

SI computation is

not BLIND

but *incremental*

Magri effect

Magri's observation

A sentence with **a weak scalar item** (e.g. 'some') that is contextually equivalent to the version with **a strong scalar item** (e.g. 'all') is infelicitous. (**MAGRI EFFECT**)

- (1) Every student solved either none or all of the problems.
 - a. #The smartest student solved **some** of the problems.
 - b. The smartest student solved **all** of the problems.

Challenge for a pragmatic theory of Scalar Inference (SI) computation:

The two sentences have contextually equivalent truth-conditions. Why can't they be used to convey the same message? What distinguishes them?

Some more examples

- (2) (The Electoral College for the US presidential election is a winner-takes-all voting system)
- a. #Some of the 40 votes of Texas went to the Republican candidate.
 - b. All of the 40 votes of Texas went to the Republican candidate.

- First-year Linguistics students have to take exactly two Linguistics courses: Either [Syntax and Semantics] or [Phonology and Morphology].
- Tim is a first-year Linguistics student, entering his second year.

- (3) a. #Tim took Syntax or Semantics.
b. Tim took Syntax and Semantics.

This talk

1. Magri's theory based on **Contextual Blindness Hypothesis**
2. Challenges
 - 2.1 Not all scalar items trigger Magri effects
 - 2.2 No embedded Magri effects under negation
3. An alternative theory based on **incremental computation** of SIs

Contextual Blindness Hypothesis

Contextual Blindness Hypothesis

Magri's proposal (Part I)

SI computation is **contextually blind**: It negates contextually relevant alternatives that are **logically** (rather than contextually) excludable.

For the sake of presentation, let's assume that Exh is the mechanism.

$$\llbracket \text{Exh}(\phi) \rrbracket^c = \lambda w. \llbracket \phi \rrbracket^c(w) = 1 \wedge \forall \psi \in \text{Alt}_c(\phi) [\text{Excl}_\phi(\psi) \rightarrow \llbracket \psi \rrbracket^c(w) = 0]$$

Some possibilities for $\text{Excl}_\phi(\psi)$, all based on **logical** entailment

1. ψ is logically stronger than ϕ
2. ψ is logically non-weaker than ϕ
3. ψ is innocently excludable given ϕ and $\text{Alt}_c(\phi)$

Contextual relevance

Magri's proposal (Part II)

Exh is obligatory and negates all contextually relevant and excludable alternatives.

Two (natural) assumptions about contextual relevance:

- Everything that is asserted is contextually relevant.
- Contextually truth-conditionally equivalent alternatives are either all contextually relevant, or all contextually irrelevant.

Corollary: When **SOME** is contextually equivalent to **ALL** and is asserted, the SI ' \neg **ALL**' is obligatory. But '**SOME** \wedge \neg **ALL**' is contextually contradictory, so the sentence is #.

Embedding

Magri (2011) observes that Magri effects arise in embedded contexts, regardless of the monotonicity profile of the embedded context

- (4) Every student solved either none or all of the problems.
- a. #Many students who solved **some** of the problems are British.
 - b. Many students who solved **all** of the problems are British.

- (5) Every student solved either none or all of the problems.
- a. #Every/No student who solved **some** of the problems is British.
 - b. Every/No student who solved **all** of the problems is British.

Exh everywhere

Embedded Magri effects led Magri to assume that Exh is always present at every possible position it can apply, even in DE contexts.

SIs can be suspended, if **STRONG** \notin Alt_c(**WEAK**).

- With contextual equivalence, **STRONG** must be in Alt_c(**WEAK**), so the SI is obligatory.
- SI cancellation ("**WEAK**. In fact **STRONG**!") involves a parse with **STRONG** \notin Alt_c(**WEAK**).
- In DE contexts, SIs are typically suspended.

Note: Magri's theory cannot be straightforwardly reformulated with Pexh, which is simply inert in DE contexts. To derive Magri effects in DE contexts, the A-operator would have to be forced to be present

Consequences

If Magri's **Contextual Blindness Hypothesis** is on the right track, the mechanism for SI computation is:

- Not contextually grounded reasoning about speaker intention (as in the Gricean approach to SIs)
- Embeddable under logical operators, so is part of the compositional semantic system

Challenges for Blindness

Empirical challenges

1. Modals and (certain) ad hoc implicatures not trigger (strong) Magri effects
2. Under negation SIs are not obligatory, even with contextual equivalence
 - With contextual equivalence, Magri would expect 'not(**WEAK**)' to mean $\text{not}(\text{WEAK} \wedge \neg \text{STRONG})$, which should be contextually tautologous
 - Contrary to this, 'not(**WEAK**)' interpretation is attested

Possibility modals

Possibility modals (e.g., 'allowed') give rise to SIs with respect to **necessity modals** (e.g., 'required'), but don't give rise to (strong) Magri effects.

