

Residue of Universality

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Revised draft, August 2020

Abstract

A classical issue in the grammar of NPIs is whether they are existentials interpreted under the scope of negation or universals interpreted outside the scope of negation. This paper contributes to this debate by investigating the interpretation of the French coordinating particle *ni* ('nor') – an NPI that has recently been argued to have a universal-like (i.e., conjunctive) meaning (Doetjes 2005, Gonzalez and Demirdache 2014). In addition to providing new empirical arguments against a conjunctive analysis, we develop a disjunctive analysis of French *ni* which relies on the independently observed property of connectives to take scope at a higher level than their surface position. Our proposal thus reconciles existential analyses of NPIs with the universal-like behavior of *ni*. An additional question that this paper addresses concerns the derivation of wide scope readings of connectives. We show that in contrast to approaches based on type-shifting or on a Hamblin-like semantics for disjunctions, Conjunction Reduction approaches cannot capture the challenging behavior of French *ni*.

Key words: negative polarity, negative coordination, quantificational force, disjunction, wide scope connectives

1 Introduction

Over the past decades, Negative Polarity Items (NPIs) like English *any* have attracted the interest of many linguists, who investigated what aspect of their grammar makes them have their characteristic restricted distribution, or whether their licensors form a natural class, among other questions (Klima 1964, Ladusaw 1979, Linebarger 1987, Kadmon and Landman 1993, Krifka 1995, Giannakidou 1998, Lahiri 1998, Zwarts 1998, Chierchia 2013, Crnić 2019, among many others). For a recent overview, see Homer (2019). Another core issue in the grammar of NPIs that we are going to address in this paper is the following: are NPIs existentials interpreted under the scope of negation ($\neg > \exists$) or universals interpreted outside the scope of negation ($\forall > \neg$)? Both answers have been provided in the literature: (i) NPIs are narrow scope existentials (Ladusaw 1979, Linebarger 1987, Lahiri 1998, a.o.) and (ii) NPIs are wide scope universals (Jayaseelan 2011, Shimoyama 2011, Sells and Kim 2006, Gonzalez and Demirdache 2014). Given that an existential interpreted under the scope of negation is logically equivalent to a universal interpreted outside the scope of negation, the sentence in (1) which contains the English NPI *any* could either have the truth conditions in (1a) or in (1b).

- (1) Zoe hasn't read any books.
- a. $\neg\exists x[\textit{book}(x) \wedge \textit{read}(x)(z)]$ $\neg > \exists$
- b. $\forall x[\textit{book}(x) \rightarrow \neg\textit{read}(x)(z)]$ $\forall > \neg$

Since Ladusaw (1979), the majority of researchers have argued that NPIs are interpreted as narrow scope existentials (and thus, that sentence (1) is interpreted as in (1a)). The strongest arguments in favor of this view will be discussed in Section 2. Recently however, some works have emerged in the literature arguing that cross-linguistically, we find polarity sensitive expressions that are interpreted as wide scope universals.¹ These include Malayalam *aar-um* ('anybody') and *ent-un* ('anything') (Jayaseelan 2011), Japanese neg-words (e.g., *dare-mo* 'anyone') (Shimoyama 2011), Korean neg-words (e.g., *amwu-to* 'anyone') (Sells and Kim 2006) and the French negative coordinating particle *ni* ('nor') (Doetjes 2005, Gonzalez and Demirdache 2014). The latter is illustrated in example (2).

- (2) Chloé n'a pas lu *Les Misérables* ni *L'étranger*.
 Chloé NE.has not read *Les Misérables* nor *L'étranger*
 'Chloé neither has read *Les Misérables* nor *L'étranger*.'

Given that existential statements are equivalent to disjunctions of propositions, on an existential analysis of NPIs one would expect NPI *ni* to be interpreted as a narrow scope disjunction (as claimed by de Swart (2001) and Mouret (2007)). However, Doetjes (2005) and Gonzalez and Demirdache (2014) provided several arguments (to be discussed in Section 3) in favor of a conjunctive analysis of *ni*, showing that there exists a tension between existential analyses of NPIs and the universal-like behavior of this expression.

The main empirical goal of this paper is to contribute to this debate (narrow scope existential vs. wide scope universal NPIs) by investigating the interpretation of the coordinating particle *ni* in detail. On the one hand, we review and question the validity of existing arguments that have been adduced in favor of a conjunctive analysis of *ni* and furthermore provide new empirical arguments for a disjunctive analysis. On the other hand, we present a novel analysis of this coordinating particle that reconciles existential analyses of NPIs with the universal-like behavior of *ni*. In a nutshell, we argue that despite appearances, French *ni* is interpreted as a disjunction (just like other NPIs are interpreted as existentials). However, in contrast to existential NPIs like *any*, it can take wider scope than what we see on the surface – a property that it shares with other connectives. A related consequence of the proposal is that it sheds new light on a test that has been widely used cross-linguistically to argue that NPIs are universals (cf. Shimoyama 2011).

This empirical problem is intertwined with a theoretical one. Most accounts of negative polarity are based on the existential hypothesis (Klima 1964, Ladusaw 1979, Kadmon and Landman 1993, Krifka 1995, Giannakidou 1998, Lahiri 1998, Zwarts 1998, Chierchia 2013, among many others). Some of these existential accounts derive the behavior of NPIs in a principled way from independent factors. For instance, for alternative-based accounts (Krifka 1995, Lahiri 1998, Chierchia 2013, a.o.), NPIs are existential items that obligatorily activate alternatives. Once these alternatives are factored into meaning, a semantically coherent meaning is derived when NPIs occur in negative environments, but not when they appear in positive contexts. These accounts further predict that we

¹Here, we limit our discussion to NPIs and neg-words. Other expressions that are sensitive to the presence of negation are Positive Polarity Items (PPIs). Whether some PPIs are interpreted as wide scope universals is a question that is independent from the one discussed in this paper. One recent paper that addresses this question is Zeijlstra (2017).

should only find existential NPIs across languages. Universal expressions would not give rise to a semantically coherent meaning in negative environments. Thus, universal items whose distribution is restricted to negative contexts – namely, universal NPIs – are predicted not to exist. By arguing in favor of a disjunctive analysis of *ni*, this paper indirectly supports alternative-based accounts of negative polarity.

