The Missing Hyponymic Alternatives Puzzle: comparing conceptual and negative alternatives

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1. Introduction
2. Taxonomic non-Excludability and Missing Hyponymic Alternatives
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5. Motivating emergent negation in alternatives
6. Open issues
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Alternatives: the standard picture

- Many phenomena, from implicatures to the meanings of operators like *only*, involve sets of alternatives ($\mathcal{A}$):

(1) a. Amy drank some of the beers.
$\rightsquigarrow$ *Amy drank some but not all of the beers.*

b. $\mathcal{A}$ = {Amy drank some of the beers, Amy drank all of the beers}

(2) a. (Only) Amy$_F$ left.
$\rightsquigarrow$ *Amy left and Ben didn't.*

b. $\mathcal{A}$ = {Amy left, Ben left}

- Determining what can and what can't be included in $\mathcal{A}$ is crucial for our understanding of this kind of strenghtening inferences.

Alternatives: the standard picture

- Consider the meaning of sentences with focused predicates, (3):

(3) (Only) Poodles$_F$ are friendly.

- A standard answer: alternatives are obtained via *predicate substitution* (P-Sub), by replacing the predicate with another (with potential additional constraints, Rooth 1992; Fox and Katzir 2011; see below.)

(4) $$\mathcal{A}(3) = \left\{ \begin{array}{l} \text{Poodles are friendly,} \\ \text{Labradors are friendly,} \\ \text{Huskies are friendly,} \\ \ldots \end{array} \right\}$$

Goal for today

- We will present a number of puzzles for this approach to alternatives.
- Such puzzles can be solved if one considers alternatives to involve *emergent negation* (em-Neg) instead, specifically constituent negation on the focused predicate:

(3) (Only) Poodles_F are friendly.

(5) $\mathcal{A}(3) = \left\{ \begin{array}{l} \text{Poodles are friendly,} \\ \text{Non-poodles are friendly} \end{array} \right\}$

- We will argue that our proposed solution fares better than another view that treats alternatives as conceptual (rather than linguistic) in nature.

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Taxonomic non-Excludability (TnE)

- As it was noted long ago by Hirschberg (1985); Matsumoto (1995), a predicate cannot implicate the exclusion of its hyponyms:

(6) A. Does Amy have a poodle?

B. #No, she has a dog.
$\not\rightsquigarrow$ *Amy has a dog that is not a poodle.*

Taxonomic non-Excludability (TnE)

- When compared to examples such as (7) below, the question of why can't the use of the weaker term implicate the negation of the stronger term arises:

(7) A. Did Amy drink all of the beers?

B. No, she drank some of them.
$\rightsquigarrow$ *Amy drank some but not all of the beers.*

- This illustrates what we call *Taxonomic Non-Excludability (TnE)*: in basic (QUD-controlled) discourses, a predicate cannot implicate the exclusion of its hyponyms.

The standard solution: no innocently excludable alternatives

- Singh (2008) and Meyer (2013) suggest that the unavailability of alternatives such as *poodle* for *dog* comes from the fact that these are not **innocently excludable** (Fox and Hackl, 2006; Fox, 2007).
- Informally, the idea is that *dog* cannot exclude consistently specific breeds of dogs, because being a dog entails being of some breed of dog: strenghtening is therefore vacuous.

(8) **Innocent Exclusion procedure (Bar-Lev and Fox, 2017)**

a. Take all maximal sets of alternatives that can be negated consistently with the prejacent.

b. Only exclude (i.e., negate) those alternatives that are members in all such sets - the **Innocently Excludable** **(**$\mathcal{A}_{IE}$**)** alternatives.

The standard solution: no innocently excludable alternatives

(6) A. Does Amy have a poodle?

B. #No, she has a dog.
$\not\rightsquigarrow$ *Amy has a dog that is not a poodle.*

- Now assume that the assertion in B above involves alternatives not just obtained by replacing *dog* with *poodle*, but also other breed-predicates:

(9) $\mathcal{A}(6) = \left\{ \begin{array}{l} \text{She has a poodle,} \\ \text{She has a labrador,} \\ \text{She has a husky,} \\ \ldots \end{array} \right\}$

The standard solution: no innocently excludable alternatives

(10) $\mathcal{A}(6) = \left\{ \begin{array}{l} \text{She has a poodle,} \\ \text{She has a labrador,} \\ \text{She has a husky,} \\ \ldots \end{array} \right\}$

- These alternatives are not Innocently Excludable: it's impossible to be a dog without being some breed of dog (the story goes; see below).
- The strenghtened meaning of B's assertion would be *she has a dog and she does not have a poodle, a labrador, a husky...*; this meaning is not available, as the absence of inference confirms.

