

## THETA THEORY, CASE AND INFINITIVES

**INITIAL GOAL:** Find an explanation for the ungrammaticality of (1) and (2).

- (1) a. \*It appeared Bill to be sick. (cf. It appeared that Bill is sick.)  
b. \*Appeared that Bill is sick.
- (2) a. \*Sam rained.  
b. \*Rained.

### 1. THETA THEORY

#### 1.1. THETA ROLES

• The semantic contribution of NPs, PPs and embedded CPs in a sentence can be categorized according to the **THETA ROLES** (from ‘thematic roles’; short ‘ $\Theta$ -roles’) they bear.  $\Theta$ -roles include - among others - Agent, Theme, Goal, Experiencer and Instrument:

- (3) a. Thelma opened the door (*Thelma* = Agent, *the door* = Theme)  
b. The lemmings jumped into the pool (*the lemmings* = Agent, *into the pool* = Goal)  
c. Sam gave Bill a book (*Sam* = Agent, *Bill* = Goal, *a book* = Theme)  
d. The story amused the guests (*the story* = Theme, *the guests* = Experiencer)  
e. They broke the glass with a hammer (*with a hammer* = Instrument)

#### REVIEW

Argument . . . . . XP that bears a  $\Theta$ -role  
 Adjunct . . . . . XP that does not bear a  $\Theta$ -role  
 External argument . . . Subject (shows up external to VP, in SpecTP)  
 Internal arguments . . . Objects (remain internal to VP)  
 Subject theta role . . . assigned to SpecVP  
 Objects theta role . . . assigned to complement position of  $V^\circ$  (under  $V'$ )

Abbreviations: Agent . . . . . Ag                      Experience . . . . . Exp  
                          Theme . . . . . Th                      Instrument . . . . . Inst  
                          Locative . . . . . Loc

• CPs in subject and object position are assigned  $\Theta$ -roles:

- (4) a. Nobody knew that his name was Trudelbert (*that his name was Trudelbert* = Th)  
b. That he was late forced them to reconsider their plans (*that he was late* = Causer/Ag)

• Not only verbs assign  $\Theta$ -roles. Adjectives (see (5)) and prepositions (see (6)) do so, too.

- (5) a. Sue was proud of Mary’s performance (*Sue* = Exp, *of Mary’s performance* = Th)  
b. Why are you so eager to climb that hill? (*to climb that hill* = Goal (?))
- (6) She entered the store with a hat in her hand (*a hat* = Th)

- Adjuncts do not bear  $\Theta$ -roles, they are not arguments of the predicate but modify it:

(7) Fortunately, Luis left the meeting before midnight (*fortunately, before midnight* = adjuncts)

## 1.2. CONDITIONS ON THETA ROLE ASSIGNMENT

- $\Theta$ -roles are assigned locally: subject theta role to SpecVP, all others to respective complement positions of V, P, A or N:

(8) \*The knife<sub>Inst</sub> opened the box<sub>Th</sub> with Mary<sub>Ag</sub>

- The number of  $\Theta$ -roles must match the number of arguments in the clause.

(9) \*Sam devoured Not enough arguments

(10) \*Sally arrived the dog Too many arguments

This condition is expressed by the Theta Criterion.

(11)

### THETA CRITERION

In a well-formed syntactic representation, both A. and B. hold:

A. Each argument bears exactly one  $\Theta$ -role.

B. Each  $\Theta$ -role is assigned to exactly one argument

- Not all DPs receive  $\Theta$ -roles. **EXPLETIVES** - in English represented by certain uses of *there* and *it* - do not contribute to the meaning of the sentence. Given that only XPs which add something to the interpretation can bear  $\Theta$ -roles, expletives are not assigned  $\Theta$ -roles.

(12) **EXISTENTIAL CONSTRUCTION**

- a. There is a mistake (in this calculation)
- b. A mistake exists

(13) **EXTRAPOSITION**

- a. It is obvious that he lied
- b. That he lied is obvious

(14) **RAISING**

- a. It appears/seems/is likely that he lied.
- b. He appears/seems/is likely to have lied.

Together with the Theta Criterion, the observation that (14)b is grammatical leads one to (15):

(15) **ASSUMPTION:**

Raising predicates lack an external argument, i.e. they do not assign a subject  $\Theta$ -role.

