JMORF/MORS — Morpho-Syntax

Raising and Control

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Lecture 11
Location: KB-1.11

Overview

- Introduction: two kinds of NP-V-(NP)-***to***-VP
- Infinitival ***to***
- Subject-raising verbs
- Subject-control verbs
- Raising and control in Transformational Grammar
- Object raising and object control
- Problems 12.1, 12.2, 12.4, 12.6

Introduction

Where We Are & Where We're Going

- Revision
  - In the last two lectures, we have seen a kind of **subject sharing** — that is, cases where one NP served as the SPR for two different verbs. Examples?
  - Last time, we looked at **dummy** NPs — that is, non-referential NPs. Examples?

- Today, we're going to look at the kind of subject sharing we saw with ***be*** in more detail.

- Then we'll look at another kind of subject sharing, using dummy NPs in differentiating the two kinds.

What Makes This Topic Different

- The phenomena we have looked at so far (**agreement**, **binding**, **imperatives**, **passives**, **existentials**, **extraposition**) are easy to pick out on the basis of their form alone.

- In this chapter, we look at constructions with the general form NP-V-(NP)-***to***-VP. It turns out that they divide into two kinds, differing in both syntactic and semantic properties.

The Central Idea

- *Pat continues to avoid conflict* and *Pat tries to avoid conflict* both have the form NP-V-***to***-VP
  - But ***continue*** is semantically a one-place predicate, expressing a property of a situation (namely, that it continues to be the case)
    continue(avoid(Pat,conflict))
  - Whereas ***try*** is semantically a two-place predicate, expressing a relation between someone who tries and a situation s/he tries to bring about.
    try(Pat, avoid(Pat, conflict))

- This semantic difference has syntactic effects.

Infinitival *to*

The Status of Infinitival *to*

- It's not obvious what part of speech to assign to ***to***.
- It's not the same as the preposition ***to***:

  (1) *Pat aspires to stardom.*
  (2) *Pat aspires to be a good actor.*
  (3) *?*Pat aspires to stardom and to be a good actor.*
  (4) **Pat aspires to stardom and be a good actor.*

- We call it an **auxiliary verb**, because this will make our analysis of auxiliaries a little simpler.

The Lexical Entry for Infinitival *to*

$$\left\langle \text{to}, \left[\begin{array}{ll} \text{SYN} & \left[\text{HEAD} \left[\begin{array}{ll} \text{FORM} & \textit{base} \\ \text{INF} & + \\ \text{AUX} & + \end{array}\right]\right] \\ \text{ARG-ST} & \left\langle \boxed{1}, \left[\begin{array}{ll} \text{HEAD} & \left[\begin{array}{ll} \textit{verb} & \\ \text{INF} & - \\ \text{FORM} & \textit{base} \end{array}\right] \\ \text{VAL} & \left[\begin{array}{ll} \text{SPR} & \langle \boxed{1} \rangle \\ \text{COMPS} & \langle\ \rangle \end{array}\right] \\ \text{SEM} & \left[\text{INDEX}\ \textit{s}\right] \end{array}\right] \right\rangle \\ \text{SEM} & \left[\begin{array}{ll} \text{INDEX} & \textit{s} \\ \text{RESTR} & \langle\rangle \end{array}\right] \end{array}\right] \right\rangle$$

The Syntax of Infinitival *to*

$$\begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{FORM} & \textit{base} \\ \text{INF} & + \\ \text{AUX} & + \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

- This makes it a verb, because AUX is declared on *verb*
- [INF +] uniquely identifies the infinitival ***to***
- Verbs select complements with different combinations of FORM and INF values, e.g.
  - complements of ***condescend*** are [FORM *base*] and [INF +]
  - complements of ***should*** are [FORM *base*] and [INF −]
  - complements of ***help*** are [FORM *base*]
- The meaning of [AUX +] becomes clear in Chapter 13

The Argument Structure

$$\left[\begin{array}{l}\text{ARG-ST}\ \left\langle \boxed{1}, \left[\begin{array}{ll}\text{HEAD} & \left[\begin{array}{ll}\textit{verb} & \\ \text{INF} & - \\ \text{FORM} & \textit{base}\end{array}\right] \\ \text{VAL} & \left[\begin{array}{ll}\text{SPR} & \left\langle \boxed{1} \right\rangle \\ \text{COMPS} & \left\langle\ \right\rangle\end{array}\right] \\ \text{SEM} & \left[\text{INDEX}\ \textit{s}\right]\end{array}\right] \right\rangle\end{array}\right]$$

- What kind of constituent is the second argument?
- The tagging of the first argument and the SPR of the second argument is exactly like ***be***.

