1 Introduction

The question of where and how negative polarity items (NPIs) such as English *any* and *ever*, Italian *mai*, and French *le moindre* are licensed is a long-standing question in linguistics research. Complicating this is the presence of *interveners*—elements which unilaterally block NPIs in their scope. It is claimed that the class of factive predicates intervene in Italian (1a) and French (1b), but not in English (idiomatic glosses of (1)).

(1) a. *Rimpiango che questo sia mai accaduto.*
   I regret that this had ever happened.
   ‘I regret that this ever happened.’ (Chierchia, 2015)

b. *Jean ne sait pas que Marie a la moindre chance de gagner.*
   John know not that Mary has a single chance of winning.
   ‘John doesn’t realize that Mary has any chance of winning.’ (Homer, 2008)

We investigate this variation in a judgment study in English (*n* = 46), Italian (*n* = 29), and French (*n* = 34) of sentences with NPIs under factives. We find that, consistent with previous claims, this effect exists in Italian and not English, but that French appears to pattern with English (against expectation).

2 Background: NPIs

2.1 NPI licensing

NPIs, such as *any*, *ever*, *yet*, *either*, *at all*, *in years*, and *bother to*, are famously licensed in negative environments (2a) but not positive ones (2b)

(2) a. John didn’t ever eat cake.

b. *John ever ate cake.

Accounts have variously been semantic, such as Baker’s (1970) theory that NPIs are licensed in sentences with negative implicata, or syntactic, such as Linebarger’s (1980) theory that they are licensed in the immediate scope of a negative operator. The most commonly-cited account is that of Ladusaw (1979), who postulates that NPIs are licensed just in downward-entailing (DE) environments which reverse the direction of entailment—that is, for *p*, *q* such that *p* ⊨ *q*, env(*q*) ⊨ env(*p*)—and not in upward-entailing (UE) environments which preserve it. Negation, for instance, is downward entailing: without it, entailment is from more specific cases to more general (*John ate chocolate cake* entails *John ate cake*; cf. (2b)), but with it, the reverse is true (*John didn’t eat cake* entails *John didn’t eat chocolate cake*; cf. (2a)). Chemla et al. (2011) provide experimental evidence for this account, showing that whether French speakers judge the scope of a quantifier to be downward or upward entailing closely predicts whether they judge the NPI *le moindre* ‘a single’ grammatical or not.

Turning to neuro-imaging, results are more mixed. Shao & Neville (1998), find that NPIs, but
not similar non-polar words, elicit anterior negativity between 300–500ms, associated with morphosyntactic errors such as feature mismatch. Saddy et al. (2004); Drenhaus et al. (2005), however, find that the German NPI *jemals ‘ever’ in UE, but not DE, environments elicit an N400 response, associated with semantic incongruities. Finally Xiang et al. (2009) find that NPIs in the same environments elicit a P600 response, a positive voltage spike peaking at 600ms, associated with syntactic errors such as valence errors.

One flaw in the DE theory is pointed out by von Fintel (1999), who notes that it undergenerates: NPIs are licensed in certain environments (3) which turn out not to be downward-entailing (4).

(3)  a. Only John ate any cake.
    b. John regrets ever buying a car.

(4)  a. Only John ate cake. ⌫ Only John ate chocolate cake.
    b. John regrets buying a car. ⌫ John regrets buying a red car.

(5)  a. Only John ate chocolate cake. ⋵ John ate chocolate cake.
    b. John regrets buying a red car. ⋵ John bought a red car.

Von Fintel (1999) notes that in each inference in (4), a presupposition is introduced in the conclusion which is not present in the premise (5), shifting the common ground mid-evaluation; if these are satisfied, the downward inference again holds. He proposes a weaker licensing condition, termed Strawson downward-entailingness, which disregards any presuppositions when computing entailment. Importantly, this means that the content of a presupposition should never interfere in NPI licensing.

