

HG2002 Semantics and Pragmatics

Semantics and Pragmatics Review

Francis Bond

Division of Linguistics and Multilingual Studies

<http://www3.ntu.edu.sg/home/fcbond/>
bond@ieee.org

Lecture 12

Location:

<https://bond-lab.github.io/Semantics-and-Pragmatics/>

Creative Commons Attribution License: you are free to share and adapt
as long as you give appropriate credit and add no additional restrictions:

HG2002 (2020)

<https://creativecommons.org/licenses/by/4.0/>.

Review Overview

- Overall Review
- Review of the lectures
- Parting Words

Final in class quiz
Same time and place, next week

Big Picture

- Language can be used to convey information
 - we model this as **meaning**
 - **lexical semantics** looks at relations between words in the lexicon
 - **structural semantics** looks at relations between words in utterances
 - **pragmatics** looks at how and why we use words
- Meaning is infinite
 - it can be built up **compositionally**
 - it can vary and be extended continuously
 - we can only model it approximately

Revision: Introduction to Semantics

What is Semantics

- Very broadly, semantics is the study of meaning
 - Word meaning
 - Sentence meaning
- Layers of Linguistic Analysis
 1. Phonetics & Phonology
 2. Morphology
 3. Syntax
 4. Semantics
 5. Pragmatics
- Semantics could be **autonomous** or **integrated** with other knowledge

Meaning in the larger context

- Semiotics is the study of interpreting symbols, or **signification**
 - We refer to the **signified**
 - Using a **signifier** Saussure

- Problems with defining meaning
 - The **grounding** problem and **circularity**
 - The boundaries of meaning: **linguistic** vs **encyclopedic knowledge**
 - Individual variation in meaning: **idiolects**
 - Words can be combined to form an infinite number of expressions
 - * This building up of meaning is referred to as **composition**
 - * If the meaning of the whole can be deduced from the parts then it is **compositional**

Metalanguages and Notational Conventions

We use language to talk about language, which can get messy. So we use certain words with very specific technical senses, and we use fonts to convey information.

- *word* “gloss” or *utterance* (do this in your assignments!)
- *lexeme*
- *predicate*
- CONCEPT
- **technical term** ← remember me!

Utterances, Sentences and Propositions

- **utterance**: an actual instance of saying (or writing or ...) something
- **sentence**: an abstraction, the type of what was said
 - (1) Caesar invades Gaul
- **proposition**: a further abstraction, normally ignoring some non-literal meaning
 - (2) `invade(Caesar, Gaul)`
- **information structure**: what part of a proposition is emphasized
 - (3) Caesar invaded Gaul
 - (4) Gaul was invaded by Caesar

-
- (5) It was Gaul that Caesar invaded
 - (6) It was Caesar who invaded Gaul

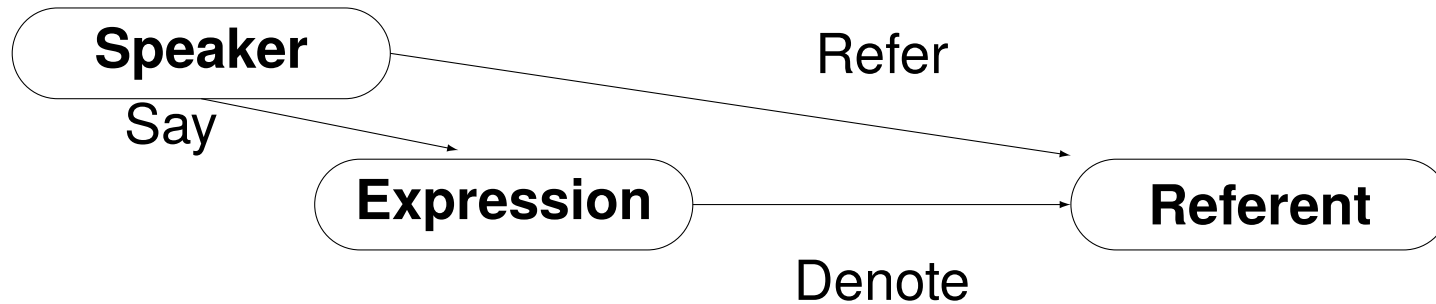
Information Theory

- Language has many uses, only one of which is to convey information
 - but surely transferring information is important
- We can measure information in a limited, technical, and very useful, sense
 - Think of a **signal** being transmitted from a source to a destination, possibly with **noise** in the channel
 - Measure information in **bits**:
 - the number of yes/no questions needed to determine a term
 - Context can help decoding due to **Mutual Information**
- How can we get our message across efficiently and safely
 - **Optimal encoding** can make the transmission efficient
 - Frequent expressions should be short

-
- **Redundant encoding** can make the transmission robust
So we can understand even with noise

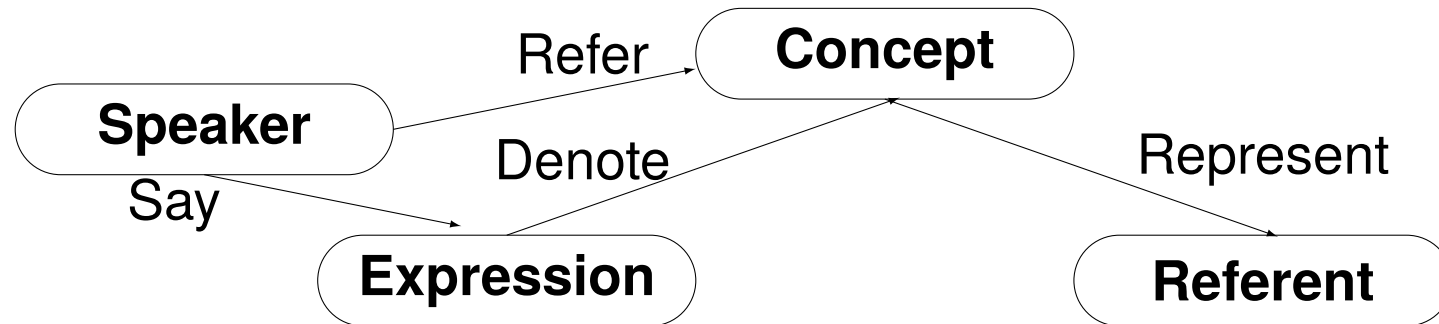
Revision: Meaning, Thought and Reality

Referential View



Referential view is focused on direct relationships between expressions (words, sentences) and things in the world (realist view). (More in Chapter 10)

Representational View



Representational view is focused on how relationships between expressions (words, sentences) and things in the world are mediated by the mind (cognitive linguistics). (More in Chapters 9 and 11)

Two types of naming

- **The description theory:** Names are like short hands for descriptions:

William Shakespeare = “the playwright who wrote Hamlet”

- **The causal theory:** Names begin with some event of naming (e.g. a christening) before becoming commonly accepted.

