

# Lexical Semantics

## Week 14: Factives and implicatives

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### 1 Complement constructions

Certain verbs take full complement clauses as one of their arguments:

- ***that*-clauses:**

- introduced with the complementizer *that*
- verb agrees with the within-clause subject

- (1) a. It seems that he has been found guilty.  
b. We are pleased to inform you that your application was successful.  
c. Sheena was sorry that they were drifting apart.

- **infinitive clauses:**

- introduced by *to*
- verb appears in the bare infinitive form (does not agree with either a within-clause or a raised subject)

- (2) a. The children were excited to go to a movie.  
b. I was surprised to see Megan with Bill.  
c. Geoff remembered to turn off the stove before leaving.

- **gerunds:**

- use the nominalized -ing form of a verb

- (3) a. My having agreed to come along does not mean I'll enjoy the trip.  
b. His being found guilty seemed inevitable.  
c. Eating the apple was her first big mistake.

Clausal arguments can appear in different grammatical roles:

- as subjects:
  - (3b) His being found guilty seemed inevitable.
  - (4) That he was found guilty is wrong.
- as objects:
  - (2a) The children were excited to go to a movie.
  - (5) She told me that my application was successful.
- extraposed subjects:
  - (6) a. It is wrong that he has been found guilty.  
b. It bothers Sheena that they are drifting apart.  
c. It was a mistake to eat the apple.

Different verb and complement clause combinations commit the speaker to different things:

- (7) Sheena was sorry that they were drifting apart.
    - a. *Speaker is committed to:* They were drifting apart.
    - b. Sheena was sorry that they were drifting apart, #but nothing between them had changed.
  - (8) Geoff remembered to turn off the stove before leaving.
    - a. *Speaker is committed to:* Geoff turned off the stove before leaving.
    - b. Geoff remembered to turn off the stove before leaving, #but he did not turn off the stove.
- the ways in which the speaker is committed to aspects of the complement may be different, however: we've seen **entailments**, **presuppositions**, and **conversational/Gricean implicatures**
  - today, we're interested in verbs which give rise to different types of speaker commitments

## 2 Factives and presupposition

### 2.1 The 'zoo' of presupposition triggers

As far as we've seen, presuppositions can be characterized as felicity conditions:

- if  $P$  is a presupposition of a sentence  $S$ , then the background context must support/be compatible with  $P$  in order for  $S$  to be utterable

- we can test for presupposition with the negation or question tests, both of which should preserve the inference:

(9) John has stopped smoking.  $\rightarrow$  *John used to smoke.*

a. *Negation test:* John has not stopped smoking.

$\rightarrow$  *John used to smoke.*

b. *Question test:* Has John stopped smoking?

$\rightarrow$  *John used to smoke.*

- while the negation and presupposition tests change the asserted content of the original sentence, the presuppositions are preserved (they *project* through negation and questioning)

### A wide range of lexical items can be *presupposition triggers*:

- NB: there is much ongoing debate about whether or not all presuppositions should be characterized the same way

#### 1. **definite descriptions:** my bicycle, Jessica's dog, the King of France

(10) My bicycle is broken.  $\rightarrow$  *I have a bicycle.*

#### 2. **aspectual verbs:** start, continue, stop

(11) John started smoking.  $\rightarrow$  *John did not smoke before.*

#### 3. **repetitive verbs and adjectives:** renew, repeat, again

(12) Jessica ran to the store again.  $\rightarrow$  *Jessica had previously run to the store.*

#### 4. **temporal adverbs:** still, already, yet, before

(13) The bread is still warm.  $\rightarrow$  *The bread was warm previously.*

#### 5. **focus particles:** only, even

(14) Only you can save mankind.  $\rightarrow$  *No one else can save mankind.*

#### 6. **verbs of judging:** *blame, criticize, accuse*

(15) a. Jethro accused me of writing a letter to the president.

$\rightarrow$  *Writing a letter to the president was bad*

(vs. entailed content: *Jason claimed I was responsible for the letter*)

b. Jethro criticized me for writing a letter.