- All Australian citizens who are 18 years old or above are required to vote at Australian federal elections (with some exceptions but let's ignore them).
- No one else is allowed to vote.
- Bruce is Australian and has just turned 18.

- (6) a. Bruce is now **allowed** to vote at federal elections.
b. Bruce is now **required** to vote at federal elections.

Ad hoc implicatures

An example of an *ad hoc* implicature

(7) A: What linguistics courses did your students take?
B: Andy took Syntax.

(7B) can be understood as implying that Syntax is the only linguistics course Andy took.

- Some theories negate simple but logically independent alternatives like "Andy took Semantics", "Andy took Phonology", etc.
- Other theories negate logically stronger alternatives like "Andy took Syntax and Semantics", "Andy took Syntax and Phonology", etc.

Ad hoc implicatures (cont.)

- First-year Linguistics students have to take exactly two Linguistics courses: Either [Syntax and Semantics] or [Phonology and Morphology].
- Tim is a first-year Linguistics student, entering his second year.

Recall that "or" triggers a Magri effect in this context

- (8) a. #Tim took **Syntax or Semantics**.
b. Tim took **Syntax and Semantics**.

- (9) a. Tim took **Syntax**.
b. Tim took **Semantics**.

According to Magri, (9a) and (9b) are contextually truth-conditionally equivalent, so must be both relevant or both irrelevant

not(**WEAK**)

Prediction: With contextual equivalence,

- Magri would expect 'not(**weak**)' to mean 'not(**WEAK** \wedge \neg **STRONG**)'
- 'not(**WEAK** \wedge \neg **STRONG**)' is bound to be contextually tautologous (hence #).

Some is a PPI, so let's consider *or*.

- First-year Linguistics students have to take exactly two Linguistics courses: Either [Syntax and Semantics] or [Phonology and Morphology].
- Tim is a first-year Linguistics student, entering his second year.

- (10) a. #Tim didn't take **Syntax or Semantics**.
b. Tim didn't take **Syntax and Semantics**.

But is (10a) contextually tautologous?

A disjunction requires that each disjunct be independently contextually relevant (Szabolcsi & Haddican 2004).

- [as above]
- Philosophy students can take any one Ling course in their first year.
- Klaus is looking for a good final-year student (P or L) who took Syntax.
- Nathan is looking for a good final-year student (P or L) who took Semantics.
- My supervisee is a final-year student in Linguistics.

(11) a. #My supervisee is smart. And she took **Syntax or Semantics**.
b. My supervisee is smart. And she took **Syntax and Semantics**.

(12) a. My supervisee is smart. But she didn't take **Syntax or Semantics**.
b. My supervisee is smart. But she didn't take **Syntax and Semantics**.

Remarks on indirect SIs

Magri points out that indirect SIs of '**not STRONG**' ('not all') do not trigger Magri effects

(13) Every student solved either none or all of the problems.

Unsurprisingly,

- a. #the smartest student solved **some** of the problems.
- b. the smartest student solved **all** of the problems.

Compare:

(14) Every student solved either none or all of the problems.

Unsurprisingly,

- a. the dumbest student **didn't** solve **all** of the problems.
- b. the dumbest student solved **none** of the problems.
- c. the dumbest student **didn't** solve **any** of the problems.

Remarks on indirect SIs (cont.)

Magri's explanation:

- The alternative to '**not(STRONG)**' is '**not(WEAK)**'
- When **WEAK** and **STRONG** are contextually truth-conditionally equivalent, '**not(WEAK)**' will have a mandatory embedded SI, and mean '**not(WEAK \wedge \neg STRONG)**'
- This alternative is logically independent from '**not(STRONG)**' and can give rise to an SI: **not(STRONG) \wedge \neg not(WEAK \wedge \neg STRONG) = not(STRONG) \wedge WEAK**

It's crucial for Magri that the embedded SI in the '**not(WEAK)**' alternative is mandatory

Side note: Chatain's (ms.) examples

(15) In this dystopian regime, there is no free choice: Every action is either forbidden or mandatory.

- a. %I'm **allowed** to vote for the party.
- b. I'm **required** to vote for the party.
- c. %I'm **not required** to vote for the party.
- d. I'm **not allowed** to vote for the party.

- Chatain makes the same point as our second observation based on (16d)
- According to Chatain, (16a) and (16c) are #

NB: I'm not claiming that under contextual equivalence "allowed" and "required" are always interchangeable. There can well be preferences based on some (yet to be understood) contextual factors

Towards an incremental theory of Magri effects

- (16) Every student solved either none or all of the problems.
- a. #The smartest student solved **some** of the problems.
 - b. The smartest student solved **all** of the problems.