The Semantics of Infinitival *to*

$$\begin{bmatrix} \text{ARG-ST} & \left\langle \boxed{1}, \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} \\ \text{INF} & - \\ \text{FORM} & \textit{base} \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \boxed{1} \rangle \\ \text{COMPS} & \langle\ \rangle \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \\ \text{RESTR} & \langle\rangle \end{bmatrix} \end{bmatrix}$$

- The INDEX value is taken from the SEM of the second argument.
- What is the semantic contribution of ***to***?

Subject-Raising Verbs

Dummies and *continue*

- Some examples:

  (5) *There continue to be seats available.*
  (6) *It continues to matter that we lost.*
  (7) *Advantage continues to be taken of the innocent.*
  (8) **It continues to be seats available.*
  (9) **There continues to matter that we lost.*
  (10) **Advantage continues to be kept of the innocent.*

- Generalization: Non-referential NPs can appear as the subject of ***continue*** just in case they could be the subject of the complement of ***continue***.

A New Type, for Verbs like *continue*

Subject-Raising Verb Lexeme (*srv-lxm*)

$$\begin{bmatrix} \text{ARG-ST} & \left\langle \boxed{1}, \begin{bmatrix} \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \boxed{1} \rangle \\ \text{COMPS} & \langle\ \rangle \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{SEM} & \left[\text{RESTR} \left\langle \left[\text{ARG} \ s \right] \right\rangle \right] \end{bmatrix}$$

- The subject sharing is just like for ***be*** and ***to***: the subject of ***continue*** is also the subject of its complement
- ***continue*** imposes no other constraints on its subject
- The index of the complement must be an argument of the predication introduced by the verb

The Lexical Entry for *continue*

$$\left\langle \text{continue}, \begin{bmatrix} \textit{srv-lxm} \\ \textsc{arg-st} & \langle \text{X}, \text{VP} \left[\textsc{inf}\ +\right] \rangle \\ \textsc{sem} & \begin{bmatrix} \textsc{index} & s_1 \\ \textsc{restr} & \left\langle \begin{bmatrix} \textsc{reln} & \textbf{\textit{continue}} \\ \textsc{sit} & s_1 \end{bmatrix} \right\rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

continue with Inherited Information

$$\left\langle \text{continue}, \left[\begin{array}{ll} \textit{srv-lxm} & \\ \text{SYN} & \left[\text{HEAD} \left[\begin{array}{ll} \textit{verb} & \\ \text{PRED} & - \\ \text{INF} & - \\ \text{AGR} & \boxed{2} \end{array}\right]\right] \\ \text{ARG-ST} & \left\langle \boxed{1} \left[\begin{array}{ll} \text{HEAD} & \textit{nominal} \\ \text{VAL} & \left[\begin{array}{ll} \text{SPR} & \langle\rangle \\ \text{COMPS} & \langle\rangle \end{array}\right] \end{array}\right], \text{VP} \left[\begin{array}{ll} \text{INF} & + \\ \text{SPR} & \langle \boxed{1} \rangle \\ \text{INDEX} & s_2 \end{array}\right] \right\rangle \\ \text{SEM} & \left[\begin{array}{ll} \text{MODE} & \textit{prop} \\ \text{INDEX} & s_1 \\ \text{RESTR} & \left\langle \left[\begin{array}{ll} \text{RELN} & \textbf{\textit{continue}} \\ \text{SIT} & s_1 \\ \text{ARG} & s_2 \end{array}\right] \right\rangle \end{array}\right] \end{array}\right] \right\rangle$$

Key Property of Subject-Raising Verbs

The subject plays no semantic role in the predication introduced by the **SRV** itself. Its semantic role (if any) is only in the predication introduced in the complement.