→ *I was responsible for the letter*

(vs. entailed content: *Jason thought it was bad to write the letter*)

7. **factive verbs and adjectives:** regret, be tragic, know

(16) It is tragic that he has been found guilty. → *He has been found guilty.*

8. **implicative verbs:** manage, dare

(17) Mallory did not manage to summit Everest. → *Mallory made an attempt to summit Everest.*

## 2.2 Fact(ive)s

Kiparsky & Kiparsky (1970) point out the existence of the class of **factive verbs** (and adjectives), which commit a speaker to the truth of their complements via *presupposition*:

factives	non-factives	factives	non-factives
be significant	be likely	regret	suppose
be odd	be sure	be aware (of)	assert
be tragic	be possible	realize	allege
be exciting	be true	comprehend	assume
be relevant	be false	bear in mind	claim
matter	seem	ignore	believe
amuses	appear	make clear	conclude
make sense	happen	mind	deem
suffice	turn out	resent	charge
bother	maintain		

- (18) It is odd that John is ill. **factive**  
 a. *presupposes*: John is ill  
 b. *negation test*: It is not odd that John is ill. → *John is ill.*
- (19) It is true that John is ill. **non-factive**  
 a. *asserts/entails*: John is ill.  
 b. *negation test*: It is not true that John is ill. ↯ *John is ill.*
- (20) Martha realized that it was raining. **factive**  
 a. *presupposes*: It was raining.  
 b. *negation test*: Martha did not realize that it was raining. → *It was raining.*
- (21) Martha supposed that it was raining. **non-factive**  
 a. *no commitment to*: It was raining.

Both the negation and question tests are known as **projection tests** because they involve an inference ‘projecting’ through a higher clause level:

- presuppositions also project from under factive verbs
- ... so, if you stack factive verbs, you get the presuppositions of the main verb plus the presuppositions of any factives underneath it:

- (22) Martha realized that Juno was sorry that John was ill.  
       a. *presupposes*: Juno was sorry that John was ill.  
       b. *presupposes*: John was ill. (because *be sorry* is also factive)

Some potential counterexamples to the characterization of factive verbs:

- certain contexts can eliminate the real-world orientation of a factive presupposition:

- (23) I dreamed that I was Napoleon and that nobody knew it.  
       *does not presuppose*: I was Napoleon  
       *does presuppose*: I was Napoleon in the dream-world context

- mistaken beliefs, false memories:

- (24) John mistakenly believes that he caused the accident, and he deeply regrets it.<sup>1</sup>

- (25) Before 1980 everyone knew that ulcers were caused by stress.

- future events (coming-to-know): *discover*, *realize* in the present or future tenses

- (26) If we discover that we have misdiagnosed you, we will alert you immediately.

- in both cases, the presupposition shifts to a commitment towards the results of ‘discovery’

- all of these counterexamples involve shifting the context of evaluation into some possible rather than actual world

- this is kind of suggestive about the limits of presupposition projection
- recall, from the verbs of judging, that contextual shifts can affect presupposition:

- (27) Officer O'Reilly accused me of not offering him a bribe and threatened to take me to the police station and accuse me of offering him a bribe.

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<sup>1</sup>Glass (2016) proposes that the Mandarin belief verb *yiwei* actually lexicalizes false belief.  
<https://ling.auf.net/lingbuzz/002600>

### 3 Implicative verbs

#### 3.1 Some basic content distinctions

- verbs with **no commitment** to the truth of a complement clause: verbs of saying:

(28) Kim said that she scheduled the meeting.  
*Kim may or may not have actually scheduled the meeting*

- constructions which **presuppose** the truth of the complement:

(29) Kim remembered that she scheduled the meeting.  
*presupposes*: Kim scheduled the meeting.

- constructions which **entail** the truth of the complement:

(30) It is true that Kim scheduled a meeting.  
*asserts/entails*: Kim scheduled a meeting. *trigger*: be true

(31) Kim remembered to schedule a meeting. **implicative**  
*entails*: Kim scheduled a meeting.

