

Unit 8

# Theta Theory

Constraining X-bar theory using the mental dictionary

# Objectives

1. Distinguish between thematic relation and theta role.
2. Identify the thematic relations agent, theme, goal, source, experiencer, location, instrument, recipient, beneficiary.
3. Explain how X-bar theory over-generates. Explain the structure of the lexicon.
4. Draw the theta grids for a predicate.
5. Apply the theta criterion to a sentence as a filter to X-bar theory.
6. Distinguish sentences with expletive subjects from ones with theta-role-bearing subjects.
7. Explain the Extended Projection Principle and how it accounts for expletives.
8. Explain the ordering of the EPP with the theta criterion in the context of the model we are developing.

# Overgeneration

- X-bar theory can produce sentences that are NOT well formed.
- It over-generates (generates ungrammatical sentences)

# Overgeneration

- X-bar theory says complements are optional:
  - $X' \rightarrow X$  (WP)
    - The philosopher loves caramel apples
    - The philosopher smiled
- BUT
  - \*The philosopher loves
  - \*The philosopher smiled the breadbox.

# Overgeneration

- Traci gave the whale the jawbreaker.
  - \*Traci gave the whale.
  - \*Traci gave the jawbreaker.
- 
- Certain verbs require objects, others require that they don't have them, others require two.
  - It depends on the particular verb.

# The Lexicon

- The mental dictionary
- The store of information about particular words.
  - pronunciation of word
  - morphological irregularities
  - meaning of word
  - requirements about other words they occur with.

# Reminder:

## Subcategories of V

[NP ___]	intrans 1	arrive
[NP ___ NP]	trans 1	hit
[NP ___ {NP/CP}]	trans 2	ask
[NP ___ NP NP]	ditrans 1	spare
[NP ___ NP PP]	ditrans 2	put
[NP ___ NP {NP/PP}]	ditrans 3	give
[NP ___ NP {NP/PP/CP}]	ditrans 4	tell

# Selectional Restrictions

- Selectional Restrictions limit the semantic properties of arguments
  - #My toothbrush loves raisins.
  - #The bolt of lightning killed the rock.



# Thematic Relations

- A way of encoding selectional restrictions.
- semantic relation between the argument and the predicate.

## Thematic Relations

# Thematic Relations

- **Agent**: initiator of the action, capable of volition
  - Brad hit Andrew
- **Natural Phenomenon**: initiator of action, incapable of volition
  - A falling rock hit Terry.
- We won't really distinguish agents from natural phenomena

## Thematic Relations

# Thematic Relations

- **Experiencer:** the argument that experiences or perceives the event
  - Becki saw the Eclipse
  - Syntax frightens Jim
  - Susanna loves cookies
- **Note that not everything that experiences something is an experiencer.** It has to be associated with a verb of emotion, perception or cognition.
  - A falling rock hit Terry. (Terry is NOT an experiencer)

# Thematic Relations

- **Theme** (also patient and percept) the entity that undergo actions, are moved, experienced or perceived
  - Susanna loves cookies
  - A falling rock hit Terry.
  - The syntactician bought a phonology textbook.

# Thematic Relations

- **Goal:** The entity towards which motion takes place. Goals may involve abstract motion.
  - A falling rock hit Terry.
  - The syntactician bought a phonology textbook.
  - Millie went to Chicago
  - Travis was given a semantics article.

# Thematic Relations

- **Recipient:** A special kind of goal that involves a change of possession
  - Julie gave Jessica the book
  - Roy received a scolding from Sherilyn.
- **Source:** The opposite of goal, entity from which movement occurs.
  - Bob gave Steve the Syntax assignment
  - Stacy came directly from Sociolinguistics class.

# Thematic Relations

- **Location:** Place where action occurs
  - Andrew is in Tucson's finest apartment
  - We're all at school.
- **Instrument:** The entity with which action occurs.
  - Patrick hacked the computer apart with an axe
  - This key will open the door to the Douglass building.

# Thematic Relations

- **Beneficiary:** The entity for whom the action occurs
  - He bought these flowers for Jason
  - She cooked Matt dinner.
- There are many other thematic relations, but these will do for our purposes.