2.2 Intervention

Linebarger (1980) notes that certain elements such as conjunctions and universal quantifiers, which appear between an NPI and a DE operator, block the latter from licensing the former.

(6) She didn’t wear any earrings to every party.

   a. ¬ > ∃_{NPI} > ∀  
      (No particular pair was always worn.)
   b. * ¬ > ∀ > ∃_{NPI}  
      (She wore no earrings to some parties.)

The only reading of (6) is (a), in which the universal element *every* does not come between the NPI *any* and its licensor, *didn’t*. Linebarger posits that this is due to an *immediate structure constraint* requiring NPIs to be in the *immediate* scope of negation. Other elements, however, such as disjunctions and existential quantifiers, do not intervene:

(7) a. The professor didn’t give some students any homework.
    b. *The professor didn’t give every student any homework.

(8) a. I don’t care about John or give a damn about Bill.
    b. *I don’t care about John and give a damn about Bill.

Chierchia (2004) theorizes that this is because, in a DE environment, such elements generate a positive implicature; e.g., *Sue didn’t eat all the cookies* implicates that *Sue ate some of the cookies*. Thus, (6) will generate the implicature *She did wear any earrings to some party*. If this implicature is generated as a grammatical process before NPI licensing is evaluated, then the implicature itself will contain an unlicensed NPI, rendering the whole utterance unacceptable.

Denić et al. (2018) test this explanation experimentally, reasoning that if this account is true, speakers’ judgments of sentences like (7) as ungrammatical should correlate with their propensity to compute implicatures with the same items. However, they find no such correlation.
A similar contrast is identified by Homer (2009): *too* but not *either* intervenes:

(9)  
   b. *Context: Mary didn’t read anything interesting. John didn’t read anything interesting either.*

This seems to pose a problem for the Strawson-DE theory above, since the contributions of these particles is thought to be presuppositional (Krifka, 1995). Ahn (2016) proposes in response that *too* and *either* are not, in fact, presuppositional, but rather, respectively, a disguised conjunction and disjunction, thus reducing this contrast to the one in (8).

Other problematic contrasts exist, however. In particular, factive predicates, but not non-factive ones, are claimed to intervene in Italian by Chierchia (2015) and in French by (Homer, 2008). Factivity is generally thought to be a presupposition (Karttunen, 1971). Interestingly, factives do not seem to intervene in English, as shown in (1). In our paper we focus on this cross-linguistic contrast, gathering quantitative data across the three languages and different types of embedding predicates and NPIs, in order to determine the empirical status of this claim and how it should be considered in a theory of negative polarity item licensing.

### 3 Experimental conditions

In determining the acceptability of NPIs under factives, it is important to examine internal variation in these categories. In this section, we compare cognitive with emotive factives, and weak with strong NPIs.

#### 3.1 Types of factive

The class of factive predicates has been known to contain internal variation since Karttunen (1971). In particular, two broad classes of factives are often recognized: cognitive factives such as *discover* and emotive factives such as *regret*.

Abusch (2002, 2010) observes that cognitive factives are *soft* presupposition triggers which can be cancelled by placement in a DE environment (10a), while emotive factives are *hard* triggers whose presupposition projects in all environments (10b).

(10)  
   a. If I later discover that I’ve lied, I’ll confess.  
   b. If I later regret that I’ve lied, I’ll confess.

Abusch posits that soft triggers are not presuppositions at all, but implicatures, which are known to be defeasible in such environments.

In addition, Djärv et al. (to appear) note that the complements of cognitive factives—but not emotive factives—are *at-issue*, meaning that, even as embedded clauses, they can serve as answers to questions:

(11) Where was Harriet yesterday?

   a. — Henry discovered that she had an interview at Princeton.
   b. *— Henry is happy that she had an interview at Princeton.

Djärv et al. find that, when presented with responses in a discourse that contradict a prior factive complement, English speakers prefer responses that contradict *emotive* factives.

