

# A prosodic perspective on syntactic phenomena adjacency

Mark Liberman & Martin Salzmann

UPenn  
msalzm@ling.upenn.edu

Ling 620 2021A  
April 2, 2021

## Shift in perspective

- So far, we have mainly looked at prosodic phenomena where it seemed useful to take syntactic structure into account
- today, we will look at syntactic phenomena which can arguably be better understood if prosody is taken into account

# Overview

- 1 That-trace effects
- 2 Extraposition constrained by adjacency
- 3 Impoverishment within prosodic domains
- 4 References

# The challenge 1

- Long extraction of subjects is in principle possible, but barred across an overt complementizer:
  - (1) Who did you say (\*that) \_\_\_ wrote the book?
- objects and adjuncts do not display this restriction:
  - (2) a. What did you say (that) Peter bought \_\_\_?
  - b. How did you say (that) Peter \_\_\_ solved the problem?
- we find an unnatural natural class here – why would objects and adjuncts pattern alike, to the exclusion of subjects?
- why should the overtness of the complementizer be relevant?
- the effect has led to a significant complication of the grammar in the syntactic literature of the 80ies
- currently, anti-locality-based accounts are popular, but they largely restate the facts (don't move from Spec,TP to Spec,CP)

## The challenge 2

- conversely, *that* is obligatory in matrix subject-relative clauses and clefts:
  - (3) a. the man \*(that) \_\_\_ wrote the book
  - b. It's my cousin \*(that) \_\_\_ wrote the book
- empirical aspects
  - ▶ cross-linguistically variable effect, inexistent in many languages
  - ▶ a lot of variation, e.g., within English
  - ▶ not the signature of a classical movement constraint

## Facts suggesting a role for prosody

- that-trace effects are mitigated if the complementizer is reduced
  - (4) The author ~~that~~ the editor predicts \*that/?th't \_\_ will be adored
- canceled by ellipsis:
  - (5) John said that someone would write a new textbook, but I can't remember who ~~John said that~~ \_\_ would write a new textbook.
- mitigated by Right Node Raising:
  - (6)
    - a. Who does John doubt whether and Bill suspect that [\_\_ cheated on the exam]?
    - b. That's the president I've been hoping for and you've been petitioning for [\_\_ to be impeached].

## Facts suggesting a role for prosody 2

- ameliorated by intervening adverbs (adverb effect):
  - (7) a. Who do you think that **after years and years of cheating death** \_\_ finally died?
  - b. The author that the editor predicts that **for all intents and purposes** \_\_ will be adored?
  
- amelioration by intonation focus on the embedded verb:
  - (8) a. A: I didn't think that John would survive.  
B: Well then, who did you think that \_\_ WOULD?
  - b. ?Who do you think that \_\_ WROTE Barriers (as opposed to say, edited it)?
  - c. \*Who do you THINK that \_\_ wrote Barriers (as opposed to say, know)?

# Proposal

(9) that-trace filter (cf. Kandybowicz 2006)

\* <C, t> iff

- a. C and t are adjacent within a prosodic phrase AND
- b. C is aligned with a prosodic phrase boundary

- just a descriptive generalization, but not a bad one
- ellipsis: adjacency no longer relevant
- if C is not pronounced/omitted, the entire question is parsed as one intonation phrase:

(10) [<sub>iP</sub> Who did you claim \_\_ discovered Antarctica]?

- when C is overt, an intermediate phrase boundary divides the clauses; when C is reduced, no break:

(11) a. [<sub>iP</sub> Who do you think [<sub>intP</sub> that \_\_ wrote Barriers]]?  
 b. [<sub>iP</sub> Who do you think **th't** \_\_ wrote Barriers]?