William Shakespeare = “the guy other people call William Shakespeare”

Mental Representations

- Divide meaning into
 - **reference**: the relation to the world
 - **sense**: the rest of the meaning
- Introduce **concepts**
 - Classic view is to represent by **Necessary and Sufficient Conditions**: **definitional** view of meaning
bachelor is an unmarried male adult.

Prototype Theory

- Some members of a category are more typical and more salient than other members of the same category. (Rosch)
 - Membership is not just IN/OUT but graded
 - Members may share some attributes but not all
 - Categories are culture dependant
 - Concepts are organized in groups around a **prototype**
 - These have typical members (remembered as **exemplars**)
 - prototypes have **characteristic features**
 - Some categories (concepts) are seem to be more psychologically basic than others: **basic level categories**
 - * You only need to store detailed knowledge about BLCs
 - * Other things are then compared to them
 - * Makes it quicker and easier to compute similarities and differences

Basic Level Categories

- Some categories (concepts) are more basic than others
 - maximize the number of attributes shared by members of the category
 - minimize the number of attributes shared with other categories
- They have various properties
 - Pictures of objects are categorized faster at the basic level
 - Basic level names used more often in free-naming tasks
 - Children learn them earlier
 - Basic-level names are more common in adult discourse
 - Basic-level categories are common in different cultures
 - Basic level names tend to be short
 - Basic-level names tend to be common in compound nouns

Linguistic Relativity

- The language we think in makes some concepts easy to express, and some concepts hard
- The idea behind **linguistic relativity** is that this will effect how you think
- Do we really think in language?
 - We can think of things we don't have words for
 - Language under-specifies meaning
- Maybe we store a more abstract representation **the language of thought** or **Mentalese**

Revision: Word Meaning

Words

word slippery to define: orthographic, phonological, conceptual definitions mainly overlap

lexeme base (uninflected) form of a word (or multi word expression)

vagueness having an underspecified meaning

ambiguous having more than one possible meaning

content word with a denotation (typically open class : **lexical word**)

function word no denotation (typically closed class: **grammatical word**, **structural word**)

Senses and Relations

polysemous having multiple meanings

- this implies that words are somehow divided into senses
- presumably we remember them: so we have an inventory
- if there is no mechanism for extension then this is a **fixed sense inventory**
- how we **generate** meaning **dynamically** is a hot research topic

monosemous having just one meaning

homonyms words unrelated meaning; grammatically equivalent; with identical forms

Lexical Relations

synonymy all meanings identical; in all contexts; descriptive and non-

hyponymy is-a, kind-of: supertype **hypernym**; subtype **hyponym**

meronymy part-whole: part **meronym**; whole **holonym**

antonymy (complementary, gradable, reverse, converse, taxonomic sisters)

member-collection member of a group (*tree-forest*)

portion-mass element of stuff (*grain-rice*)

domain used in a domain (*[software] driver -golf*)

Revision: Sentence Relations and Truth

Logic

- Classical logic is an attempt to find valid principles of argument and inference.

<i>a</i>	If something is human then it is mortal	premise
<i>b</i>	Socrates is human	premise
<hr/>		
<i>c</i>	Socrates is mortal	conclusion

- Can we go from *a* and *b* to *c*? Yes
- Truth is **empirical**: The premises need to correspond with the facts of the world
 - Sentences have **truth values** (true, false or unknown)
 - The state of the world that makes a sentence true or false are its **truth conditions**

Methods of Argument

➤ Modus Ponens

<i>a</i>	If something is human then it is mortal
<i>b</i>	Socrates is human
<hr/>	
<i>c</i>	Socrates is mortal

$p \rightarrow q, p \vdash q$

➤ Modus tollens

<i>a</i>	If something is human then it is mortal
<i>b</i>	Zeus is not mortal
<hr/>	
<i>c</i>	Zeus is not human

$p \rightarrow q, \neg q \vdash \neg p$

➤ **Hypothetical syllogism**

a If something is human then it is mortal

b If something is mortal then it dies

c If something is human then it dies

$p \rightarrow q, q \rightarrow r \vdash p \rightarrow r$

➤ **Disjunctive syllogism**

(modus tollendo ponens: affirm by denying)

a Either a human is mortal or a human is immortal

b A human is not immortal

c A human is mortal

$p \vee q, \neg q \vdash p$ (also true that $\neg p \vdash q$)

$p \oplus q, \neg q \vdash p$ (also true that $\neg p \vdash q$)

$p \oplus q, q \vdash \neg p$ (also true that $p \vdash \neg q$)

Empirical truths and connectives

p	q	$p \rightarrow q$	$p \wedge q$	$p \vee q$	$p \oplus q$	$p \equiv q$	$\neg p$
		if	and	or	XOR	iff	not
T	T	T	T	T	F	T	F
T	F	F	F	T	T	F	F
F	T	T	F	T	T	F	T
F	F	T	F	F	F	T	T

- Words themselves often carry more implications
I did A and B often implies *I did A first*
- There are many ways of saying the operations

Necessary Truth, A Priori Truth and Analyticity

- Arguments from the speaker's knowledge
 - **A priori** truth is truth that is known without experience.
 - **A posteriori** truth is truth known from empirical testing.
- Arguments from the facts of the world
 - **Necessary truth** is truth that cannot be denied without forcing a contradiction.
 - **Contingent truth** can be contradicted depending on the facts.
- Arguments from our model of the world
 - **Analytic truth** Truth follows from meaning relations within the sentence.
can include word meaning
 - **Synthetic truth** Agrees with facts of the world.

Entailment

➤ Entailment

a	The evil overlord assassinated the man in the red shirt.
<hr/>	
b	The man in the red shirt died.

A sentence p entails a sentence q when the truth of the first (p) guarantees the truth of the second (q), and the falsity of the second (q) guarantees the falsity of the first (p).

➤ Sources of Entailment

➤ Hyponyms

(7) *I rescued a dog today. vs I rescued an animal today.*

➤ Paraphrases

(8) *My mom baked a cake. vs A cake was baked by my mom.*

Presuppositions

- Many statements assume the truth of something else
 - (9) a. *Kim's spouse bakes the best pies.*
 - b. *Kim has a spouse.*
- Negating the presupposing sentence *a* doesn't affect the presupposition *b* whereas negating an entailing sentence destroys the entailment.
- Sources of Presuppositions
 - Names presuppose that their referents exist
 - Clefts (*it was X that Y*); Time adverbials; Comparatives
 - Factive verbs: *realize*; some judgement verbs: *blame*; ...
- Presupposition is one aspect of a speaker's strategy of organizing information for maximum clarity for the listener.

