Review: quantifier typology

- Right upward entailment (aka monotone):
  - *some*, *many*, *every*
- Right downward monotone:
  - *not every*
- Left downward entailment/monotone:
  - *every*, *no*, *few*
- Left upward monotone:
  - *some*, *at least two*
- Non-monotone: neither monotone increasing nor monotone decreasing (neither entails the other)
  - *exactly three*

- This paper: can categorize nouns this way too. What happens when Dets and Ns combine?
Overview

- Review of what we’ve already seen
  - Generalized quantifiers for 1-place Dets (pre-1985)
  - Some new ones: NEITHER(A)(B), FEWER_THAN_FIVE(A)(B), BETWEEN_FIVE_AND_TEN(A)(B)

- Two-place Dets (1985)
  - More students than teachers came to the party.

- Linguistic observations: Det choice is (in part) syntactically conditioned
  - Partitives
  - Existential There sentences

- Learning theory?
Det inventory

- Lexical Dets
- Cardinal Dets
- Approximative Dets
- Definite Dets
- Exception Dets
- Bounding Dets
- Possessive Dets
- Value Judgment Dets
- Proportionality Dets
- Partitive Dets
- Negated Dets
- Conjoined Dets
- Adjectively Restricted Dets
Motivating two-place Dets

- Every man and woman jumped overboard.
  \[(\text{EVERY}\ldots\text{AND}\ldots)(\text{MAN, WOMAN})(\text{JUMPED OVERBOARD})\]
  - Ambiguity: to avoid the spurious reading

- Extensional Dets: same value for same Det (lawyers+doctors)
  - Excludes: \textit{not enough, too many, ...}

- Excludes \textit{many, few} (vague intuitions)
Generalizations

• Most lexical NP’s are almost always increasing: proper nouns, personal pronouns, demonstratives, possessive pronouns, lexical uses of all, many, few
  • They’re also monotonic
• Decreasing: few, “n” words (no one, nothing, nobody), fewer than six

• Lexical NP’s are always monotonic, almost always monotonic increasing
• Lexical Det₁’s always form continuous NP’s, usually monotonic (increasing)

• Neither increasing nor decreasing, therefore not monotonic: exactly 4, about 100, most of X but less than half of Y, both X and Y but not U or V, etc.
  • Observation: there’s no lexical item to express them in English
    • What about other lang’s?
Bare numerals

• Problematic: interpretation varies w/rt context
  • Are there two seats free on the front row? (i.e. at least two)
    • Increasing
  • Two students stopped by. (two specific, identifiable students)
    • Increasing
  • How many students failed the class? Two. (exactly two)
    • Non-monotonic
• Grice, context, etc. are all important
Conjunctions and disjunctions of increasing NPs are increasing.
  • John and every student...
Conjunctions and disjunctions of decreasing NPs are decreasing.
Conjunctions and disjunctions of increasing Dets are increasing.
  • Both John’s and Bill’s cats...
Conjunctions and disjunctions of decreasing Dets are decreasing.
Negation reverses monotonicity (for NPs and Dets)
  • not [more than six cats]... at least two and not more than six...
The Det in a partitive construction determines the partitive’s monotonicity.
  • Less than five students.... Less than five of the students...
Possessive Dets [X’s N] build increasing NP’s if X is increasing.
Possessive Dets [X’s N] build decreasing NP’s if X is decreasing.
Possessive Dets [X’s N] build non-monotonic NP’s if X is non-monotonic.
NPI’s

- John *has/hasn’t ever been to Orem.
- John *did/didn’t see any birds on the lawn.

- NPI’s must be licensed by a negator
- Notice what happens with Dets:
  - No/*Some student here has ever sneezed.
  - None/*One of John’s students has ever sneezed.
- No negator!

- Laduslaw-Fauconnier Generalization: NPI’s occur in monotonic decreasing (but not monotonic increasing) functions
  - No/*Every woman’s lawyer should ever act without her consent.
- There seems to be a negation-like component in these Det’s (?!?!?)
  - Technical proof: OK if you don’t understand it
Domain restriction

- Conservativity: \( \delta(\alpha)(\beta) \leftrightarrow \delta(\alpha)(\alpha \land \beta) \)
  - John’s doctor is a vegetarian. \( \iff \) John’s doctor is both a doctor and a vegetarian.

- Extension
  - *blik where Blik A’s are B’s. \( \iff \) There are exactly three things that aren’t A’s.

