

Supplementary materials

Bilingual children's use of the 'Maximize Presupposition' principle

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APPENDIX I: Cross-linguistic aspects of Neg-Raising: A brief summary¹

Neg-raising is a linguistic phenomenon attributed to a subset of the non-factive attitude verbs that allow inferences from (1a) to (1b):

- (1) a. John doesn't think that Mary visited her friend on Tuesday.
b. John thinks that Mary didn't visit her friend on Tuesday.

However, as argued in Bošković and Gajewski (2009), from a cross-linguistic perspective, the inference is necessary but not sufficient evidence for the neg-raising status of the predicate, i.e. a language might not feature a class of neg-raising predicates at all, even though the pattern illustrated in English by (1a) and (1b) might still be available in such a language. Since there are other formal properties linked to neg-raising, the task of identifying neg-raising predicates in different languages is still possible.

One relevant test is based on the relation between neg-raising predicates and a variety of Negative Polarity Items (NPIs). Neg-raising verbs, in contrast to other attitude reports can create a licensing environment in their embedded complements for strict (NPIs) like *in years* as in (3), (cf. Gajewski 2007 and references therein).

- (2) a. Bill doesn't think Sue has visited in years.
b. *Bill doesn't know that Sue has visited in years.
c. *Bill doesn't claim that Sue has visited in years.

Building on Zwarts (1998), Gajewski (2007) argues that strict NPIs can only appear in an anti-additive environment. An operator *f* is anti-additive if it allows for the inference pattern in (3):

¹ This appendix does not aim at constructing an exhaustive picture of the phenomenon of Neg-raising and the consequences for the varieties of theories dedicated to it because of the limited scope of our article. See Fillmore 1963; Lakoff 1969; Ross 1973; Horn 1978; Gajewski 2007; Romoli 2013; Collins and Postal 2014; 2017; among others, for a detailed discussion. Instead, we offer some basic observations, already reported in the literature on neg-raising, which motivate our claim that while the Italian translational equivalent of *think/believe* is a Neg-raising predicate, the Slovenian one is not. We note, nevertheless, that, despite the theoretical researchers' continuous interest to Neg-raising, the phenomenon is rarely scrutinized in the context of cross-linguistic comparison. Consequently, it is difficult to find reports that apply a unified set of Neg-raising tests to both Slovenian and Italian in the standard, minimal pair, fashion (e.g. using the same types of NPIs) due to unavoidable language specifics such as lexical differences.

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(3) $f(X) \wedge f(Y) \Rightarrow f(X \vee Y)$

Gajewski (2007) brings evidence that negation in combination with a neg-raising predicate creates such an environment while the combination of negation and non-neg-raising predicates does not.^{2,3}

This contrast among attitude verbs is explained by assuming, following Bartsch (1973), that verbs like *think* or *believe* introduce an excluded middle presupposition whose content expresses the 'opinionatedness' of the report holder regarding the truth of the sentential complement of the verb in the world of evaluation. It is the conjunction of the assertion and this presupposition that create an anti-additive environment. Gajewski's examples in (4) and (5) demonstrate the relevance of the predicate *not think* to anti-additivity in contrast to *not claim*.

(4) a. John doesn't think that Mary left and John doesn't think that Bill left. \Rightarrow
b. John doesn't think that Mary or Bill left.

(5) a. John isn't certain that Mary left and John isn't certain that Bill left. \Rightarrow
b. John isn't certain that Mary or Bill left.

Consider now the Slovenian data in (6) from Ilc (2019). The difference between (6a) and (6b) demonstrates the status of the expression *najmanj dve leti* ('at least two years') as an NPI, while (6c) shows that *verjeti*, the Slovenian counterpart of the English *believe*, does not pass this test for being a Neg-raising predicate (similar judgments obtain with *misliti* 'to think'):

- (6) a. Micka je ni obiskala najmanj dve leti. (Ilc 2019)
Micka her not-is visited at-least two years
'Micka has not visited her in at least two years.'
- b. *Micka jo je obiskala najmanj dve leti.
Micka her is visited at-least two years
'Micka visited her at least two years.'
- c. Ne verjamem, da jo je Micka obiskala *najmanj dve leti.
Not believe that her is Micka visited at-least. two
leti.

² Anti-additivity is a property of operators in Zwarts (1998). In order to accommodate the logical properties of a negated verb, Gajewski defines anti-additivity as a property of environments.

³ See Lakoff (1969), among others, for an alternative, syntactic explanation of the relation between strict NPIs and neg-raising.

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years

'I don't believe that Micka has visited her in at least two years.'