Revision: Situations

Summary of Situation

- Verb/Situation Types
 - Stative
 - Dynamic
 - * Punctual
 - * Durative
 - Telic/Resultative
 - Atelic
- Tense/Aspect and Time: R, S and E
- Modality
 - Epistemic: Knowledge, Possibility
 - Deontic: Permission, Obligation
- Evidentiality

Situation Types

Situations	Stative	Durative	Telic	Examples
States	+	+		<i>desire, know</i>
Activities	—	+	—	<i>run, drive a car</i>
Accomplishment	—	+	+	<i>bake, walk to school, build</i>
Punctual	—	—	—	<i>knock, flash</i>
Achievement	—	—	+	<i>win, start</i>

Tense and Time

- Locate a situation to a point in time:
S = speech point; R = reference time: E = event time
- Simple Tense
 - * Past ($R = E < S$) *saw*
 - * Present ($R = S = E$) *see*
 - * Future ($S < R = E$) *will see*
- Complex Tense
 - * Past Perfect ($E < R < S$) *had seen*
 - * Present Perfect ($E < R = S$) *have seen*
 - * Future Perfect ($S < E < R$) *will have seen*

Aspect in General

- **Perfective** focus on the end point
 - **Completive** *I built the building*
 - **Experiential** *I have built the building*
- **Imperfective**
 - **Progressive** *I was listening/I am listening*
 - **Habitual** *I listen to the Goon Show*
- Different languages grammaticalize different things

Mood: Knowledge vs Obligation

- **Epistemic modality**: Speaker signals degree of knowledge.

(10) *You can drive this car* (You are able to)

- **Deontic modality**: Speaker signals his/her attitude to social factors of obligation and permission.

- **Permission**

(11) *You can drive this car* (You have permission to)

(12) *You may drive this car*

- **Obligation**

(13) *You must drive this car* (You have an obligation to)

(14) *You ought to drive this car*

Mood more Generally

- Grammatical Inflection used to mark modality is called **mood**
 - **indicative** expresses factual statements
 - **conditional** expresses events dependent on a condition
 - **imperative** expresses commands
 - **injunctive** expresses pleading, insistence, imploring
 - **optative** expresses hopes, wishes or commands
 - **potential** expresses something likely to happen
 - **subjunctive** expresses hypothetical events; opinions or emotions
 - **interrogative** expresses questions
- English only really marks imperative and subjunctive, and then only on **be**
 - (15) *Be good!*
 - (16) *If I were a rich man*

Revision: Participants

Thematic Roles

- Thematic roles are parts of the sentence that correspond to the participants in the situation described
- They classify relations between entities in a situation
- Roles link different alternations

(17) *Kim patted Sandy*

(18) *Sandy was patted by Kim*

Thematic Roles

- **AGENT** (takes *deliberately, on purpose, what did X do?*)
 - Volitional, typically animate
 - Typically SUBJECT
 - *Kim kicked Sandy*

- **PATIENT** (*What happened to X?*)
 - Undergoes change in state usually, both animate and inanimate
 - Typically OBJECT
 - *Kim kicked Sandy*

- **THEME**
 - Moved, location or state is described
 - Typically OBJECT
 - *He put the book on the shelf*

➤ EXPERIENCER

- Non-volitional, displaying awareness of action, state
- Typically SUBJECT
- *He heard thunder*

➤ BENEFICIARY

- for whose benefit the action was performed
- Typically indexed by "for" PP and "to" PP in English
- *They gave me a present*
- *They gave a present to me*
- *They made a present for me*

➤ LOCATION

- Place
- Typically indexed by locative PPs in English
- *I live in Jurong*

➤ GOAL

- towards which something moves (lit or metaphor)
- Typically indexed by "to" PP in English
- *She handed her form to him, She handed him her form*

➤ SOURCE

- from which something moves or originates
- Typically indexed by "from" PP in English
- *We gleaned this from the Internet*

➤ **INSTRUMENT/MANNER**

- Means by which action is performed
- Can be indexed by "with" PP in English
- *I ate breakfast with chopsticks*

➤ **STIMULUS**

- Usually used in connection with EXPERIENCER
- *The lightning scared him*

Theta-Grid

- Verbs can be described with their **valence** (**theta-grid**, **sub-categorization**)
 - **give**: V ⟨AGENT, THEME, BENEFICIARY⟩
 - underlined role maps to subject
 - order of roles allows prediction of grammatical function
- This is used to link the meaning with the realization
- Distinguish between
 - **participant roles** depend on the verb — in the grid (**arguments**)
 - **non-participant roles** combine freely — not in the grid (**adjuncts**)
- Theta Roles are semantic NOT syntactic

Linking Grammatical Relations and Thematic Roles

- Thematic roles typically map onto grammatical functions systematically
 - AGENT is usually the subject
 - PATIENT is usually the object
- It is possible to predict how arguments are linked to the verb from their thematic roles, and hence their grammatical functions.
- **Thematic Hierarchy** The higher you are in the hierarchy the more likely to be subject (then object, then indirect, then argument PP, then adjunct PP)

$$\text{AGENT} > \left\{ \begin{array}{c} \text{RECIPIENT} \\ \text{BENEFICIARY} \end{array} \right\} > \left\{ \begin{array}{c} \text{THEME} \\ \text{PATIENT} \end{array} \right\} > \text{INSTRUMENT} > \text{LOCAL}$$

➤ Generally true across languages

Dowty's Proto-Arguments

- The **Agent** Proto-Role (Dowty 1991)
 - Volitional; Sentient (and/or perceptive)
 - Causes event or change of state; Movement
- The **Patient** Proto-Role
 - Change of state; Incremental theme (i.e. determines aspect)
 - Causally affected by event
 - Stationary (relative to movement of proto-agent).
- when a verb takes a subject and an object
 - the argument with the greatest number of Proto-Agent properties will be the one selected as SUBJECT
 - the one with the greatest no. of Proto-Patient properties will be selected as OBJECT

Alternations

- Many verbs have multiple theta-grids

- (19) a. *Kim broke the window with the hammer*
b. *The hammer broke the window*
c. *The window broke*

- (20) a. *I cut the cake with the knife*
b. *This cake cuts easily*

- The relations between them are called **alternations**
- English Verb Classes and Alternation (Levin 1993)

Voice

- Another way to change the number of arguments is **voice**: passive, middle

(21) Transitive Passive

- a. *Kim ate Sandy*
- b. *Sandy was eaten by Kim*

(22) Ditransitive Passive

- a. *A gave B C; A gave C to B*
- b. *C was given to B by A; B was given C by A*

(23) Transitive Middle (or just causative/inchoative)

- a. *They open the gate very quietly*
- b. *The gate opens very quietly*

(24) Intransitive Middle

- a. *The knife cuts the cake well*
- b. *The knife cuts well*

Classifiers and Noun Classes

- Many languages include special ways to classify nouns
 - Noun Classifiers (Bantu, Yidi , ...)
 - Numeral Classifiers (Chinese, Malay, Japanese, ...)
 - * English group nouns: *flock, mob, group, pack, ...*
 - Gender (German, Spanish, ...)
- Classifiers can be marked on the noun, on the verb, on a separate word (a classifier) or on all words

What gets Classified?