EXERCISE:

- Draw trees for the examples in (14).
- Are all instances of *there* and *it* expletives?
- Are expletives restricted to subject position? If yes, why?
- Does the subject of *It rains* bear a  $\Theta$ -role?

## 2. CASE

Not every argument DP can be assigned a  $\Theta$ -role. More specifically, only DPs that are marked with (abstract) **CASE** are visible to the mechanisms responsible for distributing  $\Theta$ -roles.

- In finite clauses (i.e. clauses with a predicate that is morphologically marked as finite), the abstract head  $T^\circ$  assigns nominative Case to the subject in SpecTP.

- (16) a. She<sub>NOM</sub> claimed that he<sub>NOM</sub> had left.  
 b. It<sub>NOM</sub> seemed that it<sub>NOM</sub> had rained.

Technically, this is implemented by Checking Theory: in well-formed sentences,  $T^\circ$  as well as the subject bear the feature [+NOM]. The two features match, and can therefore be ‘checked’.

- Non-finite  $T^\circ$  does not assign Case. It is for this reason that the subject of infinitives must remain phonologically unexpressed, as witnessed by the contrast in (17).

- (17) a. It<sub>NOM</sub> seemed to have rained.  
 b. \*It<sub>NOM</sub> seemed it<sub>NOM</sub> to have rained. Lower subject lacks Case

The generalization underlying the Case requirement is captured by the Case Filter.

- (18) 

**CASE FILTER**  
 Every DP must be licensed by (abstract) Case.

○ For more on Case see last semester’s lecture 13 (DP Movement II) by Tom McFadden:  
[http://ifla.uni-stuttgart.de/~tom/WS200506\\_IntroSyn/lect13\\_dp2.pdf](http://ifla.uni-stuttgart.de/~tom/WS200506_IntroSyn/lect13_dp2.pdf)  
 or chapter 10 of (the second edition) Carnie’s book.

## 3. SYNTHESIS: REVISITING (1) & (2)

- With these background assumptions, it becomes possible to explain the ill-formedness of the first group of examples that guided the discussion (examples repeated from above):

- (19) \*It appeared Bill to be sick. ✗Case Filter/✓Theta Criterion  
 (cf. Bill appeared to be sick.)
- (20) \*Sam rained. ✓Case Filter/✗Theta Criterion
- (21) \*Rained. ✓Case Filter/✗Theta Criterion

- The reason for the ungrammaticality of (1)b remains mysterious, though, as this example observes both the Case Filter and the Theta Criterion:

- (22) \*Appeared that Bill is sick. ✓Case Filter/✓Theta Criterion

☞ The solution to the puzzle comes in form of the empirical generalization known as the **EPP**:

(23)

**EXTENDED PROJECTION PRINCIPLE (EPP)**

SpecTP must be filled by a DP or CP.

The EPP cannot be reduced to other known principles, or be derived from other primitives of the theory. It therefore represents a so-called **AXIOM**. Even though positing something as blunt as the EPP is not the most desirable scientific practice, with its help it becomes possible to account for a number of phenomena, among them the ill-formedness of

(24) \*Appeared that Bill is sick.                      ✓Case Filter/✓Theta Criterion/✗EPP

○ Note also that multiple violations are possible:

(25) \*Rained.    ✓Case Filter/✗Theta Criterion/✗EPP

● Note that the example in (26) appears to observe all conditions, but is ill-formed nonetheless:

(26) \*They seemed that had lost the game.                      ✓Case Filter/✓Theta Criterion/✓EPP  
(cf. They seemed to have lost the game.)

Sentences of the general format in (26) exhibit what is referred to as a “Freezing Effect”: a DP which is assigned Case once appears to be frozen in place, it must not undergo further movement. The Freezing Effect can be accounted for by a further, more general principle, which states that derivations have to be as economical as possible. Among others, **ECONOMY** has the effect of excluding configurations in which a DP is Case marked more than once, because the most economical (i.e. cheapest) way to satisfy the Case Filter consists in assigning Case only as many times as required by the Case Filter, viz. once. From this it follows now that assigning Case to a DP (*they* in (26)) which has already been assigned Case in a lower position (the embedded SpecTP) leads to ill-formed output strings: (26) violates the general principles of syntactic economy.

