Is there (some) exhaustification present in questions?

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25th Workshop on the Roots of Pragmasemantics
Szklarska Poręba 22 February 2025

The slope

1. Alternative-based inferences
2. Scalar Questions
3. The proposal
4. Outlook

Alternative-based inferences

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- The literal meaning of sentences is rooted in classical logic.
- In conversations, sentences can be strengthened with an implicature (Grice, 1975).
- Strengthening happens via negating utterances alternative to the sentence (Horn, 1972).

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- In conversations, sentences can be strengthened with an implicature (Grice, 1975).
- Strengthening happens via negating utterances alternative to the sentence (Horn, 1972).

(1) Some students passed the exam.
ALT: All students passed the exam.
$\rightsquigarrow$ **Not** all students passed the exam.

Implicatures in DE environments

"*The generalization, in rough terms, is the following: ordinary* ***scalar implicatures are systematically suspended in the very contexts that license elements like any.***" (Chierchia et al., 2004)

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"*The generalization, in rough terms, is the following: ordinary* ***scalar implicatures are systematically suspended in the very contexts that license elements like any.***" (Chierchia et al., 2004)

(2) ✓It is false that Sue failed <u>anyone</u>.

Implicatures in DE environments

"*The generalization, in rough terms, is the following: ordinary* ***scalar implicatures are systematically suspended in the very contexts that license elements like any.***" (Chierchia et al., 2004)

(2) ✓It is false that Sue failed anyone.

(3) It's false that Sue failed some students.
She failed all students.

Implicatures in DE environments

(4) Every student who has <u>any</u> money drinks beer every Friday.

(5) Every student who solved some exercises passed the exam.
$\not\rightsquigarrow$ Some student who solved all of the exercises did not pass.

Deriving oddness through alternatives (Magri, 2009, 2011)

(6) a. #Some Italians come from a warm country.
b. #Some lions are mammals.

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Oddness follows from the fact that their strengthened meaning mismatches with common knowledge.

Common knowledge: *All Italians come from the same country.*

(7) #Some Italians come from a warm country.
ALT: All Italians come from a warm country.
$\rightsquigarrow$ **Not** all Italians come from a warm country.

Using oddness to detect implicatures (Magri, 2011)

(8) a. Every Italian comes from a beautiful country.
b. #Every Italian woman comes from a beautiful country.

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(8) a. Every Italian comes from a beautiful country.
b. #Every Italian woman comes from a beautiful country.

(9) *Context:* In this department, every professor assigns the same grade to all of his students.
a. #This year, every professor of this department who assigned an A to *some* of his students got a prize.
b. This year, every professor of this department who assigned an A to *all* of his students got a prize.

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- Even in DE environments where *any* is licensed, the implicatures are computed.
- If they contradict common knowledge, they result in the oddness of the sentence.

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In plain cases, these implicatures are not visible, say because an Economy Principle rules them out by dooming the corresponding alternative irrelevant. But in the case in which the embedded alternative is contextually equivalent to the embedded prejacent, the implicature can be detected through oddness. (Magri, 2011, p. 44)

Grammatical approach (Fox, 2007; Bar-Lev and Fox, 2020)

- Generate grammatical (syntactic) alternatives:
  sub-constituents and lexicon (Katzir, 2007)
- Take all maximal sets of alternatives that can be assigned *false* with the prejacent.
- (*IE*) Exclude the intersection of those sets.

Example 1 disjunction

Prejacent: $\alpha \vee \beta$

- Set of alternatives: $\mathit{Alt}(\alpha \vee \beta) = \{\alpha \vee \beta, \alpha, \beta, \alpha \wedge \beta\}$

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Prejacent: $\neg(\alpha \vee \beta)$

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Prejacent: $\neg(\alpha \vee \beta)$

- Set of alternatives:
  $Alt(\neg(\alpha \vee \beta)) = \{\neg(\alpha \vee \beta), \neg\alpha, \neg\beta, \neg(\alpha \wedge \beta)\}$
- Maximal subsets to be assigned false: $\emptyset$.
- Innocently excludable alternatives: $\emptyset$

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Prejacent: $\exists x P x$ Some lions are mammals.