Puzzle: The two sentences are contextually equivalent. Why do they differ in felicity?

Two approaches to the puzzle:

1. The two sentences are actually not contextually equivalent.
 - Magri breaks the contextual equivalence with obligatory SI based on logical entailment (= **Blindness**).
 - (Alternative possibility: situation semantics/truth-maker semantics)
2. The two sentences are indeed contextually equivalent but only at the clausal level. They are **incrementally** not always contextually equivalent .

The Magri sentences are not **incrementally** contextually equivalent:

(Every student solved either none or all of the problems.)

- The smartest student solved **some** ...
- The smartest student solved **all** ...

Some possible continuations:

1.... of the problems quickly.

✓ CONTEXTUALLY DISTINCT

2.... of the problems.

⚠ CONTEXTUALLY EQUIVALENT

Hypothesis: Magri effects are due to incremental computation of SIs

There is evidence that SI computation starts on '**some**'.

- **Visual world paradigm** (Grodner, Klein, Carbary & Tanenhaus 2010, Breheny, Fergusun & Katsos 2013, Degen & Tanenhaus 2019, Sun & Breheny 2019; see also Huang & Snedeker 2009, 2011, 2018)
- **Self-paced reading** (Bergen & Grodner 2012)

(For other scalar items, no experimental evidence about *where* SI computation starts.)

Idea: Magri effects are garden-path effects.

- **Some** creates a parsing expectation that the material to come will give rise to a contextually consistent SI '**¬ALL**'.
- If this expectation is violated, the parser fails.

The Magri sentences are not **incrementally** contextually equivalent:

(Every student solved either none or all of the problems.)

- The smartest student solved **some** ...
- The smartest student solved **all** ...

Some possible continuations:

1.... of the problems quickly.

✓ CONTEXTUALLY DISTINCT

2.... of the problems.

⚠ CONTEXTUALLY EQUIVALENT

Modals and *ad hoc* implicatures

- (17) a. Bruce is now **allowed** to vote at federal elections.
b. Bruce is now **required** to vote at federal elections.

- (18) a. Tim took **Syntax**.
b. Tim took **Semantics**.

Tentative explanation:

- Computation of these SIs do not start immediately.
- No processing data at this point as far as I know.

'not(or)'

We assume **or** creates an SI-based parsing expectation, similarly to **some**.

My supervisee took **Syntax or** ...

1. ... Logic.

2. ... Semantics.

In a negative sentence, the parser encounters the negation first. When it subsequently hits **or**, it already knows that there should be no SI, so no SI-based parsing expectation.

My supervisee did not take **Syntax or** ...

Magri (2011) reports Magri effects in the restrictors of *every* and *no*.

These examples involve existence presuppositions with SIs.

- (19) Every student solved either none or all of the problems.
- a. #Every/No student who solved **some** of the problems is British.
 - b. Every/No student who solved **all** of the problems is British.

- (19a) presupposes that there are students who solved some but not all of the problems (see Spector & Sudo 2017, Marty 2017, etc.).
- The parser expects an NP that would give rise to a contextually consistent strengthened presupposition.

Every student who solved **some** ...

Some DE operators trigger positive SIs, and **some** under their scope trigger SIs within these SIs.

(20) Every student solved either none or all of the problems.
Among the students in your class,
a. #there are at most five who solved **some** of the problems.
b. there are at most five who solved **all** of the problems.

- These 'DE' operators are not entirely DE.
- Therefore '**some**' and '**or**' create parsing expectations.

Indirect SIs (**not all**) do not trigger Magri effects

- **Not all** doesn't give rise to Magri effects, because 'all' does not trigger SI-based parsing expectations (in the same way as **Some**).

(Every student solved either none or all of the problems.)

a. The smartest student solved some ...

b. The dumbest student did not solve all ...

- Thalmann & Panizza's (2019) VWP experiment found delayed SI computation for **not all** in German (for adults).

Not most

The account so far:

- No direct SI of **or** under negation, as the parser knows it's in DE
- The indirect SI of **not all** is delayed, so no parsing expectations

We expect **not most** to not trigger Magri effects:

- Its direct SI is suspended due to negation.
- Its indirect SI (' \neg **none**') is delayed

But this prediction is not borne out.

- (21) Every student solved either none or all of the problems.
Unsurprisingly,
a. #the smartest student solved **most** of the problems.
b. #The dumbest student didn't solve **most** of the problems.

To explain the Magri effect of **not most**, we assume:

- The computation of indirect SIs is only delayed for **strongest items** like 'all' under negation.
- **Intermediate items** like 'most' and **weak items** like 'some' are **cues for SI computation**: they make the parser immediately compute (direct or indirect) SIs, if possible.