## Proposal 2

- RNR'ed constituents and high adverbs parsed as a separate intonation phrase → trace and *that* in different domains
- (12) a. [<sub>intP</sub> Who does John doubt whether] [<sub>intP</sub> and Bill suspect that] \_\_ [<sub>iP</sub> cheated on the exam]?
- b. [<sub>intP</sub> Who do you think that] [<sub>iP</sub> for all intents and purposes] \_\_ [<sub>intP</sub> wrote Barriers]?
- focus on the embedded verb causes it to be parsed into a separate intP as well – C and trace no longer in the same domain, (13); no effect if focus is on different element, (14):
- (13) a. \* [<sub>intP</sub> Who did you say [<sub>intP</sub> that \_\_ wrote Barriers]]?
- b. [<sub>intP</sub> Who did you say that] \_\_ [<sub>intP</sub> WROTE Barriers]?
- (14) a. \* [<sub>intP</sub> Who did you say [<sub>intP</sub> that \_\_ wrote] [<sub>intP</sub> BARRIERS yesterday]]?
- b. \* [<sub>intP</sub> Who did you say [<sub>intP</sub> that \_\_ wrote Barriers] [<sub>intP</sub> YESTERDAY]]?

## Proposal 3

- in other languages one can find subject resumptives in such configurations, which also remove the *that*-trace violation

(15) lit.: Who did you say that **he** wrote Barriers?

- provides a handle on relative clauses and clefts: complementizer phrased together with head noun – that does not introduce a new domain

- (16)
- [<sub>iP</sub> The butler that \_\_\_ murdered the maid]  
(No intP boundary before C)
  - \*[<sub>iP</sub> The butler [<sub>intP</sub> that \_\_\_ murdered the maid]]  
(Non-restrictive RC only possible with *who*)
  - [<sub>iP</sub> It's the butler that \_\_\_ murdered the maid]  
(No intP boundary before C)

## Discussion

- it has been argued that only high adverbs have the amelioration effect, but low ones do not:
  - (17) a. Who<sub>1</sub> did John say that fortunately \_\_\_<sub>1</sub> ran to the store?
  - b. \*Who<sub>1</sub> did John say that \_\_\_<sub>1</sub> quickly ran to the store?
- this would be unexpected under a prosodic account unless the adverbs/adverbials also differ prosodically
- in Salzmann et al. (2013) we argue that that-trace effects are not so much about extraction but rather about the adjacency between *that* and the finite verb

# Overview

- 1 That-trace effects
- 2 Extraposition constrained by adjacency
- 3 Impoverishment within prosodic domains
- 4 References

## West-Germanic verb clusters

- Continental West-Germanic OV-languages: the verbal elements cluster at the end of the clause in subordinate clauses

(18) 321 *Standard German*

dass man darüber [reden<sub>3</sub> können<sub>2</sub> sollte<sub>1</sub>]  
 that one about.it talk.INF can.INF should.3SG  
 'that one should be able to talk about it'

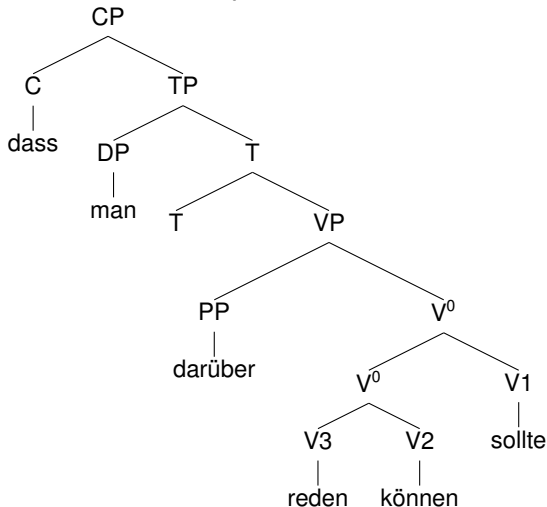
- in main clauses, the finite verb is fronted to the 2nd position (C):

(19) Man sollte<sub>1</sub> darüber schon [reden<sub>3</sub> können<sub>2</sub> t<sub>sollte</sub>].  
 one should about.it indeed talk.INF can.INF  
 'One should be able to talk about it.'