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Prejacent: $\neg\exists x P x$ It is false that Sue failed some students.

- Set of alternatives: $Alt(\neg\exists x P x) = \{\neg\exists x P x, \neg\forall x P x\}$

Example 2 *Some*

Prejacent: $\exists x P x$ — Some lions are mammals.

- Set of alternatives: $Alt(\exists x P x) = \{\exists x P x, \forall x P x\}$
- Maximal subsets to be assigned false: $\{\forall x P x\}$.
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Prejacent: $\neg\exists x P x$ — It is false that Sue failed some students.

- Set of alternatives: $Alt(\neg\exists x P x) = \{\neg\exists x P x, \neg\forall x P x\}$
- Maximal subsets to be assigned false: $\emptyset$.
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The case of the restrictor of every

Prejacent: $\forall x(Ix \wedge Wx) \rightarrow Cx$

Every Italian woman comes from a beautiful country.

$Alt(\phi) =$

- Someone $\{\exists x \ldots\}$ (non-excludable)

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But $\forall x(Ix \rightarrow Cx)$ expresses: *All Italians come from a beautiful country.* Its negation contradicts common knowledge!

The case of the restrictor of every

Prejacent: $\forall x(Sx \wedge \exists yRxy) \rightarrow Px$

Every student who solved some exercises passed the exam.

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- Everyone passed $\{\forall x Px, \forall x Sx \rightarrow Px, \cancel{\forall x(\exists y Rxy) \rightarrow Px}\}$. (excludable)
- All students who solved all the exercises passed $\forall x(Sx \wedge \forall y Rxy) \rightarrow Px$ (**non-excludable**)

The case of the restrictor of every

(10) *Context:* In Italy, children always inherit the last name of their father. (Magri, 2011)

a. #Every father, some of whose children have a funny last name, must pay a fine.

b. Every father whose children have a funny last name must pay a fine.

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(10) a. #Every father, some of whose children have a funny last name, must pay a fine.

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- Someone $\{\exists x \ldots\}$ (non-excludable)
- Every $\{\forall xFx, \forall x(Fx \rightarrow Px), \forall x\exists y(Cyx \wedge Qy \rightarrow Px)\}$. (excludable #)
- All fathers such that all of their children have a funny last name need to pay. $\forall x(Fx \wedge \forall yCyx \wedge Qy) \rightarrow Px$ (**non-excludable**)

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- Every $\{\forall x Fx, \forall x(Fx \rightarrow Px),$ ~~$\forall x \exists y(Cyx \wedge Qy \rightarrow Px)$~~$\}$. (excludable #)
- All fathers such that <u>all</u> of their children have a funny last name need to pay. $\forall x(Fx \wedge \forall y Cyx \wedge Qy) \rightarrow Px$ (**non-excludable**) $\longrightarrow$ We cannot derive inconsistency

Embedded implicatures

(10) a. #Every father, some of whose children have a funny last name, must pay a fine.

To explain cases like (10) we need to postulate embedded implicatures.

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To explain cases like (10) we need to postulate embedded implicatures.

And what about:

✓ Every student who solved some exercises passed the exam.

Alternatives *contextually equivalent* to the prejacent, become relevant (Magri, 2011).

Embedded implicatures

If children always inherit the last name of their father, we see that:

Some of X's children have a funny last name.

$$\equiv$$

All of X's children have a funny last name.

Hence, the latter must be included in the set of relevant alternatives for embedded implicatures.

Scalar Questions

Alternative-based reasoning in questions.

"*The generalization, in rough terms, is the following: ordinary **scalar implicatures are systematically suspended in the very contexts that license elements like any.***" (Chierchia et al., 2004)

(11) ✓Did any students arrive?