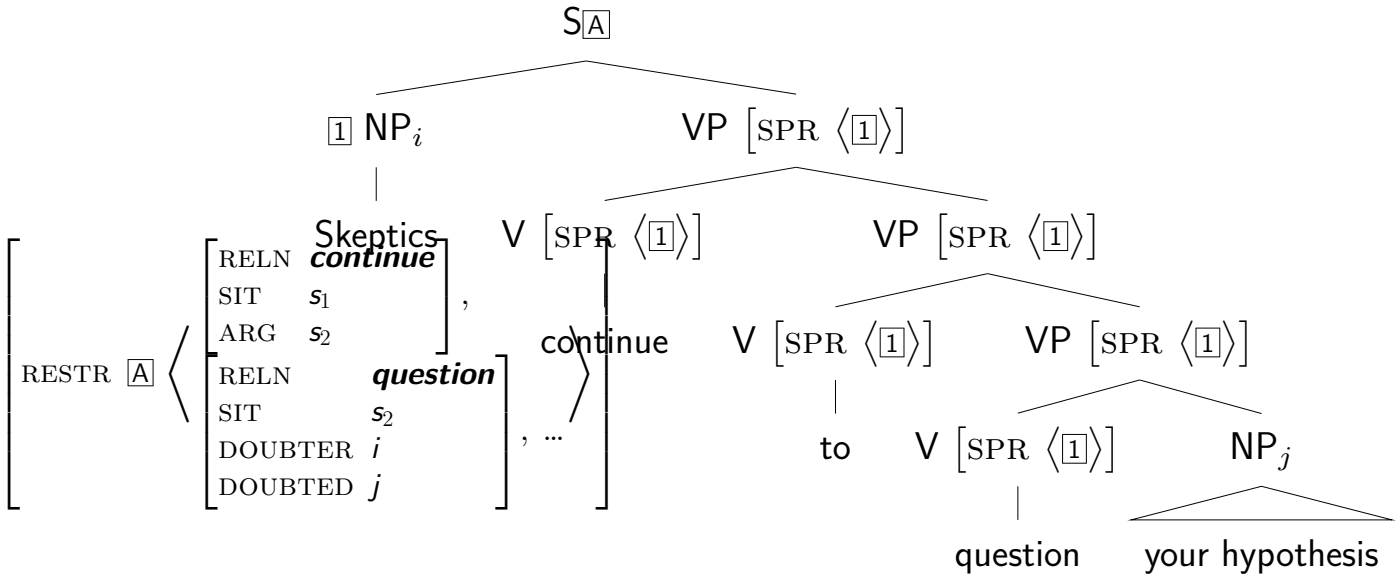
$$\left\langle \text{continue}, \left[\begin{array}{ll} \textit{srv-lxm} & \\ \text{ARG-ST} & \left\langle \boxed{1} \left[\begin{array}{ll} \text{HEAD} & \textit{nominal} \\ \text{VAL} & \left[\begin{array}{ll} \text{SPR} & \langle\rangle \\ \text{COMPS} & \langle\rangle \end{array}\right] \end{array}\right], \text{VP} \left[\begin{array}{ll} \text{INF} & + \\ \text{SPR} & \left\langle \boxed{1} \right\rangle \\ \text{INDEX} & s_2 \end{array}\right] \right\rangle \\ \text{SEM} & \left[\begin{array}{ll} \text{MODE} & \textit{prop} \\ \text{INDEX} & s_1 \\ \text{RESTR} & \left\langle \left[\begin{array}{ll} \text{RELN} & \textit{continue} \\ \text{SIT} & s_1 \\ \text{ARG} & s_2 \end{array}\right] \right\rangle \end{array}\right] \end{array}\right] \right\rangle$$