The standard solution: no innocently excludable alternatives

- Note that the issue is not that *dog* cannot be an alternative to *poodle* (*pace* Hirschberg 1985):

(11) A. Is Amy required to have a poodle?

B. No, she's required to have a dog.
$\rightsquigarrow$ *Amy is required to have a dog and she's not required to have a poodle* $\equiv$
Amy is required to have a dog of any breed.

The standard solution: no innocently excludable alternatives

(12) B: No, she's required to have a dog$_F$.

(13) $\mathcal{A}(B) = \left\{ \begin{array}{l} \text{She is required to have a poodle,} \\ \text{She is required to have a labrador,} \\ \text{She is required to have a husky,} \\ \dots \end{array} \right\}$

- In what follows, we assume that strenghtening inferences are derived in the grammar via an exhaustification operator Chierchia (2006); Spector (2007); Fox (2007); Chierchia et al. (2012) (but nothing crucial hinges on this):

(14) $\textsc{exh}(B) = [\![\text{She's required to have a dog}]\!] = 1 \wedge \forall \phi \in \mathcal{A}_{IE}(B), [\![\phi]\!] = 0$

A difficulty for the IE theory: the MisHAP

- However, the IE solution faces a number of non-trivial issues.
- As it has been pointed out by Feinmann (2025), a problem is that many languages do not lexicalize the necessary alternatives for IE to prevent strenghtening of the predicate.

(15) A. Did Amy drown?

B. #No, she died.

$\not\rightsquigarrow$ *Amy died, but not by drowning.*

- In English, very few ways of dying are lexicalized (e.g., *choke*).
- This is what we call the **Missing Hyponymic Alternatives Puzzle (MisHAP)**.

A difficulty for the IE theory: the MisHAP

- In fact, this problem could arguably be extended to our *dog/poodle* case above: few speakers have lexical items for all breeds of dogs, and most hybrid breeds are not lexicalized at all.
- Even if a speaker does not personally know the term for some breed, they do know that a term exists; this might prove sufficient to prevent strenghtening.
- This is in contrast to ways of dying, where no one believes that for every conceivable way of dying, some English speaker has a word for it.

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Hybrids

- Following Paillé (2025a,b), we assume trivalent meanings for predicates:

(16) $[\![$ This (a) is a poodle $]\!] =$
$$\begin{cases} 1 \text{ iff (a) is a pure poodle;} \\ 0 \text{ iff (a) is not even part-poodle;} \\ \# \text{ otherwise (i.e., iff (a) is only part-poodle).} \end{cases}$$

- Hence, as a rule (i.e., regardless of what's focused in a sentence), *poodle* will be undefined for part-poodle individuals.

Hybrids

- Negation reverses truth and falsity conditions, so *non-poodle* is true only of things that are entirely non-poodles:

(17) $[\![$ This (a) is not a poodle $]\!] =$
$$\begin{cases} \text{1 iff (a) is not even part-poodle;} \\ \text{0 iff (a) is a pure poodle;} \\ \text{\# otherwise (i.e., iff (a) is only part-poodle).} \end{cases}$$

Hybrids

- Note that such meanings predict that hybrids, such as labradoodles, will be systematically undefined.
- By 'hybrids,' we don't just mean e.g. labradoodles, but also other individuals that would fall in extension gaps of more than one predicate from the same class: black and white cats are hybrids (in the extension gap of *black* and of *white*), as are French-British dual citizens (in the extension gap of *French* and *British*), etc.
- This also applies to colors:

(18) $$[\![\text{green(x)}]\!] = \begin{cases} 1 \text{ iff } x \text{ is fully green;} \\ 0 \text{ iff } x \text{ not green at all;} \\ \# \text{ otherwise.} \end{cases}$$

Hybrids

- With that in mind, consider the meaning of the following:

(19) (Only) poodles$_F$ are friendly.

