HG2002 Semantics and Pragmatics

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Lecture 6

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

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Overview

- Revision: Situations
  - Verb Types
  - TAM: Tense, Aspect and Modality
  - Mood and Evidentiality
- Thematic Roles
  - Grammatical Relations and Thematic Roles
  - Verbs and Thematic Role Grids
  - Problems with Thematic Roles
  - The Motivation for Identifying Thematic Roles
  - Voice
- Classifiers and Noun Classes
- Next Lecture: Chapter 7: Context and Inference

Revision: Situations

Summary of Situations

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

Situation Types

Situations	Stative	Durative	Telic	Examples
State	+	+		*desire, know*
Activity	–	+	–	*run, drive a car*
Accomplishment	–	+	+	*bake, walk to school, build*
Punctual	–	–	–	*knock, flash*
Achievement	–	–	+	*win, start*

(1) *Kim desires more cowbell*

(2) *Sandy drives to school*

(3) *Hiromi compiled a lexicon*

(4) *Bobby tapped on the window*

(5) *Alex lost the race*

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.

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

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

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

    (8) *You may drive this car*
  - **Obligation**

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

    (10) *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***

  (11) *Be good!*

  (12) *If I were a rich man*

Participants

Thematic Roles

In this section we talk about the relations between the participants in a situation and the situation itself.

- **Thematic roles** are the roles played by the parts of the sentence that correspond to the participants in the situation described
- They classify relations between entities in a situation
- Also known as
  - Deep case (Fillmore, 1968)
  - Thematic roles; Theta roles; θ-roles
  - Semantic Roles; Participant Roles

Roles link different alternations

(13) *Kim patted Sandy*

(14) *Sandy was patted by Kim*

- Which is the **Subject** and which the **Object** in these sentences? **?**
- What are the thematic roles of Kim and Sandy? **?**

Thematic Roles

- **AGENT** (takes *deliberately, on purpose, what did X do?*)

  A participant which the meaning of the verb specifies as doing or causing something, possibly intentionally.

  - The initiator, performer of controller of an action; typically volitional, typically animate
  - Typically SUBJECT

  (15) *Kim kicked Sandy*

  (16) *The ogre leaped into the fray*

  (17) *The student watched the video*

- (**ACTOR**) generalization of **AGENT** that allows non-volitional, non-actor: if you use this, then **AGENT** is restricted to animate, volitional participants

➢ **PATIENT** (*What happened to X?*)

A participant which the verb characterizes as having something happen to it, and as being affected by what happens to it.

- ➢ The undergoer of an action
- ➢ Undergoes change in state usually, both animate and inanimate
- ➢ Typically OBJECT

(18) *Kim kicked Sandy*

(19) *The ogre ate the dog*

(20) *The protagonist died*

(21) #*The student watched the video*

(22) #*I heard a sound*

➢ THEME

A participant which is characterized as changing its position or condition, or as being in a state or position.

- ➢ Moved, location or state is described
- ➢ Typically OBJECT

(23) *Hiromi put the book on the shelf*

(24) *Freddy gave you the chocolate*

(25) *The book is on the shelf*

(26) #*The dog walked home*

➢ EXPERIENCER

A participant who is characterized as aware of something.

- ➢ Non-volitional, displaying awareness of action, state
- ➢ Typically SUBJECT

(27) *Liling heard thunder*

(28) *Jo felt sick*

(29) *The lecturer annoyed the students*

BENEFICIARY

- for whose benefit the action was performed
- Typically indexed by *for* PP in English
  or OBJECT in ditransitive verbs

(30) *They made me a present*

(31) *They made a present for me*

LOCATION

- Place
- Typically indexed by locative PPs in English

(32) *I am living in Indonesia*

(33) *It is on the table*

GOAL

- towards which something moves (lit or metaphor)
- Typically indexed by *to* PP in English
  or OBJECT in ditransitive

