# HG2002 Semantics and Pragmatics

# Participants

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Lecture 6

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

# 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 Situation

- 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* |

# 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 ($E < R = S$) *had seen*
    - Future Perfect ($S < E < R$) *had 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.

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

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

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

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

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

    (5) *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***

  (6) *Be good!*

  *(7)* *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; $\theta$-roles
  - Semantic Roles; Participant Roles

# Roles link different alternations

(8) *Kim patted Sandy*

(9) *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

  (10) *Kim kicked Sandy*
  (11) *The ogre leaped into the fray*
  (12) *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

(13) *Kim kicked Sandy*

(14) *The ogre ate the dog*

(15) #*The student watched the video*

(16) #*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

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

(18) *Freddy gave you the chocolate*

(19) *The book is on the shelf*

(20) *The protagonist died*

(21) **The dog walked home*

## ➢ EXPERIENCER

A participant who is characterized as aware of something.

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

(22) *Liling heard thunder*

(23) *Jo felt sick*

(24) *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

(25) *They made me a present*

(26) *They made a present for me*

## LOCATION

- Place
- Typically indexed by locative PPs in English

(27) *I am living in Indonesia*

(28) *It is on the table*

## GOAL

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

(29) *She handed the form to him*

(30) *She handed him her form*

## SOURCE

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

(31) *We gleaned this from the Internet*

## STIMULUS

- Usually used in connection with EXPERIENCER

(32) *The lightning scared them*

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

## INSTRUMENT/MANNER

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

(34) *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, THEME, BENEFICIARY⟩ (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?

(35) *The genie touched the lamp with their nose.*
(36) *The baby rubbed the lamp with its hands.*
(37) *The baby squeezed the rubber toy with its hands.*
(38) *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

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

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

(41) *The ice broke*
⟨PATIENT⟩ (NP)

# Other Predicates

- Adjectives (normally theme)

  (42) *John is tall* ⟨THEME⟩
  (43) *John is cold [to touch]* ⟨THEME⟩
  (44) *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)

  (45) *John is a boy* ⟨THEME⟩

- Identity Copula (reversible)

  (46) *Kim is my teacher* ⟨THEME, THEME⟩?
  (47) *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

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

⟨AGENT, PATIENT, INSTRUMENT⟩

b. *The hammer broke the window*

⟨INSTRUMENT, PATIENT⟩

c. *The window broke*

⟨PATIENT⟩

(49) 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

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

a. *Kim ate Sandy*

b. *Sandy was eaten (by Kim)*

(51) **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)*

(52) **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)

(53) **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

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

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

(56)

| | | | | | |
|---|---|---|---|---|---|
| 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

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

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

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

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

(61) *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)

(62) *Vi-su vidogo viwili hi-vi amba-vy-o nili-vi-nunua*
vi-knife vi-small vi-teo 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` **?**

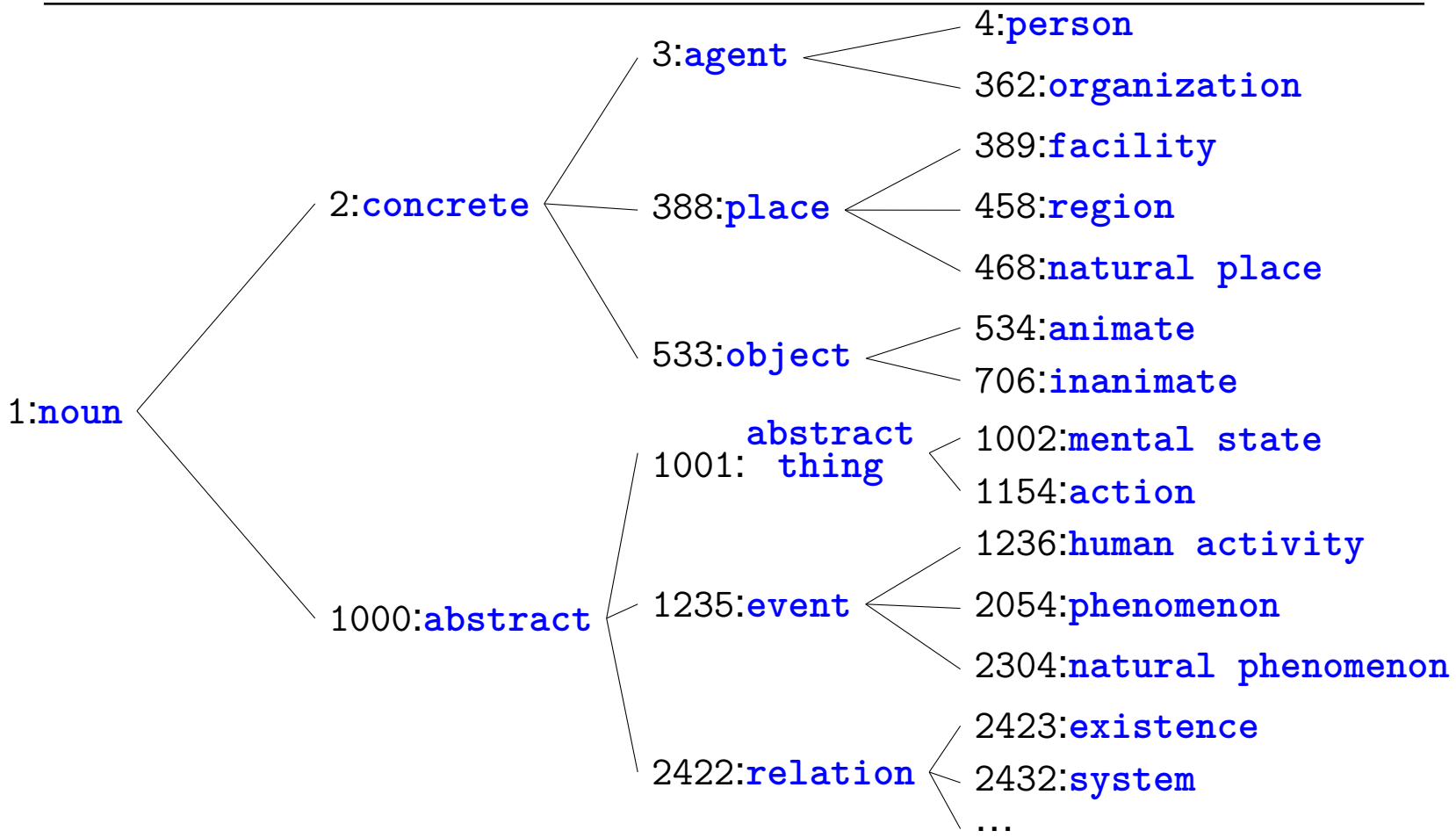
# Classifiers in Japanese and Chinese

- 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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