϕ.

- Mongolian also appears to be Left-prominent:
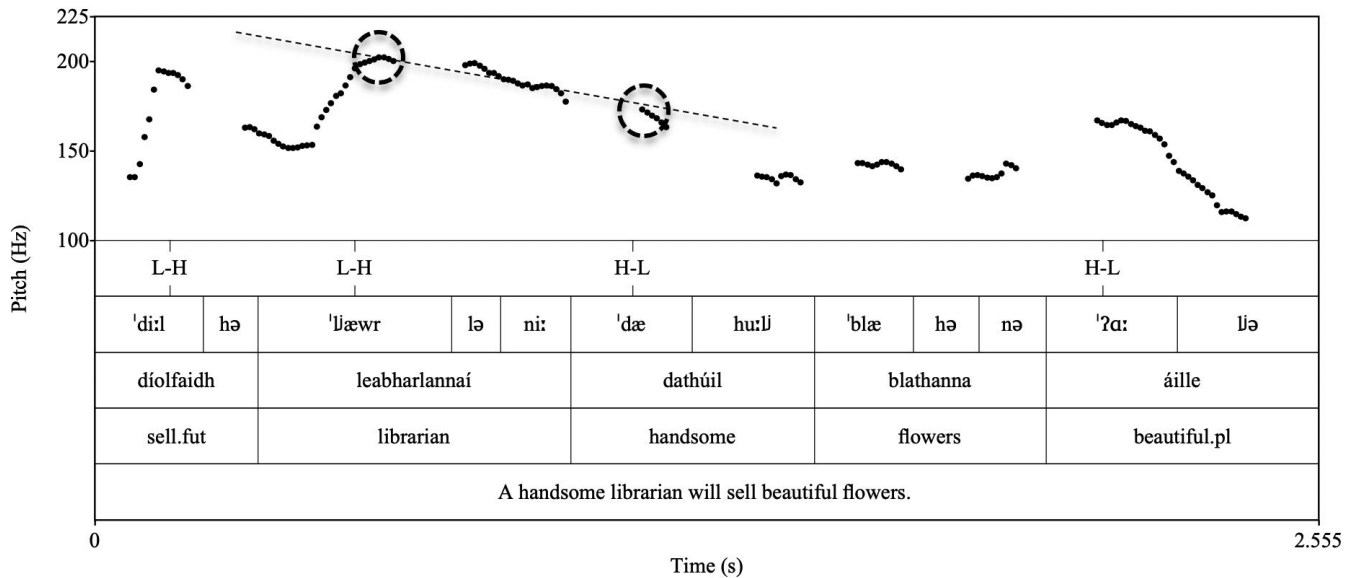
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[1]which could be wrong…

(13)

u	ran	no	yon	na	muun	ü	neeg	no	moi	o	yuu	tant	og	san

uran	noyon	namuun	ünee-g	nomoi	oyuutan-t	og-san
artistic	knight	gentle	cow-ACC	spacey	student-DAT	give-PAST

0 — 2.943

'The artistic knight gave a gentle cow to the spacey student'

Here's a pitch track for Irish (Elfner, 2012, p. 56)

(14)

L-H		L-H			H-L					H-L	

ˈdiːl	hə	ˈljæwr	lə	niː	ˈdæ	huːlj	ˈblæ	hə	nə	ˈʔɑː	ljə

díolfaidh	leabharlannaí	dathúil	blathanna	áille
sell.fut	librarian	handsome	flowers	beautiful.pl

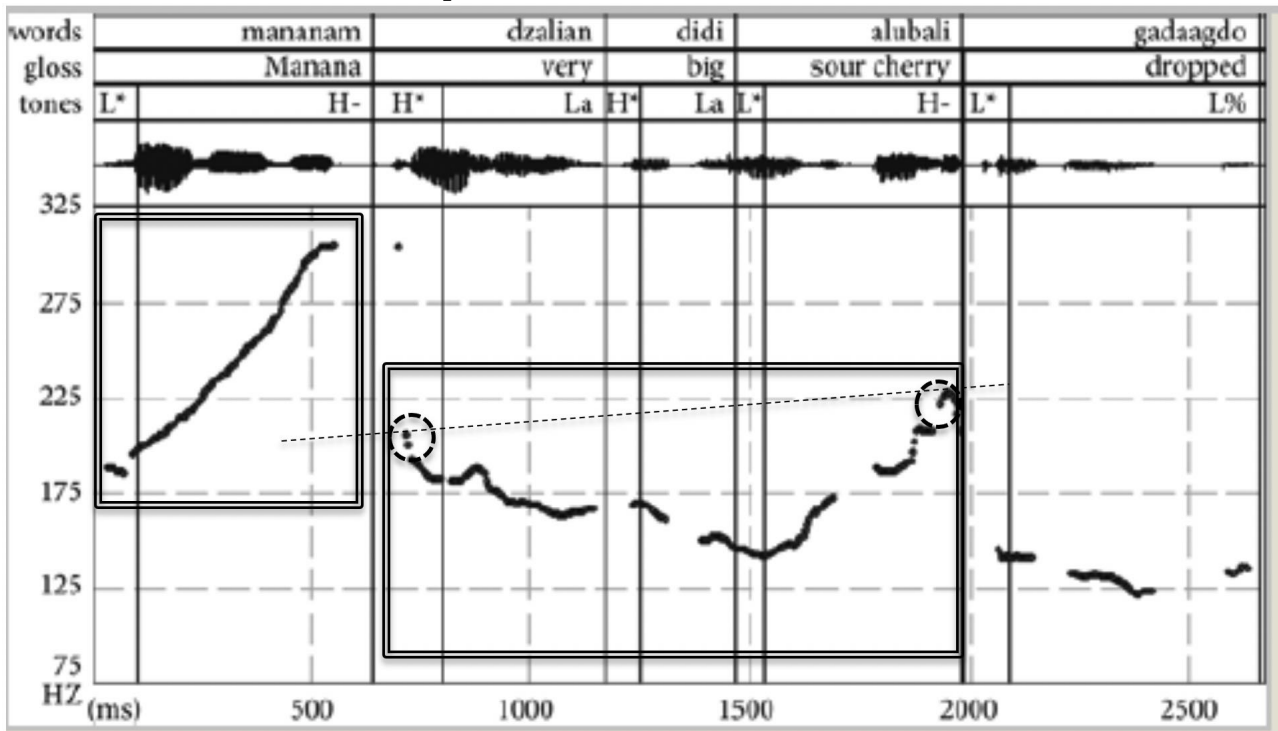A handsome librarian will sell beautiful flowers.

0 — 2.555

Time (s)

- Again, this looks like a Left-prominent language.

- We saw that French, Italian, Portuguese, Bulgarian, Russian, Basque, Zulu, and Icelandic are Right-prominent languages. Georgian looks like another one:

(15) (Vicenik & Jun, 2014, p. 163)

Left-prominent languages: English, Norwegian, Korean, (Japanese, Mongolian, Irish)
Right-prominent languages: French, Italian, Portuguese, Bulgarian, Russian, Zulu, Basque, Icelandic, (Georgian)

2.2 A test under development: lengthening

• A recently developed test involves measuring the length of stressed vowels[2], in sentences like:

(16) At the big fencing tournament in Ottawa, she used a **Canadian saber** for the first time.

  – same vowels

  – open syllables

  – following consonant of the same kind (both voiced or both voiceless stops)

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[2]Thanks to Edward Flemming for advice about how to do this.

(17)

kʰ   ə   n   **ej**   d   i   j   ə   n   s   **ej**   b   ɚ
'Canadian saber'
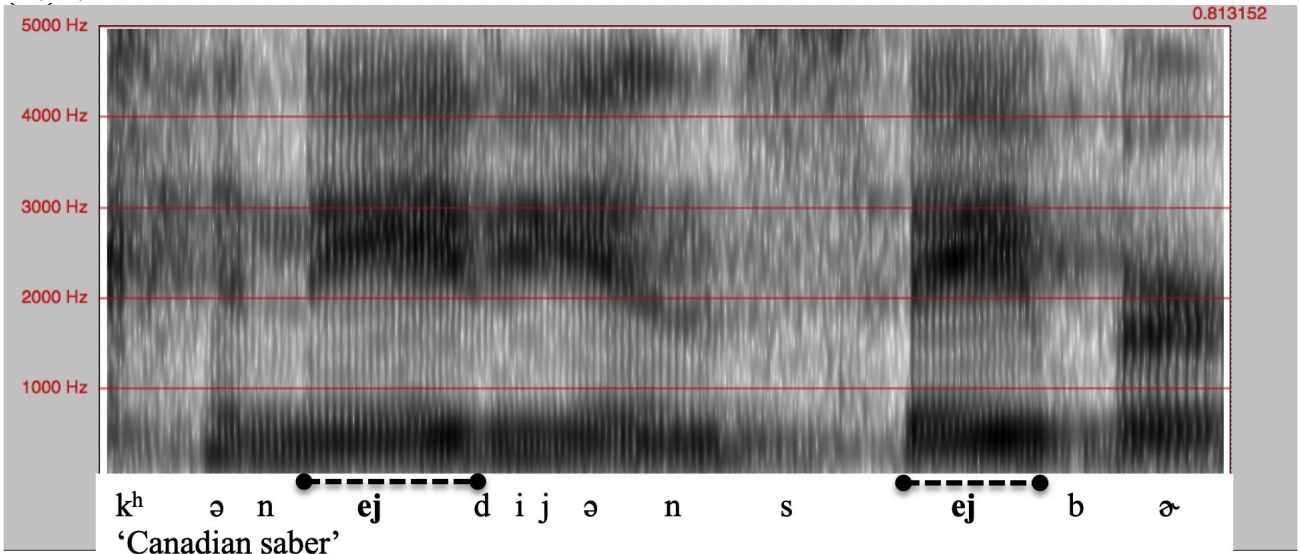
- Measuring the length of the stressed vowels, and taking the average ratio of the length of the first vowel to the length of the second vowel.

- Languages tested so far:

  – English (2 speakers)

  – German (3 speakers)

  – Portuguese (2 speakers),

  – Russian (3 speakers), and

  – Italian (1 speaker).

(18)

German	1.02
English	1.01
Russian	0.87
Portuguese	0.80
Italian	0.72

(19)
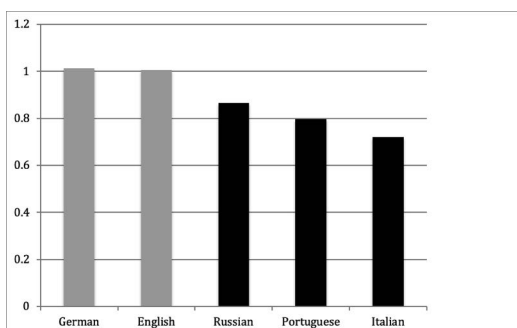
- Again, the difference between the languages with the larger ratio (German and English) and the languages with the smaller ratio (Russian, Portuguese, and Italian) is statistically significant ($p < .01$); see Appendix A for details.

- For the languages that have undergone both tests, the tests agree: English is Left-prominent, and Russian, Portuguese, and Italian are Right-prominent. Why is German in the Length test but not in the Pitch test? See Appendix B; basically, German pitch is quite complicated.

- So here's a new test for position of prosodic activity; the Active edge of ϕ is associated with greater duration, as well as higher pitch.

Left-prominent languages: English, Norwegian, Korean, German,
          (Japanese, Mongolian, Irish)
Right-prominent languages: French, Italian, Portuguese, Bulgarian, Russian, Zulu,
          Basque, Icelandic, (Georgian)

2.2.1 Contiguity Theory

- One way of summarizing a core claim of Richards (2016):

(20) Given a Probe and a Goal, there must be a domain containing the Probe and the Goal, within which the Goal is "Contiguity-prominent".

- How does the Goal become Contiguity-prominent?

(21) a. Relative relations of Contiguity-prominence are calculated for elements that are not in a domination relation.

   b. If a domain contains only a single XP,
         that XP is Contiguity-prominent in that domain

   c. a parameter: given multiple XPs in a domain,
         a language realizes Contiguity-prominence on the {Leftmost, Rightmost}.

- And a working definition for 'domain':

(22) **Domains**
      A domain is a string that minimally contains a probe and a goal.