- constructions which **entail** the negation of the complement:

(32) It is false that Kim scheduled a meeting.  
(33) Kim forgot to schedule a meeting. **implicative**

- constructions which **implicate** the truth of their complements:

(34) Kim was able to schedule a meeting.  $\leadsto$  *Kim scheduled a meeting.*  
a. Kim was able to schedule a meeting, #but she was too lazy to make the phone call.

**Note the contrast between *remember that* and *remember to*:**

- (35) Kim remembered that she had scheduled a meeting. **factive**  
a. *presupposes*: Kim had scheduled a meeting.  
b. *negation test*: Kim did not remember that she had scheduled a meeting.  
 $\rightarrow$  *Kim had scheduled a meeting.*
- (36) Kim remembered to schedule a meeting. **implicative**  
a. *entails*: Kim scheduled a meeting.  
b. *negation test*: Kim did not remember to schedule a meeting.  
 $\nrightarrow$  *Kim scheduled a meeting.*  
c. *contradiction test*: Kim remembered to schedule a meeting, #but she did not schedule a meeting.

- *forget that* and *forget to* show a similar contrast:
  - (37) Kim forgot that she had scheduled a meeting.  
*presupposes*: Kim had scheduled a meeting.
  - (38) Kim forgot to schedule a meeting.  
*entails*: Kim did not schedule a meeting.
    - a. *contradiction test*: Kim forgot to schedule a meeting, #but she scheduled a meeting.
- but *that* and *to* are not the locus of the factive/implicative split:
  - (39) ...both *be lucky that* and *be lucky to* are both factive<sup>2</sup>
    - a. It was lucky that Kim scheduled the meeting.
      - i. *presupposes*: Kim scheduled the meeting.
      - ii. *negation test*: It wasn't lucky that Kim scheduled the meeting. → *Kim scheduled the meeting*.
    - b. Kim was lucky to schedule the meeting.
      - i. *presupposes*: Kim scheduled the meeting.
      - ii. *negation test*: Kim wasn't lucky to schedule the meeting. → *Kim scheduled the meeting*.
  - (40) *be bad that* and *be bad to* are the same:
    - a. It wasn't bad that we had one day of rain on the trip.
    - b. It wasn't bad to have one day of rain on the trip.

## 3.2 Types of implicatives

**Implicative** verbs produce entailments about the truth of their complements:

- (41) Tensing and Hillary managed to scale Everest.
  - a. *entails*: Tensing and Hillary scaled Everest.
  - b. *presupposes*: It was difficult/effortful to scale Everest
  - c. *presupposes*: Tensing and Hillary attempted to scale Everest.
- they also presuppose something about the relationship between the subject and the realization of the complement
  - e.g., with *manage*, some difficulty or requirement of effort
- this presupposition is what changes the meaning from verb to verb:
  - (42) Juno dared to enter the cave.
    - a. *entails*: Juno entered the cave.
    - b. *presupposes*: It required courage to enter the cave.

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<sup>2</sup>For some speakers of English, some adjectives like *lucky*, *stupid* are becoming implicative when used with *to*-complements, so there may be a linguistic change taking place.

- the task in providing an analysis of implicative verbs has been to characterize what these presuppositions have in common (ongoing debate)

There are different types of implicatives:

# 1. Two-way implicative verbs:

## a. two-way polarity preserving implicative verbs

- entail the **truth** of their complements **signature:**  $++ \mid --$
- *manage, dare, bother, condescend, remember*

- (43)
- a. Tensing and Hillary managed to scale Everest. (++)  
 $\vdash$  Tensing and Hillary scaled Everest.
  - b. Juno dared to enter the cave. (++)  
 $\vdash$  Juno entered the cave.
  - c. Mr. Sinha bothered to meet with the petitioners. (++)  
 $\vdash$  Sinha met with the petitioners.
  - d. Stallone remembered to thank his director. (++)  
 $\vdash$  Stallone thanked his director.

