Chapters 10-12

Passives, Dummies, Raising, and Control
Facts an Analysis of Passive Should Capture

- Passive participles are morphologically identical to past participles
- The subject of a passive plays the same semantic role as the object of the corresponding active
- The role played by the subject of the active can be optionally expressed in a PP headed by *by*.
- The passive is productive: *MIT is frequently googled*.
- There are lexical exceptions, both negative and positive: *That look suits you* vs. *You are suited by that look*.
  *They rumor Pat to be a spy* vs. *Pat is rumored to be a spy*.
Our Analysis: A Derivational Lexical Rule

- Having a rule avoids redundancy and captures productivity

- It’s derivational because:
  - Inflectional rules can’t change ARG-ST or SYN.
  - In some languages, further inflections can be added to passive verb forms.
The Passive Lexical Rule

\[
\begin{align*}
\text{d-rule} & \\
\text{INPUT} & \left\langle \begin{array}{c}
1 \\
\text{tv-lxm} \\
\text{ARG-ST} & \left\langle [\text{INDEX } i] \right\rangle \oplus A
\end{array} \right\rangle \\
\text{OUTPUT} & \left\langle F_{\text{PSP}}(1), \begin{array}{c}
\text{part-lxm} \\
\text{SYN} & \left\langle \begin{array}{c}
\text{HEAD} \\
\text{FORM } \text{pass }
\end{array} \right\rangle
\end{array} \oplus \left\langle \begin{array}{c}
\text{ARG-ST} & A \\
\text{PP} & \left\langle \begin{array}{c}
\text{FORM} \\
\text{by}
\end{array} \right\rangle
\end{array} \oplus \left\langle \begin{array}{c}
\text{INDEX} \\
i
\end{array} \right\rangle \right\rangle
\end{align*}
\]
Things to Note About the Passive Rule

- The input must be a transitive verb. That is, its second ARG-ST element must be an NP, which is the first element of the output’s ARG-ST.
- There is a special FORM value, allowing selection of VPs headed by passive participles.
- The morphological function is the same as for past participles.
- An argument-marking PP may carry the index of the input subject.
The *be* that Occurs with Most Passives

\[
\begin{align*}
\langle be, & \rangle \\
\langle be-lxm, & \rangle \\
\langle ARG-ST, & \rangle \\
\langle SYN, & \rangle \\
\langle VAL, & \rangle \\
\langle HEAD, & \rangle \\
\langle verb FORM pass, & \rangle \\
\langle SPR, & \rangle \\
\langle COMPS, & \rangle \\
\langle INDEX s, & \rangle \\
\langle INDEX s, & \rangle \\
\langle RESTR \langle \rangle, & \rangle \\
\end{align*}
\]
Things to Note About the Entry for *be*

- Its second argument (i.e., its complement) is a VP headed by a passive verb.
- Its first argument (its subject) is tagged as identical to its complement’s subject.
- It adds nothing to the semantics.
Generalizing the Entry for \textit{be}

- The only change is replacing [FORM pass] with [PRED +]
- [PRED +] words are passive participles, present participles, plus nouns, adjectives, and prepositions that can be used predicatively
- For example, \textit{alive} is [PRED +], \textit{utter} is [PRED −], and \textit{red} is unmarked for PRED
Existentials

• The *be* in *There is a page missing* cannot be the same *be* we just saw because it has two complements, *a page* and *missing*.