Finally, emotive factives, but not cognitive factives, license NPIs in English:
(12) a. *John discovered that he had left any food in the fridge.
b.  John regretted that he had left any food in the fridge.
This final difference is especially significant for a study involving NPIs.

3.2 Types of NPI
Like factives, NPIs are also not monolithic, and come in at least two varieties: weak and strong 
(Zwarts, 1998). While weak NPIs can be found in the environments discussed in 2.1, strong NPIs 
are not licensed in certain environments, although they are Strawson DE, such as the complements 
of emotive factives (13) and non-neg-raising predicates (14).

(13) a. I regret ever meeting you.
b. *I regret meeting you in years.

(14) a. I didn’t claim I’d ever seen her.
b. #I didn’t claim I’d seen her in years. (for the reading in which in years modifies see)
NPIs with similar “strong” distributions are found in other languages as well, such as Italian af-
fatto ‘at all’, German im Entferntesten ‘in the slightest’, and Dutch ook maar ‘anything’.

With these differences in mind, we test both emotive and cognitive factives, and, when possible, 
both weak and strong NPIs, in order to account for such differences.

4 Experiment 1
A judgment study of English sentences was conducted on on Amazon Mechanical Turk to investi-
gate the empirical status of the claim that factives do not intervene in English. In addition to studies 
such as Schnoebelen & Kuperman (2010), which generally validate the results of psycholinguistic 
studies done on Mechanical Turk against the same studies performed in the lab with undergraduates, 
Sprouse (2011) finds that, in particular, the results of acceptability judgment studies of English-
speaking Mechanical Turk workers (“Turkers”) track those of lab studies closely enough to serve 
as reliable substitutes for them, and so we take advantage of this method of collecting data quickly 
for our study.

4.1 Participants
48 participants were recruited on Amazon Mechanical Turk. Participants were restricted to the 
United States and Canada, and were paid US$1. Two participants were excluded for failing our 
screening task: they rated weak NPIs under think without negation—i.e., an environment with no 
possible licenser—better than corresponding sentences without the NPI.

4.2 Procedure
Sentences were presented along with a Likert scale from 1 (worst) to 5 (best), which was compiled 
using TurkTools (Erlewine & Kotek, 2016). This is shown in fig. 1. Participants were instructed to 
rate the “naturalness” of the sentences, and examples of grammatical and ungrammatical sentences 
due to island violations) were provided for reference.

As discussed in sec. 3.1, the two varieties of factive predicate, cognitive and emotive, have quite 
different properties. Thus, one of each type was tested. In addition, for non-factive predicates, both 
neg-raising and non-raising predicates were tested, since it is plausible that the low interpretation 
of matrix negation would affect its ability to license an embedded NPI. Thus, four predicates total 
were used in each experiment. The same predicates were used for each language, so they were 
chosen so as to have the same properties in each language—most importantly, they all easily embed 
‘that’-clauses. Finally, two types of NPI were tested (control sentences had no NPI). Strong NPIs
1. 1: Shane is surprised that Rachel has at some point eaten carrots.
   2: **No, he isn't surprised that she has ever eaten carrots.**

   ![Questionnaire Example](image)

2. 1: Sadie thinks that Lester has at some point eaten olives.
   2: **Yeah, she thinks that he has ever eaten olives.**

   ![Questionnaire Example](image)

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Figure 1: Part of questionnaire, as seen by participants

such as *in years* or *either* are excluded from certain DE environments (including the complements of emotive factives; see sec. 3.1) in which weak NPIs such as *ever* or *any* are licit.

Each participant was shown a list of 24 sentences in one of 8 random orders, representing all combinations of 4 matrix predicates (non-factive, non-neg-raising *claim*; non-factive, neg-raising *think*; cognitive factive *realize*; and emotive factive *be surprised*) × 2 matrix polarities (negation, no negation) × 3 kinds of embedded NPI (weak *ever*, strong *in years*, and control sentences with no NPI). The sentences were presented in the context of conversations between people about dietary habits, samples of which are shown in fig. 1. The conversational contexts were meant to neutralize any pragmatic strangeness of having negated sentences, or NPIs with exhaustive interpretations—particularly Italian *affatto* ‘at all’—out of the blue. Food names were normalized to count nouns, since one of the French NPIs used, *le moindre*, is incompatible with mass nouns. No filler items were used.