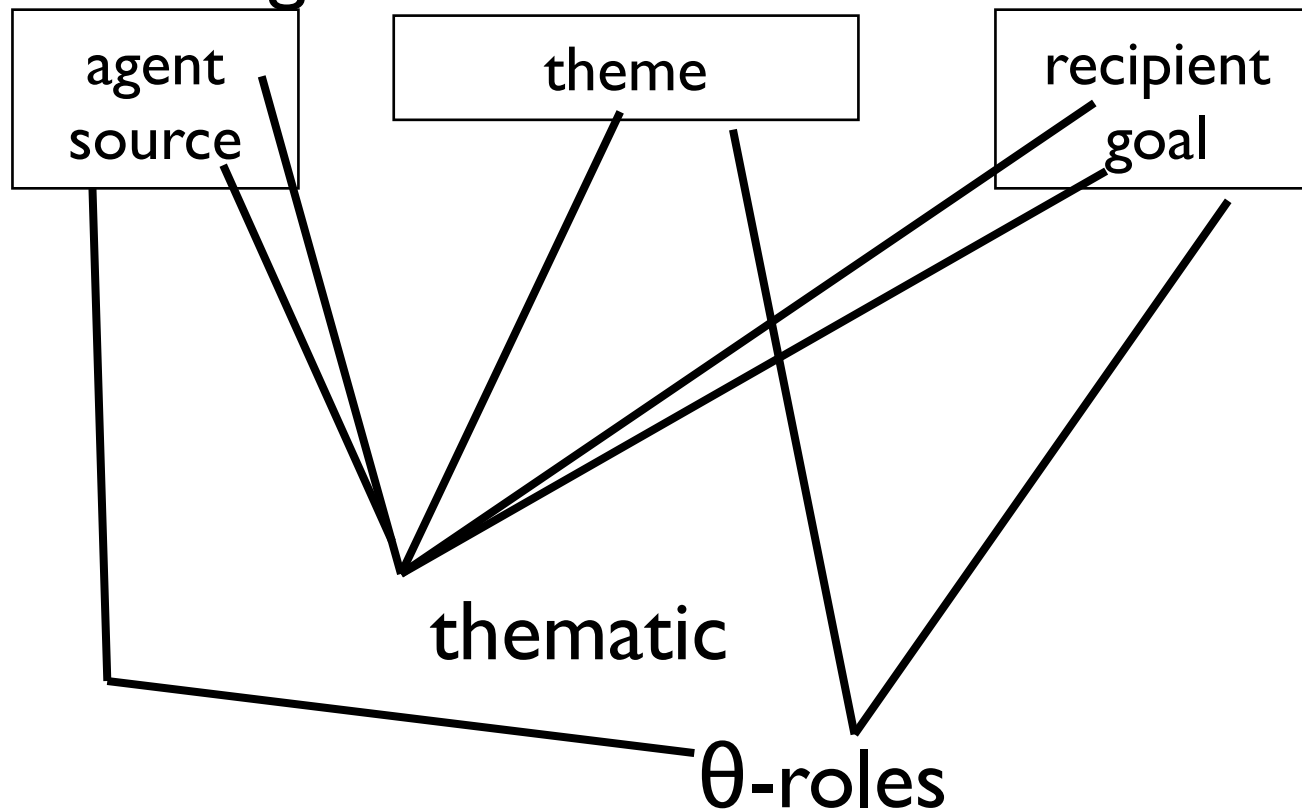


# Theta Roles

- Theta role ( $\theta$ -role) is a bundle of thematic relations associated with a particular argument.
- Thematic relation  $\neq$  theta role.
- An argument can have many thematic relations, but only one theta role.