(34) *She handed the form to him*

(35) *She handed him her form*

SOURCE

- from which something moves or originates
- Typically indexed by *from* PP in English

(36) *We gleaned this from the Internet*

STIMULUS

- Usually used in connection with EXPERIENCER

(37) *The lightning scared them*

(38) *I don't like the lightning*

INSTRUMENT/MANNER

- Means by which action is performed
- Can be indexed by *with* PP in English

(39) *I ate breakfast with chopsticks*

Split Themes

- Jackendoff (1990) suggests
  - **action tier** (actor-patient)
    ACTOR, AGENT, EXPERIENCER, PATIENT, BENEFICIARY, INSTRUMENT
  - **thematic tier** (spatial)
    THEME, GOAL, SOURCE, LOCATION

Theta-Grid

- Have a semantic **valence** (**theta-grid**)
  - ***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**)
    - In general, if it takes part in an alternation: it should be in the grid.
  - **non-participant roles** combine freely — not in the grid (**adjuncts**)
    - If there can be multiple instances: it should not be in the grid.

Theta-Grids (continued)

- Theta Grids/subcategorization are properties of meta-lexemes
  - For a given sense they are constant:
    hand: V ⟨AGENT, BENEFICIARY, THEME⟩ (NP, NP, NP)
    - *I handed Kim the book*:
  - passivization changes the grid:
    handed: V ⟨BENEFICIARY, THEME, AGENT⟩ (NP, NP, PP:by)
    - *Kim was handed the book by me*:
  - Can change with alternations, voice, …
- Theta Roles are semantic NOT syntactic
  - Never SUBJECT, OBJECT, ADJECTIVE, …

Some Issues

- Every theory has a different set of roles
- From 8 to 42! (two groups at NTT)
- How useful is the notion of PATIENT if it encompasses all these?

(40) *The genie touched the lamp with their nose.*
(41) *The baby rubbed the lamp with its hands.*
(42) *The baby squeezed the rubber toy with its hands.*
(43) *She cracked the mirror with a stone.*

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.
- Different languages show these in different ways:
  - English uses position for SUBJ/OBJ and prepositions
  - Japanese uses postpositions

- Latin inflects: *familia* “family, household”

	Singular	Plural
Nominative	familia	familiae
Accusative	familiam	familiās
Genitive	familiae	familiārum
Dative	familiā	familiīs
Ablative		

- Most language mark arguments and adjuncts slightly differently
  - There are far fewer arguments (typically not more than 4)
  - There are more adjuncts, so they are typically marked with a contentful marker

Many verbs allow alternations

(44) *Jo broke the ice with a pickaxe*
⟨AGENT, PATIENT, INSTRUMENT⟩ (NP, NP, PP:with)

(45) *The pickaxe broke the ice*
⟨INSTRUMENT, PATIENT⟩ (NP, NP)

(46) *The ice broke*
⟨PATIENT⟩ (NP)

Other Predicates

- Adjectives (normally theme)

  (47) *John is tall* ⟨THEME⟩
  (48) *John is cold [to touch]* ⟨THEME⟩
  (49) *John is/feels cold* ⟨EXPERIENCER⟩
  different adjectives in e.g., Japanese
  tsumetai "cold (to touch)" vs *samui* "(feel) cold"

- Predicative Copula (treat second NP as predicate)

  (50) *John is a boy* ⟨THEME⟩

- Identity Copula (reversible)

  (51) *Kim is my teacher* ⟨THEME, THEME⟩?
  (52) *My teacher is Kim* ⟨THEME, THEME⟩?

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)

$$\text{AGENT} > \left\{ \begin{array}{l} \text{GOAL/RECIPIENT} \\ \text{BENEFICIARY} \end{array} \right\} > \left\{ \begin{array}{l} \text{THEME} \\ \text{PATIENT} \end{array} \right\} > \text{INSTRUMENT} > \text{LOCATION}$$

- Generally true across languages

Dowty's Proto-Arguments

- The AGENT Proto-Role
  - 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).

