La costruzione del significato

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La costruzione del significato

- Panoramica
  - James Pustejovsky e i qualia roles
  - Patrick Hanks e le valenze
  - Problematiche ed esempi
  - Linguistic affordances

Pustejovsky

Pustejovski

https://aclanthology.info/pdf/J/J91/J91-4003.pdf

- Argument Structure
  - The behavior of a word as a function, with its arity specified. This is the predicate argument structure for a word, which indicates how it maps to syntactic expressions.
- Event Structure
  - Identification of the particular event type for a word or phrase: e.g. as state, process, or transition.
- Qualia Structure
  - The essential attributes of an object as defined by the lexical item.
- Inheritance Structure
  - How the word is globally related to other concepts in the lexicon.

Pustejovsky

Pustejovski

- **Qualia structure**
  - Constitutive role
    - Material, weight, parts
  - Formal role
    - Orientation, magintude, shape, dimensionality, color, position
  - Telic role
    - Purpose, function
  - Agentive role
    - creator, artifact, natural kind, causal chain

Pustejovsky

Pustejovski

novel(*x*)
Const: narrative(*x*)
Form: book(*x*)
Telic: read(T,y,*x*)
Agentive: artifact(*x*), write(T,z,*x*)

- **Qualia structure**
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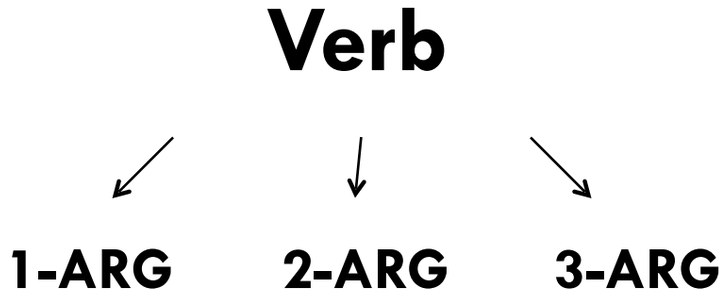
Hanks

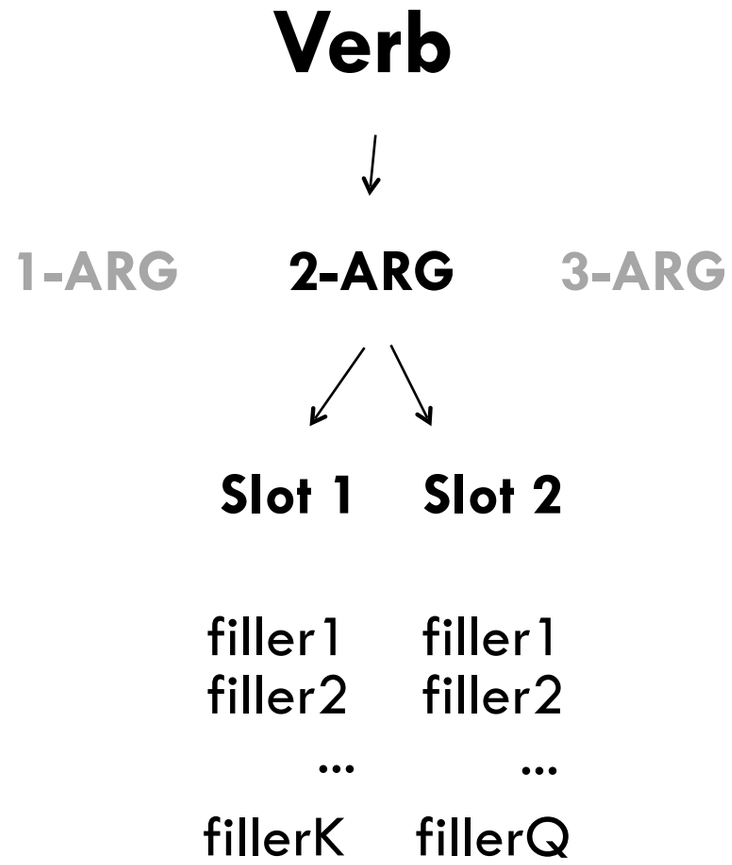
Sometimes, valency can differentiate meanings



Patrick Hanks. *How people use words to make meanings: Semantic types meet valencies* (http://rgcl.wlv.ac.uk/papers/hanks-2012a.pdf)

