Main Goal

- Double-distinctness readings for polysemous expressions require individuation across multiple senses
  - E.g. *two heavy informative books* - two physically and informationally distinct books
- It is disputed whether this is semantically encoded or pragmatically inferred
- Analysis: modifiers like *heavy* and *informative* update contexts and constrain domain restriction
  - Readings can be predicted based on what modifiers are used and an ordering of QUDs

Polysemy vs. Lexical ambiguity (simplifying assumptions)

Lexical ambiguity
e.g., *party*_{polit.} vs. *party*_{festive} vs. *party*_{travel group}

e.g., $party_{polit.}$ vs. $party_{festive}$ vs. $party_{travel\ group}$
- Non-related senses
- Accidental homophony – *Partei* vs. *Feier* vs. *Reisegruppe* (German)

Polysemy
e.g., $statement_{eventuality/information/physical\ object}$
- Inter-related senses;
- Non-accidental homophony

Copredication

- Copredication: Based on a single antecedent, applying multiple predicates with non-overlapping domains (Pustejovsky 1995; Asher 2011)
- Polysemous nouns such as *lunch* allow for copredication without zeugma as in (1) and (2), cf. (3)
  - *lasted two hours* (dom. = Eventualities)
  - *long* (dom. = Eventualities)
  - *was delicious* (dom = Physical objects (esp. food))
  - *misleading* (dom. = Informational entities)

(1) Lunch lasted two hours and was delicious.   copredication over PHYS and EV

(2) Ali gave a long, but misleading statement.   copredication over INF and EV

(3) ?The party lasted all night and left basecamp in the morning

Copredication and quantification

- Combined with e.g. numerals this can give optionality with respect to what is individuated (4)

(4) Ali made two statements.   [Individuation: minimally EV or INF]

- But modifiers arguably restrict this choice (5)-(7)

(5) Ali made two long statements.   [Individuation: minimally EV]

(6) Ali made two misleading statements.   [Individuation: minimally INF]

(7) Ali made two long, but misleading statements.   [Individuation: EV and INF?]

- (7) has the *double distinctness reading* (Gotham 2017)
  - Two statement events with two different informational contents
- Gotham captures double distinctness by analysing common nouns as encoding individuation criteria that are restricted as part of the compositional semantics of e.g. modified NPs.

The point of contention: Is double-distinctness semantically derived?

- Liebesman and Magidor 2017, 2019: No

(8) Context. Librarians making two piles: informative books vs. uninformative books.

(9) Three informative books are heavy

- In context (8), (9) can describe three heavy books with the same contents
- Therefore no semantically required double distinctness reading. Double distinctness is pragmatic

- Gotham 2021: Yes
  - We must explain why we get double-distinctness when we do
  - Exceptions are explicable in terms of loose talk

Overview and Hypotheses

Underspecification in the semantics of CNs and modifiers

- Polysemous CNs encode, but underspecify, individuation information
- CNs are context-sensitive, and underspecify domain restrictions (Stanley and Gendler Szabó 2000)
- Modifiers can contribute to specifying individuation criteria or other contextual domain restrictions
  - In one context *Two informative books* can mean 'two informationally distinct books'
  - In another context *Two informative books* can mean 'of the informative books, two of them'

Hypothesis: *Modifiers can each restrict individuation criteria or contribute to general quantifier domain restriction, but not both.*

- E.g. *Two informative books* cannot require a reading 'of the informative books, two of them that are informationally distinct'

A counter example?

(10) On their break, Alex memorised the first page of two informative books.

- Reading of (10) in (8): of the books from the interesting pile (contextual domain restriction), Alex memorised the first page of two of them.
  - This cannot be true if Alex memorised one page and there was a duplicate copy (i.e., the double distinctness reading).

- But there is no forced double-distinctness reading in (11):

(11) On their break, Alex tore out the first page of two informative books.

If **more than one information-relevant expression**, e.g., *informative* and *memorise*, we can get both a generalised domain restriction and individuate in terms of informational content.