Our proposal that *ni* is interpreted as a disjunction relies on the independently observed property of connectives to take wider scope than what we see on the surface. Although we know how to derive wide scope readings of DP quantifiers, there is no agreement for connectives yet. The fact that connectives can sometimes take wide scope with respect to a scope-bearing operator they co-occur with is illustrated in (3) for the disjunction *or*. When co-occurring with negation, *or* can either take surface scope (i.e., the narrowest scope), as shown in (3a), or it can take wide scope relative to negation, as shown in (3b).

- (3) Zoe didn't invite Lou or Suzi to the conference.
- a. Zoe neither invited Lou nor Suzi to the conference. $\neg > or$
- b. Either Zoe did not invite Lou to the conference or Zoe did not invite Suzy to the conference. $or > \neg$

We discuss the three main approaches that derive wide scope readings of connectives like (3b): the type-shifting approach (Rooth and Partee 1982, Hendriks 1993, Partee and Rooth 1983, a.o.), an approach based on an Hamblin-like semantics for the disjunction (Alonso-Ovalle 2006, Li and Law 2016, a.o.), and the Conjunction Reduction approach (Gleitman 1965, Ross 1967, Hankamer 1979, Hirsch 2017, a.o.). This paper argues against the Conjunction Reduction approach for *ni* and casts doubt on this approach as a way to derive wide scope readings of all connectives.

The rest of this paper is organized as follows. Section 2 discusses arguments in favor of an existential analysis of NPIs. Section 3 introduces the French coordinating particle *ni*. After showing that *ni* exhibits polarity sensitivity, we review arguments that have been provided in favor of a conjunctive analysis of *ni*. In Section 4, we present a novel analysis of *ni*: in particular, we propose that NPI *ni* is interpreted as a disjunction that does not necessarily have surface scope (just like other connectives). We then show how such an analysis derives the restricted distribution of *ni*. Section 5 demonstrates how our proposal captures the challenging data discussed in Section 3. Section 6 discusses two alternative proposals to derive wide scope readings of connectives and shows that a Conjunction Reduction approach fails to capture the challenging behavior of *ni*. In Section 7, we extend our analysis to other polarity sensitive items that have been argued to be interpreted as wide scope universals, namely, Japanese neg-words. Finally, section 8 concludes.

2 Evidence in favor of the existential analysis

As discussed in the introduction, NPIs like English *any* can in principle be interpreted as existentials scoping under negation or as universals scoping over negation. Since Ladusaw (1979), the existential camp has been predominant and a number of arguments have been provided in support of a narrow scope existential analysis of NPIs. One of them is based on the morphological make-up of polarity sensitive items cross-linguistically. Expressions that can only occur in (a subset of) negative environments – whether they are NPIs or neg-words – tend to be morphologically derived from weak

indefinites meaning ‘some’ or ‘one’, or *wh*-words, across languages. For instance, the Hindi NPIs *koi bhii* (‘anyone’) and *ek bhii* (‘any’) are composed of the emphatic particle *bhii* (‘even/also’), and the indefinites *koi* (‘some’) and *ek* (‘one’) respectively (Lahiri 1998). For more examples, we refer the reader to Haspelmath (1997). Crucially, there are very few expressions involving a universal-like element which are restricted in their distribution the way NPIs and neg-words are. These include the English adverbial expressions (*all that*) *much* and *at all* (Chierchia 2013), and Malayalam *aar-un* (‘anybody’), *ent-un* (‘anything’), etc., which involve the conjunctive marker *-um* (‘and’) (Jayaseelan 2011). Whether these expressions are truly interpreted as wide scope universals is left for further research. What is important here is that cross-linguistically, NPIs overwhelmingly involve weak indefinites, suggesting that they are interpreted as ‘lowest-scale’ existentials.

We now turn to Ladusaw’s (1979) two main arguments in favor of an existential analysis of NPI *any*. The first one is based on the interpretation of sentences containing *any* when the latter occurs in the scope of a downward-entailing expression that is non-anti-additive. Downward-entailing (DE) and anti-additive (AA) functions are defined in (4a) and (4b) respectively.

- (4) a. A function *f* is downward-entailing iff for any *A* and any *B*, if $B \subseteq A$ then $f(A) \rightarrow f(B)$.
 b. A function *f* is anti-additive iff for any *A* and any *B*, $f(A \vee B) \leftrightarrow f(A) \wedge f(B)$.

Example (5) shows that the adverb *rarely* is DE but not AA. *Rarely* is DE because it allows inference from sets (the set of people who study) to subsets (the set of people who study linguistics), as shown in (5a). But *rarely* does not satisfy the equivalence in (4b). We can find a context in which Zoe rarely sings and Zoe rarely dances but in which it is false that Zoe rarely sings or dances (she does either too often for *rarely* to be true). In this context, the right-hand side of (4b) is satisfied but not the left-hand side. Thus, the former does not entail the latter, as shown in (5b). We conclude that *rarely* is not AA.

- (5) a. Zoe rarely studies. \rightarrow Zoe rarely studies linguistics.
 b. Zoe rarely sings and Zoe rarely dances. \nrightarrow Zoe rarely sings or dances.

Let us now consider Ladusaw’s (1979) example in (6) where *any* co-occurs with the adverb *rarely*. The existential analysis predicts that this sentence has the reading in (6a). In contrast, if *any* is interpreted as a wide scope universal, sentence (6) should have the reading in (6b). Crucially, since *rarely* is non-AA, these two readings are not equivalent. Given that the sentence in (6) does not have the reading in (6b), Ladusaw (1979) concludes that *any* is interpreted as a narrow scope existential.²

- (6) The IRS rarely audits anyone. (Ladusaw 1979:102)
 a. It is usually not the case that there is someone whom the IRS audits.
 (= The IRS almost always audits no one.)
 b. *Everyone is such that it is usually the case that the IRS doesn’t audit him.

Ladusaw’s (1979) second argument is based on the ability of *any* to occur in *there*-sentences. While universal quantifiers are not licensed in *there*-sentences, *any* is, as illustrated in (7). Example (8) further shows that when a quantifier such as *some* occurs in this construction, it has to take the narrowest scope: that is, sentence (8) does not mean that there is some specific person who is required to be in John’s house. If *any* were interpreted as a universal taking wide scope with respect to

²Cf. Gajewski (2008) for a similar argument.

negation, we would expect the sentence in (7a) to be ungrammatical, contrary to facts. This suggests that *any* is interpreted as an existential taking narrow scope with respect to negation in (7).