- **Taxonomic Class:** HUMAN, ANIMAL, TREE, FEMALE
- **Function:** piercing, cutting, writing instrument, for eating/drinking
- **Shape:** long, flat, round (1D, 2D, 3D)
- **Consistency:** rigid, flexible
- **Size:** grab in fingers, hand, < human, > human
- **Location:** towns
- **Arrangement:** row, coil, heap
- **Quanta:** head, pack, flock

Noun Classes vs Classifiers

	Noun classes	Classifiers
Size	Small Finite Set	Large Number (low hundreds)
Realization	Closed Grammatical System	Separate Morpheme
Marking	Also outside the noun word	Only in the noun phrase

- Gender (noun class in e.g., German)
 - typically 3 (Masculine, Feminine, Neuter)
 - marked as inflection
 - marked on determiners, adjective and nouns
- Numeral Classifiers (in e.g., Japanese)
 - typically 30-80 in common use, hundreds exist
 - separate classifier phrase (numeral/interrogative+classifier)
 - classifier phrase modifies noun

Summary

- Semantics motivates syntax
 - But most generalizations fail to cover all examples
- Argument structure and thematic roles link predicates and their arguments
 - Remember the basic roles and examples
- Dowty's Argument Selection Principle
prototypical agents and patients are subjects and objects
- Problems with thematic roles
- Noun Classes and Classifiers

Revision: Context and Inference

What is Deixis

- any linguistic element whose interpretation necessarily makes reference to properties of the extra-linguistic context in which they occur is **deictic**

Person relative to the speaker and addressee

Spatial Location demonstratives; ...

Temporal Location tense; *yesterday, today, tomorrow*

Social relative to the social status: *professor, you, uncle, boy*

- Discourse deixis: referring to a linguistic expression or chunk of discourse

More than 90% of the declarative sentences people utter are indexical in that they involve implicit references to the speaker, addressee, time and/or place of utterance in expressions like first and second person pronouns, demonstratives, tenses, and adverbs like here, now, yesterday (Bar-Hillel 1954: 366).

Spatial Deixis

- Two way systems (English, ...)

proximal	<i>this</i>	<i>here</i>	close to the speaker
distal	<i>that</i>	<i>there</i>	far to the speaker

- Three way systems (Japanese, ...)

proximal	<i>kore</i> “this”	<i>koko</i> “here”	close to speaker
medial	<i>sore</i> “that”	<i>soko</i> “there”	close to addressee
distal	<i>are</i> “that”	<i>asoko</i> “over there”	far from both
interrogative	<i>dore</i> “which”	<i>doko</i> “where”	question

- Can decompose: *this* “this thing”, *here* “this place”, *where* “what place”
now “this time”, *then* “that time”, *when* “what time”

Person Deixis

- Commonly a three way division

First Person	Speaker	<i>I</i>
Second Person	Addressee	<i>you</i>
Third Person	Other	<i>he/she/it</i>

- Often combined with

- **gender:** *he/she/it*
- **number:** *I/we*, *'anta* “you:m”, *'antumaa* “you:dual”, *'antum* “you:m:pl”
(Arabic)
- **inclusion:** *núy* “we including you”, *níi* “we excluding you”
(Zayse)
- **honorification:** *kimi* “you:inferior”, *anata* “you:equal”,
don't use pronouns for superiors: *sensei* “teacher”,
...(Japanese)

Social Deixis

In European languages, a two-way choice in 2nd person pronominal reference is known as the T/V distinction, based on the French forms for “you”.

➤ T/V distinctions in European languages

	Familiar 2sg	Polite 2sg
French	tu	vous
German	du	Sie
Spanish	tú	usted

- Shift from asymmetric use showing **power** (superior uses **du**; inferior uses **vous**) to symmetric use showing **solidarity** (strangers use **vous**; intimates use **du**): typically the socially superior person must invite the socially inferior person to use the familiar form

Strict and Sloppy Readings

(25) *Kim wrote to her mother and Sandy did too*

- **Strict anaphora** is the reading where *did too* is understood as “wrote to Kim’s mother”
- **Sloppy anaphora** is the reading, where *did too* is understood as “wrote to one’s own mother”, resolving to “wrote to Sandy’s mother”.

Context-dependence is everywhere

- For example, in a bookstore

(26) *I am looking for the new Wolfe* [book by Wolfe]

- In a snooker (pool) game

(27) *I have two reds left*

- **metonymy**: substituting the name of an attribute or feature for the name of the thing itself

(28) *The ham sandwich is at table three*

(29) *I spent all morning with the suits*

- **synecdoche**: substituting the name of a part for the name of a thing

(30) *It's good to see some new faces here*

Knowledge as Context

➤ Knowledge to interpret utterances can come from multiple sources

1. The physical context of the utterance

Deixis

2. What has already been said

Discourse

3. Background and common knowledge

World knowledge

➤ In a dialogue, we often only add new knowledge as a **fragment**

(31) a. *Who moved these chairs?*

b. *Sandy (did)*

Information Structure

- Many languages signal whether information is **new** or **given**
- We can signal this in many ways:
 - Determiners in English
 - Intonation (focus)
 - Topic marking

Cooperation in Conversation

➤ **Cooperative Principle:** people cooperate in conversation

“Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged.”

➤ **Implicature**

The aspect of meaning that a speaker conveys, implies, or suggests without directly expressing.

Can you pass the salt? may implicate “pass me the salt”

Gricean Maxims

Maxim of Quantity

- Make your contribution as informative as is required (for the current purposes of the exchange).
- Do not make your contribution more informative than is required.

Maxim of Quality

- Do not say what you believe to be false.
- Do not say that for which you lack proper evidence.

Maxim of Relation

- Be relevant.