- Sections 2.1-2.2 were about the parameter in (21c).

- (21b) guarantees that if the Probe and the Goal are more or less adjacent (not linearly separated by any intervening XP), then (21) will be satisfied, regardless of the direction of Contiguity-prominence:

(23) a.   PROBE (X^0) GOALP (γP δP …)

   b. (γP δP …) GOALP (X^0) PROBE

- The strings in (23) are always acceptable, by (21 b); there is a domain containing the Probe, the Goal, and no other maximal projection.

- On the other hand, if there is a maximal projection linearly intervening between Probe and Goal, the setting of (21c) will matter:

(24) a.   PROBE XP GOALP **]** (γP δP ...)   **Right-prominent**

     a'. *   **[** PROBE XP GOALP (γP δP ...)   **Left-prominent**

     b. * (γP δP ...) GOALP XP PROBE **]**   **Right-prominent**

     b'.   **[** GOALP XP PROBE (γP δP ...)   **Left-prominent**

- In (24a), there is a domain containing the Probe and the GoalP, in which the Goal is on the Contiguity-prominent (**Right**) edge.

- In (24a'), there is no such domain: GoalP is not on the **Left** edge of any domain containing both the probe and the GoalP.

- Similarly, (24b) is unacceptable, while (24b') is acceptable.

☞ **Upshot:** If the Probe and Contiguity-prominence are both on the same side of the Goal (both on the left, in (24a'); both on the right, in (24b)), then the Probe and the Goal must be made adjacent.

(i.) **PROBE**   **[** XP   **[** GOAL

(ii.) **GOAL]**   ~~XP/~~   **PROBE**
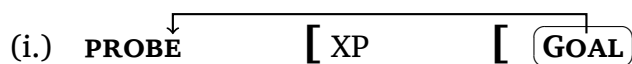
- If the Probe and Contiguity-prominence are on opposite sides of the Goal (as in (24a) and (24b')), then movement need not take place.

(iii.) **PROBE**   XP **]**   GOAL **]**

(iv.) **[** GOAL   **[** XP   **PROBE**
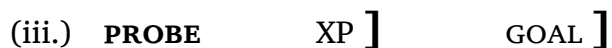
- note that in (iii), movement wouldn't do any *harm*, and might do some good...

(iii'.) **PROBE**   **]** XP   **]** GOAL
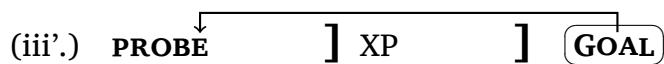
- So we should expect **optionality** in (iii) (head-initial Probe, Contiguity-prominence on the Right).

2.2.2 Wh-questions

If the Probe is C, and the Goal is a wh-phrase...

- two kinds of head-final languages:

(25)   a.   ***Dare**-ga   pan-o   katta   (**C**)   [*Japanese*]
            who-NOM   bread-ACC bought
            'Who bought bread?'

       b.   *Pan-o   **dare**-ga   katta   (**C**)*
            bread-ACC   who-NOM   bought

(26)   a.   * ***vin**   p'ur-i   iq'ida   (**C**)   [*Georgian: Erschler (2015)*]
            who.ERG   bread-NOM   bought
            'Who bought bread?'

       b.   *p'ur-i   **vin**   iq'ida   (**C**)*
            bread-NOM   who.ERG   bought

- Japanese is behaving like a Left-prominent language.
  Georgian is behaving like a Right-prominent language.[3]

- two kinds of languages with initial C:

(27)   **Who** (**C**)-did you see?

(28)   (**C**) *Tu   as   vu   **qui**?*
            you   have seen who
       'Who did you see'?

- English is behaving like a Left-prominent language:
        adjacency required between C and following wh.

- French is behaving like a Right-prominent language:
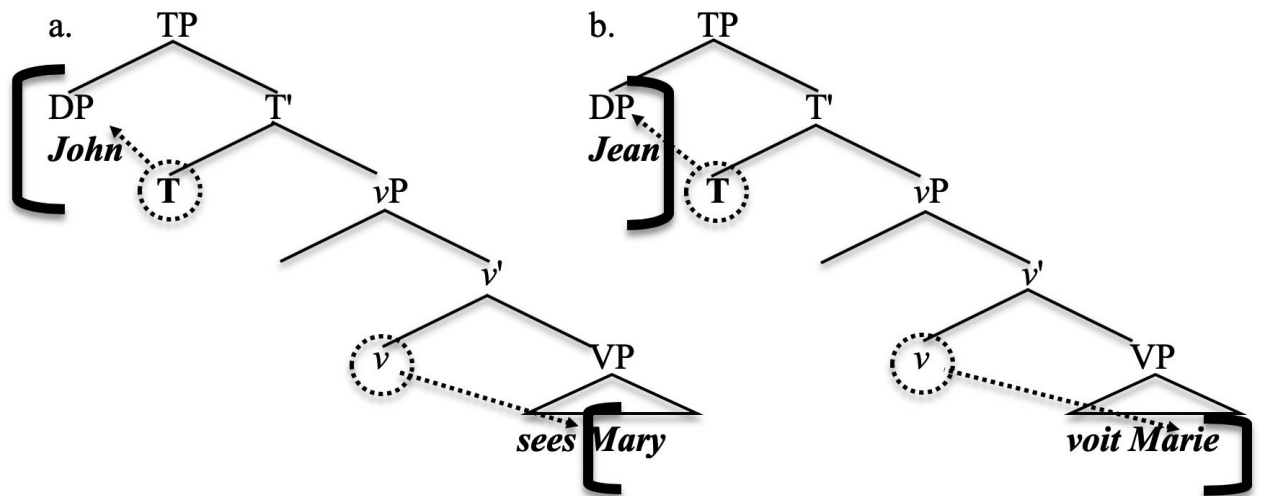   no adjacency required between C and wh.

_____

[3]tragically: it looks like Georgian C is head-initial. Perhaps there is some other head involved.

2.2.3 "Verb movement to T"

If the Probes are T and v, and the Goals are the subject and the object, respectively...

(29)

- English v, French T are Agreeing with their Goals across a Prominent boundary:
  → adjacency required

(30)   a.   John (often) sees (***often***) Mary

b.   Jean (***souvent***) voit (souvent) Marie

- If English T moves to C, it must then be adjacent with the following subject:

(31)   a.   **Probably** Mary is happy.

b.   * Is **probably** Mary happy?

- And if the French subject is absent, the verb can be preceded by adverbs that normally couldn't precede it:

(32)   a.   *Jean parle   **pas** l'italien*
              Jean speaks not   Italian
              'Jean doesn't speak Italian.'

b.   * *Jean   **pas** parle   l'italien*
              Jean   not speaks Italian

c.   **pas** parler   l'italien*
              not   to.speak Italian
              'To not speak Italian...'

- Moreover, in non-V2 clauses, Norwegian = English, and Icelandic = French (Wiklund et al., 2007).

(33) *Jeg vet* [*hvorfor Hedda (ofte) kjøper (*ofte) sko*] *[Norwegian]*
     I   know   why   Hedda often buys   often   shoes

(34) *Ég veit* [*af*   *hverju Hedda (*oft) kaupir (oft) skó]*   *[Icelandic]*
     I   know   why Hedda often   buys   often   shoes

    'I know why Hedda often buys shoes'

• English and Norwegian are behaving like Left-prominent languages;
        adjacency between v and following object, or between fronted T and following subject,
        but no adjacency necessary between T and preceding subject.

• French and Icelandic are behaving like Right-prominent languages;
        no adjacency necessary between v and following object,
        but adjacency required between T and preceding subject.

2.2.4 Pied-piping

If the Probe is Q, and the Goal is a wh…

• assume, following Cable (2007, 2010a, 2010b):

(35) a. [To **whom**] are you speaking?

     b.   QP
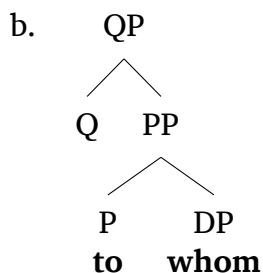
• Assuming that English, Norwegian, Icelandic, and French are all Q-initial…

(36) *[**Q** Paintings of <u>**what**</u>] did you see at the museum?   *[English]*

(37) * [**Q** *Fotografier*   *av* <u>**hvem**</u>] *kjøpte hun?*   *[Norwegian]*
        photographs of **who**   bought she

     '**Who** did she buy photographs of?'   *(Øystein Vangsnes, p.c.)*

(38) [**Q** *Málverk eftir* <u>**hvern**</u>] *sást þú?*   *[Icelandic]*
        painting by **who**   saw you

    '[A painting by **who**] did you see?'
               (Hrafnhildur Bragadóttir, Stefan Olafsson, Helgi Gunnarsson, p.c.)

(39) ?[**Q** *Des   peintures de quoi de Monet*] *as-tu   vu   au   musée?*
     of.the paintings of what by Monet   have-you seen at.the museum

[French]

'[Paintings of what by Monet] did you see at the museum?'
(Sophie Moracchini, Paul Marty, p.c.)

- English and Norwegian are behaving like Left-prominent languages:[4]
      (near)-adjacency between Q and following wh.

- French and Icelandic are behaving like Right-prominent languages:
      Q and wh can be arbitrarily far apart.

2.2.5 Raising past experiencers

If there are two T Probes, both probing a subject which has raised past them both...

- Cross-linguistic variation: some languages can, and others can't, do Raising past experiencers:

(40) a. John seems (**to Mary**) ＿＿to be talented.

      b. *Sofie ferekom (**ham***) ＿＿ *at være   helt   enig.*   *[Norwegian]*
         Sofie appears him   to be.INF completely agreed

         'Sofie appears (to him) to completely agree.'

      c. *Jean semble (*á **Marie***) ＿＿ *avoir du   talent*   *[French]*
         Jean seems   to   Marie to.have of.the

         'Jean seems (to Marie) to have talent.'

      d. *Ólafur   hefur virst   (***mer***) ＿＿ *vera gáfaður*   *[Icelandic]*
         Olaf.NOM has seemed me.DAT   be.INF smart

         'Olaf seemed (to me) to be smart.'

- Branan (2018): Contiguity Theory can account for the facts in (40), if the raised subject must be Contiguous with *both* T's:

(41) a. [John **T** seems [(to Mary) **T** to be...

      b. John] **T** seems (to Mary)] **T** to be...

- As we also expect: if the experiencer is removed or deprived of its prosodic status, (40b) becomes acceptable:

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[4] ...and so is German. You can't say (37) in German, either (*Bilder von was hast du gesehen?).

(42) a. *Jean* **lui** *semble* ___ *avoir   du   talent.*
       Jean to.him seems   to.have of.the talent
       'Jean seems to him to have talent.'

   b. **Á Marie,** *Jean   semble* ___ *avoir   du   talent.*
       to   Marie Jean   seems to.have of.the
       'To Marie, Jean seems to have talent.'

   c. **Hvem**   *hestarnir   virðast* ___ *vera seinir?*
       who.DAT the.horses seem   to.be slow
       'To whom did the horses seem to be slow?'

- English and Norwegian are behaving like Left-prominent languages;
      embedded infinitival T and the preceding subject can be arbitrarily distant.

- French and Icelandic are behaving like Right-prominent languages;
      embedded infinitival T and the preceding subject can't be separated by the
      experiencer.

2.3   Counterexamples!

One of the joys of having a theory that makes predictions is that there are counterexamples…

2.3.1   Unexpectedly obligatory wh-movement

- In a left-headed, Right-prominent language, wh-movement should be optional.

- This is true in French, Portuguese, and Zulu:

(43) (<u>**C**</u>) *Tu   as   vu   **qui**?*   *[French]*
        you have seen who
     'Who did you see?'

(44) (<u>**C**</u>) *O Bill comprou o **que**?*   *[Portuguese]*
        Bill   bought   what
     'What did Bill buy?'

(45) (<u>**C**</u>) *U-bona-**ni**?*   *[Zulu]*
        2SG-see-what
     'What do you see?'

- But it is false in Icelandic, Italian, Russian, and Bulgarian:

(46) *(**C**) *Pétur hefur talað   við* **hvern***?*   *[Icelandic]*
           Peter has   spoken with who.ACC

      'Who has Peter spoken with?'