- (7) a. There aren't any students in the room. (Gajewski 2008:71)
 b. (i) *There aren't all the students in the room.
 (ii) *There isn't every student in the room.

- (8) There must be someone in John's house. (Heim 1987:24)

Although these arguments are all about English *any*, to a large extent they hold cross-linguistically. For instance, when the French NPI *qui que ce soit* ('anyone') occurs in the scope of a non-AA expression like *rarement* ('rarely'), it takes narrow scope relative to this expression. That is, sentence (9) is interpreted as in (9a). Crucially, this sentence does not allow the reading in (9b) predicted to be available by the universal hypothesis, providing evidence that *qui que ce soit* must be interpreted as a narrow scope existential, just like English *any*.

- (9) Zoé a rarement rencontré qui que ce soit à la bibliothèque.
 Zoé has rarely met who that it is.SUBJ at the library
 'Zoé rarely met anyone at the library.'
 a. It has usually not been the case that there is someone that Zoé met at the library.
 b. *Everyone is such that usually, Zoé did not meet them at the library.

This section reviewed some key arguments in favor of an existential analysis of NPIs. Despite all this evidence, recall that a few expressions that clearly show polarity sensitivity have been claimed to be interpreted as wide scope universals. Among them, the French negative coordinating particle *ni* to which we now turn.

3 A challenging NPI: the coordinating particle *ni*

On an existential analysis of NPIs, one would expect the French coordinating particle *ni* to be interpreted as a narrow scope disjunction (as claimed by de Swart (2001) and Mouret (2007)). That is, a sentence like (10a) should have the truth conditions in (10b).

- (10) a. Benjamin n'aime pas *Les Misérables* ni *L'étranger*.
 Benjamin NE-likes not *Les Misérables* nor *L'étranger*
 'Benjamin doesn't like *Les Misérables* nor does he like *L'étranger*.'³
 b. $\neg (\text{likes}(m)(b) \vee \text{likes}(e)(b))$

However, the diachronic development of *ni* as well as the morphological make-up of negative coordinating particles in other languages do not support this analysis. French *ni* comes from Latin *nec*, whose full form was *neque*. Latin *neque* could be decomposed into the prehistoric negative morpheme **ne* and the enclitic coordinating particle *-que* ('and') (Gianollo 2017). Similarly, its equivalent in languages like Italian and Serbo-Croatian are morphologically complex items which involve a conjunction.⁴ Additional arguments for a conjunctive analysis of *ni* have been provided in the literature

³Sentential negation in French is expressed by the negative adverb *pas*, optionally co-occurring with the preverbal clitic *ne*, glossed as NE. For readability ease, we do not indicate that *ne* is optional in our examples, although it is.

⁴For detailed investigations of Latin *neque* and Serbo-Croatian *ni*, we refer the reader to Gianollo (2017), and Arsenijević (2011) and Gajić (2018), respectively.

by Doetjes (2005) and Gonzalez and Demirdache (2014). In section 3.2, we will focus on the interpretation of *ni*, reviewing and refining the arguments for the conjunctive analysis. But first, we discuss the distribution of *ni* and show that it is a strong NPI.

3.1 Distribution of *ni*: *ni* is a strong NPI

Like other coordinating particles (e.g., the disjunction *ou* ('or')), *ni* can coordinate different types of phrases: namely, DPs in (11a), PPs in (11b), VPs in (11c), APs in (11d), and CPs in (11e).

- (11) a. Erwan n'aime pas *Les Misérables* ni *L'étranger*.
 Erwan NE.likes not *Les Misérables* nor *L'étranger*
 'Erwan doesn't like *Les Misérables* nor does he like *L'étranger*.' [DP]
- b. Erwan ne veut pas aller à la piscine avec son frère ni avec sa soeur.
 Erwan NE wants not go to the pool with his brother nor with his sister.
 'Erwan doesn't want to go to the pool with his brother or with his sister.' [PP]
- c. Erwan n'aime pas lire le journal ni écouter la radio.
 Erwan NE.likes not read the newspaper nor listen.to the radio
 'Erwan doesn't like reading newspapers or listening to radios.' [VP]
- d. Ce voyage n'était pas instructif ni spectaculaire.
 this trip NE.was not enlightening nor spectacular
 'This trip was not enlightening nor was it spectacular.' [AP]
- e. Erwan ne veut pas que ses élèves aillent à Londres ni qu'ils aillent à Paris.
 Erwan NE wants not that his students go to London nor that.they go to Paris
 'Erwan doesn't want his students to go to London or to go to Paris.' [CP]

de Swart (2001) pointed out that *ni* shows polarity sensitivity.⁵ As shown in (12a), it cannot occur in a positive sentence. To be licensed, *ni* has to occur in a negative environment, as in (12b).

- (12) a. *Chloé aime le thé ni le café.
 Chloé likes the tea nor the coffee
- b. Chloé n'aime pas le thé ni le café.
 Chloé NE.likes not the tea nor the coffee
 'Chloé doesn't like tea nor does she like coffee.'

Co-occurrence with negation is however not sufficient. Example (13a) shows that *ni* cannot appear in subject position of a negative sentence. For *ni* to be licensed, negation (*jamais* 'never' in example (13b)) has to c-command it (Dagnac 2016).

- (13) a. *Sonia ni Kristell n'aime pas le thé.
 Sonia nor Kristell NE.likes not the tea

⁵The coordinating particle *ni* can also be reiterated introducing both (or every) conjuncts of a coordinated structure. In this case, it behaves as a neg-word (de Swart 2001, Mouret 2007). That is, like French neg-words, it can occur on its own (as in (i)) and can yield both a negative concord (NC) reading and a double negation (DN) reading when it co-occurs with sentential negation (as in (ii)).

- | | | | |
|-----|--|------|---|
| (i) | Chloé n'aime ni le thé ni le café. Chloé NE.likes nor the tea nor the coffee 'Chloé neither likes tea nor coffee.' | (ii) | Chloé n'aime pas ni le thé ni le café. Chloé NE.likes not nor the tea nor the coffee |
| | | | a. 'Chloé likes neither tea nor coffee.' NC Reading |
| | | | b. 'Chloé likes either tea or coffee.' DN Reading |

Although *ni* and *ni...ni* may well be related, these examples show that they have different properties which justify studying them separately. Whether we can find a unified analysis of the two constructions is an open question that we leave for future investigation. In this paper, we focus on NPI *ni*, that is, on single occurrences of *ni*.