## West-Germanic verb cluster 2

- a popular approach (at some point): clause-finally, the verbal elements form a complex head:

(20)



## West-Germanic verb cluster 3

- motivation for a complex head-approach: the cluster is inseparable, extraposition to VP is not possible if this targets a position within the cluster:

(21) *Standard German*  
 dass man [VP<sub>1</sub> [VP<sub>1</sub> [VP<sub>2</sub> [VP<sub>2</sub> [VP<sub>3</sub> [VP<sub>3</sub> t<sub>darüber</sub> reden<sub>3</sub>]  
 that one talk.INF  
 \***darüber**] können<sub>2</sub>] \***darüber**] sollte<sub>1</sub>] **darüber**]  
 about.it can.INF about.it should about.it  
 ‘that one should be able to talk about it’

## West-Germanic verb cluster 4

- Problems for a complex head approach:
- ① under V2, only the finite verb moves, movement of the entire cluster is impossible – requires excorporation

(22) \*Man [reden<sub>3</sub> können<sub>2</sub> sollte<sub>1</sub>] darüber schon.  
 one talk.INF can.INF should about.it indeed  
 ‘One should be able to talk about it.’

- ② extraposition to a lower VP (e.g., VP3) is possible under VP-topicalization:

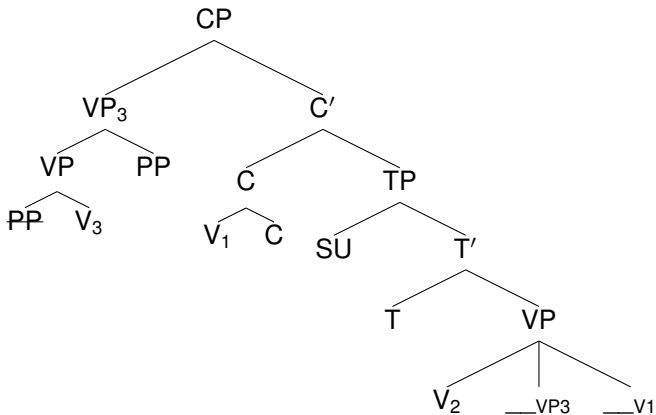
(23) [<sub>VP3</sub> [<sub>VP3</sub> t<sub>darüber</sub> reden<sub>3</sub>] **darüber**] sollte<sub>1</sub> man  
 talk.INF about.it should.3SG one  
 schon [<sub>VP1</sub> [<sub>VP2</sub> t<sub>VP3</sub> können<sub>2</sub>] t<sub>sollte</sub>]  
 indeed can.INF  
 ‘that one should be able to talk about it’



## West-Germanic verb cluster 5

- structure under topicalization of VP3:

(24)



## West-Germanic verb cluster 6

- Under complex head-formation, one runs into a movement paradox: V2-clauses cannot obviously be derived from V-final clauses since the constituency is different:
  - (25) a. V-final: verbs form a unit to the exclusion of the PP
  - b. verb second: V3 forms a unit with the PP to the exclusion of the other verbs
- to allow for verb second structures, one might assume that complex head-formation is optional
- but if it is assumed that complex-head formation is optional, one can no longer account for the impenetrability of the cluster in V-final clauses
- for more problems that arise under a complex head-approach, see Wurmbrand (2007)

## A prosodic solution

- Bobaljik & Wurmbrand (2005), Wurmbrand (2007):
  - ▶ in V-final clauses, all verbs are parsed into the same prosodic phrase
  - ▶ extraposition requires the extraposee to form its own prosodic phrase
  - ▶ if extraposition targets a position within the verb cluster, a prosodic constituent will be disrupted (perhaps even a layering violation)

(26)      dass man *t<sub>darüber</sub>* (V<sub>3</sub> \*PP V<sub>2</sub> \*PP V<sub>1</sub>) (PP)

- ▶ the result is felicitous if extraposition targets the edge of the verb cluster, in which case it can form its own prosodic constituent without disrupting the cluster
- ▶ extraposition under topicalization (movement to Spec,CP) is possible because material in Spec,CP is parsed into a separate prosodic domain