- Uncontroversially, the sentence excludes that pure-breed dogs like huskies or labradors are friendly.
- What about hybrids?

Hybrids

(19) (Only) poodles$_F$ are friendly.

- For hybrids, inferences are heterogeneous.
- We note the following two propreties:
  1. (19) makes *no* claim about the friendliness of part-poodle dogs;
  2. However, (19) *does* make a claim about non-poodle hybrids (e.g., labrador-husky hybrids), namely that they are not friendly.
- To appreciate the first property, imagine how you would evaluate the friendliness of a poodle-labrador hybrid based on that sentence alone: you would not know what to think.

Hybrids

- This holds in general for hybrids.

(20) (Only) white$_F$ cats are friendly.

1. (20) makes *no* claim about the friendliness of partly-white cats;
2. However, (20) *does* make a claim about entirely non-white multicoloured cats, namely that they are not friendly.

Applying P-Sub to hybrids

- Can we obtain both properties via P-Sub?
- We try this below assuming that implicatures are grammatically computed with a trivalent exhaustivity operator, PEXH (Bassi et al., 2021) that negates non-entailed alternatives in the truth conditions but not in the falsity conditions.

(21) **The Presuppositional Exhaustification Operator (Bassi et al., 2021)**
For a given proposition ϕ,

$$[\![\text{PEXH}(\phi)]\!] = \begin{cases} 1 \text{ if } [\![\phi]\!] = 1 \wedge \bigwedge([\![\psi]\!] = 0) : \psi \in \mathcal{A}_{IE}; \\ 0 \text{ if } [\![\phi]\!] = 0; \\ \# \text{ otherwise.} \end{cases}$$

Applying P-Sub to hybrids

(19) (Only) poodles$_F$ are friendly.

(22) a. $\mathcal{A}(19) = \left\{ \begin{array}{l} \text{Poodles are friendly,} \\ \text{Labradors are friendly,} \\ \text{Huskies are friendly,} \\ \ldots \end{array} \right\}$

b. $[\![\textsc{pexh}_{\mathcal{A}_{IE}}[\text{Poodles are friendly}]]\!] =$
$\begin{cases} \text{1 iff pure poodles are F. \&} \\ \text{other pure-breed dogs are not F.;} \\ \text{0 iff pure poodles are not F.,} \\ \text{\# otherwise.} \end{cases}$

Applying P-Sub to hybrids

(19) (Only) poodles$_F$ are friendly.

(23) a. $\mathcal{A}(19) = \left\{ \begin{array}{l} \text{Poodles are friendly,} \\ \text{Labradors are friendly,} \\ \text{Huskies are friendly,} \\ \ldots \end{array} \right\}$

b. $[\![\textsc{pexh}_{\mathcal{A}_{IE}}[\text{Poodles are friendly}]]\!] =$

$$\begin{cases} \text{1 iff pure poodles are F. \&} \\ \text{other pure-breed dogs are not F.;} \\ \text{0 iff pure poodles are not F.,} \\ \text{\# otherwise.} \end{cases}$$

- Recall our two properties:
  1. (19) makes *no* claim about the friendliness of part-poodle dogs;
  2. However, (19) *does* make a claim about non-poodle hybrids (e.g., labrador-husky hybrids), namely that they are not friendly.

Applying P-Sub to hybrids

(24) a. $\mathcal{A}(19) = \left\{ \begin{array}{l} \text{Poodles are friendly,} \\ \text{Labradors are friendly,} \\ \text{Huskies are friendly,} \\ \ldots \end{array} \right\}$

b. $[\![\text{PEXH}_{\mathcal{A}_{IE}}[\text{Poodles are friendly}]]\!] =$

$\begin{cases} \text{1 iff pure poodles are F. \&} \\ \text{other pure-breed dogs are not F.;} \\ \text{0 iff pure poodles are not F.,} \\ \text{\# otherwise.} \end{cases}$

- The key observation is that the derivation above captures Property 1, but **not Property 2**: the TCs say nothing about part-poodle hybrids, but it also says nothing about non-poodle hybrids!
- Applying P-Sub therefore results in an overtly weak meaning.