Hanks

Collocations:
combinations of fillers



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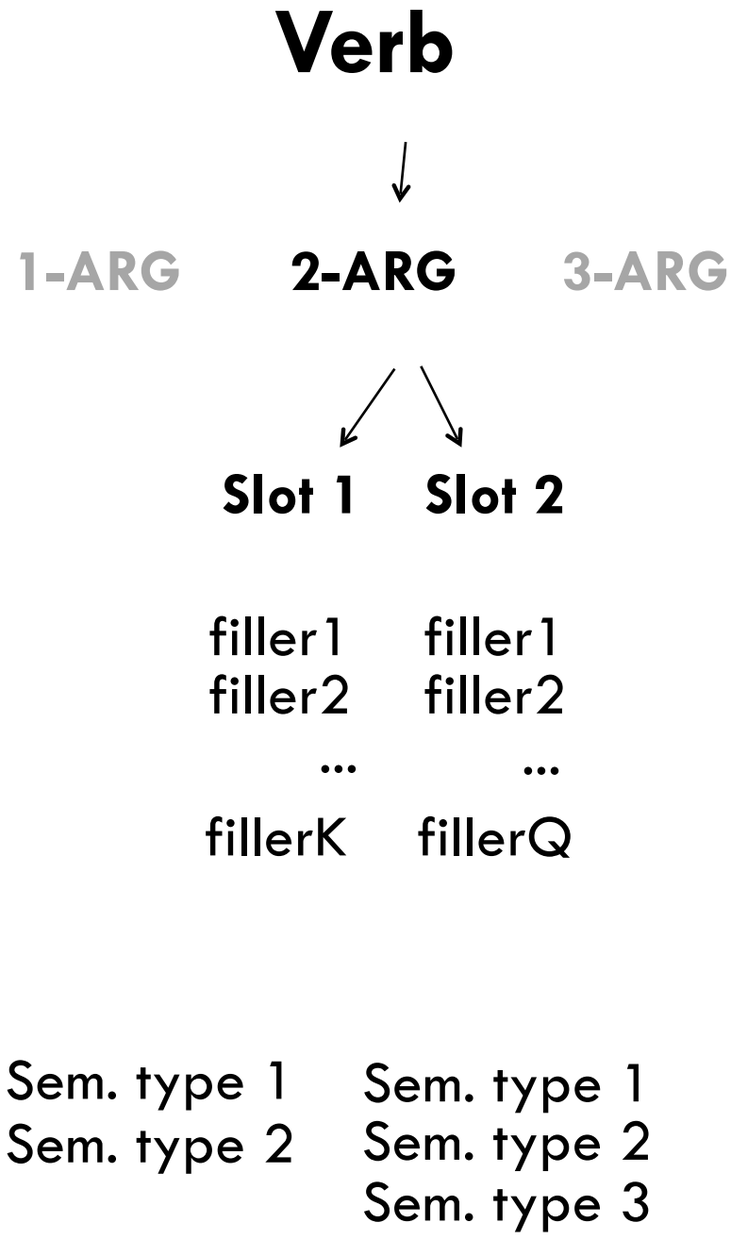
Semantic types: super-senses of the fillers, e.g., speech-act, ph.object, human, ...