# Theta Roles

- Brian gave the doorknob to Mary



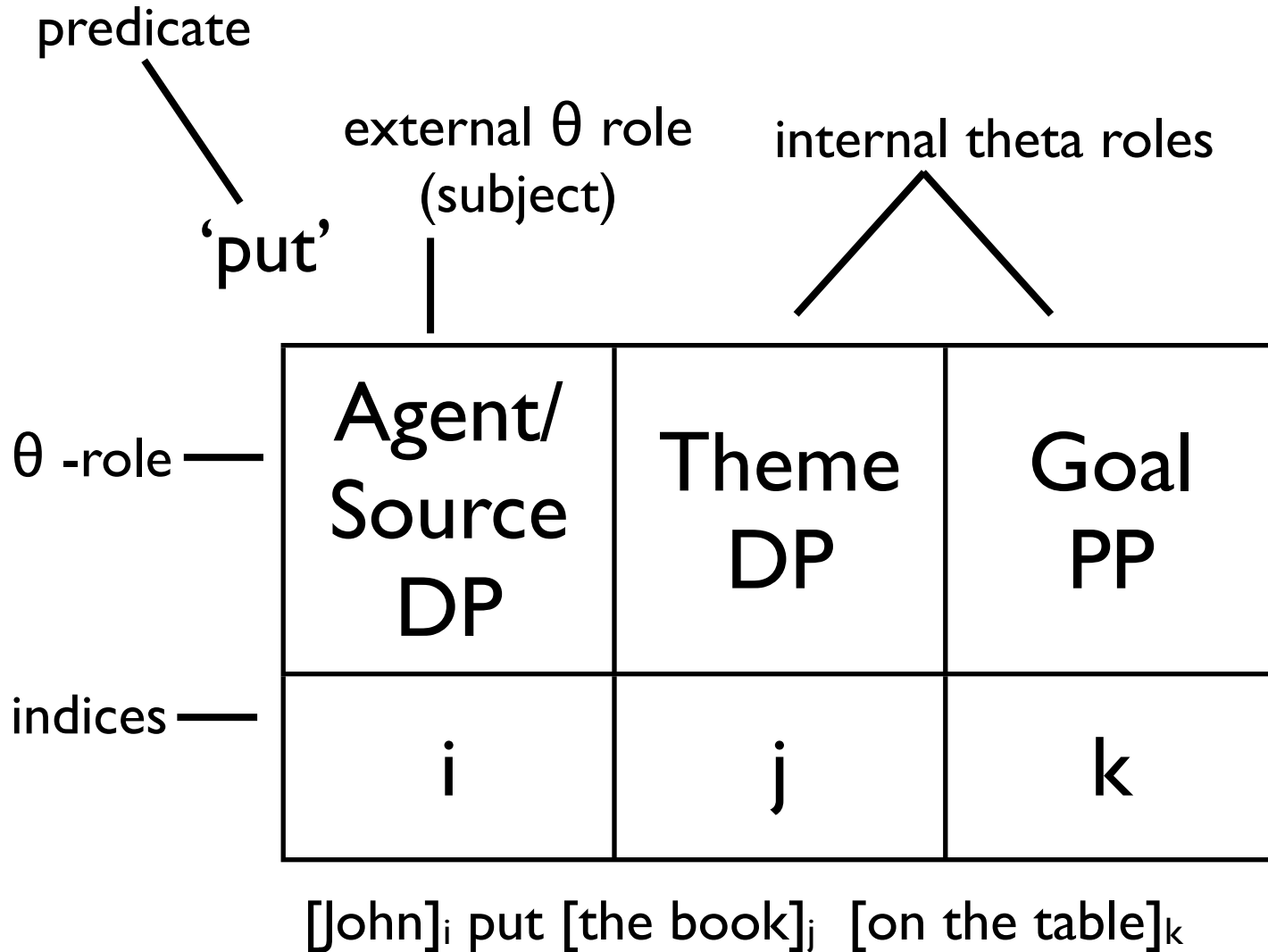
# A note on the term “Theta Role”

- Sometimes we talk about the “agent theta role”. Technically this is incorrect. Agent refers to the thematic relation. But when we are talking about the “Agent theta role” we mean the theta role whose most prominent thematic relation is the Agent.

# One to one match of theta roles & arguments

- 'put' requires an agent, a theme, a goal
  - John put the book on the table
  - \*put the book on the table
  - \*John put the book
  - \*John put on the table
  - \*John put the book the pen on the table
  - \*The rock put the sky with the fork
- Too many, too few, or the wrong kinds of arguments result in ungrammaticality.

# Theta Grids



These indices (indexes) are NOT The same as the indices  
used in binding theory

# An important point!

- Adjuncts are NOT included in theta grids.
- (With verbs) Adjuncts are optional, complements & subjects are obligatory:
  - John put the book on the table on Friday
  - John put the book on the table
  - \*John put the book                      on Friday
- Ditransitive verbs are a problem, because they have two required objects, but there is only one complement position, we'll return to this later.

# The Theta Criterion

- A sentence meets the theta criterion iff:
  - Every argument must have one and only one theta role AND
  - Every theta role must be assigned (indexed to) to one and only one an argument.

There is a one to one correspondence between the number of theta roles and the number & type of arguments

'love'