- b. Jamais Sophie ni Lucas ne viendront à sa fête.
 never Sophie nor Lucas NE will.come to his party
 ‘Sophie and Lucas will never go to his party.’

This behavior is reminiscent of the distribution of polarity sensitive expressions like English *any*. Thus, *ni* has been claimed to be an NPI (de Swart 2001, Mouret 2007, Dagnac 2016).⁶

However, unlike *any*, the coordinating particle *ni* can only appear in a limited subset of negative environments. Specifically, it cannot occur in the antecedent of conditionals, in the left argument of *chaque* (‘every’), under the scope of negative verbs like *douter* (‘to doubt’), under the scope of *peu* (‘few’) or under the scope of the adverb *rarement* (‘rarely’), as shown in (14).⁷ In contrast, (15) shows that NPI *any* is licensed in all of these contexts.

- (14) a. *Si Ségo boit du thé ni du café, elle sera énervée.
 if Ségo drink of.the tea nor of.the coffee, she be.FUT irritated
 b. *Chaque enfant qui boit du thé ni du café sera énervé.
 every child who drink of.the tea nor of.the coffee be.FUT irritated
 c. *Je doute que Ségo aime le thé ni le café.
 I doubt that Ségo likes the tea nor the coffee
 d. *Peu d’enfants boivent du thé ni du café.
 few of-children drink of.the tea nor of.the coffee
 e. *Ségo boit rarement du thé ni du café.
 Ségo drink rarely of.the tea nor of.the coffee
- (15) a. If you eat any cookies, you won’t be hungry.
 b. Every child who ate any cookies won’t be hungry.
 c. I doubt that she ate any cookies.
 d. Few children ate any cookies.
 e. I rarely eat any cookies.

These distributional differences between NPIs like *any* and NPIs like *ni* had led Zwarts (1998) to classify NPIs into two different types: *weak* NPIs which are licensed by DE operators and *strong* NPIs which are licensed by AA operators.⁸ We have shown in Section 2 that the adverb *rarely* is DE but not AA. Similarly, the antecedent of conditionals, the left argument of *every*, the negative verb *to doubt*, and *few*, are DE but not AA. Thus, examples (14) and (15) show that *any* is licensed by DE expressions, and is therefore a weak NPI, whereas *ni* is not.

Now, the sentences in (16) show that *ni* can occur under the scope of negation, under the scope of the neg-word *personne* (‘no one’), and under the scope of negated neg-raising predicates like *penser* (‘to think’).⁹ These expressions all license strong NPIs like English *in weeks*, as illustrated in (17).

⁶A reviewer pointed out that we could assume (at least) two definitions of NPIs: (i) an item whose distribution is restricted to negative environments, and (ii) an item whose morphological make-up does not contain negation and whose distribution is restricted to negative environments. In this paper, we assume the former. In particular, we believe that NPIs may or may not be morphologically made up of a negative element. There are NPIs that are, like French *ni*, and NPIs that aren’t, like English *any*. Another French item which has been analyzed as an NPI and is made up of a negative element is the preverbal negation marker *ne* (Zeijlstra 2009).

⁷A reviewer found examples where *ni* appears under the scope of *rarement* (‘rarely’) on the internet. However, all the speakers we consulted as well as Dagnac (2016) reject such sentences. Note that if *ni* were licensed by *rarement*, we would expect it to be licensed by other DE operators that are not AA like *peu* (‘few’) for instance, contrary to facts.

⁸Zwarts (1998) distinguishes a third type of NPIs, namely *superstrong* NPIs, which are only licensed by anti-morphic operators. Because this distinction is not crucial here, we omit it for exposition ease.

⁹For a discussion of the licensing of strong NPIs by neg-raising predicates, see Lakoff (1969), Gajewski (2007), a.o.

- (16) a. Ségo n'aime pas le thé ni le café.
Ségo NE-likes not the tea nor the coffee
'Ségo does not like tea nor does she like coffee.'
- b. Personne n'aime le thé ni le café.
no one NE-likes the tea nor the coffee
'No one likes tea or coffee.'
- c. Je ne pense pas que Ségo aime le thé ni le café.
I NE think not that Ségo likes the tea nor the coffee
'I don't think that Ségo likes tea or coffee.'
- (17) a. Lou has not seen Zoe in weeks.
- b. No one has seen Zoe in weeks.
- c. I don't think that Lou has seen Zoe in weeks.

The fact that *ni* is licensed in the same environments as the strong NPI *in weeks* suggests that it is a strong NPI as well (de Swart 2001, Mouret 2007). We now turn to the interpretation of this coordinating particle.

3.2 Narrow scope disjunction or wide scope conjunction?

Given that *ni* is a strong NPI, we expect it to be interpreted as a narrow scope disjunction, just like other NPIs are interpreted as narrow scope existentials. However, the meaning of this coordinating particle is still under debate. While Mouret (2007) and de Swart (2001) claim that it is indeed interpreted as a narrow scope disjunction, Doetjes (2005) and Gonzalez and Demirdache (2014) provide several arguments against such an analysis, and in favor of a conjunctive analysis of *ni*. This section reviews their most challenging arguments and presents new data which (i) confirm the challenges for a disjunction analysis of *ni*, (ii) establish which logical expressions give rise to these challenging readings, and (iii) clarify what an analysis of *ni* has to account for.

3.2.1 Challenge 1: Under the scope of *sans* ('without')

Doetjes (2005) pointed out that when *ni* is embedded under negation and *sans* ('without'), as in (18), the sentence receives a conjunctive reading.¹⁰

- (18) La réunion n'a pas commencé sans Quentin ni Arthur.
the meeting NE.has not started without Quentin nor Arthur
'If the meeting started, it was with both Quentin and Arthur.'¹¹

To be able to discuss the interpretation of this sentence in detail, we first need to say more about the meaning of the preposition *sans* ('without'). We are not aware of any formal analysis of this item. Although it is often mentioned in the literature on negative polarity as one of the few items that

¹⁰Note that we have modified Doetjes' (2005) original example (given in (i)) to make sure that the conjunctive reading was not due to a free choice effect triggered by the modal operator.