The pattern of results expected is in fig. 2. These show the effect of adding negation to a particular sentence pattern—in particular, the “rescuing” effect on NPIs which are otherwise not licensed. Control sentences with no NPI are at ceiling with or without negation (top row). Control sentences with non-factive predicates allow weak NPIs if there is a licensing negation (left two columns). Factive predicates, not being of a special category in English, behave like the control predicates, except that emotive factives license weak NPIs (even without negation).

### 4.3 Results & Analysis

The results of experiment 1 are shown in fig. 3.

We analyze the data in a linear mixed effects model (LMEM) using lme4 (Bates et al., 2015) for R (R Core Team, 2016), with the NPI, matrix verb, and matrix polarity as fixed effects, and Worker ID and list number as random effects, and find a significant effect of the interaction between the fixed effect terms ($\chi^2(10) = 207.259, p = 4.932 \times 10^{-39}$).\(^1\)

Since names and foods were counterbalanced in each list, they were not expected to significantly affect results when added to the model as random effects. A linear mixed effects model with language, matrix verb, matrix polarity, and NPI as fixed effects, and Worker ID and list number

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\(^1\)While this data is technically categorical, it was collected in numeric form from participants; we therefore treat it as continuous here on the assumption that participants would find meaningful a rating of, say, 3.5, although such an option was not presented.
**Figure 2:** Expected results of experiment 1 (English).

**Figure 3:** Results of experiment 1 (English).

as random effects fits the data better than the same model with names and foods added as random effects (ΔAIC = 6, ΔBIC = 23.608). The latter are therefore omitted from all analyses.

The sentences with no NPI or negation are all at ceiling; a regression analysis revealed no significant differences between the four predicates ($F(3, 180) = 0.152, p = 0.928$).
In order to measure the licensing of NPIs, a t-test was run for each verb–NPI condition (including no NPI) between negation and no negation, to determine whether negation “rescued” the NPI. In the control sentences with no NPI, there was a significant effect of negation for claim (t = 3.631, p = 5.375 × 10^{-4}), think (t = 2.808, p = 0.007), and realize (t = 3.478, p = 8.624 × 10^{-4}), but not for be surprised (t = 1.972, p = 0.052). With the weak NPI ever, there was a significant effect of negation for claim, (t = -8.005, p = 6.771 × 10^{-12}), think (t = -7.979, p = 6.971 × 10^{-12}), and realize (t = -4.425, p = 2.885 × 10^{-4}), but not for be surprised (t = 1.856, p = 0.067).

4.4 Discussion
Since the difference between the predicates was not significant in the baseline condition of no negation and no NPI, any differences in NPI licensing can safely be said to be due to semantic properties of these predicates, such as factivity, and not to pragmatic idiosyncrasies of the predicates themselves.

In sentences with no NPI, we see a slight, but in several cases significant, dip in acceptability when negated. This may be a consequence of the well-known processing cost of negation (Wason, 1959, 1961; Gough, 1965; Trabasso et al., 1971; Just & Carpenter, 1971; Slobin, 1966), for which many explanations have been postulated (for an overview, see Horn, 1989, 186ff.). Wason (1965), for instance, explains the pragmatic effect of negation as a denial of some (possibly tacit) affirmative sentence, and finds lower processing costs for statements such as a whale is not a fish, which deny a more plausible affirmation, than for a whale is not a bird. This dip would be surprising, then, given that each sentence was a response—affirmation or denial—to some context sentence. Nevertheless, the effect is reported widely across the literature for a wide range of sentences and contexts.