○ Another way to block (26) would be to exploit the fact that DP-movement is usually “motivated”, following the rule “Don’t move unless you have to!”. More precisely, assume that DP-movement is driven by the need of a DP to receive Case. In contrast to regular instances of raising, movement in (26) would not satisfy this criterion, because the subject has already been assigned Case in the embedded clause. The ban on such unmotivated movement can once again be seen as an instance of syntactic economy, prohibiting in this particular case the application of unwarranted movement operations.

● For further discussion of the EPP, in particular the question whether the EPP is active also in non-finite clauses, see Handout #3.

## EXERCISES:

What went wrong in the following examples?

- (27) \*John was believed that is a liar.  
(cf. John was believed to be a liar.)
- (28) a. \*That John was sick seemed.  
b. That John was sick didn't seem very likely.

- NEXT:**
- Are subjects of non-finite clauses also regulated by the EPP?
  - What is the internal structure of infinitives, in particular what is the nature of the infinitival subject?
  - Do all infinitives involve DP-movement?

## 4. CONTROL THEORY

### 4.1. TWO TYPES OF INFINITIVES

**TEXT:** Carnie (to appear), chapter 14 (*Raising, Control and Empty Categories*).

- Some predicates, among them *seem*, license expletive subjects (*it, there*; (30)a), while others, like *promise*, don't ((30)b).

- (29) a. Donald seemed [to water the plants].  
b. Donald promised [to water the plants].
- (30) a. It seemed [that Donald watered the plants].  
b. \*It promised [that Donald watered the plants]. (where *it* serves as an expletive, i.e. does not refer to an individual)

Infinitival constructions of the second type, which typically involve verbs such as *try, forget, want, persuade, convince, ask, be reluctant,...* are called **CONTROL INFINITIVES** in the generative tradition.

- (31) **ASSUMPTIONS:**
- Expletives do not bear a  $\Theta$ -role.
  - *seem* does not assign a  $\Theta$ -role to its subject, it lacks an external  $\Theta$ -role.
  - ☞ ○ *promise* assigns a  $\Theta$ -role to its subject.

According to (31), raising constructions (*seem*) contain one  $\Theta$ -role less than control constructions (*promise*). While the total of  $\Theta$ -roles assigned by the two verbs is three in each of (29)a and (30)a, the two predicates assign four roles in (29)b and (30)b, respectively. This explains the deviance of (30)b: Since expletives cannot bear  $\Theta$ -roles, (30)b contains an unassigned  $\Theta$ -role, in violation of clause B of the Theta Criterion.

## 4.2. INTRODUCING PRO

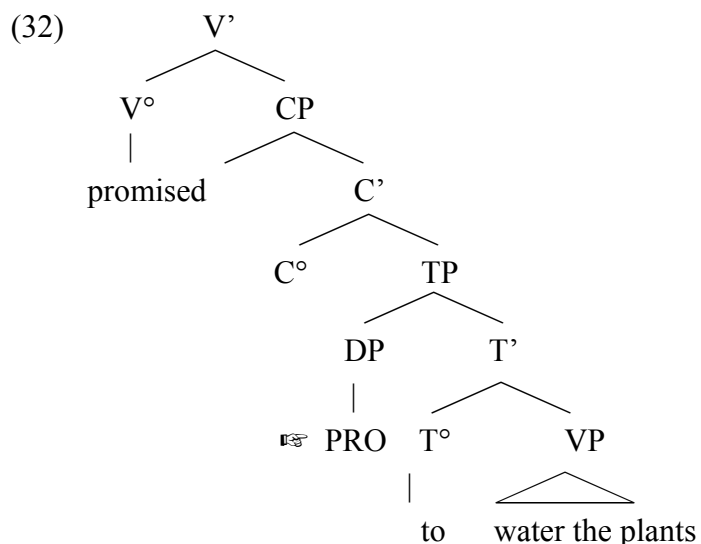
Recall that one of the defining properties of raising was that the subject did not get a  $\Theta$ -role.