- (Almost) all English Dets are conservative.
- Natural language Dets always satisfy Extension.
Existential *There-* sentences

- Intersectives for Det: INT
  - As we saw with adjectives.
- Co-intersectives for Det: CO-INT
  - *All but ten* A’s are B’s.
- Proportional Dets
  - *more than half*
- Observation: can’t represent Proportional Dets in FOPL, so FOPL is inadequate for representing (all of) natural language

- Cardinal Dets: *between five and ten, just finitely many*
- Co-cardinal Dets: *all but ten, almost all*
Monotonicity and Processing Load
BART GEURTS AND FRANS VAN DER SLIK, University of Nijmegen
Journal of Semantics, Volume 22, Issue 1, 1 February 2005, Pages 97–117,

• Memory, processing load, and quantifier sentences

• Predictions:
  • If the monotonicity profiles in two quantifying expressions are the same in a sentence, the sentence is easier to process, ceteris paribus.
  • Sentences containing both upward AND downward entailing quantifiers are more difficult than sentences with upward entailing quantifiers only.
  • Downward-entailing quantifiers built from cardinals, like *at most three*, are more difficult than others.
  • Inferences from subsets to supersets are easier than inferences in the opposite direction.

a. At least three hunters shot ↑[more than five [[colleagues]].
b. At least three hunters shot ↑[fewer than five [[colleagues]].
c. At most three hunters shot ↓[more than five [[colleagues]].
d. At most three hunters shot ↓[fewer than five [[colleagues]].

Experiment

MAJOR PREMISE: Detₐ A played against Detₜ B.
MINOR PREMISE: EITHER: All B were C
OR: All C were B.
CONCLUSION: Detₐ A played against Detₜ C.
## Results

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Lexical semantics (mostly review)

- Unaccusative verb: \( \_ \) \([\text{VP} \ V \ NP]\)
  - Argument is thematic
  - Verb can’t assign accusative case (so “object” argument moves to subject position)
  - Can’t take an object
    - Except for cognate accusatives: *I dreamed a dream. He laughed a bitter laugh.*

- Unergative verb: \( \text{NP} \) \([\text{VP} \ V]\)
  - Agentive subject

- This chapter: verbs that illustrate variable behavior
  - Which are they?
La maison d’être

- French has two aux’s
  - avoir: “to have” for unergative verbs
  - être: “to be” for unaccusative verbs

- J’ai mangé. (I have eaten.)
- Je suis tombé. (I am fallen.)
Verbs of sound (VoS)

- buzz, gurgle, jingle, rumble, screech, thud, whistle, etc.
- Intransitive, emitter is subject (could be agentive on nonagentive)
- Somewhat unaccusative, somewhat unergative

- Italian: unaccusatives select "essere" aux; unergatives select "avere"
  - VoS select "avere" (e.g. ha stormito)

- For this and other reasons, prior work considered them unergatives, but…
Diagnostics: unaccusative vs. unergative?

- Resultatives
  - Transitive: *She scrubbed the floors clean.*
  - Intransitive:
    - *The bottle broke open.* (predicated of the thematic subject; only with unaccusatives)
    - *They laughed themselves silly.* (predicated of the object; unergative)
  - So if you see an intransitive resultative, …

- VoS: exhibit both patterns with resultatives
  - Unergative: *We yelled ourselves hoarse. My mistress grumbled herself calm.*
  - Unaccusative: *The lid of the boiler clunked shut. The curtains creaked open.*

- Solution: two related senses, one for each pattern
Semantic shifts

- A semantic constituent of one category shifts to another
- Very frequent in language(s), interesting morpho/syn/sem properties
  - We'll see many more this semester.

- Verbs of manner of motion: run, swim, amble, etc. (unergative)
- Verbs of directed motion: arrive, go, descend, rise, fall, drop, etc. (unaccusative)

- Here: verb of sound → verb of directed motion
Other examples of semantic shift

- Verbs of manner of motion (run, shuffle) \(\rightarrow\) verbs of directed motion

- Verbs of exerting force (pull, push) \(\rightarrow\) verbs of directed motion
Linking theory

• How to connect syntax (constituents) with semantics (concepts) and pragmatics (context)

• What’s important:
  • Arguments, of course
  • Verb argument structure, of course
  • Event structure and substructure
    • Transitivity, causation, etc.
    • Tense
    • Aspect

• Ambiguity

• Chassé-croisé
  • He swam across the Channel.
  • Il traversa la Manche à la nage.