<u>Experiencer</u> DP	Theme DP

Megan<sub>i</sub> loves Kevin<sub>j</sub>

<u>Experiencer</u> DP	Theme DP
i	j

\*Megan<sub>i</sub> loves

<u>Experiencer</u> DP	Theme DP
i	

\*

\*Megan<sub>i</sub> loves Kevin<sub>j</sub> Jason<sub>k</sub>

<u>Experiencer</u> DP	Theme DP
i	j
	k

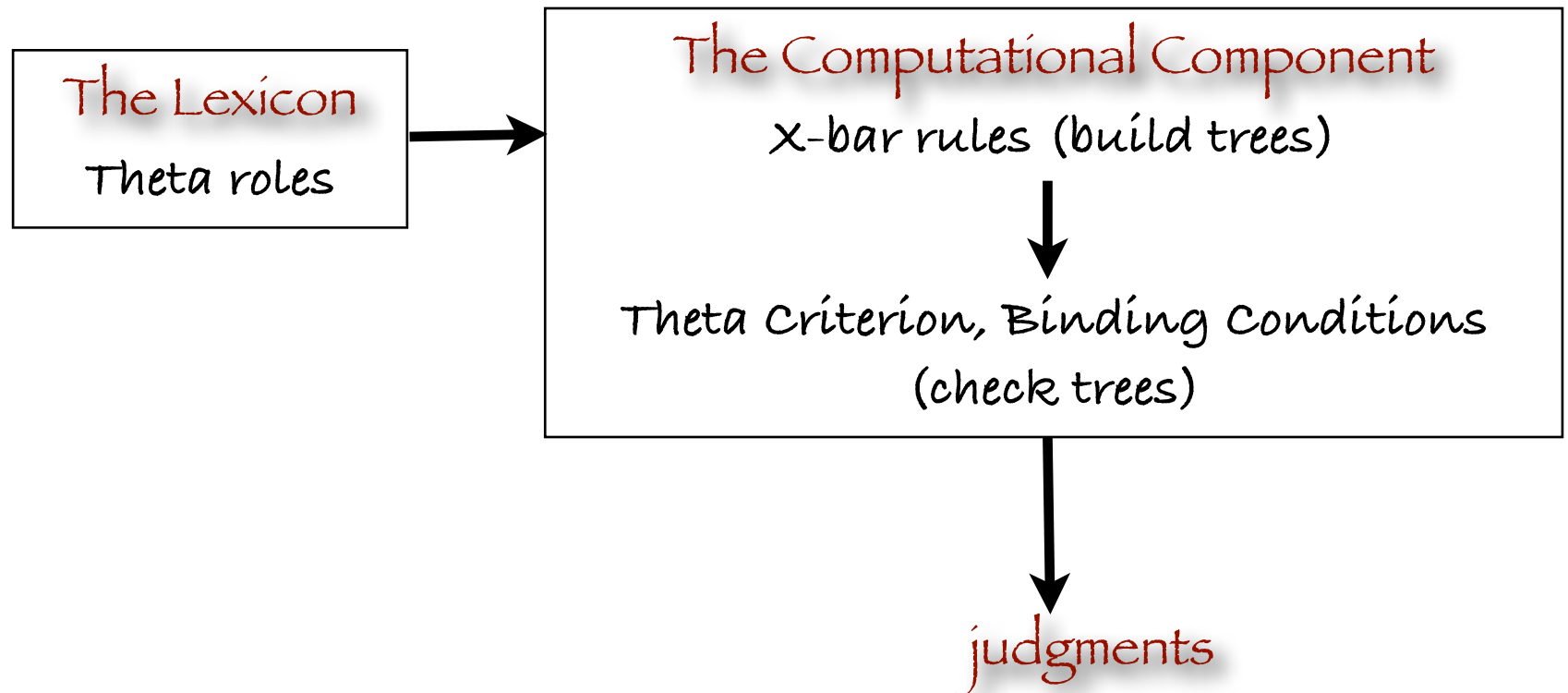
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# How does it all fit together?

- The X-bar rules generate trees. These trees are then checked against constraints (like the binding conditions and the theta criterion) to make sure they are ok.
- The constraints filter out badly constructed trees.

# The Model of the Grammar (first try)



# NPs without theta roles?

- **It** rained
- **It** snowed
- **It** hailed
- **It** is likely that Bob left
- These are called **Expletives** or Pleonastics.

# Two Kinds of 'it'

- It bit me on the leg. pronoun
- It is likely that I'll leave. expletive

# Weather verbs & propositional verbs

'rain'

takes \*no\* arguments

'is likely'