Maxim of Manner

- Be perspicuous [= be easily understood]
- Avoid obscurity of expression.
- Avoid ambiguity
- Be brief (avoid unnecessary prolixity)
- Be orderly

Conversational Implicatures and Hedges

- **Generalised conversational implicatures**
the inferences we make by assuming cooperation
- **Particularised conversational implicatures**
local inferences for a given situation
- **Scalar implicatures (Horn Scales)**
one item on a scale implicates all weaker items (and no stronger ones)
- **Conventional implicatures**
implicatures attached to lexical items
- **Hedges**: show we know we are flouting a maxim

Revision: Speech as Action

Speech as Action

- Language is often used to **do** things: **speech acts**
language has both
 - **interactivity**
 - **context dependence**
- There are four syntactic types that correlate closely to pragmatic uses

declarative	↔	assertion
interrogative	↔	question
imperative	↔	order
optative	↔	wish
- Mismatches between syntactic type and pragmatic use give rise to
indirect speech acts

Perfomative Utterances

- (32) *I promise I won't drive home*
- (33) *I bet you 5 bucks they get caught*
- (34) *I declare this lecture over*
- (35) *I warn you that legal action will ensue*
- (36) *I name this ship the Lollipop*

- Uttering these (in an appropriate context) **is** acting
Utterances themselves can be actions
- In English, we can signal this explicitly with *hereby*

Felicity Conditions

- Performatives (vs Constantives) (Austin)

Given the correct **felicity conditions**

A1 There must exist an accepted conventional procedure that includes saying certain words by certain persons in certain circumstances,

A2 The circumstances must be appropriate for the invocation

B1 All participants must do it both correctly

B2 ...and completely

C1 The intention must be to do this the act

C2 The participants must conduct themselves so subsequently.

- If the conditions don't hold, the speech act is **infelicitous**

- Failing **A** or **B** is a **misfire**

- Failing **C** is an **abuse**

Explicit and Implicit Performatives

➤ Explicit Performatives

- Tend to be first person
- The main verb is a performative: *promise, warn, sentence, bet, pronounce, ...*
- You can use *hereby*

➤ Implicit Performatives

- (37) *You are hereby charged with treason*
- (38) *Students are requested to be quiet in the halls*
- (39) *10 bucks says they'll be late*
- (40) *Come up and see me some time!*

Can be made explicit by adding a performative verb

Elements of Speech Acts

Locutionary act the act of saying something

Illocutionary act the force of the statement

Perlocutionary act the effects of the statement

Illocutionary force indicating devices(IFID)

- word order; stress; intonation contour; punctuation; the mood of the verb performative verbs: *I (Vp) you that ...*

Searle's speech act classification

Declarative changes the world (like performatives)

Representative describes the (speaker's view of the) world

Expressives express how the speaker feels

Directives get someone else to do something

Comissives commit oneself to a future action

Literal and non-literal uses

- (41) a. *Could you get that?*
b. *Please answer the door.*
- (42) a. *I wish you wouldn't do that.*
b. *Please don't do that.*
- (43) a. *You left the door open.*
b. *Please close the door.*

- People have access to both the literal and non-literal meanings
- Non literal meanings can be slower to understand
- Some non-literal uses are very conventionalized
Can/Could you X? → Please X
- Questioning the felicity conditions produces an indirect version

Felicity Conditions for Requesting

These things must hold for an utterance to be a **request**:

- **Preparatory 1:** H is able to perform A
- **Preparatory 2:** It is not obvious that the H would perform A without being asked
- **Propositional:** S predicates a future act A of H
- **Sincerity:** S wants H to do A
- **Essential:** The utterance e counts as an attempt by S to get H to do A

Why be Indirect?

- Mainly for politeness
 - **Positive Face** desire to seem worthy and deserving of approval
 - **Negative Face** desire to be autonomous, unimpeded by others
 - Threats to another's face
 - * to positive: disapproval, disagreement, interruption
 - * to negative: orders, requests, suggestions
 - Face-saving acts:
 - * don't threaten another's face: *I may be wrong but, ...*
 - * allow for negative face: *Could you please, ...*
 - Is politeness trans-cultural?

Revision: Componential Analysis

Break word meaning into its components

- components allow a compact description
- interact with morphology/syntax
- form part of our cognitive architecture
- For example:

<i>woman</i>	[FEMALE]	[ADULT]	[HUMAN]	
<i>spinster</i>	[FEMALE]	[ADULT]	[HUMAN]	[UNMARRIED]
<i>bachelor</i>	[MALE]	[ADULT]	[HUMAN]	[UNMARRIED]
<i>wife</i>	[FEMALE]	[ADULT]	[HUMAN]	[MARRIED]

- We can make things more economical (fewer components):

<i>woman</i>	[+FEMALE]	[+ADULT]	[+HUMAN]	
<i>spinster</i>	[+FEMALE]	[+ADULT]	[+HUMAN]	[−MARRIED]
<i>bachelor</i>	[−FEMALE]	[+ADULT]	[+HUMAN]	[−MARRIED]
<i>wife</i>	[+FEMALE]	[+ADULT]	[+HUMAN]	[+MARRIED]

Defining Relations using Components

- **hyponymy**: P is a hyponym of Q if all the components of Q are also in P.

spinster \subset *woman*; *wife* \subset *woman*

- **incompatibility**: P is incompatible with Q if they share some components but differ in one or more **contrasting** components

spinster $\not\approx$ *wife*

- Redundancy Rules

[+HUMAN]	→	[+ANIMATE]	
[+ANIMATE]	→	[+CONCRETE]	
[+MARRIED]	→	[+ADULT]	
[+MARRIED]	→	[+HUMAN]	...

Katz's Semantic Theory

- Semantic rules must be recursive to deal with infinite meaning
- Semantic rules interact with syntactic rule to build up meaning **compositionally**
- A **dictionary** pairs lexical items with semantic representations
 - * (**semantic markers**) are the links that bind lexical items together in lexical relations
 - * [**distinguishers**] serve to identify this particular lexical item

this information is not relevant to syntax
- **projection rules** show how meaning is built up
 - * Information is passed up the tree and collected at the top.
 - * **Selectional restrictions** help to reduce ambiguity and limit the possible readings

Verb Classification

- We can investigate the meaning of a verb by looking at its grammatical behavior
 - (44) Consider the following transitive verbs
 - a. *Margaret cut the bread*
 - b. *Janet broke the vase*
 - c. *Terry touched the cat*
 - d. *Carla hit the door*
- These do not all allow the same argument structure alternations

Diathesis Alternations

- **Causative/inchoative** alternation:
Kim broke the window ↔ *The window broke*
also *the window is broken* (state)
- **Middle construction** alternation:
Kim cut the bread ↔ *The bread cut easily*
- **Conative** alternation:
Kim hit the door ↔ *Kim hit at the door*
- **Body-part possessor ascension** alternation:
Kim cut Sandy's arm ↔ *Kim cut Sandy on the arm*

Diathesis Alternations and Verb Classes

- A verb's (in)compatibility with different alternations is a strong predictor of its lexical semantics:

	<i>break</i>	<i>cut</i>	<i>hit</i>	<i>touch</i>
Causative	YES	NO	NO	NO
Middle	YES	YES	NO	NO
Conative	NO	YES	YES	NO
Body-part	NO	YES	YES	YES