With the weak NPI ever there is, as expected, a major “rescuing” effect of negation in the first three predicates. The fourth, being an emotive factive, is already an NPI licenser, and negation has no effect. Interestingly, for weak NPIs under negation, there is a small but significant intervention effect of factivity in English (t = 3.955, p = 1.096 × 10^{-4}).

5 Experiment 2
Our next experiment turned to Italian, to investigate whether factives intervene as claimed, in contrast to English.

5.1 Participants
34 participants were recruited via Amazon Mechanical Turk. Participants were restricted to Italy, and paid US$1. Two participants were excluded for rating weak NPIs under ‘think’ without negation—an environment which they are uncontroversially not licensed—better than corresponding sentences without the NPI.

5.2 Procedure
The procedure was identical to that of experiment 1. Participants were shown a list in one of eight random orders. The lists paralleled those in experiment 1 in the relative orders of verb, NPI, negation, and lexical items.

The verbs used were non-factive, non-neg-raising sosteneres ‘claim’; non-factive, neg-raising pensare ‘think’; cognitive factive rendersi conto ‘realize’; and emotive factive essere sorpreso ‘be surprised’ The NPIs used were weak mai ‘ever’ and strong affatto ‘at all.’

The pattern of results expected is in fig. 4. Control sentences with no NPI are at ceiling with or without negation (top row). Control sentences with non-factive predicates allow weak NPIs if there is a licensing negation (left two columns). Finally, in Italian (and French) factive predicates
are claimed to be interveners—they do not allow any NPI, with or without negation.

5.3 Results & Analysis
The results of experiment 2 are shown in fig. 5.

Figure 4: Expected results of experiments 2 (Italian) and 3 (French).

Figure 5: Results of experiment 2 (Italian).
We analyze the data in a linear mixed effects model (LMM) using lme4 for R, with the NPI, matrix verb, and matrix polarity as fixed effects, and Worker ID and list number as random effects, and find a significant effect of the interaction between the fixed effect terms ($\chi^2(10) = 82.778$, $p = 1.43 \times 10^{-13}$).

The sentences with no NPI or negation are all at ceiling; a regression analysis revealed no significant differences between the four predicates ($F(3, 112) = 1.412, p = 0.243$).

In order to measure the licensing of NPIs, a $t$-test was run for each verb–NPI condition (including no NPI) between negation and no negation, to determine whether negation “rescued” the NPI. In the control sentences with no NPI, there was no significant effect of negation for any of the predicaes: sostenire ($t = -0.145, p = 0.886$), pensare ($t = 0.871, p = 0.387$), rendersi conto ($t = 0.651, p = 0.518$), or essere sorpreso ($t = 1.326, p = 0.192$). With the weak NPI mai, there was a significant effect of negation for sostenire, ($t = -5.197, p = 3.011 \times 10^{-6}$), pensare ($t = -5.169, p = 3.266 \times 10^{-6}$), and rendersi conto ($t = -2.408, p = 0.019$), but not for essere sorpreso ($t = -1.076, p = 0.287$).

5.4 Discussion
As expected, sentences with no NPI were rated at ceiling, although interestingly, there is no negation penalty in Italian as there is in English. With the weak NPI mai, negation rescues the NPI under non-factive sostenere and pensare and fails to under factive essere sorpreso, although the mean rating for the predicate ‘be surprised’ under negation was close to the English (English: 3.04, Italian 2.97). With rendersi conto, there is a slight but significant rescuing effect of negation. It may be hypothesized that, modulo the intervention effect, these predicates work more or less like English—emotive factives would otherwise license NPIs, and matrix negation would rescue NPIs within cognitive factives.

6 Experiment 3
Our final experiment turned to a second romance language, French, where we conducted a study to test the robustness of the claim of factive intervention in Romance.

6.1 Participants
34 participants were recruited on Amazon Mechanical Turk. Participants were restricted to Canada and France, and were paid US$1. No participants were excluded based on screening criteria (as for our English and Italian studies, rating sentences with NPIs and no negation better than those with negation).