More data and thoughts

Negation at the end

For **not** ... **or**, the parser meets the negation first and when it encounters **or**, it knows that there shouldn't be an SI.

Japanese is a language where negation occurs at the very end of a clause. You'd expect Magri effects of '**or** ... **not**'. But Language specific factors make it not very informative.

- Disjunction is a PPI in Japanese. $\neg(A \vee B)$ is expressed by 'A-mo B-mo ... not'.
- Japanese is scope rigid; negation usually takes the narrowest scope.
- **all** ... **not** has an indirect SI, if **all** bears contrastive topic marker (-wa). If there is no negation at the end, the sentence is #.

Ad hoc implicatures

Magri effects are observed with certain *ad hoc* implicatures (Schlenker 2012, Magri 2017).

(22) In my company, everyone who has any degree has a PhD.
#Bill works in my company and has a high school degree.

As Magri (2017) points out, his theory accounts for the infelicity of (22).

- "... has a PhD" is contextually truth-conditionally equivalent to "... has a high school degree" but logically independent.
- Consequently, the *ad hoc* implicature is obligatory and gives rise to a contextual contradiction.

But Magri's theory would also render (23) infelicitous, because it is blind to the context.

(23) In my company, everyone who has any degree has a PhD.
Bill works in my company and has a PhD.

- "... has a high school degree" is contextually equivalent with "... has a PhD" but logically independent.
- The *ad hoc* implicature should be obligatory.

Magri suggests the possibility that "has a PhD" has a scalar reading that logically entails "has a x" for lower degrees x.

The incremental theory doesn't need CONTEXTUAL BLINDNESS.

With CONTEXTUAL SIGHTEDNESS, no need for lexical stipulations like Magri's.

The crucial assumption is that the relevant *ad hoc* implicature is computed rapidly online, like SIs of *some* and *or*, and creates a parsing expectation. (No empirical evidence atm)

Bill works in my company and has a high school degree ...

1. ... from a prestigious school.

2. ... [period].

Option 1 yields an *ad hoc* implicature 'Bill doesn't have a PhD from a prestigious school'.

(Thanks to CONTEXTUAL SIGHTEDNESS, "has a PhD" is a strong item, so does not trigger an immediate computation)

Conjunction

Magri (2016) points out that conjunctive sentences pose issues for his theory.

- (24) Prof Smith always assigns the same grade to all of her students.
What happened this year?
- a. #Some of her students got an A.
 - b. #Some of her students got an A and a prize.

Magri observes that (24b) is judged better in some contexts (Pistoia-Reda & Romoli 2017).

- (25) Prof Smith always assigns the same grade to all of her students.
This year, her students got an A.
Some of her students got an A and a prize.

A processing solution

Idea: The amelioration effect is due to deaccenting, which signals that the SI should take scope over the conjunction.

(26) Prof Smith always assigns the same grade to all of her students.
This year, her students got an A.
Some of her students got an A and a prize.

Why is the sentence bad without deaccenting?

Tentative solution: The canonical intonation indicates that the SI should be drawn within the first conjunct (which might have to be later cancelled).

Predictions

1. Changing the order improves the judgment.
2. If something (e.g. both) tells the parser that the SI should outscope the conjunction, the judgment should improve.

(27) Prof Smith always assigns the same grade to all of her students. Did she have any good students this year?

- a. ??Some of her students got an A and a prize.
- b. Some of her students got a prize and an A.
- c. Some of her students got BOTH an A and a prize.

The status of infelicity

Arguably, not all garden-path effects trigger similar sense of infelicity

(28) The horse raced past the barn fell.

A similar issue arises for Magri's Blindness: Not all contradictions are similarly infelicitous, as Del Pinal (2021) points out.

(29) The smartest student solved some but not all of the problems.

- Assuming the Blindness Hypothesis, Del Pinal suggests that Magri effects feel special, because SIs are presuppositional (also Del Pinal et al. 2021)
- We could adopt this idea: Magri effects differ from other garden path effects, as they are violations of parsing expectations arising from presuppositions

Conclusions

Empirical challenges for Magri's theory

1. Not all scalar items trigger Magri effects
2. Under negation an SI is not observed with contextual equivalence

Incremental theory: Magri effects as garden-paths.

- SI computation is contextually sighted 📌 No threat for pragmaticists.
- Magri effects might be softer than one might expect under Magri's view.
 - Bott & Noveck (2004: Exp 3): *Some elephants are mammals* (in French) 40.7% true (Cremers & Chemla 2014, Ronderos & Noveck 2023 for English).
 - See Cremers & Chemla (2014: Exp 2) for a version with explicit contextual assumptions.