Analysis

- Build on the analysis of polysemy in Sutton 2022 formulated within Type Theory with Records (TTR, e.g., Cooper 2011, 2023)
- Integrate some insights from the literature on countability w.r.t. context-sensitivity of individuation in count nouns (e.g., Rothstein 2010; Sutton and Filip 2019)

Analysis outline

1. Common nouns have Kaplanian characters, functions from contexts to properties (Kaplan 1989)
   - Following Stanley and Gendler Szabó (2000), intersective domain restriction is indexical
2. Polysemous common nouns underspecify their individuation conditions.
   - Context sensitivity in individuation criteria for some count nouns (e.g., Rothstein 2010; Sutton and Filip 2019).
3. Fixing individuation criteria is also a form of contextual domain restriction.
   - If $\llbracket books \rrbracket = \{\langle o_1, \phi_1 \rangle, \langle o_2, \phi_1 \rangle, \langle o_3, \phi_2 \rangle, \langle o_1 \sqcup o_2, \phi_1 \rangle, \langle o_1 \sqcup o_3, \phi_1 \sqcup \phi_2 \rangle, \langle o_2 \sqcup o_3, \phi_1 \sqcup \phi_2 \rangle ...\}$, $\llbracket two\ informative\ books \rrbracket = \{\langle o_1 \sqcup o_3, \phi_1 \sqcup \phi_2 \rangle, \langle o_2 \sqcup o_3, \phi_1 \sqcup \phi_2 \rangle, \langle o_1 \sqcup o_2 \sqcup o_3, \phi_1 \sqcup \phi_2 \rangle\}$
4. Contextual domain restriction is QUD-sensitive
5. We can distinguish between contextually and lexically introduced QUDs
   - Context can introduce a QUD such as *Which book(s)?* (e.g. of the piles in the library)
   - Polysemous common nouns introduce a QUD such as: *How are we individuating books?*
6. Intersective modifiers contribute underspecified contextual updates: e.g., *informative* requires that the domain restriction of the modified noun be based at least in part on informational entities
7. So *informative book(s)* can contribute towards answering either QUD e.g.:
   - *Which book(s)?* – The ones in the informative piles
   - *How are we individuating books?* At least partly in terms of informational contents
8. Ordering on QUDs determines which QUD is answered
   - Given that the answer to one of the above QUDs does not constitute a an answer to the other, one instance of *informative books* will (at least partly) answer only one QUD.

Polysemous common nouns (*book*)

- In (12), *book* denotes a function from a context/situation *c*, which contains some property, to a book property intersected with this contextual restriction.
- Properties (of type *Ppty*) are functions from situations/records *r* to record types (propositions in TTR).
- A function from situations that contain some physical entity and some informational contents, to the proposition that:
  - the physical entity is a physical book,
  - the informational contents is an informational book (the physical book's contents),
  - and that the counting base (labelled **cb**) is a physical property, an informational one or both (and so individuation is underspecified).

(12) $book \mapsto \lambda c : \left[restr = f : Ppty \right] . \lambda r : \begin{bmatrix} x : Phy \\ p : Inf \end{bmatrix} . \begin{bmatrix} s_{pb} : \phi\_book(r.x) \\ s_{ib} : \iota\_book(r.p) \\ s_{co} : contents(r.x, r.p) \\ cb : PhyPpty \lor InfPpty \end{bmatrix} \land c.restr(r)$

Intersective modifiers (*informative*)

- Place an underspecified condition on the contextual nominal domain restrictor:
  - That it is a property of informational entities — $restr = \lambda r : [p : Inf].\mathcal{R} : Ppty$
- Inherit the domain from the nominal — $\lambda r : Dom(\mathfrak{P}(c))$
- Intersectively modify the nominal:
  - that the informational entity denoted by the noun is informative — $... \land [s_{inf} : informative(r.p)]$

(13) $informative \mapsto$
$\lambda \mathfrak{P}.\lambda c : \left[restr = \lambda r : [p : Inf].\mathcal{R} : Ppty \right] . \lambda r : Dom(\mathfrak{P}(c)). \mathfrak{P}(c)(r) \land [s_{inf} : informative(r.p)]$

Intersective modifier constructions (*informative book*)

- *informative* passes contextual restriction and extensional restriction information to the construction

(14) *informative book* $\mapsto$

$\lambda c : \left[restr = \lambda r : [p : Inf].\mathcal{R} : Ppty \right] . \lambda r : \begin{bmatrix} x : Phy \\ p : Inf \end{bmatrix} . \begin{bmatrix} s_{pb} : \phi\_book(r.x) \\ s_{ib} : \iota\_book(r.p) \\ s_{co} : contents(r.x, r.p) \\ cb : PhyPpty \lor InfPpty \\ s_{inf} : informative(r.p) \end{bmatrix} \land c.restr(r)$

Contextually available QUDs (q_c)

Discussing piles of informative versus uninformative books in the library can introduce a QUD over the following contextual properties, *Which books?*:

(15) a. $c : \begin{bmatrix} restr = \lambda r : \begin{bmatrix} x : Phy \\ p : Inf \end{bmatrix} . \begin{bmatrix} s_{inl} : in\_pile\_in\_library(r.x) \\ s_{inf} : informative(r.p) \end{bmatrix} : Ppty \end{bmatrix}$

b. $c' : \begin{bmatrix} restr = \lambda r : \begin{bmatrix} x : Phy \\ p : Inf \end{bmatrix} . \begin{bmatrix} s_{inl} : in\_pile\_in\_library(r.x) \\ s_{ninf} : \neg informative(r.p) \end{bmatrix} : Ppty \end{bmatrix}$

The formula in (14) is only compatible with (15-a).

- So one reading of *informative book* in the library context is: book in the pile of informative books

Lexically facilitated QUDs (q_l)

Claim: Using a polysemous expression such as *book* introduces a QUD, *How are we individuating books?*

- Counting base is for informational entities, physical entities or both:

(16) a. $c : \left[restr = \lambda r : \left[p : Inf \right] . \left[cb : InfPpty \right] : Ppty \right]$

b. $c' : \left[restr = \lambda r : \left[x : Phy \right] . \left[cb : PhyPpty \right] : Ppty \right]$

c. $c'' : \left[restr = \lambda r : \begin{bmatrix} x : Phy \\ p : Inf \end{bmatrix} . \left[cb : InfPpty \land PhyPpty \right] : Ppty \right]$

(16-b) is mis-typed w.r.t the restriction in formula in (14). So, only compatible with (16-a) and (16-c).

- So one reading of *informative book* is: book, individuated at least partly by informational contents
  - Informational contents must be distinct, physical manifestations need not be

Instances of modifiers only contribute to one QUD at a time

- QUDs are assumed to be ordered in terms of conversational precedence (e.g., Ginzburg 2012)
- Depending on this ordering, *informative books* will address either the contextually specified QUD (*Which books?*, q_c) or the lexically specified QUD (*How are we individuating books?*, q_l)
- For (9), if $q_c \succ q_l$, then *informative* restricts the domain to (15-a)
- In (10), we have two expressions that can restrict the domain to informational entities: *memorise* and *informative*
  - *memorise* does not address q_c, it only addressed q_l
  - *informative* can address q_c or q_l
  - So regardless of the ordering of QUD, (10) can address both questions
  - Restricts to (15-a) for q_c and to (16-a) or (16-c) for q_l
  - Hence the (re-)emergence of the double-distinctness reading

References

N. Asher. Lexical Meaning in Context: A Web of Words. CUP, 2011. • R. Cooper. Copredication, quantification and frames. In S. Pogodalla and J-P Prost (eds.) Logical Aspects of Computational Linguistics. LNCS 6736, pp. 64–79. Springer, 2011. • R. Cooper. From Perception to Communication: a Theory of Types for Action and Meaning. OUP, 2023. • J. Ginzburg. The Interactive Stance: Meaning for Conversation. OUP, 2012. • M. Gotham. Composing Criteria of Individuation in Copredication. Journal of Semantics, 34(2):333–371, 08 2017. • M.Gotham. Property Inheritance, Deferred Reference and Copredication. Journal of Semantics, 39(1):87–116, 2021. • D. Kaplan. Demonstratives: An essay on the semantics, logic, metaphysics and epistemology of demonstratives and other indexicals. In J. Almog, J. Perry, & H. Wettstein (eds.) Themes From Kaplan, pages 481–563. OUP, 1989. • D. Liebesman and O. Magidor. Copredication and property inheritance. Philosophical Issues, 27:131–166, 2017. • D. Liebesman and O. Magidor. Copredication, counting, and criteria of individuation: A response to Gotham. Journal of Semantics, 36:549–561, 2019. • J. Pustejovsky. The Generative Lexicon. MIT Press, 1995. • S. Rothstein. Counting and the Mass/Count Distinction. Journal of Semantics, 27(3):343–397, 2010. • J. Stanley and Z. Gendler Szabó. On quantifier domain restriction. Mind & Language, 15(2-3):219–261, 2000. • P. R. Sutton. Restrictions on copredication: a situation theoretic approach. Semantics and Linguistic Theory (SALT). 32:335–355, 2022. • P. R. Sutton and Hana Filip. The count/mass distinction and mass-to-count coercion for 'granular' nouns. In Hana Filip, editor, Countability in Natural Language. CUP 2021.