## b. two-way polarity reversing implicative verbs

- entail the **falsity** of their complements: **signature:**  $+ - \mid - +$
- *fail, forget, neglect*

- (44)
- a. Mallory failed to summit Everest. (+ -)  
 $\vdash$  Mallory did not summit Everest.
  - b. Stephen forgot to turn off the stove. (+ -)  
 $\vdash$  Stephen did not turn off the stove.
  - c. Dora neglected to eat dinner. (+ -)  
 $\vdash$  Dora did not eat dinner.

- for both two-way types these inferences reverse if we negate the main verb:

- (45)
- a. Mallory did not manage to summit Everest. (--)  
 $\vdash$  Mallory did not summit Everest.
  - b. Tensing and Hillary did not fail to scale Everest. (- +)  
 $\vdash$  Tensing and Hillary scaled Everest.
  - c. Sinha did not bother to meet the petitioners. (--)  
 $\vdash$  Sinha did not meet the petitioners.



- additional examples of two-way implicatives of both types

$++ \mid --$	$+- \mid -+$
turn out that/to	fail to
manage to	neglect to
succeed in	refuse to
bother to	refrain from
happen to	avoid
condescend to	

- Finnish has a large number of two-way implicatives (from L. Karttunen 2017):
  - here, the ‘obstacle’ is one way of characterizing implicative presuppositions
  - it is the thing that the subject is required to overcome in order to achieve the complement

verb	signature	obstacle	Finnish
muistaa	$++ \mid --$	forgetfulness	<i>Hän muisti sulkea oven.</i> He remembered to close the door.
onnistua	$++ \mid --$	difficulty	<i>Hän onnistui pääsemään irti.</i> He managed to get loose.
hennoa	$++ \mid --$	empathy	<i>Hennoitko tappa kissan?</i> Did you have the heart to kill the cat?
iljetä	$++ \mid --$	disgust	<i>Hän ei iljennyt katsoa.</i> She did not overcome her disgust to look.
maltaa	$++ \mid --$	impatience	<i>Hän malttoi odottaa.</i> She had the patience to wait.
ennättää	$++ \mid --$	lack of time	<i>Hän ennätti leipoa kakun.</i> She managed to have time to bake the cake.
unohtaa	$+- \mid -+$	memory	<i>Hän unohti sulkea oven.</i> He forgot to close the door.
laiminlyödä	$+- \mid +-$	care	<i>Hän laiminlöi korjata virheen.</i> He neglected to correct the error.
tarjeta	$+- \mid -+$	coldness	<i>En tarjennut uida.</i> I couldn’t stand the cold to swim.

- as Karttunen says, you are “never short of excuses in Finnish”:

- (46) a. *Question:* Why did you not do *X*?  
 b. *Answers:*
- i. En ennättänyt (not enough time)
  - ii. En joutanut (busy with something else)
  - iii. En hennonnut (didn’t have the heart)
  - iv. En tarjennut (wasn’t warm enough)
  - v. En kehdannut (couldn’t overcome embarrassment)
  - vi. En jaksanut (didn’t have the strength)
- c. ...it was not my fault, some obstacle was in the way!

## 2. One-way implicatives:

- only entail their complements (truth or falsity) in one direction
- often generate a defeasible inference in the implicative pattern in the other direction

### a. one-way polarity preserving verbs that entail only under negation

signature: --

- there are not many English examples: *be able to*

(47) Jessica was not able to hit the target. --  
 $\vdash$  Jessica did not hit the target.

- under positive matrix polarity:

(48) Jessica was able to hit the target.  
 $\leadsto$  Jessica hit the target.

- a. *defeasibility test*: Jessica was able to hit the target, but she didn't feel like throwing darts.

- Finnish examples:

verb	signature	obstacle	Finnish
jaksaa	--	lack of strength	<i>Hän ei jaksanut nousta.</i> He did not have the strength to get up.
osata	--	knowledge	<i>Hän ei osannut lukea.</i> He did not know how to read.
pystyä	--	ability	<i>Hän ei pystynyt tappelemaan.</i> He was not able to fight.
ylettää	--	height	<i>Hän ei ylettnyt ottamaan käpyä.</i> He was not tall enough to pick the pine cone.