6.2 Procedure
The procedure was identical to that of experiment 1. Participants were shown a list in one of eight random orders. The lists paralleled those in experiments 1 and 2 in the relative orders of verb, NPI, negation, and lexical items.

The verbs used were non-factive, non-neg-raising déclarer ‘claim’; non-factive, neg-raising penser ‘think’; cognitive factive réaliser ‘realize’; and emotive factive être surpris ‘be surprised’ ‘Realize’ was chosen over the more common ‘know’ because French savoir ‘know’ does not easily embed ‘that’-clauses. Due to the lack of a suitable French strong NPI (and the relative paucity of NPIs in French in general), two weak NPIs were used: quelque N que ce soit ‘any’ and le moindre ‘a single.’ The latter was listed as the “strong NPI” for the purpose of randomizing the lists; hence,

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2The lists were checked for dialectal differences by native speakers of French and Canadian French.
it appears in the same respective position in the lists as *in years* and *affatto*. However, it is analyzed here as a weak NPI. All foods chosen were count nouns, since French *le moindre* is incompatible with mass nouns.

The pattern of results expected is identical to the previous experiment (see fig. 4).

### 6.3 Results & Analysis

The results of experiment 3 are shown in fig. 6.

![Figure 6: Results of experiment 3 (French).](image)

We analyze the data in a linear mixed effects model (LME) using lme4 for R, with the NPI, matrix verb, and matrix polarity as fixed effects, and Worker ID and list number as random effects, and find a significant effect of the interaction between the fixed effect terms for *le moindre* ($\chi^2(10) = 108.327, p = 1.16 \times 10^{-18}$) as well as for *quelque ... que ce soit* ($\chi^2(10) = 54.133, p = 4.584 \times 10^{-5}$).

The sentences with no NPI or negation are all at ceiling; a regression analysis revealed no significant differences between the four predicates ($F(3, 132) = 1.234, p = 0.3$).

In order to measure the licensing of NPIs, a *t*-test was run for each verb–NPI condition (including no NPI) between negation and no negation, to determine whether negation “rescued” the NPI. In the control sentences with no NPI, there was a significant effect of negation only for *penser* ($t = 2.156, p = 0.037$), and not for *réaliser* ($t = 1.17, p = 0.247$), *déclarer* ($t = 1.408, p = 0.164$), or *être surpris* ($t = 0.786, p = 0.435$). With the weak NPI *le moindre*, there was a significant effect of negation for *déclarer* ($t = -3.845, p = 2.77 \times 10^{-4}$), and *penser* ($t = -1.786, p = 9.084 \times 10^{-5}$), *réaliser* ($t = -4.499, p = 2.905 \times 10^{-5}$), but not for *être surpris* ($t = -0.498, p = 0.662$). Finally, with the weak NPI *quelque ... que ce soit*, there was a significant effect of negation only for *penser* ($t = -0.66, p = 1.815 \times 10^{-3}$), but not for *déclarer*, ($t = -1.948, p = 0.056$), *réaliser* ($t = -0.96, p = 0.34$), or *être surpris* ($t = -1.331, p = 0.189$).
6.4 Discussion

The two weak NPIs tested in French yielded quite different results. *Le moindre* is a minimizer, which has been analyzed as decomposable into *even* and a superlative morpheme (Gonzalez & Moracchini, 2016), similar to the English minimizer *a single*. This item roughly followed the pattern of English *ever*: it displayed little, if any, effect of factive intervention.

The other NPI, *quelque ... que ce soit*, was rated poorly in all environments except under negated *penser*. If this due to intervention, it is apparently an effect both of factive and of non-neg-raising predicates. On the other hand, there may be pragmatic properties of this particular item that precluded its acceptance in the contexts given. For one, the item is relatively infrequent in spoken French, the register the sentences were presented as being in, which may have compromised their felicity, despite all sentences having been checked by native French speakers. Although this NPI is clearly somewhat felicitous under *penser*, being significantly “rescued” by negation ($p = 1.815 \times 10^{-5}$), it is not fully so, reaching only a mean rating of 3.06. This suggests that it is the item itself, and not an intervention effect, effecting such low ratings for this item. However, these results make it difficult to identify French squarely as an intervention or a non-intervention language.