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Introducing conceptual alternatives

- A potential way out both problems is **conceptual altenatives**.
- Both P-Sub and em-Neg assume that alternatives are **linguistic objects** (Katzir 2007; Fox and Katzir 2011 and many subsequent literature).
- Recently, Buccola et al. (2022) and Jeretič et al. (2023) (after Charlow 2019) have proposed that **alternatives might be conceptual in nature**.
- These conceptual alternatives (CAs) can divert from an utterance's meaning in ways that need not correspond to possible sentences/structures.

CAs and the MisHAP

- CAs look like an appealing way to deal with the MisHAP.
- Recall the crucial example:

(15) A. Did Amy drown?

B. #No, she died.
$\not\rightsquigarrow$ *Amy died, but not by drowning.*

- While not all ways of dying are lexicalized, it remains that we have concepts for them.
- We can therefore appeal to Innocent Exclusion to explain the lack of inference in such cases: that would solve the MisHAP.

CAs and the MisHAP

(15) A. Did Amy drown?

B. #No, she died.

$\not\rightsquigarrow$ *Amy died, but not by drowning.*

(25) $$\mathcal{A}_C(15) = \left\{ \begin{array}{l} \textsc{drown}(\textsc{Amy}), \\ \textsc{die.by.choking}(\textsc{Amy}), \\ \textsc{die.by.falling.off.a.balcony}(\textsc{Amy}), \\ \ldots \end{array} \right\}$$

- Since the alternatives $\mathcal{A}_C$ cover the entire conceptual space of ways of dying, they are all Innocently Excludable, therefore licensing no inference.

CAs and hybrids

- What about hybrids?
- The CA approach must either claim that hybrid breed concepts are valid CAs (for an utterance with a non-hybrid term like *poodle*), or that they are not.
- Consider specifically the following concepts for a poodle-labrador hybrid, C_{PL} and a husky-labrador hybrid, C_{HL}.

CAs and hybrids

(19) (Only) poodles_F are friendly.

1. (19) makes *no* claim about the friendliness of part-poodle dogs;
2. However, (19) *does* make a claim about non-poodle hybrids (e.g., labrador-husky hybrids), namely that they are not friendly.

C_{PL}: poodle-labrador hybrid C_{HL}: husky-labrador hybrid

- If C_{PL} is an alternative to *poodle*, then Property 1 is not predicted: (1) would negate that part-poodle dogs are friendly.
- If C_{HL} (and other hybrid-concepts) is **not** an alternative to *poodle*, then Property 2 is not predicted: **no claim would be made about non-poodle hybrids**.
- In both cases, CAs fail to derive the observed properties: in the first case, P1 is not derived because of too many inferences; in the second case, P2 is not derived because some inferences are lacking.

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Emergent Negation in alternatives (em-Neg)

- While CAs could in principle account for the lack of inferences with hyponyms and solve the MisHAP, they fail to generate the attested inferences about hybrids, just like P-Sub.
- In what follows, we propose a new conception of alternatives that accounts for both cases: **alternatives with emergent Negation (em-Neg)**.

The take of em-Neg on hybrids

- Now consider what happens if instead of considering alternatives as substitutions, we assume they consist in the predicate and its negation:

(26) a. $\mathcal{A}_{Neg}(19) = \left\{ \begin{array}{l} \text{Poodles are friendly,} \\ \text{Non-poodles are friendly} \end{array} \right\}$

b. $[\![\textsc{pexh}_{\mathcal{A}_{Neg}}[\text{Poodles are friendly}]]\!] =$
$\begin{cases} \text{1 iff pure poodles are F. \&} \\ \text{fully non-poodle dogs are not F.;} \\ \text{0 iff pure poodles are not F.,} \\ \text{\# otherwise.} \end{cases}$

The take of em-Neg on hybrids

(27) $[\![\text{PEXH}_{\mathcal{A}_{Neg}}\text{[Poodles are friendly]}]\!] = \begin{cases} \text{1 iff pure poodles are F. \&} \\ \text{fully non-poodle dogs are not F.;} \\ \text{0 iff pure poodles are not F.,} \\ \text{\# otherwise.} \end{cases}$

- We now obtain both properties:
  1. (19) makes *no* claim about the friendliness of part-poodle dogs; ✓
  2. However, (19) *does* make a claim about non-poodle hybrids (e.g., labrador-husky hybrids), namely that they are not friendly. ✓

Back to the MisHAP

- With em-Neg, the MisHAP is no longer problematic, since non-lexicalized conceptual hyponyms are all covered by the negation of a hyponym: *non-poodle* covers the entire conceptual space of dog breeds that excludes poodles.
- We assume that whenever *dog* has *poodle* as an alternative, it also necessarily has *non-poodle*.