### b. one-way polarity reversing verbs that entail only under negation

signature: -+

- again, not many English examples: *hesitate*

(49) Leanne did not hesitate to speak up in class.  
 $\vdash$  Leanne spoke up in class.

- under positive matrix polarity, at most an implicature:

(50) Leanne hesitated to speak up in class.  
 $\leadsto$  Leanne did not speak up in class.

- a. *defeasibility test*: Leanne hesitated to speak up in class, but she eventually gave the right answer.

- Finnish examples:

verb	signature	obstacle	Finnish
häikäillä	−+	scruples	<i>Hän ei häikäillyt ottaa lahjuksia.</i> He did not have scruples against taking bribes.
siekailla	−+	hesitation	<i>Hän ei siekaillut hypätä katolta.</i> He did not hesitate to jump off the roof.
kainostella	−+	shyness	<i>Hän ei kainostellut pyytää apua.</i> He was not too bashful to ask for help.

c. **one-way polarity preserving verbs that entail only under positive polarity: *causatives*** **signature: ++**

- English examples: *cause, force, make*

(51) Gurung made the children dance. (++)  
⊢ The children danced.

(52) Gurung did not make the children dance.  
 $\leadsto$  The children did not dance.

a. *defeasibility test*: Gurung did not make the children dance, they danced of their own accord.

- Finnish examples of this sort use the Finnish causative construction, which is morphologically distinct from the implicative construction

d. **one-way polarity reversing verbs that entail only under negative polarity: *negatively-oriented causative verbs*** **signature: +−**

- English examples: *refuse to, prevent NP from, keep NP from*

(53) The language barrier prevented us from becoming friends. (+−)  
⊢ We did not become friends.

(54) The language barrier did not prevent us from becoming friends.  
 $\leadsto$  We became friends.

a. *defeasibility test*: The language barrier did not prevent us from becoming friends, we just did not have any common interests.

- again, Finnish examples of this type use the causative construction

## 4 Polarity calculation and projection

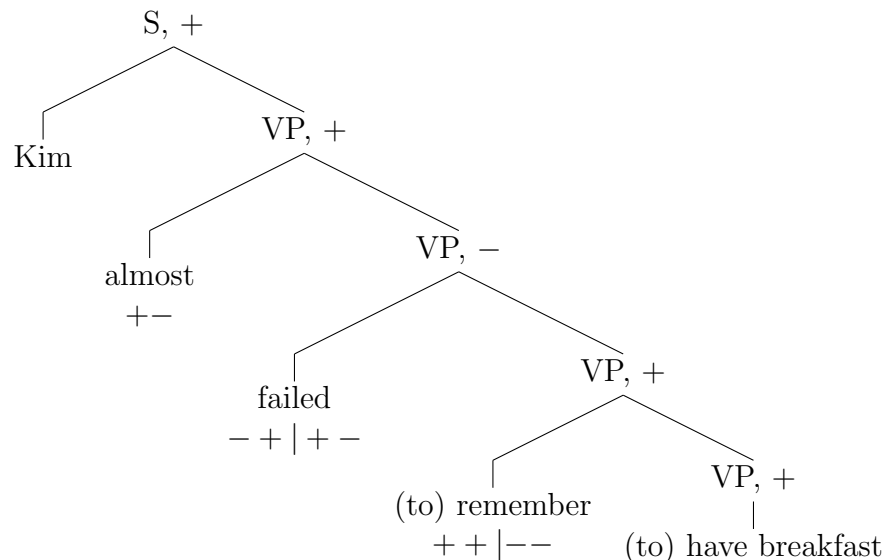
Both factives and implicatives convey information about the truth values of embedded clauses (as asserted by the speaker, or as presupposed in the context)

- we can perform a ‘polarity’ calculation for embedded clauses

- understanding how these verbs work is particularly useful in NLP contexts, where you are trying to design a system that can understand the contextual implications of a sentence or piece of text
- for instance, in example (54), we would like to work out whether or not Kim had breakfast:
  - we haven't talked about adverbs like *almost*, but it has a similar effect on the polarity of embedded clauses as an implicative verb, and we can give it an implicative signature of  $+-$  to capture the fact that, if you *almost* do something, you have not actually done it

(55) Kim almost failed to remember to have breakfast.  $\vdash$  Kim had breakfast.