- We can analyze components that correlate with the alternations

<i>break</i>	CAUSE, CHANGE	{ <i>break, chip, crack, crash, crush, ...</i> }
<i>cut</i>	CAUSE, CHANGE, CONTACT, MOTION	{ <i>chip, clip, cut, hack, hew, saw, ...</i> }
<i>hit</i>	CONTACT, MOTION	{ <i>bang, bash, batter, beat, bump, ...</i> }
<i>touch</i>	CONTACT	{ <i>caress, graze, kiss, lick, nudge, ...</i> }

Cognitive Semantics

- Major semantic components of Motion:
- * **Figure**: object moving or located with respect to the **ground**
 - * **Ground**: reference object
 - * **Motion**: the presence of movement of location in the event
 - * **Path**: the course followed or site occupied by the Figure
 - * **Manner**: the type of motion

(45) *Kim swam away from the crocodile*
Figure Manner Path Ground

(46) *The banana hung from the tree*
Figure Manner Path Ground

- These are lexicalized differently in different languages.

Language (Family)	Verb Conflation Pattern
Romance, Semitic, Polynesian, ...	Path + fact-of-Motion
Indo-European (– Romance), Chinese	Manner/Cause + fact-of-Motion
Navajo, Atsuwegei, ...	Figure + fact-of-Motion

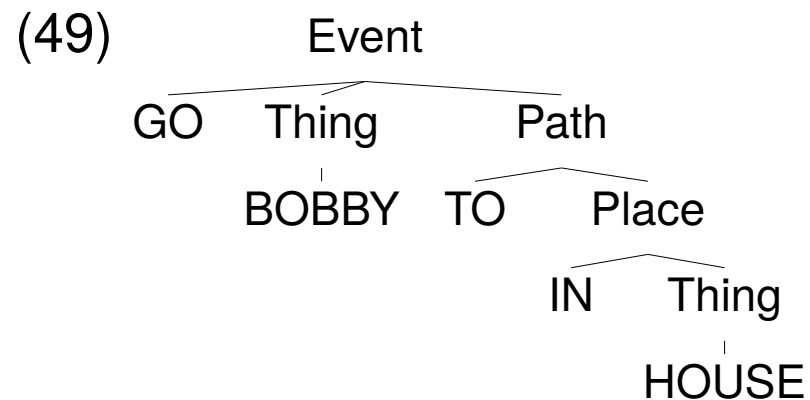
Jackendoff's Lexical Conceptual Structure

- An attempt to explain how we think
- **Mentalist Postulate**
 - Meaning in natural language is an information structure that is mentally encoded by human beings
- Universal Semantic Categories
 - * **Event**
 - * **State**
 - * **Material Thing/Object**
 - * **Path**
 - * **Place**
 - * **Property**

Motion as a tree

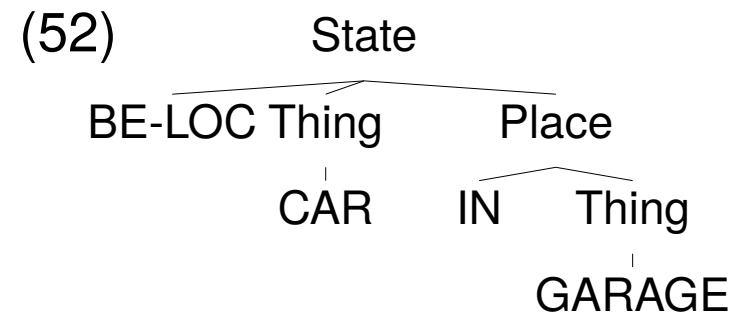
(47) *Bobby went into the house*

(48) “Bobby traverses a path that terminates at the interior of the house”



(50) *The car is in the garage*

(51) “The car is in the state located in the interior of the garage”



Things: Boundedness and Internal Structure

- Two components:

Boundedness	Internal Struct.	Type	Example
+b	−i	individuals	<i>a dog/two dogs</i>
+b	+i	groups	<i>a committee</i>
−b	−i	substances	<i>water</i>
−b	+i	aggregates	<i>buses, cattle</i>

- This can be extended to verb aspect (the verb event is also [$\pm b$, $\pm i$]).

sleep [−b], *cough* [+b], *eat* [$\pm b$]

(53) Bill ate two hot dogs in two hours.

(54) *Bill ate hot dogs in two hours.

(55) #Bill ate two hot dogs for two hours.

(56) Bill ate hot dogs for two hours.

Conversion: Boundedness and Internal Structure

➤ Including

plural	$[+b, -i] \rightarrow [-b, +i]$	<i>brick</i> → <i>bricks</i>
composed of	$[-b, +i] \rightarrow [+b, -i]$	<i>bricks</i> → <i>house of bricks</i>
containing	$[-b, -i] \rightarrow [+b, -i]$	<i>coffee</i> → <i>a cup of coffee/a coffee</i>

➤ Excluding

element	$[-b, +i] \rightarrow [+b, -i]$	<i>grain of rice</i>
partitive	$[-b, \pm i] \rightarrow [+b, -i]$	<i>top of the mountain, one of the</i>
universal grinder	$[+b, -i] \rightarrow [-b, -i]$	<i>There's <u>dog</u> all over the road</i>

Pustejovsky's Generative Lexicon

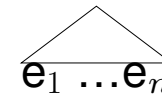
- Each lexical entry can have:
 - ARGUMENT STRUCTURE
 - EVENT STRUCTURE
 - LEXICAL INHERITANCE STRUCTURE
 - QUALIA STRUCTURE:
 - CONSTITUTIVE constituent parts
 - FORMAL relation to other things
 - TELIC purpose
 - AGENTIVE how it is made
- Interpretation is **generated** by combining word meanings
- Events have **complex** structure

State

S
|
e

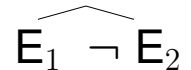
understand, love, be tall

Process

P


sing, walk, swim

Transition

T

 $E_1 \neg E_2$

open, close, build

Qualia Structure

(60) *fast typist*

- a. a typist who is fast [at running]
- b. a typist who types fast

➤ typist $\left[\begin{array}{l} \text{ARGSTR} \left[\text{ARG1 } x:\text{typist} \right] \\ \text{QUALIA} \left[\begin{array}{l} \text{FORMAL } [x \subset \text{person}] \\ \text{TELIC } [\text{type}(e, x)] \end{array} \right] \end{array} \right]$

➤ (60a) *fast* modifies x

➤ (60b) *fast* modifies e

Summary

- Meaning can be broken up into units smaller than words: **components**
 - These can be combined to make larger meanings
 - At least some of them influence syntax
 - They may be psychologically real
- Problems with Components of Meaning
 - Primitives are no different from necessary and sufficient conditions
 - it is impossible to agree on the definitions
 - but they allow us to state generalizations better
 - Psycho-linguistic evidence is weak
 - It is just **markerese**
 - There is no **grounding**

Revision: Formal Semantics

Language meets Logic (again)

- **formal semantics** is also known as
 - **truth-conditional semantics**
 - **model-theoretic semantics**
 - **Montague Grammar**
 - **logical semantics**
- A general attempt to link the meaning of sentences to the circumstances of the world: **correspondence theory**
 - If the meaning of the sentence and the state of the world **correspond** then the sentence is **true**

Model-Theoretical Semantics

1. Translate from a natural language into a logical language with explicitly defined syntax and semantics
2. Establish a mathematical model of the situations that the language describes
3. Establish procedures for checking the mapping between the expressions in the logical language and the modeled situations.