(47) *(**C**) *Hai   visto* **chi***?*   *[Italian]*
           have.2SG seen who

      'Who did you see?'

(48) *(**C**) *Ty   videl* **kogo***?*   *[Russian]*
           you saw   who.ACC

      'Who did you see?'

(49) *(**C**) *Ivan e   kupil* **kakvo***?*   *[Bulgarian]*
           Ivan AUX bought what

      'What did Ivan buy?'

• What's going on?

2.3.1.1 Multitasking

• Richards (2016) had a proposal about Icelandic; Icelandic is prosodically suitable to have wh-in-situ, but it's a V2 language, and V2 languages generally don't allow wh-in-situ. Why not?

(50) **Multitasking** (Pesetsky & Torrego, 2001; Kotek, 2014; Van Urk & Richards, 2015)
      At every step in a derivation, if two operations A and B are possible, and the conditions satisfied by A are a superset of those satisfied by B, the grammar prefers A.

(51) $C_{[V2][+wh]}$ XP   XP   **whP** …

• The C in (51) has two options:

  – satisfy "V2" with some random XP, and satisfy [+wh] by leaving wh in situ and manipulating prosody.

  – move the wh-phrase, satisfying both Contiguity and V2 at the same time.

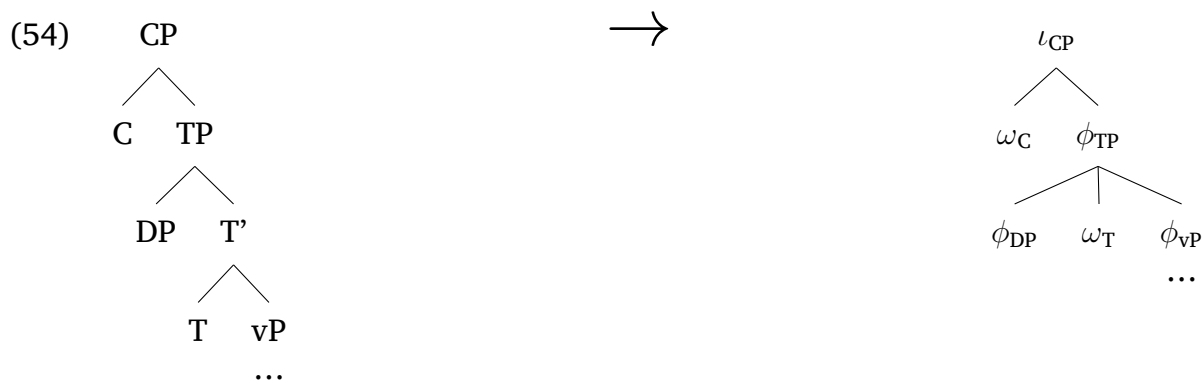• Multitasking prefers the second option.

2.3.1.2 Prominence in ι

• Italian, Russian, and Bulgarian also don't have optional wh-in-situ, and they're not V2.

• In fact, they don't have wh-in-situ anywhere:

(52) a. * **Chi** *ha comprato* **che cosa***?* [*Italian*: multiple wh-questions banned]
who has bought what

b. **Kto čto** *kupil?* [*Russian*: all wh-phrases move]
who what bought

c. **Koj kakvo** *e kupil?* [*Bulgarian*: all wh-phrases move]
wh what AUX bought

(note that this is not true of Icelandic, which has English-style multiple-wh questions):

(53) *Hver bauð hverjum í veisluna?* [*Icelandic*: one wh-phrase moves]
who invited whom in the.dinner
'Who invited who to the dinner?'

- Francis (2015): all of this has been about Contiguity-prominence in Phonological Phrases (ϕ). But what about Intonational Phrases (ι)?

- *Match Theory* (Selkirk, 2009, 2011; Elfner, 2012, 2015; Bennett et al., 2016)

    – Heads map onto Phonological Words (ω)

    – Maximal projections map onto Phonological Phrases (ϕ)

    – CPs map onto Intonational Phrases (ι)

(54)

```
        CP                              →                    ιCP
       /  \                                                 /   \
      C    TP                                            ωC     φTP
          /  \                                                  / \
        DP    T'                                         φDP  ωT   φvP
             /  \                                                    ...
            T    vP
                 ...
```

- Following Francis' idea: maybe Italian, Russian, and Bulgarian are Right-prominent in ϕ, *but Left-prominent in ι*.

- How would we find out?

- One test for prominence in ϕ has to do with pitch boosts; Left-prominent languages boost the pitch of the Left side of ϕ, and Right-prominent languages boost the pitch of the Right side.

- So, looking for pitch boosts on the Left side of ι...

(55) **Yesterday at the zoo,** an intelligent elephant discovered a **secret door** and escaped from its cage.

– measuring the ratio from the highest point in the initial phrase to the highest point in the object:

(56)
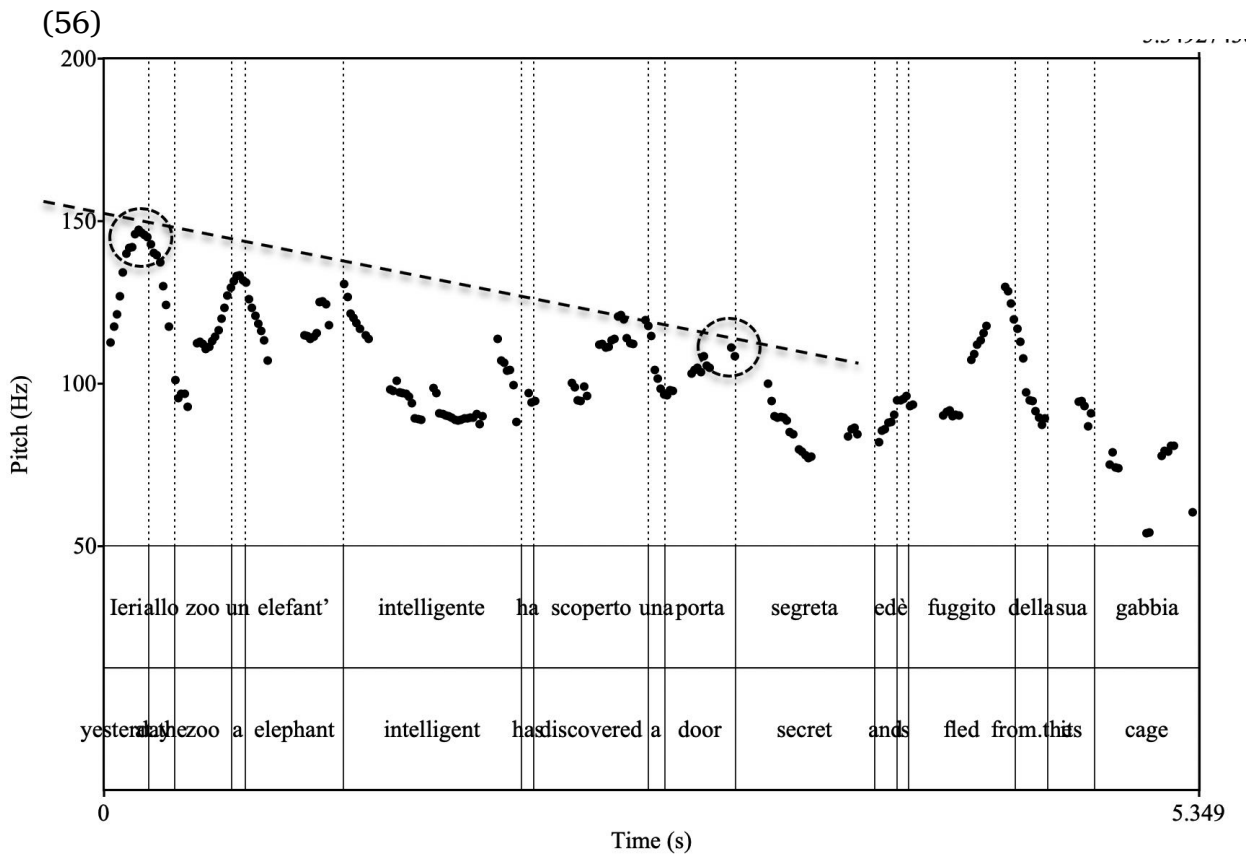
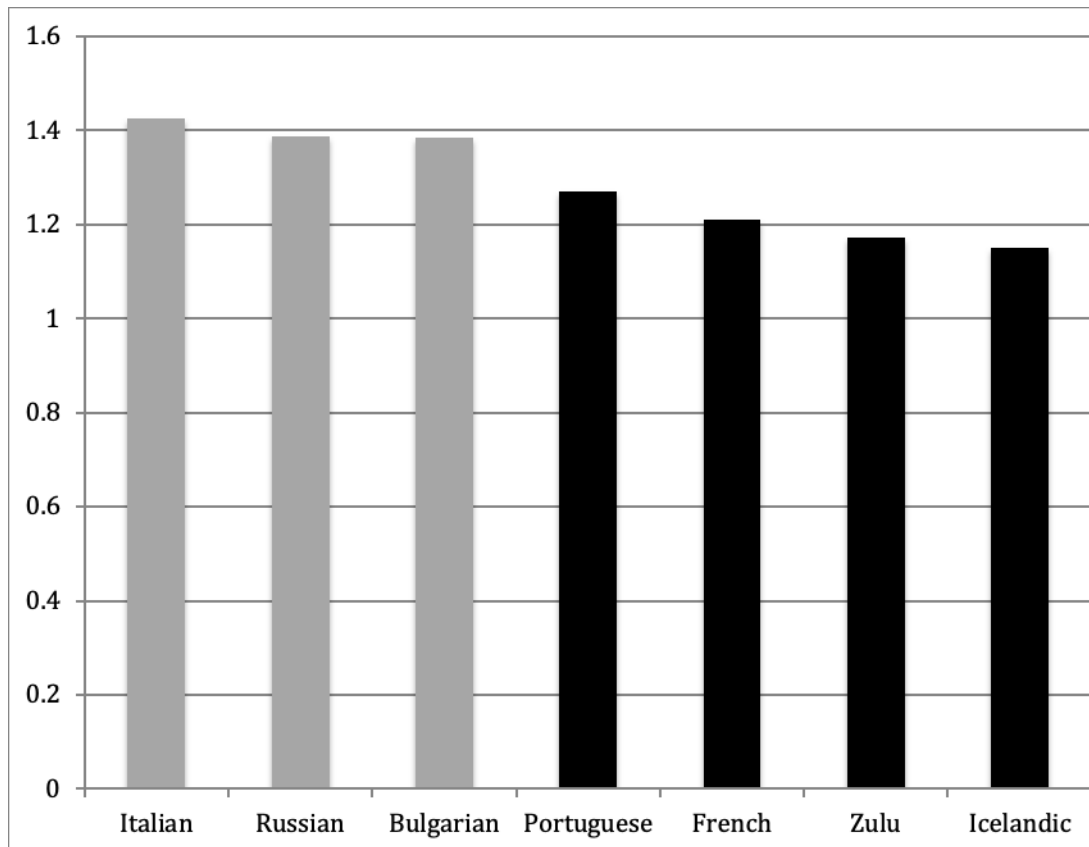
• Averages for this ratio, for the head-initial languages that are Right-prominent in ϕ:

(57)

Italian	1.43
Russian	1.39
Bulgarian	1.38
Portuguese	1.27
French	1.21
Zulu	1.17
Icelandic	1.15

(58)

- Again, the difference between the first three languages and the last four is significant ($p < .01$) (statistics in Appendix A):

  → Italian, Russian, and Bulgarian are Right-prominent in ϕ, but Left-prominent in ι.

  → Zulu, Portuguese, French, and Icelandic are Right-prominent both in ϕ and in ι.

- How does this help? basic idea:

  – in these languages, if (for example) v probes a direct object, the direct object has to be prominent in a Right-prominent domain (vP, which maps onto ϕ).

  – But if C probes a wh-phrase, in Italian, Russian, and Bulgarian, the wh-phrase has to be prominent in a Left-prominent domain (CP, which maps onto ι).

- Ingredients of an account…

- Basics of Match Theory:

  – Heads map onto Phonological Words (ω)

  – Maximal projections map onto Phonological Phrases (ϕ)

  – CPs map onto Intonational Phrases (ι)

- Since CP is both a CP and a maximal projection, by these rules CP should be both an ι and a ϕ.