(29) Donald<sub>k</sub> seemed t<sub>k</sub> to water the plants. Raising

Given that the silent subject of verbs such as *promise* receives a  $\Theta$ -role, it must be concluded that the derivation of control structures cannot proceed as in raising contexts. Thus, the subject cannot have originated inside the infinitival clause. Instead, there must be a silent category which occupies the subject position of the infinitive. This phonologically empty DP which bears the subject  $\Theta$ -role is called **PRO** (sometimes also ‘big PRO’) and the theory that wants to explain the properties of PRO is called **CONTROL THEORY**.

• In(29) PRO receives the agent role of *water*. The meaning of PRO, its semantic content (also called ‘denotation’) is moreover determined by the **CONTROLLER** *Donald* in the higher clause. *Donald* is also said to serve here as the **ANTECEDENT** of PRO.

(30)b Donald<sub>k</sub> promised [<sub>TP</sub> PRO<sub>k</sub> to water the plants]. Control



• Certain raising predicates license clausal subjects in SpecTP (see (33)b). Alternatively, the clause can be moved to the end of the clause (**EXTRAPOSED**), with SpecTP being filled by the expletive *it*:

(33) a. You<sub>i</sub> are not very likely [<sub>TP</sub> t<sub>i</sub> to leave] Raising of *you*  
 b. [That you will leave] is not very likely clausal subject  
 c. It is not very likely [that you will leave] Extraposition

○ Raising predicates contrast in this respect with control predicates, which neither permit clausal subjects nor extraposition.

(34) a. You<sub>n</sub> are not very reluctant [PRO<sub>n</sub> to leave] Control  
 b. \*[That you will leave] is not very reluctant clausal subject  
 c. \*It is not very reluctant [that you will leave] Extraposition

The contrast above follows from the assumption that control verbs project an external argument, while raising verbs don't.

→ The subject position (SpecTP) in (33)b/c can be filled by a DP or CP that does not bear the subject  $\Theta$ -role. (NB: SpecTP needs to be filled due to the EPP).

→ SpecTP in (34) can only be occupied by the category that bears the subject  $\Theta$ -role, and clauses do not make good agents.

Control constructions vary along two dimensions. First, the category that functions as controller (subject or object control), and second, the interpretation assigned to PRO.

### 4.3. OBJECT VS. SUBJECT CONTROL

With some predicates, the subject serves as controller, while others assign this function to the object. The two categories between which the control relation obtains are notationally marked by a subscripted index ('i', 'j', 'k', ...).

#### (35) SUBJECT CONTROL PREDICATES

*try, promise, forget, want, hope, manage, vow, declare, be reluctant/willing/eager/anxious,...*

- |      |    |   |                                   |
|------|----|---|-----------------------------------|
| (36) | a. | Ann <sub>i</sub> tried [PRO <sub>i</sub> to leave]    | → Ann is subject of leaving event |
|      | b. | Ann <sub>i</sub> promised [PRO <sub>i</sub> to leave] | → Ann is subject of leaving event |
|      | c. | Ann <sub>i</sub> is eager [PRO <sub>i</sub> to leave] | → Ann is subject of leaving event |

#### (37) OBJECT CONTROL PREDICATES

*persuade, convince, ask, tell, order, admonish, beg, challenge, coax, command, encourage, order, entreat, implore, inspire, instruct, invite, train, urge, warn,...*

- |      |    |   |                                    |
|------|----|---|------------------------------------|
| (38) | a. | Ann persuaded Bill <sub>i</sub> [PRO <sub>i</sub> to leave] | → Bill is subject of leaving event |
|      | b. | Ann asked Bill <sub>i</sub> [PRO <sub>i</sub> to leave]     | → Bill is subject of leaving event |
|      | c. | Ann ordered Bill <sub>i</sub> [PRO <sub>i</sub> to leave]   | → Bill is subject of leaving event |

• Control constructions can also be iterated, choosing the control predicates from either group of control predicates (subject or object control):

- (39) Subject control - object control:  
Ann<sub>i</sub> promised [<sub>TP</sub> PRO<sub>i</sub> to convince Bill<sub>k</sub> [<sub>TP</sub> PRO<sub>k</sub> to leave early]]

- (40) Object control - subject control:  
I convinced Ann<sub>i</sub> [<sub>TP</sub> PRO<sub>i</sub> to promise [<sub>TP</sub> PRO<sub>i</sub> to leave early]]

#### EXERCISE

Why are there two indices in (39), but only one in (40)?