Constraints on SRVs' Subjects Are from Their Complements

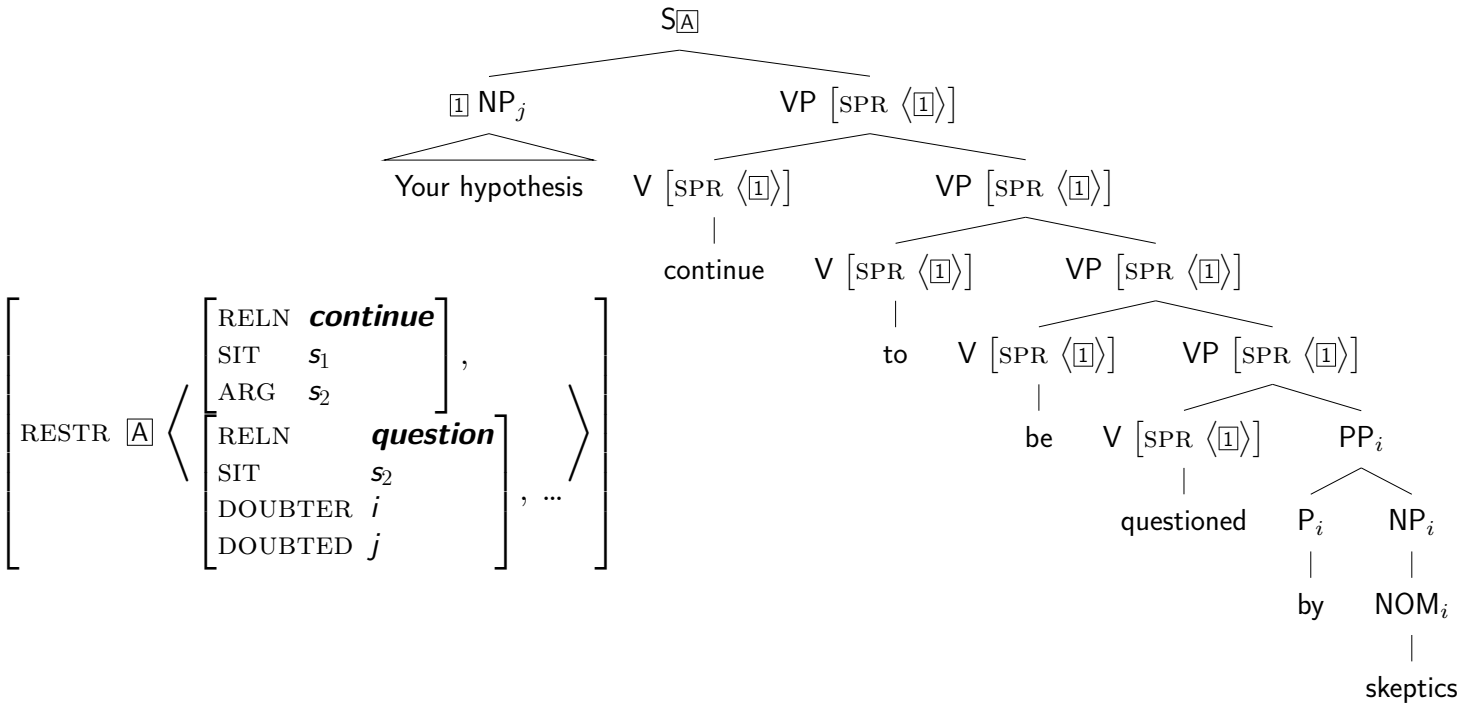
- SRVs take dummy subjects when and only when their complements do.
- SRVs take idiom chunk subjects when and only when their complements do.
- Passivizing the complement of an SRV doesn't change the truth conditions of the whole sentence:

  (11) *Skeptics continue to question your hypothesis.*
  (12) *Your hypothesis continues to be questioned by skeptics.*

continue with Active Complement



continue with Passive Complement



Subject-Control Verbs

Control Verbs

- Control verbs, like ***try***, appear in contexts that look just like the contexts for raising verbs:

  i. *Pat tried to stay calm.*

  looks superficially like

  ii. *Pat continued to stay calm.*

- Control verbs also share their subjects with their complements, but in a different way.

- A control verb expresses a relation between the referent of its subject and the situation denoted by its complement.