- Suppose we imagine that in fact, CP begins the derivation as a ϕ, but becomes an ι once its wh-feature Probes for the first time.

   English, Norwegian: CP is a ϕ, therefore Left-prominent: wh-movement.
   Italian, Russian, Bulgarian: after Probing, CP is a ι, therefore Left-prominent: wh-movement.
   Zulu, Portuguese, French: both ϕ and ι are Right-prominent: wh-in-situ optional.

- Other possible extensions, maybe to be discussed in the question period:

   – multiple wh-questions

   – topics, foci…

2.4   Interim Conclusions

- It is a mistake to grant ourselves the power to independently specify, for a given type of movement, whether it is overt or covert in a given language.

- At least for this kind of phenomenon, there may be no syntactic parameters.

- What there are, instead, are:

   – a universal set of conditions on the prosodic consequences of Probe-Goal relations

   – a cross-linguistically invariant syntax

   – cross-linguistic variation confined to facts about phonology
      (today, position of prosodic prominence,
         in Phonological Phrases (ϕ) and Intonational Phrases (ι))

- now, on to intervention effects…

3   and intervention effects

- In the previous sections, we saw a theory that determines the distribution of probes and goals.

(59) **Contiguity**

   a.   Given a probe and a goal, a domain must be selected which contains the probe and the goal, within which that goal is Contiguity-prominent.

   b.   Relative relations of Contiguity-prominence are calculated for elements that are not in a domination relation.

   c.   If a domain contains only a single XP, that XP is Contiguity-prominent in that domain.

   d.   Given multiple XPs in a domain, a language realizes Contiguity-prominence on the {Leftmost, Rightmost}.

- An important thing to note for this section: (59a) allows domains that contain multiple goals, provided all of the probes are contained in that domain, and at least one of those goals attains Contiguity-prominence within that domain.

- Languages do seem to realize domains overtly:

  - Post-focal pitch compression in Japanese…
  - Boundary tone erasure in Korean…   *Jun (1996)*
  - Pre-*wh* pitch compression in French…   *Gryllia, Cheng & Doetjes (2016)*
  - Tonal alternations and boundary erasure in Georgian…*Skopeteas, Féry & Asatiani (2009)*
  - F0 raising of the domain in Chichewâ…   *Downing (2008)*
  - Rephrasing of the verb and fronted focus in Thompson River Salish…
    Koch (2008)

- But not all languages do:

  - Egyptian Arabic, for instance, allows *wh*-in-situ, but doesn't seem to do anything special to the prosody of the sentence (Hellmuth, 2007).

- And domains are not a property only of *wh*-phrases in many of the languages we'll consider here.

  - In particular: focus bearing elements and NPIs behave like *wh*-phrases in Japanese, Korean, Georgian, and Basque.

- First ingredient: an additional option for 'realizing Contiguity-prominence in a domain':

  - Make the edgemost element more prominent than everything else in the domain.
  - Make everything in the domain that has no prominence relationships equally prominent.

- Every language does the first, only some languages do the second.

- Spelling this out in brutal detail for a Japanese sentence like (60). Recall now that Japanese is a left-active language.

(60) *Naoya-ga* *nani-o*   *nomiya-da* *nonda* *no*
      N.-NOM   what-ACC bar-DAT   drink   Q
      What did Naoya drink at the bar?

  - C and *wh* are in an Agree relationship.
  - The domain which contains both the probe and goal is the string *nani-o nomiya-da nonda no*.
  - *nani-o* is Contiguity-prominent in that domain: it is the leftmost XP in the string.

- Proposal: Japanese realizes Contiguity-prominence with the additional option, making everything else in the domain less prominent than the leftmost XP in a domain. This is what we call 'post-focal pitch compression': everything but the edgemost phrase in the domain is equally prominent.

- One more ingredient for the intervention effect [see Branan (2018) for a spiritually similar proposal].

(61) **Relationship Preservation**
Once a relation of relative Contiguity-prominence has been determined, it cannot later be changed.

- The idea here: a domain is constructed when an Agree relationship is established, and the relative relationships of prominence between elements in that domain are calculated.
- Once those relationships have been established, they must be preserved.
- end result: if an element is in a domain in a language like Japanese, and is not Contiguity-prominent in that domain, it can never become Contiguity-prominent later in the derivation.

- The intervention effect arises because of this end result.

(62) * *Dare-mo   nani-o   kawa-nakatta   no*
     anybody what-ACC buy-NEG.PAST Q

- Why is this out?
- The *wh*-phrase has been determined to lack Contiguity-prominence within the domain formed for the sake of the NPI subject. When C enters the derivation and Agrees with the *wh*-phrase, it is impossible to make the *wh*-phrase prominent, so Contiguity for the C and *wh*-phrase can't be satisfied.

- Step 1: The sentence is built until *daremo* 'anybody' and its licenser, NEG, are merged. A Contiguity domain for *daremo* is created, and *daremo* becomes Contiguity-prominent in that domain. Everything in the domain other than *daremo* is determined to be equally prominent.

(63) *Dare-mo   nani-o   kawa-nakatta*
     anybody what-ACC buy-NEG.PAST

- Step 2: The derivation continues until the C *no* 'Q' is Merged. A Contiguity domain for *nani* is created. *Nani* should become Contiguity-prominent in that domain—but this is blocked as a result of Relationship Preservation, since it was determined earlier to lack Contiguity-prominence.

(64) *Dare-mo   nani-o   kawa-nakatta   no*
     anybody what-ACC buy-NEG.PAST Q

- Scrambling repairs the intervention effect.

24

(65) a. *Nani-o   dare-mo kawa-nakatta   no*
       what-ACC anybody buy-NEG.PAST Q
       'What didn't anybody buy?'

- – Why is this better?
- – Each element that needs to become prominent is the most prominent element in its domain; the creation of these domains does not disrupt the prominence relationships of elements in the overlapping domains in a problematic way.

• Step 1: The sentence is built until *daremo* 'anybody' and its licenser, NEG, are merged. A Contiguity domain for *daremo* is created, and *daremo* becomes Contiguity-prominent in that domain. Everything in the domain other than *daremo* is determined to be equally prominent.

(66) *nani-o   dare-mo kawa-nakatta*
     what-ACC anybody buy-NEG.PAST

• Step 2: The derivation continues until the C *no* 'Q' is Merged. A Contiguity domain for *nani* is created. *Nani* becomes Contiguity-prominent in that domain, and everything in that domain which does not already have prominence statements associated with it is determined to be equally prominent with everything else in the domain.

(67) *Nani-o   dare-mo kawa-nakatta   no*
     what-ACC anybody buy-NEG.PAST Q

• An expectation if this approach is on the right track: we should be able to find cases where the configuration posited here rules sentences out, independent of the scopal properties of the relevant elements.

• One case: scrambling of focused objects across *wh*-subjects is bad; this is fine when scrambling does not take place.[5]

(68) **Scrambling creates the effect in Japanese**

   a. *Dare-ga   ringo-{sika/sae}   tabe-nakatta   no*
      who-NOM   apple-{only/even} eat-NEG.PAST Q
      'Who ate only/even an apple?'

   b. * *Ringo-{sika/sae}   dare-ga   ____ tabe-nakatta   no*
        apple-{only/even} who-NOM   eat-NEG.PAST Q
        'Who ate only/even an apple?'
      Smallest domain in which focus attains Contiguity-prominence:
      ringo-sika dare-ga tabe-nakat
      Smallest domain in which *wh-* attains Contiguity-prominence:
      dare-ga tabe-nakat-ta no

---

[5]Similar effects are reported in Korean by Beck & Kim (1997).

- The problem is identical to that which we saw earlier. The *wh*-phrase is less prominent than the focus in the focus' domain. Causing the *wh*-phrase to become Contiguity-prominent in that domain, through the creation of a new domain, ends up violating Relationship Preservation.

- This is somewhat surprising if the problem is a purely scopal phenomenon: scrambling generally seems able to reconstruct in Japanese; reconstruction of the scrambled object in (68b) to the underlying position in (68a) should be able to ameliorate the effect.

• Another case (bad for a particular theory of the effect): Uniform domain marking, dissimilar scope properties in Korean.

(69) a. *Mary-ka   John-to   mannaci ani hayssta*
         Mary-NOM John-also meet   not did

      * 'Mary didn't meet John, although she met someone else.'   *Neg > also*

    b. *Mary-ka   John-man mannaci ani hayssta*
         Mary-NOM John-only meet   not did

      ✓'It is not the case that Mary met only John. She met someone else, too.'
                                                                          Neg > only
                                                                          Lee (2004)

(70) a. * *John-to mues-ul   ilk-ess-ni*
          J.-also what-ACC read-PST-Q

      "What did also John read?"   *Tomioka (2007)*

    b. * *Minswu-man mues-ul   po-ass-ni?*
          Minswu-only what-ACC see-PST-Q

      "What did only Minswu see?"   *Noh (2011)*

- For Kotek (2017), Erlewine & Kotek (2017), Kotek & Erlewine (this workshop), whether or not an intervener intervenes should be diagnosable in part by the scope it takes relative to other elements in the clause—in particular negation [based on tests for a similar language, Japanese]. If an element must scope above negation, this shows us that it moves above negation and cannot reconstruct (and is for this theory an intervener); if an element optionally scopes above negation it either optionally moves above negation, or is able to reconstruct (and is for this theory not an intervener).

- Korean *only* and *also* behave dissimilarly in this respect: *also* can't scope below negation but *only* can.

- However, as we see in (70), both act as interveners, independent of their scopal properties. We know that these elements both form overtly domains necessary to satisfy Contiguity (Tomioka, 2007). So here we see that intervention effects can arise independently of the relevant scopal properties of the elements in the configuration.

26

☞ **The upshot: a condition on prominence relationships forces overt movement of one of the elements in the intervention configuration when that configuration arises, and we can see the effect of this condition independent of scope.**

- Side note (this will be important in a bit): it's not just *wh*-phrases that trigger the effect. NPIs and focus particles like *-man* also trigger the effect, as in (71).

(71)   **Non-wh intervention effect & scrambling amelioration**

    a.   * *amwuto i   chay-man an ilk-ess-ta*
        anyone this book-only NEG read-PAST-DEC

        'No one read only this book.'

    b.   *i   chayk-man awmuto an ilk-ess-ta*
       this book-only anyone NEG read-PAST-DEC

       'Only this book is what no one read.'   Kim (2002)

     – As we might hope, since in Korean both of these elements trigger boundary tone erasure on the span of the sentence between them and the head in the verbal complex that licenses them (Jun, 1996; Sohn, 1999).

3.1   Right-active languages

- Recall that *wh*-phrases have to appear right next to the verb in Georgian and Basque, two SOV languages that are similar in many relevant respects to Japanese (and Korean). The same happens to be true of foci, as we see below. As shown before, these languages have prosodic characteristics that suggest that prominence is generally on the rightmost element in some domain.

(72)   **Nothing may appear between the verb and *wh*-phrase/foci in Georgian and Basque**

    a.   * *vin   p'ur-i   iq'ida*   (FOC) (C)
       who.ERG bread-NOM bought

       'Who bought bread?'

    b.   *p'ur-i   vin   iq'ida*   (FOC) (C)
       bread-NOM who.ERG bought

       'Who bought bread?'   *Erschler (2015),Georgian*

(73)   a.   * *mxolod Manana-m maimun-s   ak'oca* (FOC) (C)
        only   M.-ERG   monkey-DAT kiss

        'Only Manana kissed the monkey.'

     b.   *maimun-s   mxolod Manana-m ak'oca* (FOC) (C)
       monkey-DAT only   M.-ERG   kiss

       'Only Manana kissed the monkey.'   *Borise & Polinsky (2017)*

(74) a. * *Señ-ek   Jon   ikusi   rau* (FOC) (C)
         who-ERG Jon.ABS see.PRF AUX

    b. *Jon   señ-ek   ikusi   rau* (FOC) (C)
       Jon.ABS who-ERG see.PRF AUX

    Who saw Jon?