• So we need a separate lexical entry for this *be*, stipulating:
  • Its SPR must be *there*
  • It takes two complements, the first an NP and the second a predicative constituent.
  • The semantics should capture the relation between, e.g. *There is a page missing* and *A page is missing*. 
Lexical Entry for the Existential *be*

\[
\langle \text{be} , \text{ARG-ST} \left[ \begin{array}{c}
\text{NP} \\
\text{FORM there}
\end{array} \right] , \left[ \begin{array}{c}
\text{SEM} \\
\text{INDEX } s
\end{array} \right] , \left[ \begin{array}{c}
\text{VAL} \\
\text{COMPS} \langle \rangle
\end{array} \right] \rangle
\]

\[
\langle \begin{array}{c}
\text{exist-be-lxm} \\
\text{PRED} +
\end{array} \right] \left[ \begin{array}{c}
\text{SPR} \langle 2 \rangle \\
\text{INDEX } s
\end{array} \right]
\]
Things to Note About the Existential *be*

- The subject has to be [FORM there] (i.e. the word *there*)
- The second argument serves as the subject of the third argument.
- This *be* makes no contribution to the semantics of the sentences it occurs in.
- Not all [PRED +] predicates appear as the third argument, e.g.
  
  *There was a man tall.*
The Entry for Existential *there*

\[
\langle \text{there} , \begin{array}{l}
\text{SYN} \left[ \begin{array}{l}
\text{FORM} \text{ there} \\
\text{AGR} \left[ \begin{array}{l}
\text{PER} \text{ 3rd} \\
\text{MODE} \text{ none} \\
\text{INDEX} \text{ none} \\
\text{RESTR} \langle \rangle \\
\end{array} \right]
\end{array} \right]
\end{array} \rangle
\]

Note that it’s semantically empty and unmarked for number.
Another Kind of Dummy: *it* of Extraposition
What We Need for an Analysis of Extraposition

• A lexical entry for this dummy *it*
• An analysis of *that*-clauses
• Entries for verbs that take clausal subjects (as in *That you are wrong follows*)
• A rule to account for the relationship between pairs like *That you are wrong follows* and *It follows that you are wrong*
The Entry for Dummy *it*

\[
\langle \text{it,} \rangle
\]

\[
\begin{array}{c}
\text{pron-lxm} \\
\text{SYN} \\
\text{SEM}
\end{array}
\]

\[
\begin{array}{c}
\text{HEAD} \\
\text{MODE} \\
\text{INDEX} \\
\text{RESTR}
\end{array}
\]

\[
\begin{array}{c}
\text{FORM it} \\
\text{AGR 3sing} \\
\text{none} \\
\langle \rangle
\end{array}
\]

\[
\begin{array}{c}
\text{none} \\
\text{none}
\end{array}
\]

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Complementizers: A New Type

\[
\begin{align*}
\text{comp-lxm} : & \\
\text{SYN} & \begin{bmatrix}
\text{HEAD} \\
\text{VAL}
\end{bmatrix}
\begin{bmatrix}
\text{AGR} & 3\text{sing}
\end{bmatrix} \\
\text{ARG-ST} & \begin{bmatrix}
\text{S}
\end{bmatrix}
\begin{bmatrix}
\text{INDEX} & s
\end{bmatrix} \\
\text{SEM} & \begin{bmatrix}
\text{INDEX} & s \\
\text{RESTR} & \langle \rangle
\end{bmatrix}
\end{align*}
\]
Complementizers: A New Type

- They have a complement but no specifier, so we stipulate both SPR and ARG-ST
- Semantically, they just pass up the complement semantics
- The AGR value is 3sing because clausal subjects take 3rd singular agreement
The Type *comp*

```
pos
  /\FORM, PRED/\n  \       /\
  adj    prep
det    adv
  /\        /\
  adj      prep
  /       /\
verb    adj
  /\
  AGR
  /\
agr-pos /\
  AGR
  /\
verb
  /\
  AUX
  /\
nominal
  /\
  noun
  /\
  FORM cform
```
The Lexical Entry for Complementizer *that*

\[ \langle \text{that} , \begin{bmatrix}
    \text{comp-lxm} \\
    \text{ARG-ST} \\
    \text{SEM}
\end{bmatrix}
\begin{aligned}
    \langle \\
    \text{FORM} \text{ fin} \\
    \text{MODE} \text{ prop}
\end{aligned} \rangle \]
...and with inherited information filled in