- (i) Nous ne pouvons pas commencer sans Jean ni Pierre.
we NE can not start without Jean nor Pierre
'We need both Jean and Pierre to be present before we can start.' (Doetjes 2005:82)

¹¹Although the provided paraphrase is not literal and may seem more complex than it should be, we chose this paraphrase because it is the least ambiguous.

can license strong NPIs, very little is known about its semantics and about the way it composes with other operators it may co-occur with. For our purpose, we propose a decompositional analysis of *sans* into negation and another component. This second component may vary depending on the type of constituent *sans* combines with (e.g., DPs, small clauses). Focusing here on sentences like (18) in which *sans* combines with a DP, we suggest that *sans* can be semantically decomposed into negation and the preposition *avec* (‘with’). When a phrase headed by *sans* combines with a verb v , it modifies the event denoted by v , as in (19). For more details about this analysis, see Section 5.1.

$$(19) \quad \llbracket [_{\nu P} v \text{ sans } \alpha] \rrbracket = \lambda e.v(e) \wedge \neg \text{with}(\alpha)(e)$$

Coming back to the sentence in (18), we provide the two relevant readings with their respective paraphrase in (20). If *ni* were interpreted as a disjunction taking narrow scope with respect to both *sans* and sentential negation, the two negations should cancel each other out and the sentence in (18) should have the reading in (20a). In other words, this sentence should be judged true in a context in which the meeting has started with only one person present, either Quentin or Arthur. Interestingly however, (18) is judged false in such a context.

- (20) a. $\neg \exists e[(\text{starting-the-meeting}(e) \wedge \neg(\text{with}(q)(e) \vee \text{with}(a)(e)))]$
 $\equiv \forall e[\text{starting-the-meeting}(e) \rightarrow (\text{with}(q)(e) \vee \text{with}(a)(e))]$
 ‘If the meeting has started, it was either with Quentin or Arthur.’
 b. $\forall e[\text{starting-the-meeting}(e) \rightarrow (\text{with}(q)(e) \wedge \text{with}(a)(e))]$
 ‘If the meeting has started, it was with Quentin and Arthur.’

Sentence (18) can only be uttered in a context in which the meeting has started with both Quentin and Arthur, suggesting that it has the reading in (20b) and that *ni* is interpreted as a conjunction.¹²

3.2.2 Challenge 2: Under the scope of *pas tous* (‘not every’)

As pointed out in Section 2, the existential and universal analyses of NPIs make different predictions in non-AA contexts. The second argument against the hypothesis that *ni* is interpreted as a narrow scope disjunction is based on sentences in which *ni* occurs in such an environment, namely, under the scope of *pas tous* (‘not every’). If the scope of *pas tous* were AA, (21a) should be equivalent to (21b). However, while the reading in (21a) entails the reading in (21b), the reverse entailment does not hold. One can find a context in which (21b) is true but (21a) is false (e.g., a context in which the students who do not smoke are not the same as the students who do not drink). As a result, we can conclude that the scope of *pas tous* in non-AA.

- (21) a. $\neg \forall x[\text{student}(x) \rightarrow (\text{smoke}(x) \vee \text{drink}(x))]$
 b. $\neg \forall x[\text{student}(x) \rightarrow \text{smoke}(x)] \wedge \neg \forall x[\text{student}(x) \rightarrow \text{drink}(x)]$

¹²Doetjes (2005) further claims that when *ni* coordinates two neg-words (*aucun* ‘no’ in (i)), it takes wide scope with respect to the two neg-words, suggesting that it is interpreted as a wide scope conjunction in this context as well. However, it is not clear why example (i) is an argument for a conjunctive analysis; a disjunctive analysis of *ni* could also capture the interpretation of this sentence. For this reason, we decided to not discuss this example in detail in this paper.

(i) Il n'existe aucun vaccin ni aucun traitement contre cette maladie.
 there NE-exist no vaccin nor no treatment against this illness
 ‘There exists no vaccin and no treatment against this illness.’ (Doetjes 2005:78)

Let us now consider example (22) in which *ni* occurs under the scope of *pas tous*. The two relevant readings are given in (23a) and (23b) with their respective paraphrases.

(22) %Pas tous les étudiants ne fument ni ne boivent.
 not all the students NE smoke nor NE drink
 ‘Not every student smokes and not every student drinks.’ (Gonzalez 2015:68)

(23) a. $\neg\forall x[student(x) \rightarrow (smoke(x) \vee drink(x))]$
 ‘Not every student smokes or drinks.’
 b. $\neg\forall x[student(x) \rightarrow smoke(x)] \wedge \neg\forall x[student(x) \rightarrow drink(x)]$
 ‘Not every student smokes and not every student drinks.’

If *ni* were interpreted as a narrow scope disjunction, we would expect the sentence in (22) to be ill-formed as the intervention of the universal quantifier between NPI *ni* and negation in (23a) would trigger an intervention effect (Linebarger 1987, a.o.).¹³ In contrast, if as predicted by the wide scope conjunctive hypothesis, the sentence in (22) were interpreted as in (23b), it should be well-formed. Because the reading in (23a) entails the reading in (23b), to ensure that the latter is available, we need to test whether it is available independently from the former. A context that makes the reading in (23b) true and the reading in (23a) false is context (24).

(24) Context that makes reading (23b) true:
 There are four students. Students a, b, and c smoke, and students b, c, and d, drink.

| | a | b | c | d |
|-------|-----|-----|-----|-----|
| smoke | yes | yes | yes | no |
| drink | no | yes | yes | yes |

We presented sentence (22) together with the above context to six native speakers. Two of them judged this sentence to be ill-formed (as indicated by % in (22)). This suggests that for these speakers, *ni* is interpreted as a narrow scope disjunction. Interestingly however, the other speakers judged this sentence to be well-formed and true in context (24), suggesting that for this second group of speakers, it is interpreted as in (23b). The availability of this reading provides additional evidence that *ni* is interpreted as a wide scope conjunction.