- almost* indicates that its complement did not occur
- fail* is a two-way polarity reversing implicative
- remember* is a two-way polarity preserving implicative
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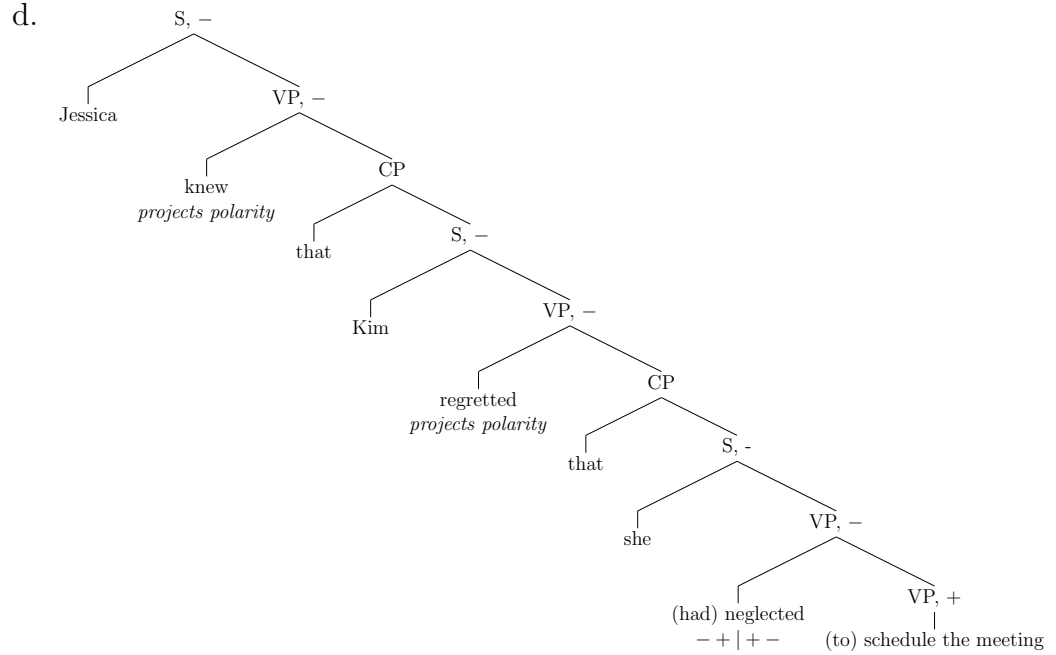


– Stepwise calculation:

- Kim **almost** failed to remember to have breakfast.
  - $\vdash$  Kim did not **fail** to remember to have breakfast.
  - $\vdash$  Kim **remembered** to have breakfast.
  - $\vdash$  Kim had breakfast.

- mixing factives and implicatives:

- Jessica knew that Kim regretted that she had neglected to schedule the meeting. *presupposes*: Kim did not schedule the meeting.
  - know* is factive, presupposes truth of its complement
  - regret* is factive
  - neglect* is a two-way polarity-reversing implicative



– Stepwise calculation:

(58) Jessica **knew** that Kim regretted that she had neglected to schedule the meeting.

- a. *presupposes*: Kim **regretted** that she had neglected to schedule the meeting.
- b. *presupposes*: Kim had **neglected** to schedule the meeting.
- c. *entails*: Kim had not scheduled the meeting

– so, (56) presupposes something which entails that Kim had not scheduled the meeting, and consequently (56) itself presupposes that Kim had not scheduled the meeting

## 5 References

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4. Kiparsky, P. & C. Kiparsky. 1970. Fact. In D. Steinberg & L.A. Jakobovits, eds., *An Interdisciplinary Reader in Philosophy, Linguistics, and Psychology*, 345–369. Cambridge: Cambridge University Press.