![Diagram of syntactic and semantic structures](image)
Structure of a Complementizer Phrase

```
(HEAD 2
  (VAL
    (CP
      (HEAD
        (VAL
          (SPR ⟨ ⟩
            (COMPS ⟨ ⟩
              (C
                (word
                  (HEAD
                    (FORM cform
                      (comp
                        (SPR ⟨ ⟩
                          (COMPS ⟨ 1 ⟩)
                            (that
                              (the Giants lost)
                        )
                    )
                  )
                )
              )
            )
          )
        )
      )
    )
  )
)
```
Sample Verb with a CP Subject

Note: the syntactic constraint on the first argument limits subjects to NPs and CPs.
The Extraposition Lexical Rule

\[\begin{align*}
\text{pi-rule} \\
\text{INPUT} & \left\langle X, \begin{bmatrix} \text{SYN} \vphantom{\text{VAL}} \end{bmatrix} \begin{bmatrix} \text{VAL} \vphantom{\text{COMPS}} \end{bmatrix} \begin{bmatrix} \text{SPR} \vphantom{\text{COMPS}} \end{bmatrix} \begin{bmatrix} \text{COMPS} \vphantom{\text{SPR}} \end{bmatrix} \begin{bmatrix} \langle 2 \text{CP} \rangle \end{bmatrix} \right] \rangle \\
\text{OUTPUT} & \left\langle Y, \begin{bmatrix} \text{SYN} \vphantom{\text{VAL}} \end{bmatrix} \begin{bmatrix} \text{VAL} \vphantom{\text{COMPS}} \end{bmatrix} \begin{bmatrix} \text{SPR} \vphantom{\text{COMPS}} \end{bmatrix} \begin{bmatrix} \text{COMPS} \vphantom{\text{SPR}} \end{bmatrix} \begin{bmatrix} \langle \text{NP[FORM } \text{it]} \rangle \end{bmatrix} \right] \rangle
\end{align*}\]

Note that the input COMPS list can be anything:

*It matters that we lost.*

*It worries me that war is immanent.*

*It occurred to Pat that Chris knew the answer.*

*It endeared you to Andy that you wore a funny hat.*
Turning to infinitival complements...

• It’s not obvious what part of speech to assign to *to*.

• It’s not the same as the preposition *to*:

  \[
  \text{Pat aspires to stardom}
  \]

  \[
  \text{Pat aspires to be a good actor}
  \]

  \[
  \text{*Pat aspires to stardom and be a good actor}
  \]

• We call it an auxiliary verb, because this makes our analysis of auxiliaries a little simpler.
The Lexical Entry for Infinitival *to*

\[
\begin{align*}
\text{SYN} & \quad \begin{bmatrix}
\text{HEAD} \\
\text{INF} + \\
\text{AUX} + 
\end{bmatrix} \\
\text{ARG-ST} & \quad \begin{bmatrix}
\text{HEAD} \\
\text{INF} - \\
\text{FORM base} \\
\text{VAL} \\
\text{SPR} \langle 1 \rangle \\
\text{COMPS} \langle \rangle \\
\text{SEM} & \quad \begin{bmatrix}
\text{INDEX } s \\
\text{RESTR} \langle \rangle \\
\end{bmatrix}
\end{bmatrix}
\end{align*}
\]
The Syntax of Infinitival *to*

\[
\begin{array}{c}
\text{SYN} \\
\text{HEAD}
\end{array}
\begin{array}{c}
\text{FORM base} \\
\text{INF +} \\
\text{AUX +}
\end{array}
\]

- [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 Argument Structure of *to*

- The second argument is a VP headed by a base form verb
- The tagging of the first argument and the SPR of the second argument is exactly like *be*. 
Like *be* and *that*, *to* just passes up an index, making no semantic contribution of its own.
A New Type for Subject Raising Verbs