Dowty's Argument Selection Principle

- 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 number of Proto-Patient properties will be selected as OBJECT

- Try: ***threw*** — ball, the man, the dog

- Relatively predictive, but what about sentences such as: *The hunger killed him*?

Alternations

- Many verbs have multiple theta-grids

(53) a. *Kim broke the window with the hammer*

⟨AGENT, PATIENT, INSTRUMENT⟩

b. *The hammer broke the window*

⟨INSTRUMENT, PATIENT⟩

c. *The window broke*

⟨PATIENT⟩

(54) a. *I cut the cake with the knife*

⟨AGENT, PATIENT, INSTRUMENT⟩

b. *This cake cuts easily*

⟨PATIENT⟩

- The relations between them are called **alternations**

Voice

➢ Another alternation that changes the number of arguments is **voice**: passive, middle

(55) **Transitive Passive**
makes the PATIENT more salient

a. *Kim ate Sandy*

b. *Sandy was eaten (by Kim)*

(56) **Ditransitive Passive**
can make the THEME or the GOAL more salient

a. *Abraham gave Brown chocolate*

b. *Abraham gave chocolate to Brown*

c. *Chocolate was given to Brown (by Abraham)*

d. *Brown was given chocolate (by Abraham)*

(57) **Transitive Middle**

requires an adverbial, becomes a timeless generic statement

a. *They open the gate very quietly* (active)

b. *The gate opens very quietly* (middle)

c. *The gate opened very quietly* (inchoative)

(58) **Intransitive Middle**

requires an adverbial, becomes a timeless generic statement

a. *The knife cuts the cake well*

b. *The knife cuts well*

Why so many possibilities?

- So we can emphasize different participants
- We may not know all the participants
- We may not care about all the participants
- There are also lexical alternations

(59) *Kim killed Sandy* vs *Sandy dies*

(60) c.f. *Kim melted the ice* vs *the ice melted*

(61)

金が	氷を	溶かした	*vs*	氷が	溶けた
Kim-ga	koori-wo	tokashita		koori-ga	toketa
Kim-SBJ	ice-OBJ	*melt:trans*		ice-SBJ	*melt:intrans*

Classifiers

Classifiers and Noun Classes

- Many languages include special ways to classify nouns
  - Noun Classifiers (Bantu, Yidiɲ, …)
  - 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

Examples

(62) *Bulumba walba malan*
CL:HABITABLE CL:STONE flat.rock
"a flat rock for camping" Yidiɲ (Dixon, 1977)

(63) *se-biji epel* "1.CL:round apple" Malay

(64) 一张纸 *yi-zhang zhi* "1.CL:flat paper" Mandarin

(65) *der Hund* "the:male dog" German

(66) *den Madchen* "the:neuter girl" German

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 in Bantu

Class	Semantics
1/2	sg/pl human
3/4	sg/pl plants, foods, non-paired body parts
5/6	sg/pl fruits, paired body parts, …
7/8	sg/pl inanimate
9/10	sg/pl animals
11/12	sg/p long objects, abstracts
13	small objects, birds
14	masses
15	infinitives

Other elements in the sentence agree with the noun (class 8)

(67) *Vi-su vidogo viwili hi-vi amba-vy-o nili-vi-nunua*
vi-knife vi-small vi-two this-vi which-vi 1.s-vi-buy
ni vi-kali sana
be vi-sharp very
These two small knives which I bought are very sharp

Classification

- Is there a system for classifying nouns in a language that you speak? **?**
  - What are the criteria for classification? **?**
- Semantic change?
  - How do you classify `watermelon`? (or what gender is $\sim$) **?**
  - How do you classify a `grain (of rice)` **?**
  - How do you classify a `human` **?**
  - How do you classify a `robot` **?**