(27)      (V<sub>3</sub>) (PP) V<sub>1</sub> SU ... V<sub>2</sub>

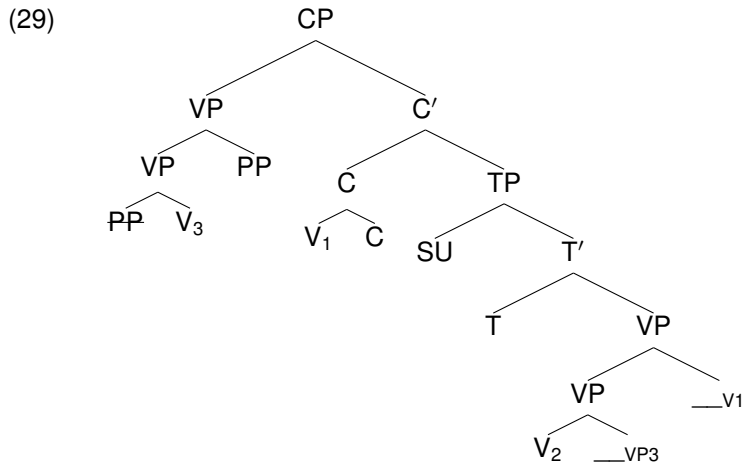
## Architectural questions

- Truckenbrodt builds the prosodic restriction into the extraposition rule
- Bobaljik & Wurmbrand (2005) instead argue that
  - ① extraposition is a purely syntactic operation that leaves copies
  - ② prosody becomes relevant at PF: pronunciation of copies is governed by PF well-formedness constraints

(28) that one **PP**<sub>i</sub> (V<sub>3</sub> \***PP**<sub>T</sub> V<sub>2</sub> V<sub>1</sub>)

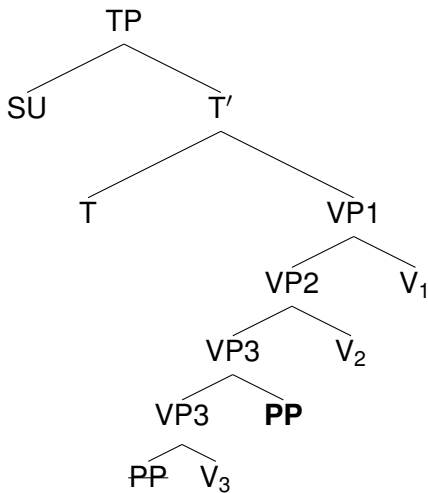
- under this approach, there is no complex head-formation but just stacked VPs → the movement paradox can be avoided

## Structure under VP-topicalization



## Structure under V-final

(30)



## Possible predictions and issues

- The prosodic approach tends to predict that extraposition may be possible if what you extrapose is very light
- however, even extraposition of monosyllabic PPs to a position between V2 and V1 leads to ungrammaticality:

(31) a. dass er \_\_\_<sub>i</sub> tänkt<sub>2</sub> hät<sub>1</sub> **draa**<sub>i</sub>  
 that he thought has it.at

b. \*dass er \_\_\_<sub>i</sub> tänkt<sub>2</sub> **draa**<sub>i</sub> hät<sub>1</sub>  
 that he thought it.at has  
 ‘that he thought of it’

*Swiss German*

- interestingly, the restriction only affects sequences of verbs but not A+V-sequences:

(32) a. dass er stolz isch **druf**  
 that he proud is it.on

b. dass er stolz **druf** isch  
 that he proud it.on is  
 ‘that he is proud of it’

# Overview

- 1 That-trace effects
- 2 Extraposition constrained by adjacency
- 3 Impoverishment within prosodic domains
- 4 References



## Allomorphy rules at PF

- current syntactic theory is ill-equipped to handle adjacency effects because, on most accounts, no linear order is established in syntax
- rather, linearization is a matter of the post-syntactic component
- phenomenon: morphological alternations in Dutch inflection that seem to be affected by linear order and adjacency
- Ackema & Neeleman (2003) propose that impoverishment rules (rules that delete features of syntactic terminals before vocabulary insertion) are sensitive to prosodic domains
- they thus posit an initial prosodic phrasing after linearization, which can be followed by impoverishment
- this tends to deviate from classical DM-approaches where phonology (and prosody) come in later

## Dutch agreement weakening

- in the 2nd singular, the full form ending in *-t* alternates with a form that only contains the stem (and thus is identical to the 1st singular)