#### 4.4. THE INTERPRETATION OF PRO

● There are two different types or flavours of PRO: On the one side, there is **NON-ARBITRARY PRO**, which was employed in all the examples used so far. On the other side, the subject of control constructions can be filled by **ARBITRARY PRO**, whose semantic content can roughly be paraphrased as “someone” or “whoever”.

- (41) a. [PRO<sub>arb</sub> to open a can] can be difficult  
 b. The hose must be connected [in order PRO<sub>arb</sub> to water the plants]  
 c. [PRO<sub>arb</sub> playing the alphorn] causes brain defects

Note on the side: (41) also demonstrates that PRO is not restricted to the subject position of infinitival complements, but may also show up in purpose clauses, as in (41)b, and in gerunds, exemplified by (41)c. More on that maybe later.

○ In arbitrary control constructions, the controller is not lexically realized (i.e. audible). One might therefore wonder whether this more generally distinguishes arbitrary from non-arbitrary control, where the antecedent so far was always seen to be overt. This is not a pervasive property of non-arbitrary control, though. There are contexts such as (42) in which PRO is controlled by the (suppressed) thematic subject of the passive verb *sink*:

- (42) a. The ship was sunk in order PRO to collect the insurance.      does not mean the same as  
 b. The ship was sunk in order for someone to collect the insurance.

● The contexts that involve **NON-ARBITRARY PRO** are sometimes claimed to split once again into two different groups (see Carnie p.411): **OBLIGATORY** and **OPTIONAL** control.

- (43) She<sub>i</sub> read that it will be possible PRO<sub>i</sub> to apply.

Interpretation A: She<sub>i</sub> read that it will be possible for her<sub>i</sub> PRO<sub>i</sub> to apply.

→ obligatory control

Interpretation B: She<sub>i</sub> read that it will be possible for somebody else<sub>k</sub> PRO<sub>k</sub> to apply.

→ optional control

○ But note that one might also argue that (43) is not ambiguous after all, but simply manifests a case of arbitrary control. This alternative analysis becomes available because Interpretation A as well as interpretation B can be subsumed under this alternative interpretation, sketched in (44):

- (44) Interpretation C: She<sub>i</sub> read that it will (generally) be possible PRO<sub>arb</sub> to apply.

Thus, it might not be necessary to assume this additional distinction, resulting in a more parsimonious - and therefore superior - categorization of the data.



## 5. RESTRICTIONS ON PRO

Just like other syntactic phenomena, control does not apply in an unrestricted way. PRO is subject to two types of conditions:

- I. Conditions that determine which positions in the tree can be left silent. (→ Case)
- II. Conditions that determine the distance between PRO and its controller. (→ Locality)

### 5.1. CASE

The Theta Criterion forces us to assume that non-raising infinitives contain covert subjects:

- (45) a. Jerry forgot that he ate the beans.  
b. Jerry forgot PRO to eat the beans.

Moreover, the Theta Criterion tells us how many  $\Theta$  roles there are, but not whether the XPs that bears them are overt or covert.

- PRO is prohibited from occurring in object position:

- (46) a. \*Jerry squeezed PRO.  
b. \*Jerry told PRO about the problem.  
c. \*Jerry wrote about PRO.

- PRO cannot serve as the subject of finite clauses (i.e. the verb is finite):

- (47) a. Dan hoped that Otto will drive the van  
b. \*Dan hoped that PRO will drive the van

○ PRO is excluded from subject positions that follow an overtly filled  $C^{\circ}$ . These constructions are called *for*-infinitivals.

- (48) a. She desired/wanted for them to leave  
b. \*She desired/wanted for PRO to leave

● Observationally, PRO and overt DPs are in **COMPLEMENTARY DISTRIBUTION**. Whenever, in a given position, PRO is possible, then an overt DP is not, and v.v.