[That John will leave]i is likely  
it is likely [that John will leave]i

Proposition  
CP

i

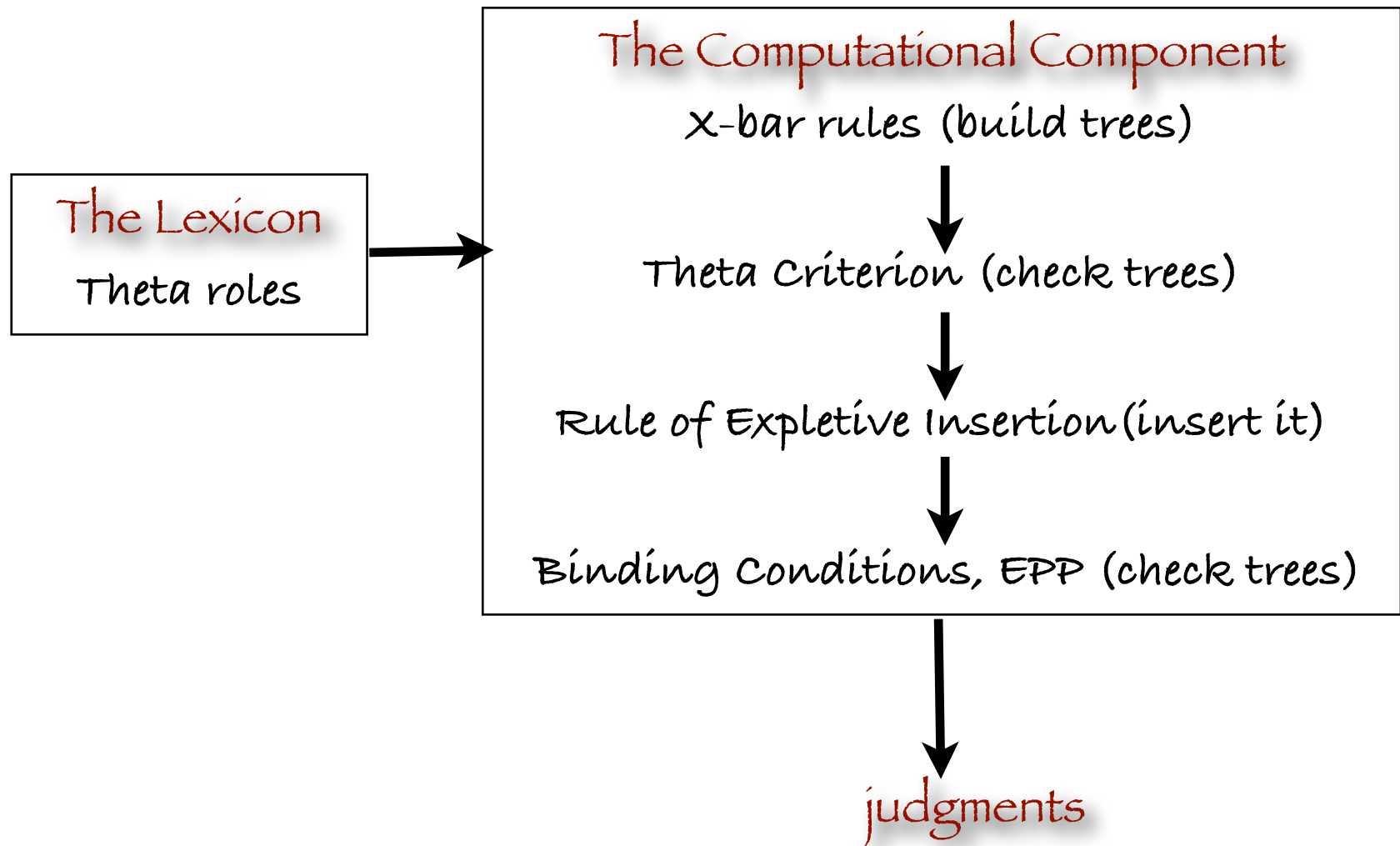
# Why do expletives exist?

- There is another constraint on the grammar:
- **The Extended Projection Principle (EPP)**  
Every sentence must have a subject.
  - \*rain (meets theta criterion, but violates EPP).
- **Rule of Expletive insertion:**
  - insert an 'it' in subject position.

# A contradiction

- Theta criterion: all NPs must have a theta role
- EPP: all sentences must have a subject
- What do you do with verbs that have no theta roles to assign? Why doesn't Expletive insertion cause a violation of the theta criterion.
- Solution lies in ordering

# The Model of the Grammar (second try)





# Summary

- X-bar theory **overgenerates** (generates too many sentences)
  - Use the Lexicon, Theta roles, and the theta criterion to limit it.
- **Predicate**: a relation between entities
- **Arguments**: the participants in a predicate
- **Thematic relations** describe the semantic properties of arguments

# Summary

- **Theta roles** are bundles of thematic relations associated with a single argument position
- **Theta criterion** requires 1-1 relation between # of arguments and # of theta roles
- **Theta grid** used for checking theta criterion.
- Adjuncts not part of theta grid
- Expletives are NPs without theta roles
- **EPP** requires every sentence to have a subject

# Summary

- **Expletive insertion** occurs to save the derivation.
- There is **ordering** of operations.
  - Constraints filter out bad sentences.
  - Order: X-bar → Theta Criterion → Expl. Insertion → EPP & Binding conditions → Judgments.