Control Verbs Are Not Transparent

- They never take dummies or idiom chunks as subjects.

  i. **There try to be bugs in my program.*
  ii. **It tries to upset me that the Giants lost.*
  iii. **Advantage tries to be taken of tourists.*

- Passivizing the complement's verb changes the truth conditions.

  i. *The police tried to arrest disruptive demonstrators.*
  $\neq$
  ii. *Disruptive demonstrators tried to be arrested by the police.*

A New Type

Subject-Control Verb Lexeme (*scv-lxm*)

$$\begin{bmatrix} \text{ARG-ST} & \left\langle \text{NP}_i, \begin{bmatrix} \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \text{NP}_i \rangle \\ \text{COMPS} & \langle\ \rangle \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{SEM} & \begin{bmatrix} \text{RESTR} & \left\langle \begin{bmatrix} \text{ARG} & s \end{bmatrix} \right\rangle \end{bmatrix} \end{bmatrix}$$

- This differs from *srv-lxm* in that the first argument and the SPR of the second argument are coindexed, not tagged (re-entrant)
- This means that they only need to share INDEX values, but may differ on other features
- And the first argument — the subject — must have an INDEX value, so it cannot be non-referential

The Lexical Entry for *try*

$$\left\langle \text{try}, \left[\begin{array}{l} \textit{scv-lxm} \\ \textsc{arg-st}\ \langle \mathrm{NP}_i,\ \mathrm{VP}\ [\textsc{inf}\ +] \rangle \\ \textsc{sem}\ \left[\begin{array}{ll} \textsc{index} & s_1 \\ \textsc{restr} & \left\langle \left[\begin{array}{ll} \textsc{reln} & \textbf{\textit{try}} \\ \textsc{sit} & s_1 \\ \textsc{trier} & i \end{array} \right] \right\rangle \end{array} \right] \end{array} \right] \right\rangle$$

Note that the subject (NP_i) plays a semantic role with respect to the verb, namely the TRIER.

try with Inherited Information

$$\left\langle \text{try}, \left[\begin{array}{ll} \textit{scv-lxm} & \\ \text{SYN} & \left[\text{HEAD} \left[\begin{array}{ll} \textit{verb} & \\ \text{PRED} & - \\ \text{INF} & - \\ \text{AGR} & \boxed{1} \end{array}\right]\right] \\ \text{ARG-ST} & \left\langle \text{NP}_i,\ \text{VP} \left[\begin{array}{ll} \text{INF} & + \\ \text{SPR} & \langle \text{NP}_i \rangle \\ \text{INDEX} & s_2 \end{array}\right] \right\rangle \\ \text{SEM} & \left[\begin{array}{ll} \text{MODE} & \textit{prop} \\ \text{INDEX} & s_1 \\ \text{RESTR} & \left\langle \left[\begin{array}{ll} \text{RELN} & \textit{try} \\ \text{SIT} & s_1 \\ \text{ARG} & s_2 \\ \text{TRIER} & i \end{array}\right] \right\rangle \end{array}\right] \end{array}\right] \right\rangle$$

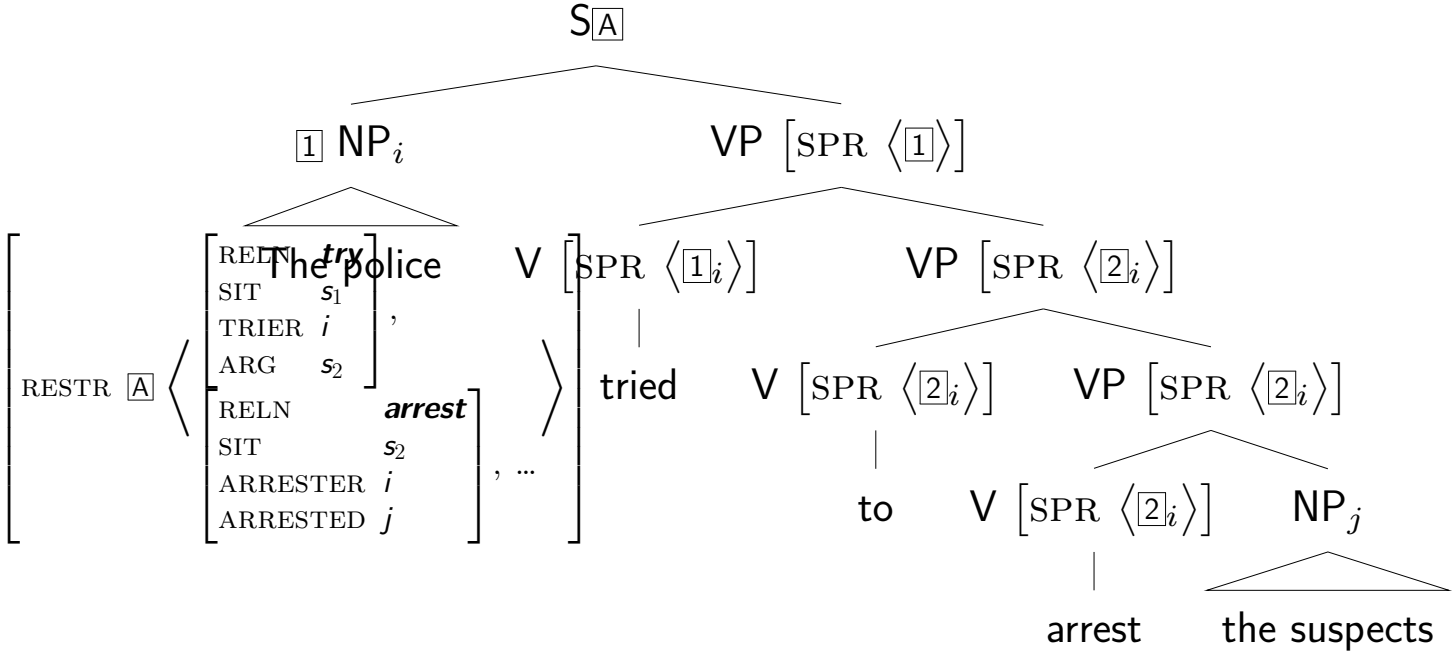
Things to Note:

- The first argument has an index
- The first argument is coindexed with SPR of the second argument
- Both the first and second arguments play semantic roles in the **try** relation
- Very little had to be stipulated in the entry

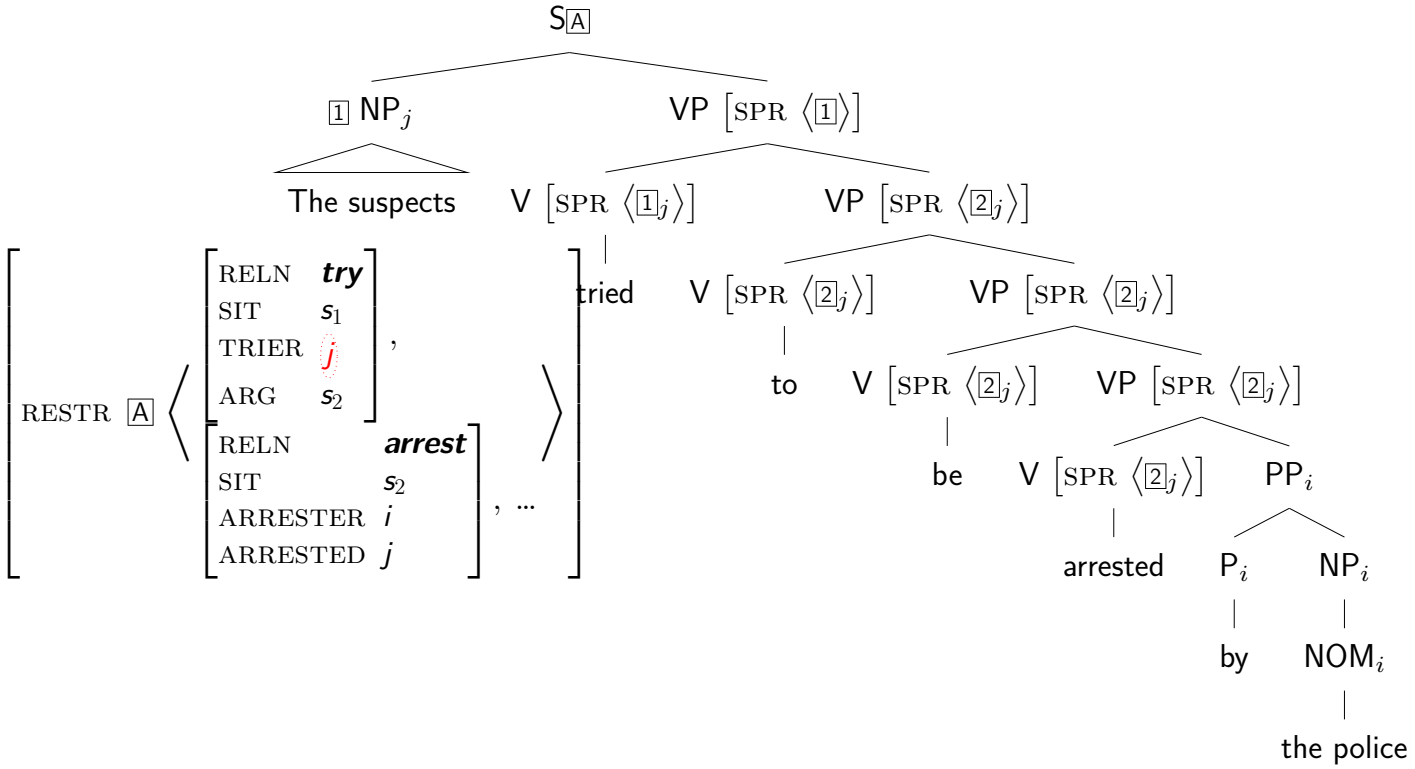
Questions

- What rules out dummies and idiom chunks as subjects of ***try***?
- What accounts for the semantic non-equivalence of pairs like the following?
  i. *Reporters tried to interview the candidate.*
  ii. *The candidate tried to be interviewed by reporters.*
- Why does ***continue*** behave differently in these respects?

try with an Active Complement



try with Passive Complement



ARG-ST of Raising vs. Control Verbs

$$\left\langle \mathrm{NP}_i,\ \mathrm{VP}\begin{bmatrix}\mathrm{INF} & + \\ \mathrm{SPR} & \langle \mathrm{NP}_i \rangle \\ \mathrm{INDEX} & s_2\end{bmatrix} \right\rangle \qquad \left\langle \boxed{1}\ \mathrm{NP},\ \mathrm{VP}\begin{bmatrix}\mathrm{INF} & + \\ \mathrm{SPR} & \langle \boxed{1} \rangle \\ \mathrm{INDEX} & s_2\end{bmatrix} \right\rangle$$

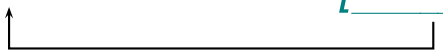
Control **Raising**

Raising and Control in Transformational Grammar

Raising & Control in Transformational Grammar

- Raising

  (13) _____ *continue [the dogs to bark]*



- Control

  (14) *[the dogs]$_i$ try [NP$_i$ to bark]*

  – In early TG, the NP got deleted.
  – In more recent TG, it's a silent pronoun.