(75) a. * *Jonek Miren   ikusi rau* (FOC) (C)
        J.ERG M.ABS seen has

    b. *Miren   Jonek ikusi rau* (FOC) (C)
       M.ABS J.ERG seen has

    'Jon saw Miren.'   *Arregi (2002),Basque*

- Why is this the case? Consider the examples in (74-75):

  – In (74-75a), the domains for C and FOC contain the *wh-* or focused subject respectively, the object, the verb, and the relevant functional head.

  – The subject does not attain Contiguity-prominence in that domain: there is more than one XP in that domain, so the rightmost XP—the object—is Contiguity-prominent in that domain.

  – In (74-75b), the domains for C and FOC contain the *wh-* or focused subject respectively, the verb, and the relevant functional head.

  – The subject is the only XP in this domain, so it is Contiguity-prominent in that domain.

- *Wh*-intervention effects are present in the language. Interestingly, scrambling doesn't make things better in these languages.

(76) **Scrambling does not ameliorate the effect in Georgian and Basque**

    a. ?? [*Manana-m-ac   k'i   ]$_{foc}$ [*romeli tojina   ]$_{wh}$ *misc-a*
        Manana-ERG-also yes(=even)   which doll.NOM   give-AOR.3SG
        (FOC) (C) *švil-eb-s?*
             child-PL-DAT

    b. * [*romeli tojina   ]$_{wh}$ [*Manana-m-ac   k'i   ]$_{foc}$ *misc-a*
       which doll.NOM   Manana-ERG-also yes(=even)   give-AOR.3SG
       (FOC) (C) *švil-eb-s?*
             child-PL-DAT

    Intended: 'Which doll did even Manana give to the children?'   *Borise &*
    Polinsky (2017)

(77) a. * <u>*Jonek*</u>   *zer*   *erosi du*
     Jon-ERG what-ABS buy AUX

   b. * *zer*   <u>*Jonek*</u>   *erosi du*
     what-ABS Jon-ERG buy AUX
     Intended: 'What did John buy?'   *Reglero (2004)*

- The semantic effects of scrambling in Georgian and Basque differ.

   – In Georgian, scrambling doesn't seem to affect scope.   *Borise & Polinsky (2017)*

   – In Basque, it does.   *Arregi (2002)*

   – So whatever's going wrong in (76-77), it isn't (only) a semantic problem.

- Note also that these languages do allow multiple *wh*-questions in addition—suggesting that the problem arises just in cases where there's multiple probes and multiple goals. Something as simple as 'there's only one preverbal focus slot' won't quite work for the cases we just looked at.

(78)   **Multiple *wh*-phrases may co-occur**

   a. *vin   ras   qidulobs*
     who what buys
     'Who is buying what?'   *Harris (1981)*

   b. *Nork.ERG zer   erranen du*
     who.ERG what say.FUT AUX
     'Who will say what?'   *Hualde & de Urbina (2003)*

- Two repairs attested: right-dislocate the focused element…

(79) *Vin   muša-ob-s*   (FOC) (C) *mxolod k'vira-s*
   who.NOM work-SF-PRS.3SG   only   Sunday-DAT
   'Who works only on Sundays?'   *Borise & Polinsky (2017)*
   nork   eriso dio (FOC) (C) <u>*mireni*</u> *libura*
   who.ERG buy AUX   M.DAT book
   Who bought <u>Mary</u> the book?   *Hualde & de Urbina (2003)*

   a. **Minimal domain for XP$_{foc}$:**
     FOC C XP$_{FOC}$

   b. **Minimal domain for XP$_{wh}$:**
     XP$_{wh}$ V FOC C

   – Why?

   – This configuration allows two domains to be created, which don't overlap in a way which is problematic for Relationship Preservation.

- – The element rendered Contiguity-prominent in one domain is not part of the other domain, so no violation of Relationship Preservation occurs.
- – The prominence relationships of the elements in the overlapping span of the sentence are not altered by the creation of a second domain—these elements do not become more prominent in the second domain—so Relationship Preservation is satisfied.

- And a side note here: the scopal properties of right-dislocation in Basque and Georgian are again dissimilar:

  - – In Georgian it's reported (Borise & Polinsky, 2017) that right-dislocation forces a particularly high interpretation in contrast to that element appearing in a pre-verbal position.
  - – In Basque the opposite is reported (Arregi, 2002): right-dislocated elements are interpreted as if they were in their 'base' position.
  - – Suggesting that the repair in (79) is not generally tied to scope.

… or (only attested in Georgian) cleft.

(80) [*Romeli ist'oria*   *aris* (FOC) (C)] [*romeli-c*   *bič'-ma-c*   *ki'*   *c'aik'itxa*
      which story.ABS is   which-PRT boy-ERG-also even read
      (FOC) (C)]
      'Which story was it that even the boy read?'   *Borise & Polinsky (2017)*

  - – Why?
  - – The domains for XP_{foc} and XP_{wh} don't overlap at all (80). Relationship Preservation is satisfied.

☞ **Languages that differ in where they place prominence react to the configuration differently. The reaction for similar languages may be the same, even if the scope-related properties of the reaction differ.**

3.2 Languages with differences in domain marking

- Part of the theory offered here relies on the notions of 'domain' and 'domain marking'. As mentioned earlier, a lot (all?) of the languages examined here overtly mark domains—they render all elements other than the left or rightmost non-prominent.

- Expectation: languages that don't overtly mark domains in this way might behave differently in terms of whether or not they display the effect.

3.2.1 Egyptian Arabic

- Egyptian Arabic is SVO, with island insensitive *wh*-in-situ.

(81) **Egyptian Arabic *wh*-in-situ is comparable to Japanese and Korean *wh*-in-situ**

    a. *ʔinta ʔaabilt*   *ʔil-bint illi ʔitgawwizit*   *miin*
        you   met.2sgmas the-girl that married.3sgfem who

        "Who$_i$ did you meet the girl that got married to him$_i$?"

    b. *ʔinta suft*   *ʔahmad wi miin fi ʔil-haflah*
        you   saw.2sgmas Ahmad and who at the-party

        "Who$_i$ did you see Ahmad and him$_i$ at the party?"   Soltan (2012)

- It consistently lacks the intervention effect.

(82) **Egyptian Arabic consistently lacks the effect**

    a. *mahammad bas ha-yiʔaabil*   *miin?*
        Mohammad only FUT-meet.3sgmas who

        "Who will only Mohammed meet?"

    b. *mahammad barDUh ha-yiʔaabil*   *miin?*
        Mohammad also   FUT-meet.3sgmas who

   "Who will also Mohammed meet?"   Soltan (2012)

- In Egyptian Arabic, each non-functional word is associated with a pitch accent, as demonstrated in (83). The final word in a sentence is generally realized with a much lower pitch accent than would be expected.

(83)   a. *maama biti9allim yunaani bi-l-layl*
       Mum   learns   Greek   in-the-night

       'Mum is learning Greek in the evening.'   *Hellmuth (2007)*

    b.
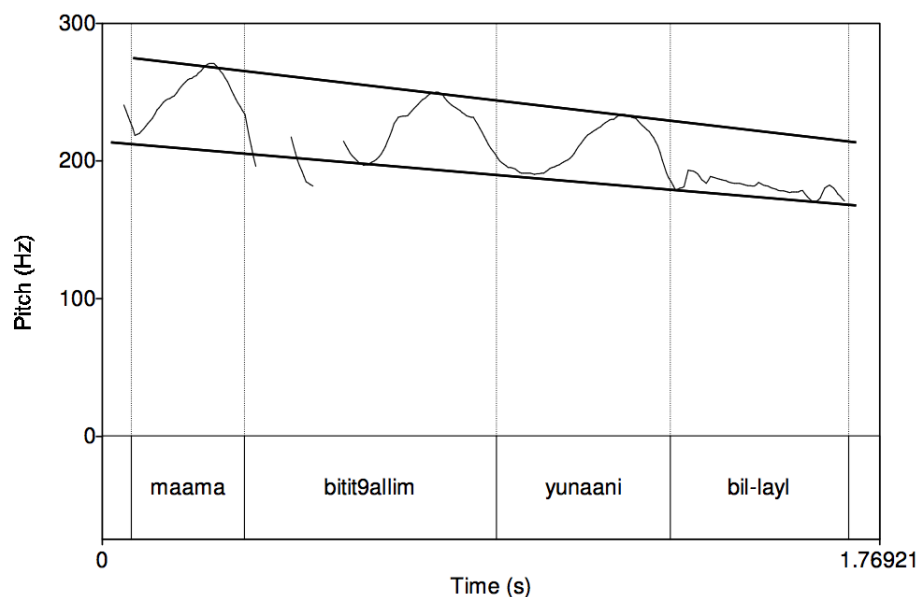
- Hellmuth (2009, 2011) performed a series of production experiments targeting narrow focus on a variety of constituents. The key finding is that Egyptian Arabic consistently fails to trigger a sort of post-focal deaccenting comparable to Japanese.

- As reported in Chahal & Hellmuth (2014), *wh*-phrases likewise fail to trigger any sort of post-focal deaccenting.

- This is what we might expect under the theory developed here: Egyptian Arabic differs from the languages previously investigated in terms of what it does with its domains. In Egyptian Arabic, domains are created within which goals are determined to be Contiguity-prominent; but no other prominence relationships in that domain are affected. As a result of this, no problems for Relationship Preservation will arise, regardless of the relative configuration of probes and goals in the language.

- This contrasts with (among other languages) Japanese and Korean. There, not only do goals become prominent in their domain, but it is furthermore established that all other XPs in the domain lack prominence. Since the prominence relationships of all elements in a domain are altered, problems for Relationship Preservation may potentially arise.

3.2.2 Amharic

- Amharic is an SOV language with island-insensitive *wh*-in-situ, like the other languages we have looked at.

(84) **Island-insensitive wh-in-situ in Amharic**

    a.   * *lä-man*   *haile*   *astämari-w*   *yä-sät't'-ä-w-ən*   *mäs'haf*
         to-who   Haile   teacher-DEF   REL-give.PER-3MS-DEF-ACC   book
         anäbbäb-ä?
         read.PER-3MS

    b.   *haile*   *astämari-w*   *lä-man*   *yä-sät't'-ä-w-ən*   *mäs'haf*
         Haile   teacher-DEF   to-who   REL-give.PER-3MS-DEF-ACC   book
         anäbbäb-ä?
         read.PER-3MS

         'Who is the person x such that Haile read the book that the teacher gave to x?'   *Eilam (2011)*

- It lacks the intervention effect.[6]

(85) **No intervention in Amharic**

    a.   *haile-mm ənkwan mən anäbbäb-ä*
         H.-FOC   only   what read.PER-3MS
         'What did only Haile read?'   *Eilam (2011)*

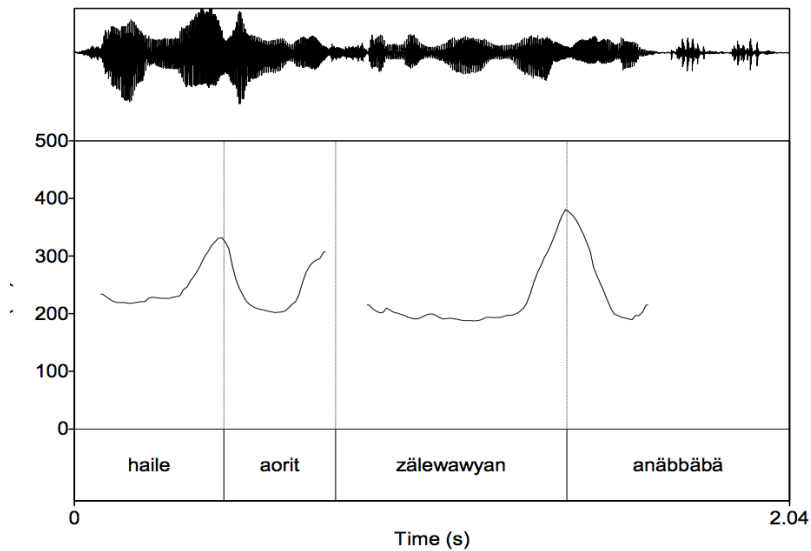[6] See Eilam (2008) for many more examples.

- Recall that one of our tests for prosodic activity involved the relative prominence of lexical elements in a DP. As we see in (86), this suggests that Amharic is a right-active language.

(86) a. *haile aorit zälewawyan anäbbäb-ä*
     H.   book Leviticus   read.PER-3MS

   'Haile read the Book of Leviticus' *Eilam (2011)*

    b.