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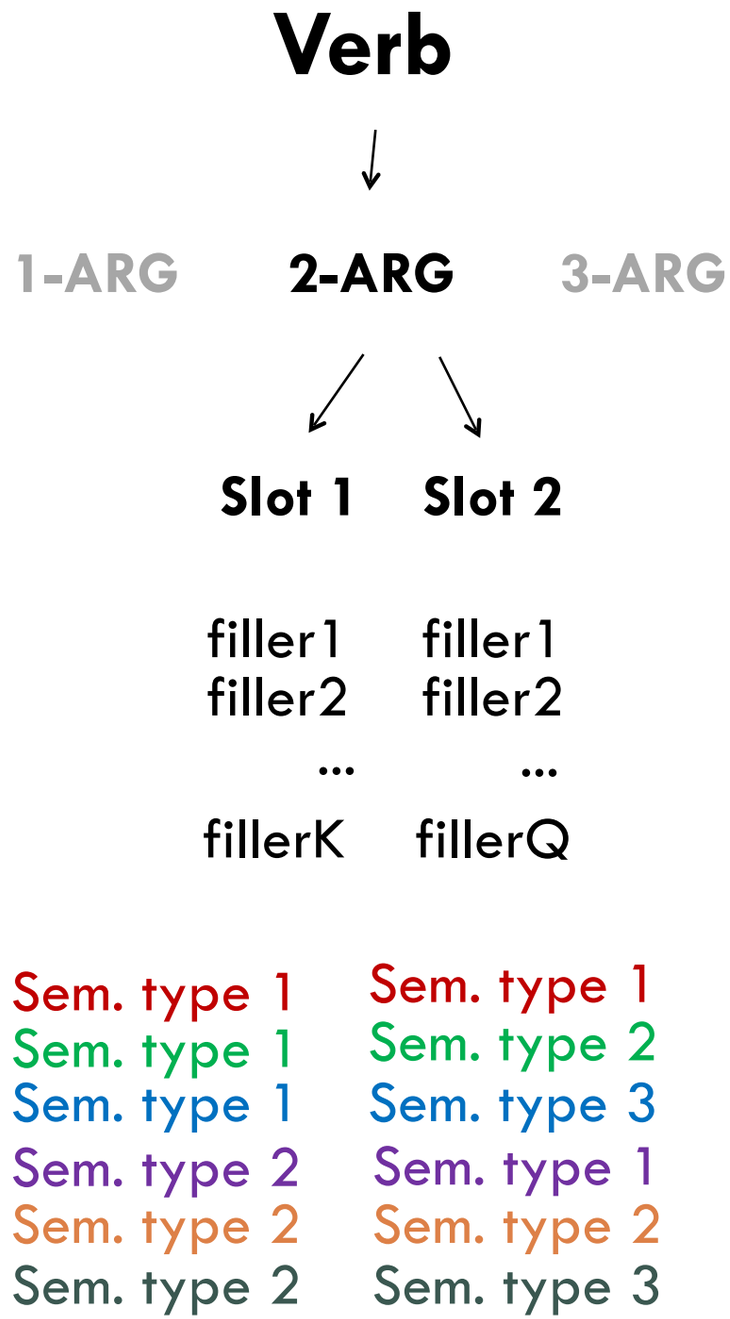
Different combinations of semantic types produce different meanings



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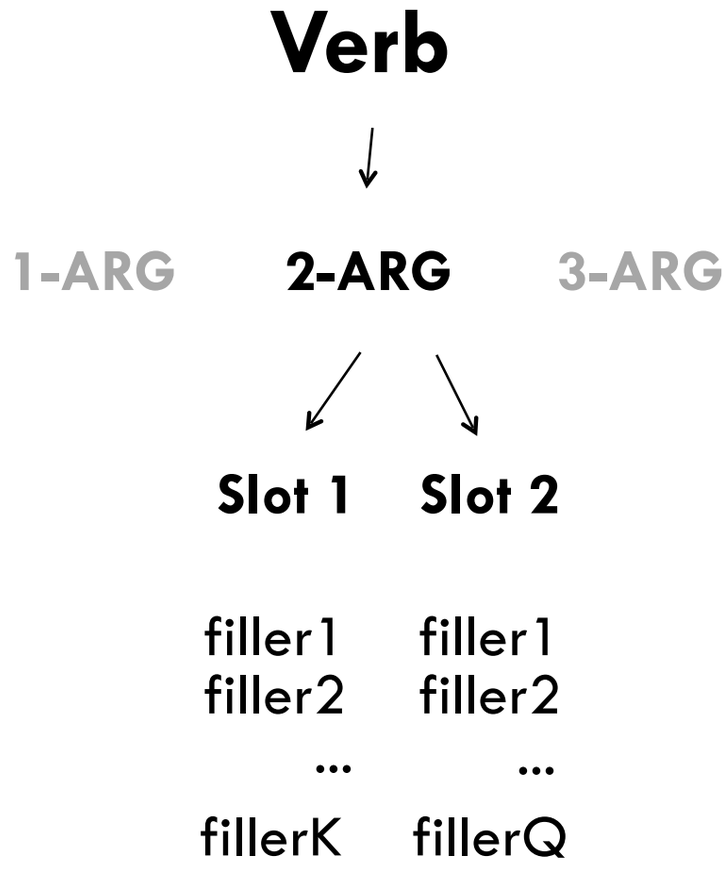