Problems with the TG Accounts

- Details never fully worked out (e.g., where does ***to*** come from?)
- What blocks
  i. **The cat continued (for) the dog to bark*
  ii. **The cat tried (for) the dog to bark*?
- Failure of experimental attempts to find evidence for psychological reality of these transformations.

Object Raising and Object Control

We Make Another Raising/Control Distinction

(15) a. *I expected Leslie to be aggressive.* *orv*

b. *I persuaded Leslie to be aggressive.* *ocv*

Object-Raising Verb Lexeme (*orv-lxm*)

$$\left[\begin{array}{ll} \textsc{arg-st} & \left\langle \textsc{np},\ \boxed{1},\ \left[\begin{array}{ll} \textsc{spr} & \langle \boxed{1} \rangle \\ \textsc{comps} & \langle\ \rangle \\ \textsc{index} & s \end{array}\right] \right\rangle \\ \textsc{sem} & \left[\textsc{restr} \left\langle \left[\textsc{arg}\ s\right] \right\rangle\right] \end{array}\right]$$

Object-Control Verb Lexeme (*ocv-lxm*)

$$\left[\begin{array}{ll} \textsc{arg-st} & \left\langle \textsc{np},\ \textsc{np}_i,\ \left[\begin{array}{ll} \textsc{spr} & \langle \textsc{np}_i \rangle \\ \textsc{comps} & \langle\ \rangle \\ \textsc{index} & s \end{array}\right] \right\rangle \\ \textsc{sem} & \left[\textsc{restr} \left\langle \left[\textsc{arg}\ s\right] \right\rangle\right] \end{array}\right]$$

- The formal distinction is again between tagging and coindexing
- This time it's the second argument and the SPR of the third argument.