7 General Discussion

Experiment 1 established, as a baseline for comparison, that there is no intervention effect of factivity in English for the weak NPI *ever*. In Italian, by contrast, there is a fairly robust such intervention effect for the weak NPI *mai*, as experiment 2 showed. The situation in French is more subtle, with a less pronounced intervention effect for *le moindre*, and a near failure of licensing of *quelque ... que ce soit*. As mentioned in sec. 6.4, this may be due simply to the fact that *que ce soit* is not a common item in spoken French.

In sentences with no NPI, there is a highly significant penalty of negation in English, but not in Italian or French. As mentioned in sec. 4.4, there is a well-known processing cost of negation, which may degrade acceptability judgments—however, if this is the cause, we should expect to see in roughly equally in all languages tested. Another possibility is that the absence of an NPI deprived the sentences of a certain definitiveness that the sentences with NPIs were perceived to have (cf. the well-known “domain-widening” effect of NPIs noted by Kadmon & Landman, 1993), and this made the former pragmatically odd. The reason may simply be that the English negative sentences were phrased in a way that participants found slightly less pragmatically felicitous, perhaps because the way information was denied was thought inappropriate, or the repetition of information in the second sentence was awkward (though this should have arisen in the affirmative responses as well). Nevertheless, negative sentences with NPIs were not so degraded that there was not a sufficiently significant rescuing effect of negation on the NPI to establish their acceptability under all predicates tested.

Assuming a presuppositional semantics for factivity, these results argue in favor of Homer’s account on which presuppositions can be NPI interveners. The effect of factivity could be further tested by cross-linguistically testing NPI licensing in sentences such as (14), in which the factive inference is cancelled. This would require testing both acceptability judgments and intuitions as to whether the inference had indeed been cancelled. However, this would not rule out a non-presuppositional analysis of factivity, such as Romoli’s (2012), and would therefore not be a coup de grace for the Strawson-entailment theory, as Homer (2009) alleges.

While the presence of the effect has been established, its cause is still unknown. Chierchia (2013) postulates that Romance factives such as ‘be surprised’, like universals (see 2.2) are high
scalar items, with alternatives that they entail (say, ‘know’—if you are surprised that \( p \), you must know that \( p \)). In this case, intervention again occurs because a UE implicature is generated. Chierchia later hypothesizes (2015) that the difference may lie in the semantics of the embedded clause: whereas an English factive asserts the proposition \( p \) in its complement, an Italian factive asserts that there exists such a proposition which is true—this creates a UE environment in which The difference between these languages, however, may well lie in the syntax or semantics of the factive predicates, or even in the NPIs which, as mentioned in sec. 2.1, display considerable variation in licensing conditions even within languages.

In addition, theories of NPI licensing which do not rely on downward entailingness exist, such as Giannakidou’s (1998) theory that they are licensed in the broader category of nonveridical environments, or Barker’s (to appear) theory of NPIs as existentials with obligatory narrow scope.

There is clearly more work to be done in general on French, at least to determine if it patterns with English, with Italian, or if it constitutes a class on its own in which there is intervention only for some NPIs, only for some factives, or only under certain conditions. This would pave the way for theoretical work which could locate the observed difference between English and Italian in the syntax/semantics.

8 Conclusion

In this paper, we provided quantitative evidence that supported the claim that factive predicates intervene in NPI licensing in Italian, and possibly also in French, though not in English. We leave unresolved the exact nature of factives in French, as well as the theoretical question of what precisely differs between languages to create this effect. If it is indeed presuppositional, it would call into question the theoretical foundation of an important theory of NPIs.

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