- Amharic differs from the languages we have investigated in the previous section, and is similar to Egyptian Arabic. Eilam (2011) shows that the pitch peaks associated with the right edge of phonological phrases in Amharic are still present after a focused element, as we see in (87).

(87) a. *haile-mm ənkwan aorit zälewawyan anäbbäb-ä*
     H.-FOC   only   book Leviticus   read.PER-3MS

     'Only Haile read the Book of Leviticus'   *Eilam (2011)*
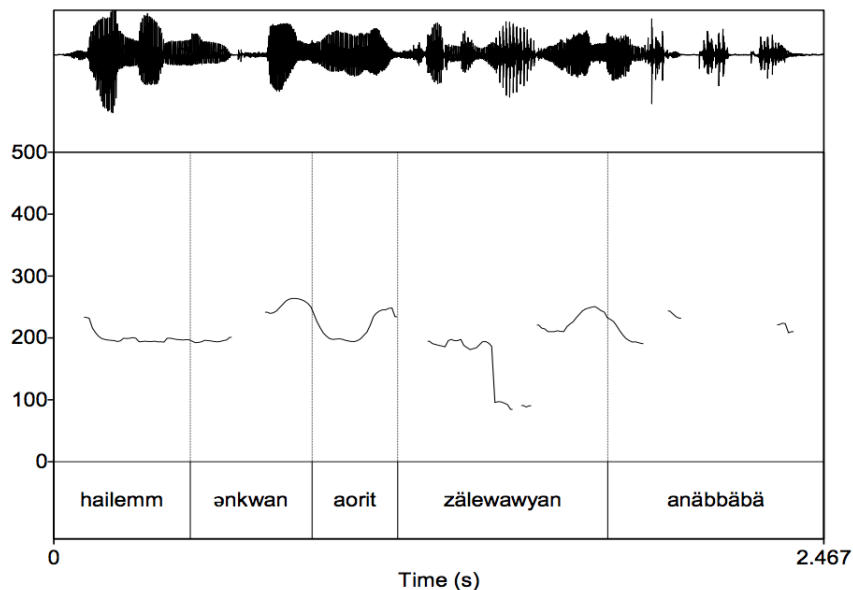
- An explanation: the lack of domain marking tells us that Amharic is like Egyptian Arabic, and unlike Japanese and Korean, in that the domain created to license focused elements only establishes that the focused element is prominent with respect to other elements in that domain. But the other elements in that domain are not determined to lack prominence.

- NPIs differ from other potential interveners in that they actually intervene—and the repair, clefting, is like Georgian, another right-headed, right-active languagea we looked at before.

(88) a. * *mannəmm mən   al-anäbbäb-ä-mm*
        anyone   what NEG-read.PER-3MS-NEG

        'What did no one read?'

    b. * *mən mannəmm al-anäbbäb-ä-mm*

        'What did no one read?'

    c. *məndən näw   mannəmm y-al-anäbbäb-ä-w?*
       what   COP.3MS anyone   REL-NEG-read.PER-3MS-DEF

       'What is it that no one read?'   *Eilam (2011)*

- Eilam (2011) notes that the presence of NPIs in the clause does affect prosodic phrasing in a way comparable to that demonstrated in Georgian—although the pitch track provided is for a sentence that, unfortunately for us, is judged to be degraded.

☞ **The upshot: whether or not a lexical item will count as an intervener is determined at least in part by the effect it has on the prosody of a sentence.**

34

3.2.3 Mongolian

- Mongolian is a canonically SOV language with island insensitive *wh*-in-situ. As we saw earlier, it appears to be a left active language.

- Reminder: this is what a 'broad focus' or 'out of the blue' utterance in Mongolian looks like. Note the marked decline in the relative height of the pitch peaks throughout the clause.

(89) **Transitive Mongolian sentence**

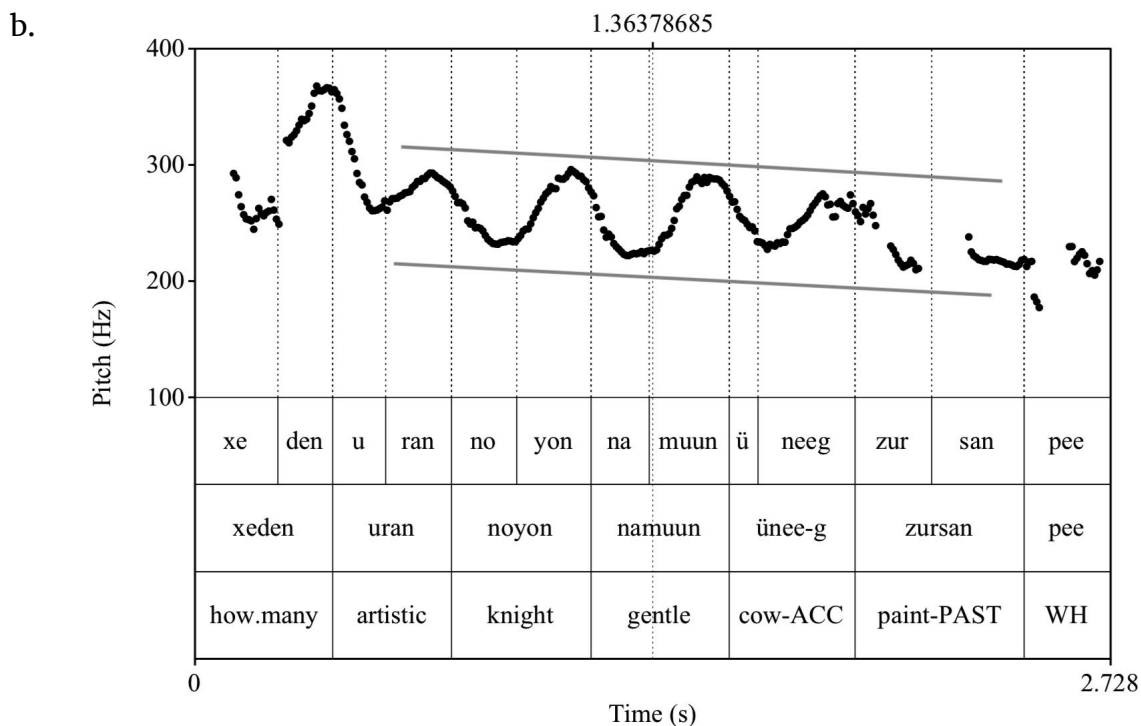   a. *uran   noyon namuun ünee-g   zur-san*
       artistic knight gentle   cow-acc paint-PST
   'The artistic knight painted the gentle cow.'
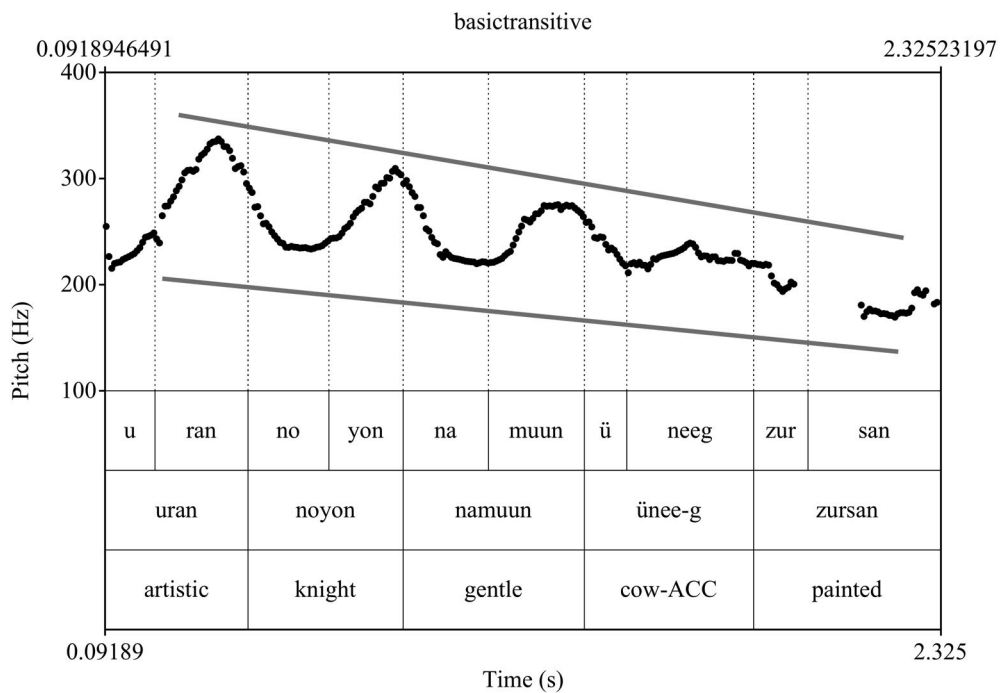
- *Wh*-questions in Mongolian are like Japanese in that the domain is overtly marked. Everything following the *wh*-phrase is realized in a relatively monotonic way: the relative height of pitch peaks throughout the clause is roughly the same.

(90) **wh-questions display overt domain marking**

    a. *xeden   uran   noyon   namuun ünee-g   zursan bee*
       how.many artistic knights gentle   cow-ACC paint   Q
       'How many artistic knights painted the gentle cow?'

    b.

xe	den	u	ran	no	yon	na	muun	ü	neeg	zur	san	pee
xeden		uran		noyon		namuun		ünee-g		zursan		pee
how.many		artistic		knight		gentle		cow-ACC		paint-PAST		WH

    c. *xeden   namuun ünee-g   uran   noyon zursan bee*
       how.many gentle   cow-ACC artistic knight drew   Q
       'How many gentle cows did the artistic knight draw?'

    d.

xe	den	na	muun	ü	neeg	u	ran	no	yon	zur	san	be
xeden		namuun		ünee-g		uran		noyon		zursan		be
how.many		gentle		cow-ACC		artistic		knight		drew		WH

36
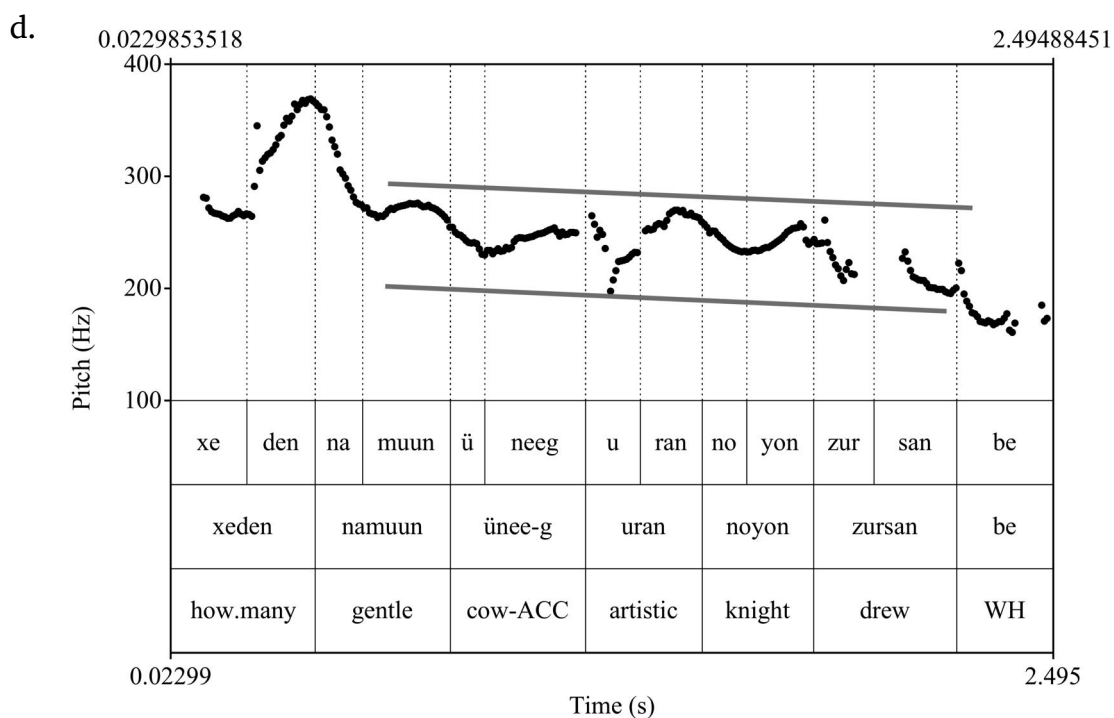
- Unlike Japanese, not all focus sensitive operators intervene in Mongolian. An explanation: some operators form domains in which everything but the goal is determined to lack prominence. Other operators form domains in which the goal is determined to be prominent (but do nothing to everything else in the domain).