Let us now turn to Italian. In Italian, *mai* ('ever') whose status as an NPI is evidenced by (7) can be licensed in a subordinate clause by negation in the matrix clause if the matrix predicate is *credere* ('believe') or *pensare* ('think'), as in (8).

(7) Mary *(non) le ha mai fatto visita
Mary not to-her has ever done visit
'Mary has not ever visited her.'

(8) Gianni non pensa che Mary le abbia mai fatto visita
Gianni Neg thinks that Mary to-her has ever done visit
'Gianni doesn't think Mary has ever visited her.'

N-words can also be licensed by matrix negation in a similar configuration (see Guerzoni 2001 for arguments that Italian *n*-words are NPIs) :

(9) Non credo che ha fatto niente
Neg believe.1SG that has.3SG done n-thing
'I believe that he didn't do anything.'

In contrast to *credere* and *pensare*, other attitude report verbs like *sostenere* ('argue', 'claim') or *affermare* ('affirm', 'claim') act as interveners for licensing *mai* in an embedded clause from matrix negation, as (10) and (11) suggest:

(10) ??Gianni non sostiene che Maria le abbia mai fatto visita.
Gianni Neg claims that Mary to-her has ever done visit
'Gianni doesn't claim that Mary has ever visited her.'

(11) Gianni sostiene che Maria non le abbia mai fatto visita.
Gianni claims that Mary Neg to-her has ever done visit
'Gianni claims that Mary has not visited her ever.'

The two discussed verb types (*pensare* vs *sostenere*) apparently differ with respect to their ability to create an environment that licenses NPIs. We interpret this difference as suggesting that in Italian there exists a class of neg-raising verbs including *pensare*. Under the hypothesis that *pensare* is a neg-raising verb while

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sostenere is not, both syntactic and semantic/pragmatic theories of neg-raising readily explain NPI licensing in the embedded clause.

Putting together the Slovenian and Italian facts about potential neg-raising predicates, we observe that the availability of neg-raising verbs is subject to variation across these two languages. This variation is critical for distinguishing between the relevant Slovenian and Italian predicates for the purposes of our experimental design.

A possible (albeit not the only) theoretical explanation for this cross-linguistic variability can be deduced from Bošković (2008) who proposes the following bi-conditional statement:

- (12) Languages that do not have articles disallow Neg-raising while languages that have articles allow it.

Bošković and Gajewski (2009) interpret the generalization in (12) by arguing that the ‘opinionatedness’ presupposition linked to neg-raising predicates depends on the categorical status of the predicate’s propositional object as a Determiner Phrase (DP), a structural layer containing the usual noun phrase (NP), as well as a determiner. According to them, languages without articles project only the NP, without DP. Consequently, languages without articles cannot lexically specify an opinionatedness presupposition in their verbs of belief. Rather, inferences from (1a) to (1b) are derived only in a pragmatic manner without relevance to structural input (cf. Horn 1989).

Taking into account the generalization in (12), the fact that Italian features (definite and indefinite) articles, while Slovenian, as most Slavic languages, features none suggests that Italian could be viewed as a ‘Neg-raising language’ and Slovenian as a ‘non-Neg-raising language’, in the above sense.

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APPENDIX II: Summary of the three-way interaction model crossing GROUP, CONDITION and LANGUAGE factors based on the children data

Factors	Estimate	SE	z	p
(Intercept)	1.727	0.234	7.373	<0.0001
GROUPMONOLINGUAL	0.281	0.309	0.907	<i>ns</i>
LANGUAGESL	-0.154	0.244	-0.630	<i>ns</i>
CONDITIONConditionMP-Neg	-0.493	0.238	-2.074	0.038
CONDITIONConditionMP	1.806	0.358	5.040	<0.0001
GROUPMONOLINGUAL:LANGUAGESL	0.354	0.380	0.932	<i>ns</i>
GROUPMONOLINGUAL: CONDITIONConditionMP-Neg	-0.442	0.295	-1.498	<i>ns</i>
GROUPMONOLINGUAL: CONDITIONConditionMP	-1.331	0.413	-3.221	0.001
LANGUAGESL:CONDITIONConditionMP-Neg	0.321	0.335	0.957	<i>ns</i>
LANGUAGESL:CONDITIONConditionMP	0.261	0.512	0.509	<i>ns</i>
GROUPMONOLINGUAL:LANGUAGESL: CONDITIONConditionMP-Neg	1.332	0.436	3.052	0.002
GROUPMONOLINGUAL:LANGUAGESL: CONDITIONConditionMP	-0.655	0.586	-1.118	<i>ns</i>