Translating English into a Logical Metalanguage

- Consider simple sentences
 - Represent the predicates by a capital **predicate letter** these can be n-ary
 - Represent the **individual constants** by lower case letters
 - Represent **variables** by lower case letters (x,y,z)
- Join simple sentences with logical connectives
treat relative clauses as **and**
 - (61) *Bobbie who is asleep writhes*: $A(b) \wedge W(b)$
 - (62) *Bobbie is asleep and Freddie drinks*: $A(b) \wedge D(f)$
 - (63) *Freddie drinks and sleeps*: $D(f) \wedge S(f)$
 - (64) *Freddie doesn't drink beer*: $\neg D(f,b)$
 - (65) *If Freddie drinks whiskey Bobbie sleeps*: $D(f,w) \rightarrow S(b)$

Quantifiers in Predicate Logic

➤ Quantifiers bind variables and scope over predications

➤ **Universal Quantifier** (\forall : *each, every, all*)

➤ **Existential Quantifier** (\exists : *some, a*)

(66) *All students learn logic*: $\forall x (S(x) \rightarrow L(x, l))$

(67) *A student learns logic*: $\exists x (S(x) \wedge L(x, l))$

(68) *Some students learn logic*: $\exists x (S(x) \wedge L(x, l))$

(69) *No students learn logic*: $\neg \exists x (S(x) \wedge L(x, l))$

(70) *All students don't learn logic*: $\forall x (S(x) \rightarrow \neg L(x, l))$

➤ All variables must be bound

Some Advantages in Translating to Predicate Logic

- Explicit representation of scope ambiguity

(71) *Everyone loves someone*

- Everyone has someone they love:* $\forall x \exists y (L(x,y))$
- There is some person who is loved by everyone:*
 $\exists y \forall x (L(x,y))$

- But the big advantage is in reasoning with the real world
denotational semantic analysis

Creating a Model

1. a **semantic interpretation** of the symbols of the predicate logic
 2. a **domain**: the model of a situation which identifies the linguistically relevant entities, properties and relations
 3. a **denotation assignment function**: this is a procedure which matches the linguistic elements with the items that they denote (a **naming function**)
- Is the denotation correct (does it match the real world)?
- **Sentence** p is true in situation v if it corresponds with the real world:
 $[p]^v = 1$: the denotatum of p in v is true
 - **Constant** denotation of a constant is the individual entity in question

➤ **Predicate constants** are sets of individuals for which the predicate holds

$\{ \langle x, y, z \rangle : x \text{ hands } y \text{ to } z \}$

Defining Relations using Logic

➤ hyponymy

➤ $\forall x(\text{DOG}(x) \rightarrow \text{ANIMAL}(x))$

➤ antonym

➤ $\forall x(\text{DEAD}(x) \rightarrow \neg \text{ALIVE}(x))$

➤ converse

➤ $\forall x \forall y(\text{PARENT}(x,y) \rightarrow \text{CHILD}(y,x))$

➤ synonym

➤ $\forall x((\text{EGGPLANT}(x) \rightarrow \text{BRINJAL}(x)) \wedge (\text{BRINJAL}(x) \rightarrow \text{EGGPLANT}(x)))$

Restricted Quantifiers

- *Most students read a book*
 - $\text{Most}(x)(S(x) \wedge R(x))$
most things are students and most things read books
 - $\text{Most}(x)(S(x) \text{ iff } R(x))$
most things, if they are students, read books
- We need to restrict the quantification
 - $(\text{Most } x: S(x)) R(x)$
- Sometimes we need to decompose
 - *everybody* $(\forall x: P(x))$
 - *something* $(\exists x: T(x))$

Higher Order Logic

➤ Recall *lan sings*

➤ $[S(i)]^{M_1} = 1$ iff $[i]^{M_1} \in [S]^{M_1}$

The sentence is true if and only if the extension of *lan* is part of the set defined by *sings* in the model M_1

➤ Remodel, with sing a property of lan: $i(S)$

$[i(S)]^{M_1} = 1$ iff $[S]^{M_1} \in [i]^{M_1}$

The sentence is true if and only if the denotation of the verb phrase *sings* is part of the extension of *lan* in the model M_1

➤ *lan* is a set of sets of properties: **second-order logic**

Generalized Quantifiers

- $Q(A,B)$: *Q A are B*
- $\text{most}(A,B) = 1$ iff $|A \cap B| > |A - B|$
- $\text{all}(A,B) = 1$ iff $A \subseteq B$
- $\text{some}(A,B) = 1$ iff $A \cap B \neq \emptyset$
- $\text{no}(A,B) = 1$ iff $A \cap B = \emptyset$
- $\text{fewer than } x(A,B,X) = 1$ iff $|A \cap B| < |X|$

Strong/Weak Quantifiers

(72) only **weak** quantifiers can occur in existential *there* sentences

- a. *There is a fox in the henhouse*
- b. *There are two foxes in the henhouse*
- c. **There is every fox in the henhouse*
- d. **There are both foxes in the henhouse*

➤ **symmetrical** (cardinal) quantifiers are **weak**
 $\text{det}(A,B) = \text{det}(B,A)$

(73) *three lecturers are Australian = three Australians are lecturers*

➤ **asymmetrical** (cardinal) quantifiers are **strong**
 $\text{det}(A,B) \neq \text{det}(B,A)$

(74) *both lecturers are Australian = both Australians are lecturers*

Negative Polarity Items

- Some words in English appear only in downward entailing expressions

- **Upward entailment** goes from a subset to a set

- **Downward entailment** goes from a set to a subset

- (75) a. *Kim doesn't eat dessert* \Rightarrow *Kim doesn't eat hot dessert*
b. *Kim doesn't eat hot dessert* \nRightarrow *Kim doesn't eat dessert*

Downward entailment

- (76) a. *Kim eats some desserts* \nRightarrow *Kim eats hot dessert*
b. *Kim eats some hot dessert* \Rightarrow *Kim eats some desserts*