Example (25) makes a similar point. The main difference with the previous example is that the universal quantifier allows both scopal configurations with respect to negation: it can either scope over it ($\forall > \neg$) or under it ($\neg > \forall$). When the universal quantifier takes wide scope with respect to negation, the sentence is interpreted as in (26a). The continuation in (25a) confirms the existence of this reading. The fact that this reading is available does not challenge the disjunctive analysis of *ni*. In contrast, when negation takes wide scope with respect to the universal quantifier, the disjunctive and conjunctive hypotheses make different predictions. As was the case for example (22), the disjunctive hypothesis predicts this scopal configuration to be unavailable since the universal quantifier would

¹³The following examples confirm that the quantifier *tous* (‘all’) is part of the class of interveners in French. When it occurs between the NPI *quoi que ce soit* (‘anything’) and negation, the resulting sentences are ill-formed.

(i) a. *Pas tous les enfants ont dessiné quoi que ce soit.
 not all the children have drawn what that it is.SUBJ
 b. *Je ne pense pas que tous les parents ont cuisiné quoi que ce soit pour ce soir.
 I NE think not that all the parents have cooked what that it is.SUBJ for this evening

The disjunctive analysis of *ni* predicts that the sentence in (29) has the reading in (30a). Because the reading in (30a) entails the one in (30b), we cannot test whether the disjunctive reading in (30a) is available independently from the scope splitting reading in (30b). What we can test however is whether the scope splitting reading in (30b) is available independently from the disjunctive reading in (30a). A context that makes the former true and the latter false is context (31). In this context, Marie does not read her lessons on three out of five days (Monday, Tuesday and Wednesday) and Jean does not read his exercises on three different days out of five (Wednesday, Thursday and Friday).

- (31) Context that makes the scope splitting reading $(Q(\neg p) \wedge Q(\neg q))$ true:
 Marie doesn't read her lessons Monday, Tuesday and Wednesday,
 and Jean doesn't read his exercises Wednesday, Thursday and Friday.

| | M | T | W | T | F |
|-------|-----|-----|----|-----|-----|
| Marie | no | no | no | yes | yes |
| Jean | yes | yes | no | no | no |

We presented the data of this section together with the relevant contexts to eight speakers. Seven of them judged the sentence in (29) to be true in context (31). The availability of the scope splitting reading $(Q(\neg p) \wedge Q(\neg q))$ once again suggests that *ni* is interpreted as a conjunction.¹⁴

To determine the extent to which this scope splitting reading is available, we tested (i) other Q-adverbs (which also create non-AA contexts when they co-occur with negation) and (ii) sentences with a different structure. First, we found that the availability of the scope splitting reading does not crucially rely on the use of the adverb *dans la plupart des cas* ('in most cases'). When *ni* co-occurs with any one of the Q-adverbs given in (32), the resulting sentence gives rise to the reading $(Q(\neg p) \wedge Q(\neg q))$ as well. The property that these Q-adverbs have in common will be discussed in detail in Section 5.3. For now, we simply note that the fact that the availability of the scope splitting reading does not rely on the use of one adverb may be taken as additional evidence in favor of a conjunctive analysis of *ni*.

- (32) Wide Scope (WS) Q-adverbs:
dans la plupart des cas ('in most cases'), *deux fois par semaine* ('twice per week'), *généralement* ('generally'), *d'habitude* ('usually'), *la plupart du temps* ('most of the time'), *de temps en temps* ('from time to time'), *parfois* ('sometimes'), *à plusieurs reprises* ('several times')

¹⁴The astute reader may have noticed that the reading given in (ia) is also true in context (31). Thus, one may wonder whether speakers accept (29) in context (31) because they interpret this sentence as in (ia). The availability of this reading would not be informative because it is equivalent to the reading in (ib).

- (i) a. $\neg(Q(p) \vee Q(q))$: 'It is not the case that either Marie reads her lessons in most cases or Jean reads his exercises in most cases.'
 b. $\neg Q(p) \wedge \neg Q(q)$: 'It is not the case that Marie reads her lessons in most cases and it is not the case that Jean reads his exercises in most cases.'

Crucially however, the Q-adverb scopes below negation in (ia), and as we will discuss in detail in Section 5.3, Q-adverbs like *dans la plupart des cas* must scope above negation. Thus, sentence (29) cannot be interpreted as in (ia). To double-check this claim, one can create a new context by adding an extra day: e.g., in a week of six days, Marie doesn't read her lessons three out of six days (Monday, Tuesday and Wednesday), and Jean doesn't read his exercises the same days. In such a context, the readings in (i) are true, because it is not the case that in most cases *p* is true, for instance. In contrast, this context makes the scope splitting reading false. The fact that the sentence containing *ni* in (29) is judged false in this new context confirms that it is not interpreted as in (i).

Second, we tested sentences with a different structure, and in particular, sentences like (33) in which gapping does not take place in the second conjunct. The relevant readings of this sentence are the same as the ones of sentence (29). They are given again in (34) and are followed by a context that makes the scope splitting reading true and the disjunctive reading false.

(33) Dans la plupart des cas, Marie ne lit pas ses cours ni ses exercices.
 in the most of cases Marie NE read not her lessons nor her exercises

(34) p : Marie reads her lessons. q : Marie reads her exercises.

a. $(Q(\neg p) \wedge Q(\neg q))$: ‘In most cases, Marie doesn’t read her lessons and in most cases, Marie doesn’t read her exercises.’

b. $Q(\neg(p \vee q)) \leftrightarrow Q(\neg p \wedge \neg q)$: ‘In most cases, Marie doesn’t read her lessons and she doesn’t read her exercises.’

(35) Context that makes the scope splitting reading $(Q(\neg p) \wedge Q(\neg q))$ true:

Marie doesn’t read her lessons Monday, Tuesday and Wednesday,
 and she doesn’t read her exercises Wednesday, Thursday and Friday.

| | M | T | W | T | F |
|-----------|-----------|-----------|-----------|-----------|-----------|
| Lessons | no | no | no | yes | yes |
| Exercises | yes | yes | no | no | no |

In this case, speakers divide into two groups. Five of them judged the sentence in (33) to be true in context (35), whereas the other three judged it to be false. This suggests that the first group of speakers allows (33) to have the scope splitting reading in (34a), whereas the second group does not. For the latter group, this sentence can only have the reading in (34b). The availability of the reading $(Q(\neg p) \wedge Q(\neg q))$ for some speakers provides further evidence in favor of a conjunctive analysis of *ni*.