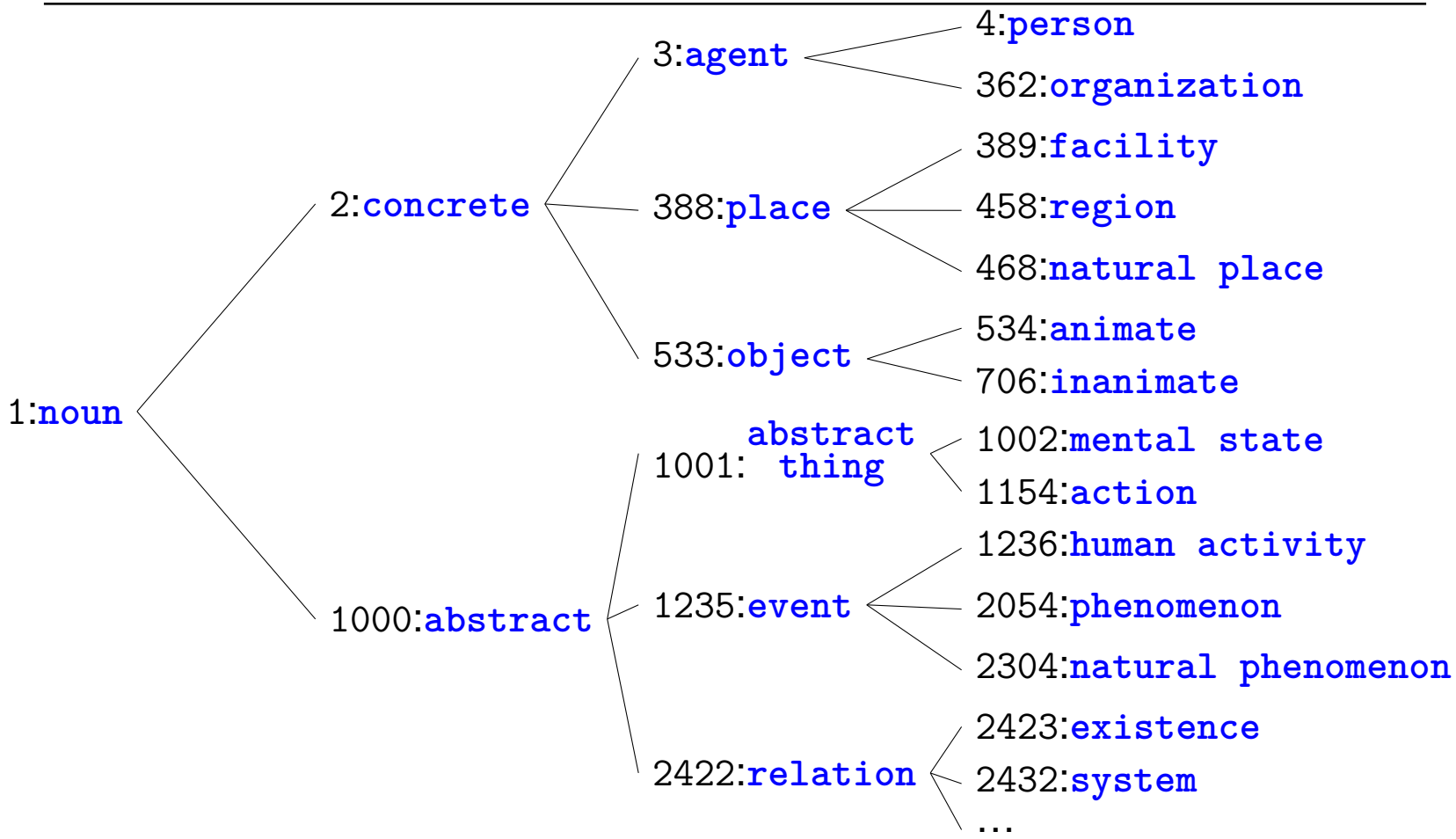
Classifiers in Japanese and Chinese

- Modeling Classifier use in Japanese and Chinese:
  - Associate classifiers with semantic classes (in an ontology) by hand
  - Most sortal classifiers select for some kind of semantic class
  - 20% of the classes require more than one classifier
    choose the most common one
  - class `961:weapon`:
    -chō “knives”, *-hon* “long thin things”, *-furi* “swords”, *-ki* “machines”