- There is a prosodic difference between the following two elements: *xürtel* creates a flat domain following it, but *zövxöng* does not. There is a marked difference, for instance, between *namuun* and *ünee-g* in terms of their relative pitch accent in (91a), but not in (91b). The ratio between the two is only 1.02 in the first case, but 1.15 in the second.

(91) a.

0.00434671776   3.42952793

u	ran	no	yon	xür	tel	na	muun	ü	neeg	zur	tak	bai	san
uran		noyon		xürtel		namuun		ünee-g		zurtak		baisan	
artistic		knight		even		gentle		cow-ACC		drew		was	

0.004347   3.43

Time (s)

b.

subjectonly

0.0487612205   2.84458725

zöv	xön	u	ran	no	yon	na	muun	ü	neeg	zur	tak
zövxön		uran		noyon		namuun		ünee-g		zurtak	
only		artistic		knight		gentle		cow-ACC		draw-	

0.04876   2.845

Time (s)

37
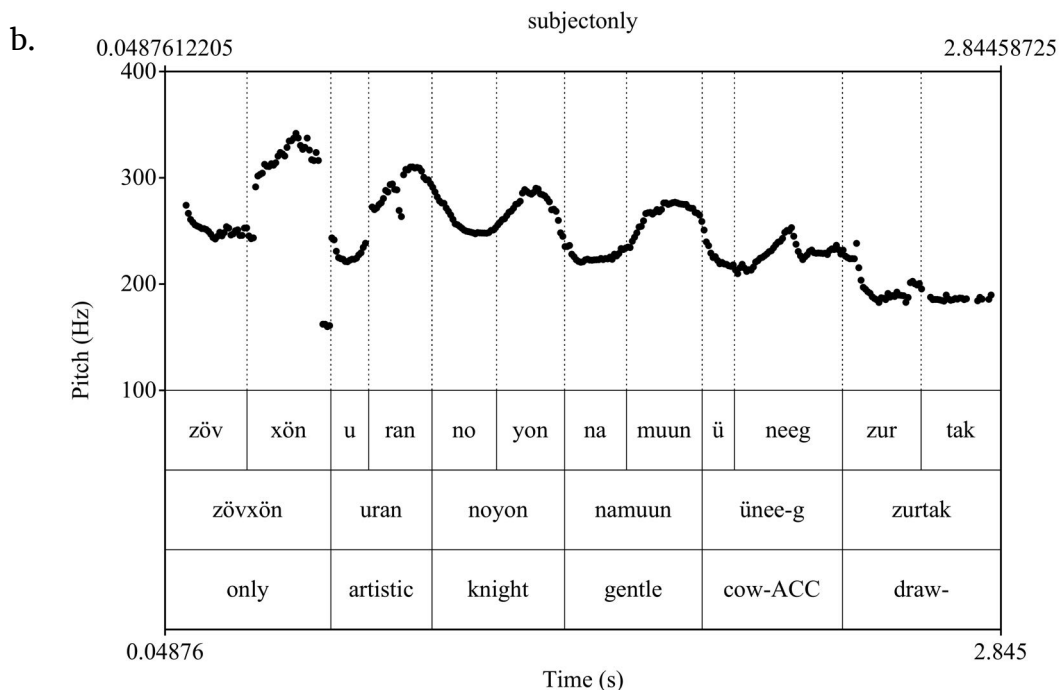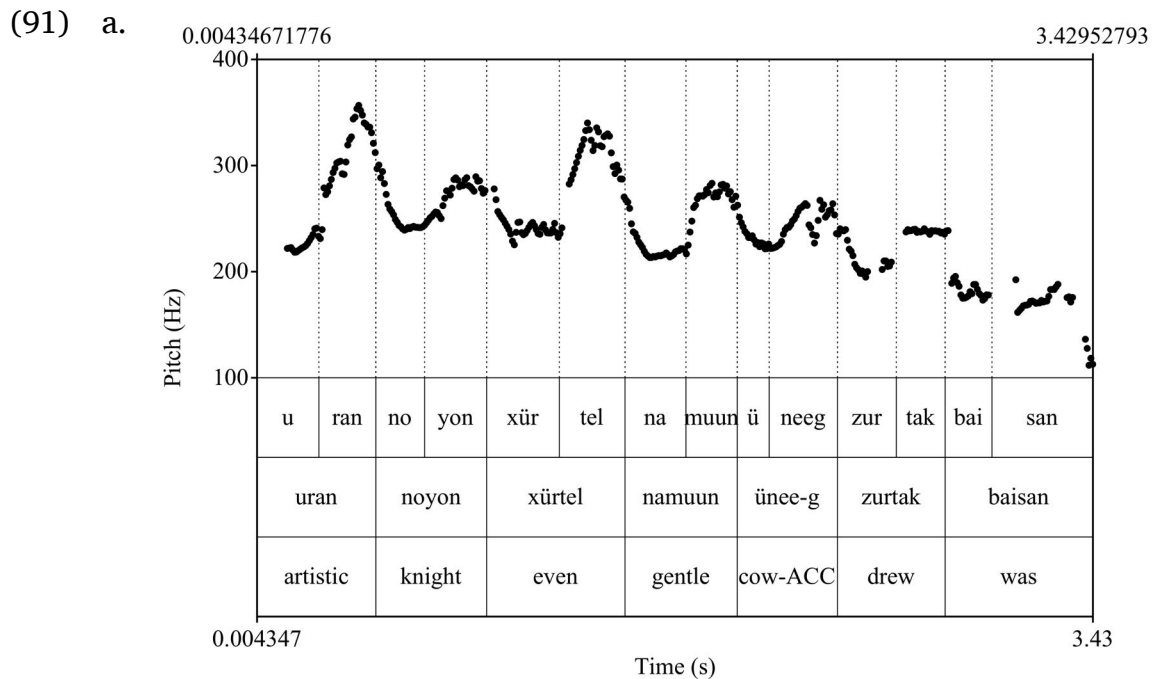
(92) **Not all focus sensitive particles intervene in Mongolian**

    a. *_uran_   _noyon xürtel yamar ünee-g_   _zursan bee_
        artistic knight even what cow-ACC paint Q

        'What cow did even the artistic knight paint?'

    b. _zövxöng uran_   _noyon yamar ünee-g_   _zursan bee_
        only   artistic knight what cow-ACC paint Q

        'What cow did only the artistic knight draw?'

- (92a) is out for the same reason as a similar sentence in Japanese: _xürtel_ forces all of the elements that follow it to become non-prominent. Making the _wh_-phrase prominent later in the derivation contradicts this previously established statement.

- (92b) is acceptable because _zövxöng_ does not render elements that follow it non-prominent.

    – (Step 1): The structure is first built to include _zövxöng uran noyon_ and it's licenser. Contiguity between the two is established by making _zövxöng uran noyon_ the most prominent in its domain—but the relative statements of prominence between _zövxöng uran noyon_ and the elements that follow it are not altered.

    – (Step 2): Later, the structure is built to include C, which Agrees with the _wh_-element. The _wh_-element is then established to be more prominent than anything following it. This doesn't contradict anything you did in step 1.

- Now, note that scrambling doesn't alter scope in Mongolian.

(93) **Scrambling does not alter scope in Mongolian**

    a. _Tere rali-du yamar nige kümün kümün büküin-i qara-jai_
        that rally-at someone-NOM   everyone-ACC see-PST

        'Someone saw everyone at the rally.' $*\forall > \exists$

    b. _Tere rali-du kümün büküin-i yamar nige kümün qara-jai_
        that rally-at everyone-ACC someone-NOM   see-PST

        'Someone saw everyone at the rally.' $*\forall > \exists$

                                                  Bao et. al (2015)

- Nevertheless, scrambling of the _wh_-phrase for a sentence like (92) repairs the effect.

(94) _yamar ünee-g   uran   noyon xürtel zursan bee_
     what cow-ACC artistic knight even paint Q

     'What cow did even the artistic knight paint?'

☞ **The upshot: whether or not something overtly marks a domain—at least in languages that have overt domain marking in some corner—will tell you whether or not it will count as an intervener.**

3.3 Intervention in multiple questions

- In some languages (like German), wh-in-situ arises only in multiple questions. And only there can we find an intervention effect.

(95) a. *Wer hat alle Bücher wo   gekauft?*
       who has all   books   where bought
       'Who bought all (the) books where?'

      b. * *Wer hat kein Buch wo   gekauft?*
          who has no   book where bought
          'Who bought no book where?'   *Grohmann (2003)*

- Recall: the length test (and facts about pied-piping) suggested that German was a left active language in ϕ.

- Following a proposal by Verena Hehl: in-situ *wh*-phrases in German are trying to become prominent in the German ι, in which prominence falls on the right.

- An observation: words like *kein* don't seem to affect the intonation of sentences they're in.

  - In this way, they're like the non-interveners in Egyptian Arabic, Amharic, and Mongolian.
  - And, (unlike foci and negative quantifiers in Japanese, as we saw earlier), they freely co-occur.

- An observation by Wang & Féry (2018): sentences with multiple foci in German do trigger some sort of marking of the span of the sentence between the two foci: all elements between the two are subject to extreme pitch compression. This description is consistent with the description of the prosody of German multiple *wh*-questions from Truckenbrodt (2012).

- German looks a lot like Mongolian—the potential intervener doesn't mark its domain, but the in-situ *wh*-phrase does—but German behaves differently, as we get the effect. What's going on?

- The insight: heads in the configuration in German are not uniformly head-final. Crossing domains of the sort in (96) place the prominent part of one domain in a 'can't be prominent' part of another.

(96) * *Wer hat kein Buch wo   gekauft NEG*
       who has no   book where bought
       'Who bought no book where?'   *Grohmann (2003)*

- In (97), a domain has been created in which *kein Buch* is Contiguity-prominent. Unlike, say, Japanese or Korean, no further statements about the lack of prominence of other elements in the domain have been created.

(97) *kein Buch wo   gekauft NEG*
      has no   book where bought

- Once the rest of the sentence has been constructed, a domain must be created in which *wo* is Contiguity prominent. In this domain, all elements that are not the *wh*-phrase have been determined not to be Contiguity-prominent, and the *wh*-phrase has been determined to be Contiguity-prominent.

(98) * *Wer hat kein Buch wo   gekauft NEG*
      who has no   book where bought

      'Who bought no book where?'   *Grohmann (2003)*

  - In (98), constructing the new domain for *wo* places some (but not all) of the domain for the negative quantifier in part of the sentence that is determined to lack Contiguity-prominence.
  - This ends up violating Relationship Preservation: at the stage of the derivation in (98), *kein buch* was determined to be Contiguity-prominent with respect to *wo*, so it cannot later be determined to lack prominence with respect to *wo*, as would happen in this configuration.

- Scrambling the *wh*-phrase fixes the problem: the domains no longer overlap.

(99) *Wer hat wo   kein Buch gekauft NEG*
      who has where no   book bought

      'Who bought no book where?'   *Grohmann (2003)*

- The difference between German and Mongolian is a result of the direction in which the prominence-altering domain is created:

  - In Mongolian—which lacks the effect—the Contiguity-prominent goal in the earlier, non-prominence altering domain is not placed in prominence-altering domain created to license the *wh*-phrase. No conflict arises.
  - In German—which has the effect—the Contiguity-prominent goal in the earlier, non-prominence altering domain *is* placed in a prominence-altering domain created to license the *wh*-phrase.