Upward entailment

- Negative Polarity Items are licensed by downward entailing expressions

Left and Right Monotonicity

➤ The monotonicity may depend on the position

- (77) a. *Every student studies semantics* \nRightarrow *Every student studies formal semantics*
b. *Every student studies formal semantics* \Rightarrow *Every student studies semantics*

Upward entailment (right argument)

- (78) a. *Every student studies semantics* \Rightarrow *Every linguistics student studies semantics*
b. *Every linguistic student studies semantics* \nRightarrow *Every student studies semantics*

Downward entailment (left argument)

-
- (79) a. *Every student who has ever studied semantics loves it*
b. **Every student who has studied semantics ever loves it*
c. *Few students who have ever studied semantics dislike it*
d. *Few students who have studied semantics ever dislike it*

➤ Formal models of quantification can be used to make predictions about seemingly unrelated phenomena

More Examples

- (80) a. *Every student is Italian.* \nRightarrow *Every student is Italian and blond.*
b. *Every student is Italian and blond.* \Rightarrow *Every student is Italian.*
- (81) a. *Some student smokes.* \nRightarrow *Some Italian student smokes.*
b. *Some Italian student smokes.* \Rightarrow *Some student smokes.*
- (82) a. *Some student is Italian.* \Rightarrow *Some student is Italian and blond.*
b. *Some student is Italian and blond.* \Rightarrow *Some student is Italian.*
- (83) a. *No student smokes.* \Rightarrow *No Italian student smokes.*
b. *No Italian student smokes.* \nRightarrow *No student smokes.*
- (84) a. *No student is Italian.* \Rightarrow *No student is Italian and blond.*

-
- b. *No student is Italian and blond.* \nRightarrow *No student is Italian.*

With **some** we must always infer from a more specific to a less specific phrase (upward entailing). With **no**, it's the opposite

Anaphora

- (85) a. *R2D2_i mistrusts itself_i*
b. $M(r,r)$
- (86) a. *Every robot mistrusts itself*
b. $(\forall x: R(x)) M(x,x)$
- (87) a. *Luke bought a robot and it doesn't work*
b. $(\exists x: R(x)) B(l,x) \wedge \neg W(x)$
- (88) a. *Every robot went to Naboo. ?It met Jar Jar.*
b. $(\forall x: R(x)) W(x,n); M(x,j)$ unbound
- (89) a. *A robot went to Naboo. It met Jar Jar.*
b. $(\exists x: R(x)) W(x,n); M(x,j)$???
- indefinite nominals exist beyond the sentence: **discourse referents**
- (90) a. *Luke didn't buy a robot. ?It met Jar Jar.*
indefinite nominals scope can still be limited

Discourse Representation Theory

- Explains how reference occurs across clauses and sentences
 - Distinguishes between names and indefinite NPS
 - Distinguishes between positive assertions, negative sentences, conditional sentences, universally quantified sentences
 - Is useful for modeling the incremental update of knowledge in a conversation

Revision: Cognitive Semantics

Introduction

- Cognitive linguistics, in general, sees language as crucially embedded in its use
 - a **functional** approach to language
 - considering **diachronic** and not just **synchronic** evidence
 - little or no separation between syntax, semantics and pragmatics
- The basic idea is that one thing is characterized in terms of another
 - **Metaphor** and **figurative** language
 - **Image Schemas**
 - **Mental Spaces**

Metaphors and Mechanisms of Interpretation

- A metaphor is an extension of the use of a word beyond its primary meaning to describe referents that bear similarities to the word's primary referent.
- Words need to be similar but not too similar
 - (91) #*wine is whiskey*
 - (92) #*their knees are penguins*
 - (93) *life is like the MRT*
- **Grammaticalization:** Once a metaphor becomes accepted, speakers tend to view the metaphorical meaning as separated from its primary meaning
 - (94) *booking a flight*

-
- Humans understand words by referring to a prototypical usage, and they match a new example against the characteristics of the prototype.
 - Use of words with broken typicality conditions is very common. Lakoff: **our conceptual system is fundamentally metaphorical in nature.**
 - Features of Metaphor
 - Conventional
 - Systematic
 - Asymmetrical
 - Metaphors enable us to understand one domain of experience (**target**) in terms of another (**source**). (Lakoff and Turner, 1989)

Metaphors we live by

- Metaphor is pervasive in everyday life, not just in language but in thought and action.
- Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature.
- If we are right in suggesting that our conceptual system is largely metaphorical, then the way we think, what we experience, and what we do every day is very much a matter of metaphor.

George Lakoff and Mark Johnson (1980) “Metaphors we live by” University of Chicago Press.

Extensions of metaphors

- Embodied Construction Grammar
 - sources domains are based on our understanding
 - Metaphor and Politics
 - Political groups base their understanding of the world on different metaphors
 - * **nurturant parent** (liberal) family is one that revolves around every family member caring for and being cared for by every other family member, with each family member pursuing their own vision of happiness.
 - * **strict father** (conservative) family revolves around the idea that parents teach their children how to be self-reliant and self-disciplined through "tough love".
- It is hard to talk across the different conceptualizations

Other approaches to the same basic idea

- **Image schemas:** Fundamental organizing principle of metaphors
 - Containment schema
 - Path schema
 - Force schema
- **Mental Spaces** are very like Possible Worlds
 - However, mental spaces do not contain a faithful representation of reality, but an idealized cognitive model.
- We typically build multiple Mental Spaces

(95) *In the film, Michelle is a Witch*

Parting Words

- I hope you enjoyed the course
- Some advice for studying
 - (Re-)read the text book
 - Go over the notes/tutorials
- Some advice for the exam — there will be time pressure
 - Read the questions carefully
 - Try to divide your time wisely
- **Get paid to think about meaning:** If you are interested in being paid to do more sense annotation over the holidays (in English, Chinese, Indonesian, Japanese) email me

Reflection

- What was the most surprising thing in this class?
- What do you think is most likely wrong?
- What do you think is the coolest result?
- What do you think you're most likely to remember?
- How do you think this course will influence you as a linguist?
- What (if anything) did you hope to learn that you didn't?

Sample Exam Questions

1. Explain the difference between an utterance, a sentence and a proposition, with examples.
2. Explain the meaning and give examples of the following situations: **activities**, **accomplishments**, **achievements**.
Show how you can distinguish between them
3. Define, with examples, the following theta roles: AGENT, EXPERIENCER, INSTRUMENT, BENEFICIARY
4. Give examples of hedges for each of the four Maxims. Name the Maxim, and give an example sentence with a hedge for it.

Video

➤ *I want to cook *with* you*

<https://www.youtube.com/watch?v=g0E-q20RcDM>

I hereby declare these lectures
over