Example *orv-lxm* and *ocv-lxm* Entries

Object-Raising Verb Lexeme (*orv-lxm*)

$$\left\langle \text{expect}, \begin{bmatrix} \textit{orv-lxm} \\ \text{ARG-ST} & \left\langle \text{NP}_j, \text{X}, \text{VP}\ \left[\text{INF}\ +\right] \right\rangle \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{RELN} & \textit{expect} \\ \text{SIT} & s \\ \text{EXPECTER} & j \end{bmatrix} \right\rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

Object-Control Verb Lexeme (*ocv-lxm*)

$$\left\langle \text{persuade}, \begin{bmatrix} \textit{ocv-lxm} \\ \text{ARG-ST} & \left\langle \text{NP}_j, \text{NP}_i, \text{VP}\ \left[\text{INF}\ +\right] \right\rangle \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{RELN} & \textit{persuade} \\ \text{SIT} & s \\ \text{PERSUADER} & j \\ \text{PERSUADEE} & i \end{bmatrix} \right\rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

- Note that the **persuade** relation has three arguments, but the **expect** relation has only two
- And the object's INDEX plays a role in the **persuade** relation, but not in the **expect** relation

Problems

P1: Classifying Verbs

Classify the following verbs as raising or control:

- ***tend, decide, manage, fail, happen***

Justify your classification by applying each of the following four tests to each verb. Show your work by providing relevant examples and indicating their grammaticality.

(i) Can the verb take a dummy ***there*** subject if and only if its complement selects for a dummy ***there*** subject?
(ii) Can the verb take a dummy ***it*** subject if and only if its complement selects for a dummy ***it*** subject?
(iii) Can the verb take an idiom chunk subject if and only if the rest of the idiom is in its complement?
(iv) Do pairs of sentences containing active and passive complements to the verb end up being paraphrases of each other?

Make sure to restrict your attention to cases of the form: NP V *to* VP. That is, ignore cases like *Kim manages a store*, *Alex failed physics*, and any other valence that doesn't resemble the ***continue*** vs. ***try*** pattern.

P2: Classifying Adjectives

Classify the following adjectives as raising or control:

- ***anxious, apt, bound, certain, lucky***

Justify your classification by providing each of the four types of data discussed in the previous problem for each adjective.

Make sure to restrict your attention to cases of the form: NP ***be*** Adj ***to*** VP. That is, ignore cases like *Kim is anxious about the exam*, *Carrie is certain of the answer*, and any other valence that doesn't resemble the ***likely*** vs. ***eager*** pattern.

P3: *expect* vs. *persuade*

Construct the arguments that underlie the proposed distinction between *orv-lxm* and *ocv-lxm*.

Construct examples of each of the following four types that show a contrast between ***expect*** and ***persuade***. Explain how the contrasts are accounted for by the differences in the types *orv-lxm* and *ocv-lxm* and/or the lexical entries for ***expect*** and ***persuade***.

(i) Examples with dummy ***there***.

(ii) Examples with dummy ***it***.

(iii) Examples with idiom chunks.

(iv) Examples of relevant pairs of sentences containing active and passive complements. Indicate whether they are or are not paraphrases of each other.

P4: A Type for Existential *be*

The ***be*** that takes ***there*** as its subject wasn't given a true lexical type in Chapter 11 (Sag et al., 2003), because no suitable type had been introduced. One of the types in this chapter will do, if we make some of its constraints defeasible.

A. Which of the types introduced in this chapter comes closest to being consistent with the constraints on ***there***-taking ***be***?

B. Rewrite that type indicating which constraints must be made defeasible.

C. Give a streamlined lexical entry for the ***there***-taking ***be*** that stipulates only those constraints that are truly idiosyncratic to the lexeme.

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Acknowledgments and References

- Course design and slides borrow heavily from Emily Bender's course: *Linguistics 566: Introduction to Syntax for Computational Linguistics*
  http://courses.washington.edu/ling566

- This lecture complements Sag et al. (2003, Chapter 12)

References

Ivan A. Sag, Tom Wasow, and Emily Bender. 2003. *Syntactic Theory: A Formal Introduction*. CSLI Publications, Stanford, second edition.