Esempio

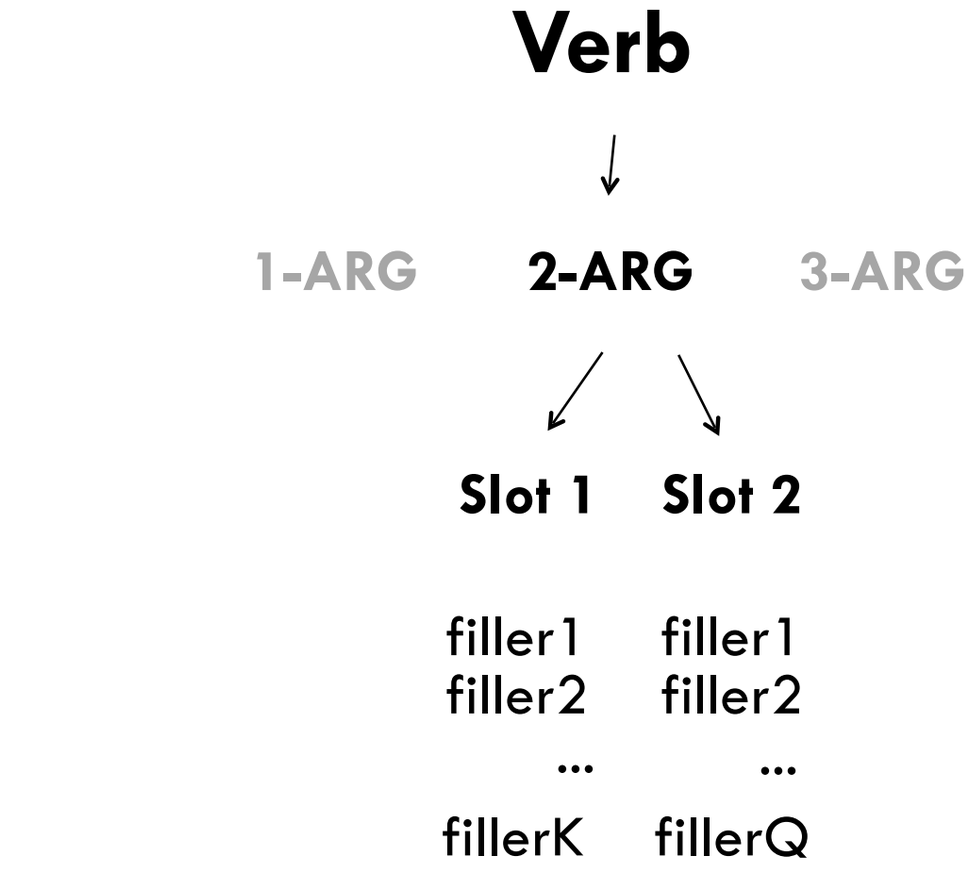
mangiare

Subj.	Obj.
Io	La mela
Tu	Il pomodoro
Mario	La foglia
Il mio amico	Bistecca
La macchina del caffè	Soldi
…	…

Sem. type 1	Sem. type 1
Sem. type 1	Sem. type 2
Sem. type 1	Sem. type 3
Sem. type 2	Sem. type 1
Sem. type 2	Sem. type 2
Sem. type 2	Sem. type 3

Hanks

Syntactic variations



Problematiche

Problems:

1. Which semantic types?

2. Which degree of generalization?

3. Terms refer to concept at a certain level of generalization depending on the context

Problematiche

"The student went to school"

which properties should be activated?

which semantic type this word refers to?

- is it a STUDENT?
- is it a PERSON?
- is it a LIVING ENTITY?

Probably, it is not intended as a LIVING ENTITY.

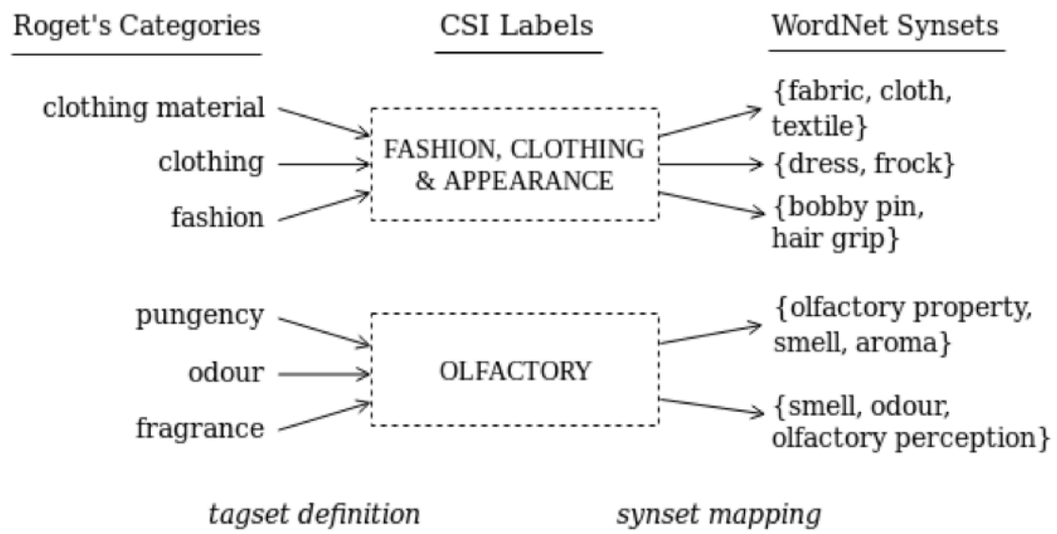
Why? The action depicted by the sentence does not activate too general properties.