Subject-Raising Verb Lexeme (srv-lxm):

\[
\begin{align*}
\text{ARG-ST} & \left[ 1, \begin{bmatrix} \text{SPR} & 1 \\ \text{COMPS} & 0 \\ \text{INDEX} & s_2 \end{bmatrix} \right] \\
\text{SEM} & \left[ \text{RESTR} \left[ \text{ARG} s_2 \right] \right]
\end{align*}
\]

- Notes on the ARG-ST constraints
  - The subject sharing is just like for *be* and *to*: the subject of a raising verb is also the subject of its complement
  - Raising verbs impose no other constraints on their subjects

- Note on the SEM constraint
  - The index of the complement must be an argument of the predication introduced by the verb
The Lexical Entry for \textit{continue}

\[
\left\langle \text{continue}, \begin{bmatrix}
\text{srv-lxm} \\
\text{ARG-ST} \\
\text{SEM}
\end{bmatrix}
\left\langle X, \left[ \text{VP} \right] \right\rangle
\left\langle \text{INDEX} \ s_1 \right\rangle
\left\langle \text{RESTR} \left[ \text{RELN} \ \text{continue} \ s_1 \right] \right\rangle
\right\rangle
\]
Entry for *continue*, with Inherited Information

\[
\langle \text{continue} , \\
\begin{array}{c}
\text{SYN} \\
\text{ARG-ST} \\
\text{SEM}
\end{array}
\begin{aligned}
&\text{HEAD} \\
&\text{VAL}
\end{aligned}
\begin{aligned}
&\text{verb} \\
&\text{AGR} \\
&\text{SPR}
\end{aligned}
\begin{aligned}
&\text{PRED} \\
&\text{INF} \\
&\langle [\text{AGR} 2] \rangle
\end{aligned}
\begin{aligned}
&\text{nominal} \\
&\text{SPR} \\
&\langle \langle \rangle \rangle
\end{aligned}
\begin{aligned}
&\text{COMPS} \\
&\langle \langle \rangle \rangle
\end{aligned}
\begin{aligned}
&\text{INDEX}
\end{aligned}
\begin{aligned}
&\text{prop}
\end{aligned}
\begin{aligned}
&\text{INDEX}
\end{aligned}
\begin{aligned}
&\text{s}_1
\end{aligned}
\begin{aligned}
&\text{RELN}
\end{aligned}
\begin{aligned}
&\text{continue}
\end{aligned}
\begin{aligned}
&\text{SIT}
\end{aligned}
\begin{aligned}
&\text{s}_1
\end{aligned}
\begin{aligned}
&\text{ARG}
\end{aligned}
\begin{aligned}
&\text{s}_2
\end{aligned}
\begin{aligned}
&\text{INDEX}
\end{aligned}
\begin{aligned}
&\text{SPR}
\end{aligned}
\begin{aligned}
&\langle [1] \rangle
\end{aligned}
\begin{aligned}
&\text{INF}
\end{aligned}
\begin{aligned}
&\text{PRED}
\end{aligned}
\begin{aligned}
&\text{INF}
\end{aligned}
\begin{aligned}
&\text{INDEX}
\end{aligned}
\begin{aligned}
&\text{s}_2
\end{aligned}
\end{aligned}
\end{aligned}
\]
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.
Hence, constraints on the subjects of SRVs are imposed by their complements

- SRVs take dummy subjects when and only when their complements do.

  There continue to be seats available.
  It continues to matter that we lost.
  *It continues to be seats available.
  *There continues to matter that we lost.

- Passivizing the complement of an SRV doesn’t change the truth conditions of the whole sentence:

  Skeptics continue to question your hypothesis ~
  Your hypothesis continues to be questioned by skeptics
Control Verbs

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

  *Pat tried to stay calm* looks superficially like

  *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 don’t take dummies as subjects.
  *There try to be bugs in my program
  *It tries to upset me that the Giants lost

• Passivizing the complement’s verb changes the truth conditions.