- Each language took around two weeks

- Currently redoing this with WordNet and associating semi-automatically from a corpus (URECA projects available)

Top four levels of the Goi-Taikei (語彙大系) Ontology



- A rich ontology for Japanese, English, Chinese and Malay
- 2,710 semantic classes (12-levels) for common nouns

Japanese Classifiers

CLASSIFIER		Referents classified	No.	%	Sample Class
None		Uncountable	794	29.3	`3:agent`
-kai	(回)	events	703	25.9	`1699:visit`
-tsu	(つ)	abstract/general	565	20.9	`2:concrete`
-nin	(人)	people	298	11.0	`5:person`
-ko	(個)	concrete objects	124	4.6	`854:fruit`
-hon	(本)	long thin objects	52	1.9	`673:tree`
-mai	(枚)	flat objects	32	1.2	`770:paper`
-teki	(滴)	liquid	21	0.8	`652:tear`
-dai	(台)	mechanical items furniture	18	0.7	`962:machinery`
-hiki	(匹)	animals	12	0.6	`537:beast`
Other		38 classifiers	91	3.4	
Total		47 classifiers	2,710	100	

Chinese Classifiers

CLASSIFIER		Referents classified	No.	%	Sample Class
None		Uncountable referents	765	28.2	`3:agent`
-ci4	(次)	events	692	25.5	`1699:visit`
-ge4	(个)	general/people	655	24.1	`2:concrete`
-wei4	(位)	people (*honored*)	68	2.5	`228:doctor`
-quai4	(块)	big objects	61	2.2	`461:land`
-ren2	(人)	people	39	1.4	`92:descendants`
-tiao2	(条)	long thin objects	33	1.2	`417:route`
-pian4	(片)	parts/pieces	25	0.9	`2578:flake`
-zhang1	(张)	big flat objects	23	0.8	`773:board`
-ming2	(名)	people (*respected*)	22	0.8	`351:expert`
-di1	(滴)	liquid	20	0.7	`652:tear`
-jian4	(件)	incidents	19	0.7	`1717:contract`
Other		70 classifiers	293	10.8	
Total		81 classifiers	2,710	100	

Language Differences

- 47 Japanese classifiers at the level of semantic classes
  81 Chinese classifiers at the level of semantic classes
  - Around the number a human typically uses (30–80)
    More classifiers at the noun level (default classifiers)
  - Chinese uses more classifiers than Japanese
    Chinese has more specific classifiers

- No classifiers assigned to 800 semantic classes
  - Uncountable, abstract nouns (e.g. *greed, lethargy*)
  - Empty classes

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

Acknowledgments and References

- Video: *Does your dog bite* excerpt from *The Pink Panther Strikes Again* directed by Blake Edwards, starring Peter Sellers. The Pink Panther Strikes Again is the fifth film in The Pink Panther series and was released in 1976.
  - It shows issues of reference and cooperation in dialog

```
Closeau
   Good day.
   My name is Professor Guy Gabroir...
   medieval castle authority from Marseilles.
   Tell me, do you have a room?
Clerk
    I do not know what a "reum" is.
Closeau
    A Zimmer.
Clerk
    Ah! A room!
```

Closeau

That is what I have been saying, you idiot.

Room.

Does your dog bite?

Clerk

No.

Closeau

Nice doggy.

Dog

Grrrr <BITE>

Closeau

I thought you said your dog did not bite.

Clerk

That is not my dog.

*

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