	PRO	OVERT DP
Subject of finite clause	*	✓
Subject of non-finite clause (under control verb)	✓	*
Subject of <i>for</i> -infinitival	*	✓
Object of verb	*	✓
Object of preposition	*	✓
Subject of purpose clause ( <i>in order to</i> )	✓	*

(49)

**PRO - GENERALIZATION**  
PRO must not be assigned Case.

○ The PRO-Generalization accounts for the well-formedness of:

(50) She forgot [<sub>TP</sub> PRO to eat the beans]

○ It also immediately rules out the ungrammatical cases:

- (51) a. \*Jerry squeezed PRO.  
b. \*She desired for PRO to leave  
c. \*Dan hoped that PRO will drive the van

○ Overt subjects in the same position as PRO are illicit, as they violate the Case Filter:

(52) \*She forgot Mary to eat the beans

#### EXERCISE

How does the fact that gerunds allow PRO subjects (*PRO playing the alphorn is fun*) as well as overt subjects (*Ann's playing the alphorn killed her dog*) fit the picture?

### 5.2.LOCALITY

● The controller must c-command PRO:

- (53) a. Ann<sub>k</sub> managed PRO<sub>k</sub> to pass the exam.  
b. \*[Ann<sub>k</sub>'s meticulous preparation for the finals] managed PRO<sub>k</sub> to pass the exam.  
c. [Ann<sub>k</sub>'s meticulous preparation for the finals] allowed her<sub>k</sub> to pass the exam

● The actual controller must be the closest possible controller to PRO:

- (54) a. \*Ann<sub>k</sub> said that [hard work]<sub>i</sub> managed PRO<sub>k</sub> to pass the exam.  
b. Ann<sub>k</sub> said that hard work<sub>i</sub> helped her<sub>k</sub> PRO<sub>k</sub> to pass the exam.

(55) a. Structure of (54)a:

[Controller A - [Controller B - [PRO ...]]]

b. Structure of (54)b:

[Controller A - [Controller B - [PRO ...]]]

## 6. DIFFERENCES RAISING VS. CONTROL

There are various differences between raising and control which can be used as diagnostic tests.

### 6.1. THEMATIC RESTRICTIONS

• Control predicates impose thematic (s-selectional) restrictions on their subject, while the subject of raising constructions only has to observe the thematic restrictions of the lower predicate. The subject of *willing* and *convince* e.g. must be able to enter psychological states.

- (56) a. This number is prime.  
 b. This number is likely to be prime. Raising  
 c. \*This number is willing to be prime. Control
- (57) a. The train arrived.  
 b. The train seemed to me to arrive. Raising  
 c. \*The train promised me to arrive. Control

○ Embedding does not always have the effect of generating ungrammatical outputs with control predicates. The reverse is also attested. In (58), *convince* admits a subject that bears a causer role, while *buy* requires an agentive role.

- (58) a. \*The exhibition bought the book.  
 b. The exhibition convinced Bill to buy the book Control  
 c. \*The exhibition seemed/appeared (to Bill) to buy the book Raising

### 6.2. IDIOM CHUNKS

Only raising predicates preserve (the idiomatic reading of) **IDIOM CHUNKS**

- (59) a. All hell broke loose.  
 b. All hell is likely to break loose. Raising  
 c. \*All hell is eager to break loose. Control

### 6.3. EXPLETIVES

• Expletive subjects are only licit with raising predicates:

- (60) a. There is a mistake in the calculation.  
 b. There seems to be a mistake in the calculation. Raising  
 c. There appears to be a mistake in the calculation. Raising  
 d. There is likely to be a mistake in the calculation. Raising
- (61) a. There is a mistake in the calculation.  
 b. \*There promised to be a mistake in the calculation. Control  
 c. \*There hoped to be a mistake in the calculation. Control  
 d. \*There managed to be a mistake in the calculation. Control

○ Note on the side: generally, expletives may never control PRO:

- (62) \*There was a war PRO to control the oil resources

## 6.4. PASSIVIZATION

• Passivization may move an object over a raising predicate (**LONG PASSIVE**). Long passive preserves the meaning of the active sentence. In contrast, passivization with (adjectival) control predicates changes the interpretation.

- (63) a. Mary is likely to hire John.  
b. John is likely to be hired by Mary.

means the same as

- (64) a. Mary is eager to hire John.  
b. John is eager to be hired by Mary.

does not mean the same as

EXERCISE:

Draw a tree for (63)b and (64)b.