Up to now, we have discussed a number of arguments in favor of the existential analysis of NPIs. Having shown that the French coordinating particle *ni* is a strong NPI, we would expect it to be interpreted as a narrow scope disjunction. However, in this section, we have reviewed some strong arguments and provided additional evidence against such an analysis. At this point, the question is thus the following: can we reconcile existential analyses of NPIs with the conjunctive, universal-like behavior of *ni*? Next section answers this question positively. In particular, we provide a novel disjunctive analysis of *ni* that derives the problematic behavior above in a principled manner. Crucially, our proposal relies on the independently observed property of connectives to take wider scope than what we see on the surface.

4 A new analysis of *ni*: *ni* as a (wide scope) disjunction

This section first presents our proposal and then demonstrates how it captures the restricted distribution of *ni*. Our proposal involves the following ingredients:

1. *Ni* is interpreted as a disjunction, and more specifically, as a generalized disjunction (Partee and Rooth 1983).
2. Like other connectives, *ni* can take scope at a higher level than its surface position.

3. Like other NPIs, *ni* obligatorily activates alternatives (Lahiri 1998, Chierchia 2013, a.o.).

For concreteness, we adopt a type-shifting approach to derive wide scope readings of *ni* (Rooth and Partee 1982, Partee and Rooth 1983, Hendriks 1993, a.o.) and an alternative-based approach to negative polarity to capture its NPI behavior. However, our proposal does not rely on any of these analyses. One can adopt their favorite (existential) analysis of NPIs as long as it captures the restricted distribution of *ni*. As for the derivation of wide scope interpretations, Section 6 will consider alternative analyses and show that an approach based on a Hamblin-like semantics for disjunctions can be adopted as well.

At the end of this section, we show that the capacity of *ni* to take wider scope than what we see on the surface is a well-known property of connectives.

4.1 *Ni* as an NPI disjunction

As pointed out in Section 3.1, *ni* is a cross-categorial operator just like other connectives: that is, it can combine elements of the same syntactic category no matter what the category is. Following Partee and Rooth (1983), we first propose that *ni* is ambiguous between a family of meanings that are all related to one another; they can all be defined from the basic (i.e., type $\langle t, \langle t, t \rangle \rangle$) meaning. More specifically, we analyze *ni* as a generalized disjunction that combines with elements of the same t-reducible type, as shown in (36).¹⁵

- (36) a. When $\tau = t$

$$\llbracket ni \rrbracket = \lambda p_\tau. \lambda q_\tau. p \sqcup q$$

$$= \lambda p_t. \lambda q_t. p \vee q$$
 b. When $\tau = \langle \tau_1, \tau_2 \rangle$ (with τ_2 a t-reducible type)

$$\llbracket ni \rrbracket = \lambda P_\tau. \lambda Q_\tau. P \sqcup Q$$

$$= \lambda P_\tau. \lambda Q_\tau. \lambda R_{\tau_1}. P(R) \sqcup Q(R)$$

Example (37) illustrates how we derive the interpretation of a basic sentence containing *ni*. The sentence in (37a) involves the coordination of two APs, as shown in (37b). *Ni* combining with two properties, it has the denotation in (37c). Composing (37c) with each AP, we obtain (37d) as the meaning of the coordination phrase, and then (37e) as the interpretation of the whole sentence.

- (37) a. Bagheera n'est pas approchable ni apprivoisable.
 Bagheera NE.is not approachable nor tamable
 'Bagheera is neither approachable nor tamable.'
- b. $[_{TP}$ Bagheera n'est pas $[_{CoordP}$ $[_{AP_1}$ approchable] ni $[_{AP_2}$ apprivoisable]]
- c.
$$\llbracket ni \rrbracket = \lambda P_{\langle e, t \rangle}. \lambda Q_{\langle e, t \rangle}. P \sqcup Q$$

$$= \lambda P_{\langle e, t \rangle}. \lambda Q_{\langle e, t \rangle}. \lambda x_e. P(x) \sqcup Q(x)$$

$$= \lambda P_{\langle e, t \rangle}. \lambda Q_{\langle e, t \rangle}. \lambda x_e. P(x) \vee Q(x)$$
 d. $\llbracket \text{approchable ni apprivoisable} \rrbracket = \lambda x_e. \text{approchable}(x) \vee \text{tamable}(x)$

¹⁵As is well-known, several Latin negative expressions became less negative over time. For instance, this is the case of the French negative marker *ne* which used to express sentential negation (Jespersen 1917, Horn 1989, a.o.). Another example is Latin *nullus* ('no, none') which underwent a change from negative quantifier to polarity item (Labelle and Espinal 2014). To our knowledge, there is no diachronic analysis of French *ni* in the literature. But a plausible hypothesis is that like *ne* and *nullus*, Latin *neque*, the ancestor of *ni*, became less negative over time, and has been reanalyzed as a disjunction. We leave the diachronic analysis of *ni* for future investigation.

$$e. \quad \llbracket (37a) \rrbracket = \neg(\text{approachable}(b) \vee \text{tamable}(b))$$

Second, we argue that just like other connectives, *ni* can take scope at a higher level than its surface position. In particular, when it co-occurs with a scope-bearing operator, it can sometimes take wide scope relative to this operator.¹⁶ There are several ways to derive wide scope interpretations of connectives. One possible implementation consists in raising the type of their arguments (Rooth and Partee 1982, Partee and Rooth 1983, Hendriks 1993, a.o.). If each argument has a higher type, then the coordination phrase would have a higher type as well, and the connective would thus take wider scope than what we see on the surface. On this view, the coordination phrase *approachable ni apprivoisable* can have the denotation in (38a). When it combines with a subject generalized quantifier, say Q_{DP} , the wide scope interpretation of *ni*, is derived, as shown in (38b). For the sake of simplicity, we are working with a toy example in (38) that does not involve negation, but full examples (involving quantificational phrases and negation) will be discussed in detail in Section 5.

$$(38) \quad \begin{aligned} a. \quad & \llbracket \text{approachable ni apprivoisable} \rrbracket = \lambda P_{\langle e, t \rangle}. P(\text{approachable}) \vee P(\text{tamable}) \\ b. \quad & \llbracket Q_{DP} \text{ est approachable ni apprivoisable} \rrbracket = \llbracket Q_{DP} \rrbracket(\text{approachable}) \vee \llbracket Q_{DP} \rrbracket(\text{tamable}) \end{aligned}$$