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Appendix A: Statistics

Here are the statistics for the three experiments described above (the Pitch experiment, the Length experiment, and the ιP-Prominence experiement).
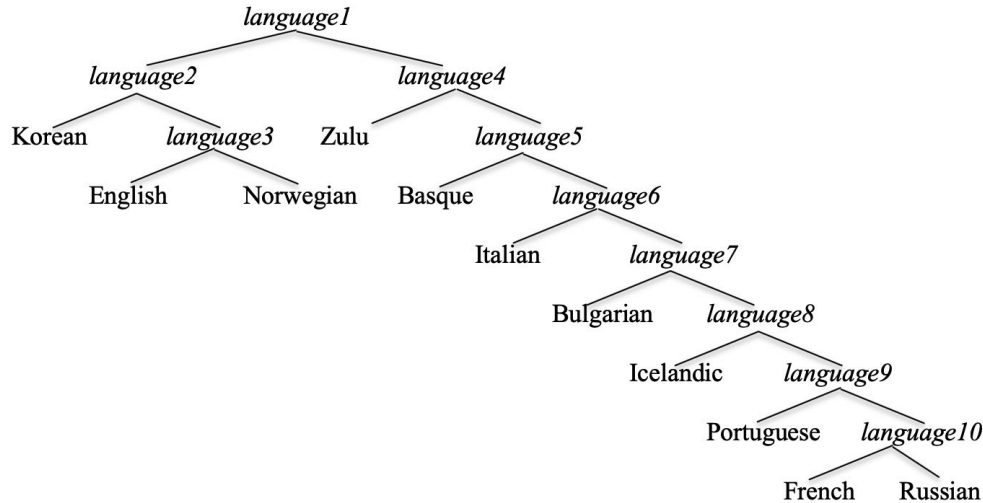
Pitch

- I've tried to use R to verify that the difference in the Pitch experiment is statistically significant.[7]

- I used the following model:

(100)   ratio $\sim$position $*$ language $+$ (1 $+$ position $\mid$ speaker)

- Here we are asking R to predict the ratio between the pitch peaks of the first and second content words of these noun phrases, using as fixed effects *position* (whether the DP is a subject or an object) and *language*, with random slopes by position and speaker (to account for differences between speakers).

- I used a user-defined coding to effectively tell R that the languages come in two groups, and to ask it whether those groups are statistically significantly different from each other, and whether there are statistically significant differences between the languages in the groups.

- In effect, I am telling R to divide languages into the following tree, and to tell me how statistically significant the divisions between sisters in the tree are. R gives names to each pair of sisters:

---

[7]I know very little about R. Thanks to Adam Albright for helping me with what I'm about to show you.

43

languagel

language2   language4

Korean   language3   Zulu   language5

English   Norwegian   Basque   language6

Italian   language7

Bulgarian   language8

Icelandic   language9

Portuguese   language10

French   Russian

(101)

- So, for example, language1 is the difference between the two groups of languages described above: Norwegian, Korean, and English on the one hand, versus all the rest of them. language4 is the difference between Zulu and the other languages in the right-hand group.

- The languages are ordered in (101) by their average ratios, given in the table in (10). By ordering them this way, we are asking R, for example, whether Zulu, which has one of the largest pitch ratios in the Right-prominent languages, really belongs in the Right-prominent group.

- Here's what R reports for the fixed effects:

(102)

	Estimate	Std. Error	df	t value	p	
(Intercept)	1.059478	0.011909	35.460000	88.966	< 2e-16	***
position1	-0.005453	0.007522	42.370000	-0.725	0.472475	
language1	0.017314	0.002486	37.490000	6.965	2.94e-08	***
language2	-0.025386	0.028941	35.090000	-0.877	0.386369	
language3	-0.014661	0.034607	44.990000	-0.424	0.673845	
language4	0.052429	0.031826	32.700000	1.647	0.109055	
language5	0.043576	0.039025	45.520000	1.117	0.270017	
language6	0.036882	0.025924	34.080000	1.423	0.163922	
language7	0.022751	0.035994	33.050000	0.632	0.531676	
language8	-0.010755	0.027544	33.520000	-0.390	0.698659	
language9	-0.058368	0.025155	36.460000	-2.320	0.026030	*
language10	-0.142182	0.035853	32.540000	-3.966	0.000377	***
language1:position1	0.003142	0.001603	47.340000	1.960	0.055947	.
language2:position1	-0.062971	0.018169	38.990000	-3.466	0.001301	**
language3:position1	0.020295	0.023709	67.070000	0.856	0.395046	
language4:position1	0.016215	0.019481	35.590000	0.832	0.410743	
language5:position1	-0.002350	0.026767	76.420000	-0.088	0.930266	
language6:position1	-0.009794	0.016136	39.510000	-0.607	0.547337	
language7:position1	-0.001671	0.022179	36.940000	-0.075	0.940346	
language8:position1	-0.010738	0.016717	28.700000	-0.642	0.525740	
language9:position1	-0.008125	0.016062	46.690000	-0.506	0.615341	
language10:position1	0.079359	0.021895	35.140000	3.625	0.000907	***

- *position1* is the effect of position, abstracting away from particular languages. This effect is not large enough to be statistically significant (though some languages do

have statistically significant interactions with position).

- The *language* lines are the effect of the divisions between languages in the tree in (101), abstracting away from the effects of position. *language1*, the division between the two kinds of languages I described above, is very statistically significant: p < .0000001.

- *language9* and *language10* are also statistically significant: French and (especially) Russian are extremely Right-prominent.

- The special status of Russian is partly driven by the special behavior of Russian subjects, which have unusually high pitch peaks on the nouns, and therefore unusually low ratios (the ratio for Russian objects is 0.93, and the ratio for Russian subjects is 0.8). This is signalled in (61) by the significant interaction between *language10* and *position1*, which demonstrates that Russian treats subjects and objects differently to an unusual degree. We could interpret the data, then, as reflecting a basic split between Right-prominent and Left-prominent languages, together with another factor affecting Russian subjects, possibly having something to do with information structure.

Length

- Asking R whether it is legitimate to regard the Length data as reflecting two kinds of languages:

(103) ratio $\sim$position $*$ language $+$ (1 $+$ position | speaker)

(104)

	Estimate	Std. Error	df	t value	p
(Intercept)	0.882538	0.024487	5.750000	36.041	5.42e-08 ***
language1	0.042810	0.009714	5.960000	4.407	0.00461 **
language2	-0.001674	0.035326	6.520000	-0.047	0.96362
language3	-0.002427	0.044784	5.330000	-0.054	0.95875
language4	-0.075651	0.053854	5.300000	-1.405	0.21587
position1	0.007696	0.015726	60.850000	0.489	0.62635
language1:position1	0.005770	0.006319	64.330000	0.913	0.36460
language2:position1	0.014254	0.023674	72.880000	0.602	0.54898
language3:position1	0.044883	0.027960	53.710000	1.605	0.11431
language4:position1	-0.003668	0.033551	53.200000	-0.109	0.91334

- Again, *language1* ("are there two groups of languages?") is significant (p < .01), and neither of the other two *language* factors is (and neither is *position*). The analysis confirms that English and German are Left-prominent, while Italian, Russian, and Portuguese are Right-prominent.

ι-Prominence

- Looking at the ratio between the fronted adverbial and the direct object:

(105)

	Estimate	Std. Error	df	t value	p	
(Intercept)	1.283817	0.033015	21.275000	38.886	<2e-16	***
language1	0.028703	0.009291	21.577000	3.089	0.00544	**
language2	-0.013021	0.065736	20.477000	-0.198	0.84494	
language3	-0.016183	0.055233	21.802000	-0.293	0.77229	
language4	0.014926	0.060232	21.627000	0.248	0.80662	
language5	-0.024515	0.112511	19.619000	-0.218	0.82976	
language6	-0.050210	0.075743	20.204000	-0.663	0.51488	

- So, again, there is a term *language1* that is statistically significant, dividing Italian, Bulgarian and Russian, on the one hand, from Portuguese, French, Zulu, and Icelandic, on the other.

Appendix B: Why isn't German in the Pitch study?

- Figuring out where to measure the highest peak in a word sometimes requires some analysis. All of the Norwegian examples, for example, have pitch peaks on their first syllables, which are stressed. Some of them also have a high boundary tone at the end of the NP:

(106)
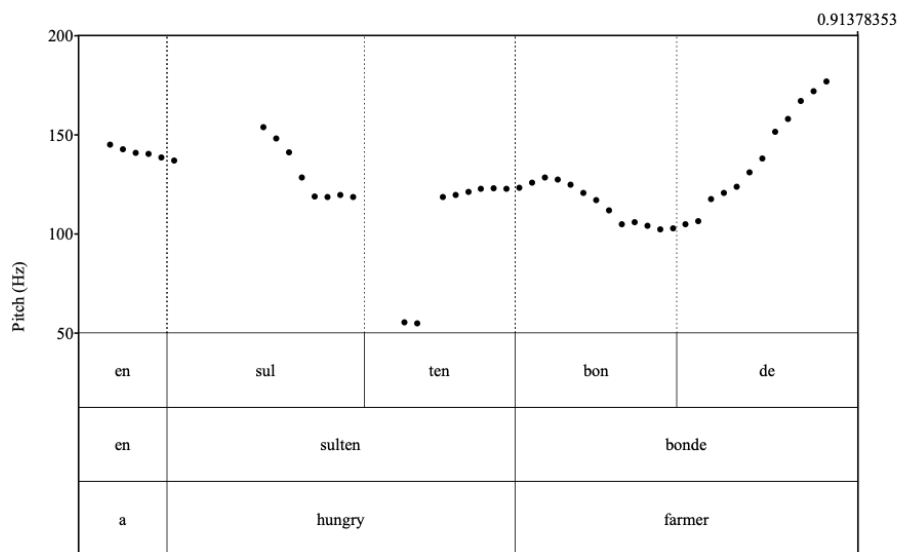
- It's important not to include the examples with boundary tones (roughly half of the data).

- An alternative, which I tried, was just ignoring the boundary tone, and measuring the height of the pitch peak on the stressed syllable. But it turns out that these pitch peaks are significantly higher when there is a following boundary tone.

- In German examples that make it possible to detect boundary tones[8], boundary tones are present, in the data I've got, about 5/6 of the time:

---

[8]There are also data in which it is not possible to determine whether boundary tones are present–e.g., *schwangere Vampir* 'pregnant vampire', where *Vampir* has final stress.

(107)
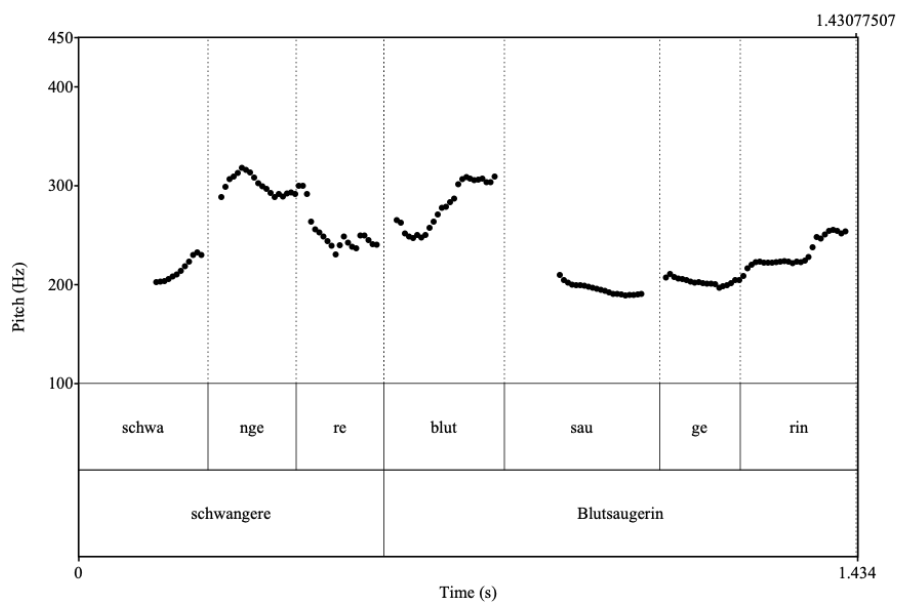
- Here *Blutsaugerin* 'vampire (fem)' has two pitch peaks, one on the stressed initial syllable, and then another boundary tone at the end. To be consistent with the strategy used for Norwegian, I would have to throw these data out...and they turn out to be most of the German pitch data. This is why German is in the Length study but not in the Pitch study.

- Possible ways of dealing with the German pitch problem include:

    – coming up with some way to compensate for boundary tones

    – coming up with some way to convince Germans not to use boundary tones

    – coming up with a different test (e.g., the Length test).