Alternative-based reasoning in questions.

"*The generalization, in rough terms, is the following: ordinary* ***scalar implicatures are systematically suspended in the very contexts that license elements like any.***" (Chierchia et al., 2004)

(11) ✓Did any students arrive?

(12) Did some students pass?
#No, they all did.

Alternative-based reasoning in questions.

"*The generalization, in rough terms, is the following: ordinary **scalar implicatures are systematically suspended in the very contexts that license elements like any.***" (Chierchia et al., 2004)

(11) ✓Did any students arrive?

(12) Did some students pass?
#No, they all did.

(13) Did John or Paul arrive?

a. #No; they both did.
b. Yes, they both did.

Magri questions

(14)
a. #Do some Italians come from a warm country?
b. #Are there any Italians (here) who form a warm country?
c. #Are some lions mammals?

Magri questions

(14)
a. #Do some Italians come from a warm country?
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To explain the oddness of these questions we need alternative-based inference to occur in questions.

Felicitous and infelicitous questions

(15) a. #John is in Paris or in France. (Hurford, 1974)

Redundancy principle: A sentence is deviant in a context *c* if its logical form contains a node O(A, B) which is obtained by application of a binary operator O to two arguments A, B, and the outcome is semantically equivalent, relative to c, to one of the arguments on its own (Katzir and Singh, 2014).

Felicitous and infelicitous questions

(15) a. #John is in Paris or in France. (Hurford, 1974)
b. ✓Either John solved two exercises, or he solved all of them. (Chierchia et al., 2009)
c. ✓Some or all students passed the exam.

Redundancy principle: A sentence is deviant in a context c if its logical form contains a node O(A, B) which is obtained by application of a binary operator O to two arguments A, B, and the outcome is semantically equivalent, relative to c, to one of the arguments on its own (Katzir and Singh, 2014).

Felicitous and infelicitous questions

(15) a. #Did John go to Paris, or to France?
b. ✓Did some students pass the exam, or did all?
(Ciardelli and Roelofsen, 2017)

To account for this difference, we need exhaustification in questions.

Weak implicatures

(16) Ann is interested in the exam results. She asks Bill who graded the exams:

a. *Context:* She knows that the exam is easy, and normally, everybody passes.
A: #Did some students pass the exam?

b. *Context:* She knows that the exam is very hard and hardly anyone can pass it.
A: Did some students pass the exam?

Weak implicatures

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A: Did some students pass the exam?

Bott et al. (2025): Small but significant effect of ‘No’ answer to the ‘some’ question in an ‘all’ situation.

Can there be embedded implicatures in questions?

(17) #Are some lions mammals?

Since all lions are members of the same class:

Some lions are mammals.

$\equiv$

All lions are mammals.

Hence, the latter must be included in the set of relevant alternatives for embedded implicatures. $\longrightarrow$ Inconsistency ✓

Hurford questions.

(18) Did some students pass the exam, or did all?

Since we know

$$\text{Some students passed the exam.} \\ \not\models \\ \text{All students passed the exam.}$$

Hence, the latter is **not** included in the set of relevant alternatives for embedded implicatures.

So *some* has to be interpreted literally which results in *all* $\models$ *some* hence $\longrightarrow$ Inconsistency #

Other solutions

- Embedded implicatures:
  - Hurford Questions
  - Weak implicatures (additional explanation needed)
- Fox (2020)'s Partition as exhaustification:
  - Issue with non-convex answerhood conditions (*No* means that none or all students passed.)
  - Hurford questions.
- Bassi et al. (2021)'s Pressupositional exhaustification
  - No issue with Magri Questions; if we lift the oddness filter proposed by Del Pinal (2021) to the inquisitive case.
  - Hurford questions.
  - Weak implicatures

The proposal

Bias in Questions (e.g. Krifka, 2015; Roelofsen and Farkas, 2015)

Some questions are biased towards their positive answers.

(19)
a. Didn't John go to the party?
b. John was at the party, wasn't he?
c. John was at the party, right?