  The police tried to arrest disruptive demonstrators ≠
  Disruptive demonstrators tried to be arrested by the police
A New Type

Subject-Control Verb Lexeme (scv-lxm):

\[
\begin{align*}
\text{ARG-ST} & \left\langle \text{NP}_i , \begin{bmatrix}
\text{SPR} & \langle \text{NP}_i \rangle \\
\text{COMPS} & \langle \rangle \\
\text{INDEX} & s_2
\end{bmatrix}\rightangle \\
\text{SEM} & \left[ \begin{bmatrix}
\text{RESTR} & \langle \text{ARG} \ s_2 \rangle
\end{bmatrix}\right]
\end{align*}
\]

- This differs from \textit{srv-lxm} in that the first argument and the SPR of the second argument are coindexed, not tagged.
  - 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 a dummy
The lexical entry for *try*

\[
\langle \text{try} , \begin{bmatrix}
\text{scv-lxm} \\
\text{ARG-ST} \\
\text{SEM}
\end{bmatrix}
\begin{bmatrix}
\langle \text{NP}_i , [\text{INF} +] \rangle \\
\text{INDEX } s_1 \\
\text{RESTR} \begin{bmatrix}
\text{RELN } \text{try} \\
\text{SIT } s_1 \\
\text{TRIER } i
\end{bmatrix}
\end{bmatrix}
\rangle
\]

Note that the subject (NP\textsubscript{i}) plays a semantic role with respect to the verb, namely the “TRIER”
Entry for *try*, with Inherited Information

Things to Note:

- The first argument has an index
- The first argument is coindexed with the 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 for *try*
Raising & Control in Icelandic

- Icelandic has quirky case:

  \[Hú\text{n} \quad \text{er vinsæl} \quad Hana \quad \text{vantar peninga}\]

  She.NOM is popular Her.ACC lacks money

  \[Henni \quad \text{batanað} \quad \text{veikin}\]

  Her.DAT recovered-from the-disease

- Quirky case is preserved under raising, but not control:

  \[Hana \quad */Hú\text{n} \quad \text{virðist vanta peninga}\]

  Her.ACC/She.NOM seems to-lack money

  \[Henni \quad */Hú\text{n} \quad \text{virðist hafa batnað} \quad \text{veikin}\]

  Her.DAT/She.NOM seems to-have recovered-from the-disease

  \[Eg \quad */Mí\text{g} \quad \text{vonast til að vanta ekki peninga}\]

  I.NOM/Me.ACC hope for to lack not money

  \[Eg \quad */Mé\text{r} \quad \text{vonast til að batnað} \quad \text{veikin}\]

  I.NOM/Me.ACC hope for to recover-from the-disease

- This follows from the difference between tagging (raising) and coindexing (control)
We make another raising/control distinction

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

\[
\text{ARG-ST} \left[ \left( \text{NP}, [1], \left[ \text{SPR} \left( \left\langle 1 \right\rangle \right], \text{INDEX} \left( s_2 \right) \right] \right) \right)
\]

\[
\text{SEM} \left[ \text{RESTR} \left( \left\langle \text{ARG} \left( s_2 \right) \right\rangle \right) \right]
\]

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

\[
\text{ARG-ST} \left[ \left( \text{NP}, \text{NP}_i, \left[ \text{SPR} \left( \left\langle \text{NP}_i \right\rangle \right], \text{INDEX} \left( s_2 \right) \right] \right) \right)
\]

\[
\text{SEM} \left[ \text{RESTR} \left( \left\langle \text{ARG} \left( s_2 \right) \right\rangle \right) \right]
\]

- 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

- Note that the ‘expect’ relation has only two arguments, but the ‘persuade’ relation has three.

- And the object’s INDEX plays a role in the ‘persuade’ relation, but not in the ‘expect’ relation.
Conclusions

• Passive, existentials, extraposition, raising, and control have all been given lexical analyses.

• The distribution of non-referential pronouns follows from their non-referential status.

• No new grammar rules or other analytic constructs have been introduced.