(33) [CP dat [TP jij dagelijks met een hondje over straat **loop-t**]]  
 that you daily with a doggy in the.street walk-2sg  
 'that you walk with a doggy in the street every day'

(34) [CP Jij<sub>2</sub> [C' **loop-t**<sub>1</sub> \_\_\_<sub>2</sub> dagelijks met een hondje over straat  
 you walk-2sg daily with a doggy in the.street  
 \_\_\_<sub>1</sub>]]

(35) [CP Dagelijks<sub>2</sub> [C' **loop**<sub>1</sub> [TP jij \_\_\_<sub>2</sub> met een hondje over straat  
 daily walk you with a doggy in the.street  
 \_\_\_<sub>1</sub>]]]

# Phrasing

- It is assumed that phrasing in Dutch and English associates right edges of XPs with prosodic phrases

(36) {A friend of Mary's} {showed some pictures} {to John}.

- in Dutch verb-second clauses, the element in Spec,CP is phrased separately, while the verb in C is phrased together with the XP that follows it:

(37) a. {you} {walk daily} {with a doggie} {in the street}  
 b. {daily} {walk you} {with a doggie} {in the street}

## Verbal inflection and lateration

(38) VIs for verbal inflection

- a. [prt]  $\leftrightarrow$   $\emptyset$
- b. [Prt, Add]  $\leftrightarrow$  /-t/ (unclear how to prevent this in the plural)
- c. [pl]  $\leftrightarrow$  /-en/

(39) Weakening rule

{[V Prt **Add**] [D Prt Add]}  $\rightarrow$  {[V Prt] [D Prt Add]}

- the feature addressee is deleted in the context of a 2nd singular D-element, if both are within the same prosodic phrase
- Does not apply in SU-V sequences since the SU is phrased separately
- applies in inversion V-SU contexts given that the SU normally occurs in Spec,TP

## Adjacency

- The rule cannot apply if verb and subject are not within the same prosodic phrase, e.g., with fronted adverbials; we thus find the full form

(40) {Volgens mij} {**gaa**-\*(t)} op de heetste dag van 't jaar}  
 according.to me go-2sg on the hottest day of the year  
 {zelfs jij} {naar het park}  
 even you to the park

- no strict adjacency requirement: a modifier of the pronoun can intervene (assuming it does not insert a separate prosodic boundary):

(41) {Volgens mij} {**ga** zelfs jij} {op de heetste dag van 't jaar}  
 according.to me go even you on the hottest day of the  
 jaar} {naar het park}  
 year to the park

## Questions/Issues

- what prevents the rule from applying if a 2sg **object** is fronted to a position adjacent to the verb?

(42) {sometimes} like-? {you.acc} {even John}

- the rule would have to refer to case somehow to prevent this, but that may not be in the spirit of the approach (not the least since such alternations tend to affect subjects)
- perhaps, since such fronted objects would be contrastive, they would not form a unit with the verb ...
- they state (on p. 688) that impoverishment is only possible if the two elements stand in an agreement relationship, but this is not formally expressed in the rule

# References I

- Ackema, Peter & Ad Neeleman. 2003. Context-Sensitive Spell-Out. *Natural Language & Linguistic Theory* 21(4). 681–735.
- Bobaljik, Jonathan & Susanne Wurmbrand. 2005. Adjacency, PF, and extraposition. In Hans Broekhuis, Norbert Corver, Riny Huybregts, Ursula Kleinhenz & Jan Koster (eds.), *Organizing Grammar: Linguistic Studies in Honor of Henk van Riemsdijk*, 679–688. Berlin/New York: Mouton de Gruyter.
- Kandybowicz, Jason. 2006. Comp-Trace Effects Explained Away. *Proceedings of WCCFL 25*. 220–228.
- Salzmann, Martin, Jana Häussler, Markus Bader & Josef Bayer. 2013. That-trace effects without traces. An experimental investigation. *Proceedings of NELS 42*. 149–162.
- Wurmbrand, Susi. 2007. How Complex Are Complex Predicates? *Syntax* 10(3). 243–288.