Weak implicatures in polar questions as a bias

1. Alternatives to a question are questions.
2. Alternatives are generated grammatically: sub-constituents and from lexicon Katzir (2007).
3. Weak implicatures are derived as **bias towards the negative answer** to an alternative.

Unified treatment of declaratives and interrogatives

- I follow Ciardelli et al. (2018) by assuming unified treatment of propositions as sets of information states.
- There is no type difference between declaratives and interrogatives: $P = \{\{P\}\}$ and $?P = \{\{P\}, \{\neg P\}\}$; $<< s, t >, t >$
- I will lift the algorithm by Bar-Lev and Fox (2020) to fit this approach.

Exhaustification of questions

- Generate grammatical (syntactic) alternatives: sub-constituents and lexicon (Katzir, 2007)
- Take all maximal sets of alternatives that can be assigned *false* with the prejacent.
- (*IE*) Exclude the intersection of those sets.

Exhaustification of questions

- Generate grammatical (syntactic) alternatives: sub-constituents and lexicon (Katzir, 2007)
- An alternative is innocently excludable if it can be resolved negatively without resolving the issue raised by the prejacent (and without contradicting it).
- Innocent exclusion of a question amounts to a weak commitment to the negative answer (negative bias)

Exhaustification of questions

- Generate grammatical (syntactic) alternatives:
  sub-constituents and lexicon (Katzir, 2007)
- An alternative is innocently excludable if it can be resolved negatively without resolving the issue raised by the prejacent (and without contradicting it).
- Innocent exclusion of a question amounts to a weak commitment to the negative answer (negative bias)
- Declarative have *no negative answers*. Hence, the bias is strengthened to negate the alternative.

Strong implicatures

(20) Did some students pass the exam? $?!\forall x Px$

Prejacent: $?!\exists x Px$ $Alt(\phi) = \{?!\forall x Px\}$

$$\underbrace{\forall x Px}_{\text{Yes}} \vee \underbrace{\neg\forall x Px}_{\text{No}}$$

Strong implicatures

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$$\underbrace{\forall x Px}_{\text{Yes}} \vee \underbrace{\neg\forall x Px}_{\text{No}}$$

(21) Some students passed the exam. $!\exists x Px$

Prejacent: $!\exists x Px$ $Alt(\phi) = \{\forall x Px\}$

Strong implicatures

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(21) Some students passed the exam. $!\exists x Px$

Prejacent: $!\exists x Px$ $Alt(\phi) = \{\forall x Px\}$

It is not possible to weakly commit to the negative answer. The implicature needs to be strengthened to the negation of the alternative.

Magri questions

(22) #Are some lions mammals?

The weak commitment to *Not all lions are mammals* violates common knowledge.

Hurford Questions

(23) Did some students pass the exam, or did all?

The weak commitment to *Not all students passed the exam* is incompatible with the second disjunct $\longrightarrow$ no redundancy.

Weak implicatures

(24) Ann is interested in the exam results. She asks Bill who graded the exams:

a. *Context:* She knows that the exam is easy, and normally, everybody passes.
   A: #Did some students pass the exam?

b. *Context:* She knows that the exam is very hard and hardly anyone can pass it.
   A: Did some students pass the exam?

If Ann thinks that it is likely that everyone will pass, she can't be biased against this belief.

The case of the restrictor of every

(25) a. #Every father, some of whose children have a funny last name, must pay a fine.

All fathers such that <u>all</u> of their children have a funny last name need to pay. $\forall x(Fx \wedge \forall y Cyx \wedge Qy) \rightarrow Px$ (**non-excludable**) $\longrightarrow$ We cannot derive inconsistency

Outlook

Outlook

1. Implicatures disappear in most DE-environments.
2. We can observe some implicatures in questions.
3. We propose to explain them using bias towards negative answers to questions.
4. Speakers are negatively biased towards questions alternative to the utterance.

Thank you!

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