Back to the MisHAP

(6) A. Does Amy have a poodle?

B. #No, she has a dog.
$\not\rightsquigarrow$ *Amy has a dog that is not a poodle.*

(28) $\mathcal{A}_{Neg}(6) = \left\{ \begin{array}{l} \text{She has a poodle,} \\ \text{She has a non-poodle} \end{array} \right\}$

- The alternatives *poodle* and *non-poodle* are not Innocently Excludable: either PEXH negates both (which would lead to a contradiction), or it negates none.
- This predicts the lack of inference for examples such as (6).

Back to the MisHAP

- Similar reasoning applies to the *drown* case: no lexical elements of other ways of dying is required.

(15) A. Did Amy drown?

B. #No, she died.
$\not\rightsquigarrow$ *Amy died, but not by drowning.*

(29) $\mathcal{A}_{Neg}(15) = \left\{ \begin{array}{l} \text{She drowned,} \\ \text{She didn't drown} \ldots \end{array} \right\}$

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em-Neg and gradable predicates

- However, our proposal is at pains to derive cases in which a scalar inference is observed, e.g., with gradable predicates such as *warm* or *pretty*:

(30) A. Does Amy like hot baths?
B. No, she likes warm baths.
$\rightsquigarrow$ *Amy likes baths that are warm but not hot.*

(31) A. Is Amy beautiful?
B. No, she's pretty.
$\rightsquigarrow$ *Amy is preety but not beautiful.*

- The fact that these inferences seem restricted to gradable predicates is a promising lead towards a solution.

- A well-known problem in formal pragmatics is the so-called **symmetry problem**:

(32) **The symmetry problem**
For any sentence S and potential alternative S', if the assertion of S implicates $S \wedge \neg S'$, there will always be another alternative $S'' = S \wedge \neg S'$ preventing us to derive the desired implicature.

em-Neg and complexity

- A well-known problem in formal pragmatics is the so-called **symmetry problem**:

(1) Amy drank some of the beers.
$\rightsquigarrow$ *Amy did not drink all of the beers.*

(33)
a. S: Amy drank some of the beers.
b. S': Amy drank all of the beers.
c. S'': Amy drank some but not all of the beers.

em-Neg and complexity

- The best response to this problem so far is that **alternatives are structure-sensitive**: they have to be at-most-as-complex as the prejacent (Katzir 2007; Fox and Katzir 2011 i.a.).

(1) Amy drank some of the beers.
$\rightsquigarrow$ *Amy did not drink all of the beers.*

(34) $\mathcal{A}_{IE}(1) = \left\{ \begin{array}{l} \text{Amy drank some of the beers,} \\ \text{Amy drank all of the beers,} \\ \text{\sout{Amy drank some but not all of the beers},} \\ \ldots \end{array} \right\}$

em-Neg and complexity

- Our proposal eschews complexity: alternatives created via negation are bound to be always more complex than the prejacent.
- The structural theory of alternatives has been challenged on independent grounds, most notably by Schwarz and Wagner (2024); Hirsch and Schwarz (2025); Haslinger and Schmitt (2025).
- The data that we have exposed in this talk represents an additional problem for this theory.

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Conclusion

- In this talk, we argued that, at least in the case of some predicates in focus/scalar contexts, the alternatives feeding the strenghtening mechanism involves **alternatives formed with negation**, rather than via **predicate substitution**.
- Our proposal is able to offer a suitable explanation for long-standing problems about the absence of observed implicatures in cases in which a predicate excludes one of its hyponyms, as well as cases in which no hyponym seem to be lexicalized in the language.
- It also accounts for intuitions about hybrids predicates in focused environments.

Thank you

Comments and suggestions most welcome!

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A labradoodle generated by the Perchance model

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