WordNet supersenses

NOUNS			
SUPERSENSE	NOUNS DENOTING	SUPERSENSE	NOUNS DENOTING
act	acts or actions	object	natural objects (not man-made)
animal	animals	quantity	quantities and units of measure
artifact	man-made objects	phenomenon	natural phenomena
attribute	attributes of people and objects	plant	plants
body	body parts	possession	possession and transfer of possession
cognition	cognitive processes and contents	process	natural processes
communication	communicative processes and contents	person	people
event	natural events	relation	relations between people or things or ideas
feeling	feelings and emotions	shape	two and three dimensional shapes
food	foods and drinks	state	stable states of affairs
group	groupings of people or objects	substance	substances
location	spatial position	time	time and temporal relations
motive	goals	Tops	abstract terms for unique beginners
VERBS			
SUPERSENSE	VERBS OF	SUPERSENSE	VERBS OF
body	grooming, dressing and bodily care	emotion	feeling
change	size, temperature change, intensifying	motion	walking, flying, swimming
cognition	thinking, judging, analyzing, doubting	perception	seeing, hearing, feeling
communication	telling, asking, ordering, singing	possession	buying, selling, owning
competition	fighting, athletic activities	social	political and social activities and events
consumption	eating and drinking	stative	being, having, spatial relations
contact	touching, hitting, tying, digging	weather	raining, snowing, thawing, thundering
creation	sewing, baking, painting, performing		

Table 1 Nouns and verbs supersense labels, and short description (from the Wordnet documentation)

CSI: semantic categories



ART_ARCHITECTURE_AND_ARCHAEOLOGY_
BIOLOGY_
BUSINESS_ECONOMICS_AND_FINANCE_
CHEMISTRY_AND_MINERALOGY_
CHORES_AND_ROUTINE_
COMMUNICATION_AND_TELECOMMUNICATION_
COMPUTING_
CRAFT_ENGINEERING_AND_TECHNOLOGY_
CULTURE_ANTHROPOLOGY_AND_SOCIETY_
EDUCATION_AND_SCIENCE_
EMOTIONS_
ENVIRONMENT_
EVALUATION_
FARMING_
FISHING_AND_HUNTING_
FOOD_DRINK_AND_TASTE_
GENERAL_
GEOGRAPHY_AND_PLACES_
GEOLOGY_AND_GEOPHYSICS_
HEALTH_AND_MEDICINE_
HISTORY_
LANGUAGE_AND_LINGUISTICS_
LAW_AND_CRIME_
LIQUID_AND_GAS_
LITERATURE_AND_THEATRE_
MATHEMATICS_
MEDIA
METEOROLOGY_
MUSIC_SOUND_AND_DANCING_
NAUTICAL_
NUMISMATICS_AND_CURRENCIES_
OLFACTORY_
PHILOSOPHY_PSYCHOLOGY_AND_BEHAVIOR_
PHYSICS_AND_ASTRONOMY_
POLITICS_GOVERNMENT_AND_NOBILITY_
POSSESSION_
RELIGION_MYSTICISM_AND_MYTHOLOGY_
SEX_
SPACE_AND_TOUCH_
SPORT_GAMES_AND_RECREATION_
TEXTILE_FASHION_AND_CLOTHING_
TIME_
TRANSPORT_AND_TRAVEL_
VISUAL_
WARFARE_DEFENSE_AND_VIOLENCE_

CSI: A Coarse Sense Inventory for 85% Word Sense Disambiguation

Proc. of the 34th AAAI Conference on Artificial Intelligence (AAAI 2020), New York, USA, 7-12th February, 2020.

https://sapienzanlp.github.io/csi/

Laboratorio - *Hanks*

- Lab *(su teoria di P. Hanks)*
  - Scegliere un verbo transitivo (almeno 2 argomenti)
  - Recuperare da un corpus *n (> 200)* istanze in cui esso viene usato
  - Effettuare parsing e disambiguazione
  - Usare i super sensi di WordNet sugli argomenti (subj e obj nel caso di 2 argomenti) del verbo scelto
  - Aggregare i risultati, calcolare le frequenze, stampare i cluster semantici ottenuti