Naturally, when *ni* co-occurs with a subject generalized quantifier, it can in principle also take narrow scope with respect to it. To derive the narrow scope interpretation of *ni*, we simply combine the denotation of the coordination phrase in (37d) with the denotation of the quantificational DP as in (39). This flexible semantics thus allows us to derive the two possible scopes *ni* can have when it co-occurs with a scope-bearing operator. Alternative analyses of the disjunction as well as alternative ways to derive wide scope readings of *ni* will be considered in Section 6.

$$(39) \quad \llbracket Q_{DP} \text{ est approachable ni apprivoisable} \rrbracket = \llbracket Q_{DP} \rrbracket(\lambda x_e. \text{approachable}(x) \vee \text{tamable}(x))$$

We now turn to the last piece of our proposal. Although *ni* can take scope at a higher level than its surface position, it always scopes under negation (or any other licenser), just like other NPIs. To capture *ni*'s NPI behavior, we adopt alternative-based accounts of negative polarity (Krifka 1995, Lahiri 1998, Chierchia 2013, a.o.), and in particular, Chierchia's (2013) approach. On this view, NPIs are existential items that obligatorily activate alternatives. Like other existential quantifiers, they activate a set of scalar alternatives, σ -ALT. In addition, they obligatorily activate a set of domain alternatives, D-ALT. For instance, a polarity sensitive item like *any* has the same denotation as a plain indefinite like *a* or *some*, given in (40a), but it also activates a set of D-ALT and σ -ALT, given in (40b) and (40c) respectively. Domain alternatives consist of subsets of the relevant quantificational domain, and scalar alternatives are obtained by replacing the existential quantifier with a universal quantifier (since $\langle \text{some}, \text{all} \rangle$ form a Horn-scale). Since scalar alternatives do not play any role in the derivation of NPIs, we are going to ignore them in the rest of the paper for the sake of simplicity.

$$(40) \quad \begin{aligned} a. \quad & \llbracket \text{any} \rrbracket = \lambda P_{\langle e, t \rangle}. \lambda Q_{\langle e, t \rangle}. \exists x \in D [P(x) \wedge Q(x)] \\ b. \quad & \text{D-ALT: } \{ \lambda P_{\langle e, t \rangle}. \lambda Q_{\langle e, t \rangle}. \exists x \in D' [P(x) \wedge Q(x)], D' \subseteq D \} \\ c. \quad & \sigma\text{-ALT: } \{ \lambda P_{\langle e, t \rangle}. \lambda Q_{\langle e, t \rangle}. \forall x \in D [P(x) \wedge Q(x)] \} \end{aligned}$$

Once they are active, alternatives need to be factored into meaning. One way to implement this is through the insertion of an exhaustification operator O_{ALT} , akin to silent *only*, defined in (41). Given

¹⁶The fact that *ni* can take wider scope than what we see on the surface does not entail that other strong NPIs exhibit a similar behavior. This is a property that *ni* shares with other connectives, as will be discussed in detail in Section 4.3.

a sentence ϕ and a set ALT of alternatives to ϕ , $O_{ALT}\phi$ asserts ϕ and negates the alternatives that are not entailed by the assertion.

$$(41) \quad \llbracket O_{ALT} \rrbracket^{g,w} \phi = \phi_w \wedge \forall p \in ALT(\phi) [p_w \rightarrow \phi \subseteq p]$$

NPIs must enter into an agreement relation with the exhaustification operator. One way to do this is by assuming that NPIs carry a [D] feature which signals that they activate a set of D-ALT, and which must be checked off by a c-commanding O_{ALT} operator.

Having introduced Chierchia's (2013) alternative-based account of negative polarity, we now turn to NPI *ni*. As already mentioned, we propose that *ni* is interpreted as a generalized disjunction. Because it is an NPI, it obligatorily activates a set of D-ALT. Following Sauerland (2004) among others, we assume that the set of D-ALT of a disjunctive statement contains each individual disjunct. To illustrate, consider the sentence in (42). (42) has the LF in (42a), and asserts (42b). The [D] feature carried by *ni* activates a set of D-ALT given in (42c). Now, since *ni* occurs in a DE environment, all the D-ALT are entailed by the assertion, and therefore not negated. Exhaustification is thus vacuous and simply returns the assertion, as shown in (42d).

- (42) Bagheera n'est pas approchable ni apprivoisable.
 Bagheera NE-is not approachable nor tamable
 'Bagheera neither is approachable nor tamable.'
- a. $\llbracket O_{ALT} [\text{pas} [\text{Bagheera est} [\text{approchable } ni_{[D]} \text{ apprivoisable}]]] \rrbracket$
 - b. Assertion: $O_{ALT} \neg (\text{approchable}(b) \vee \text{tamable}(b))$
 - c. D-ALT: $\{ \neg \text{approchable}(b), \neg \text{tamable}(b) \}$
 - d. After Exhaustification: $\neg (\text{approchable}(b) \vee \text{tamable}(b))$

In contrast, when *ni* occurs in a positive sentence, as in (43), the D-ALT given in (43c) are not entailed by the assertion. The exhaustification operator O_{ALT} thus negates all the D-ALT yielding an inference that contradicts the assertion, as illustrated in (43d).

- (43) *Bagheera est approchable ni apprivoisable.
 Bagheera is approachable nor tamable
- a. $\llbracket O_{ALT} [\text{Bagheera est} [\text{approchable } ni_{[D]} \text{ apprivoisable}]] \rrbracket$
 - b. Assertion: $O_{ALT} (\text{approchable}(b) \vee \text{tamable}(b))$
 - c. D-ALT: $\{ \text{approchable}(b), \text{tamable}(b) \}$
 - d. After Exhaustification:
 $(\text{approchable}(b) \vee \text{tamable}(b)) \wedge \neg \text{approchable}(b) \wedge \neg \text{tamable}(b)$

To summarize, if the insertion of the exhaustification operator leads to a contradiction, the sentence is ungrammatical.¹⁷ In contrast, if it results in a syntactically well-formed structure and gives rise to a semantically coherent meaning, the NPI is licensed. While this proposal captures the distribution of weak NPIs like *any*, the reader may recall that the distribution of *ni* is more restricted than the distribution of *any*. For instance, unlike *any*, *ni* cannot occur in the left argument of *chaque* ('every'). The current version of the alternatives-and-exhaustification approach of negative polarity cannot capture the distribution of strong NPIs like *ni*. Next section shows how this analysis can be enhanced to derive the contrast between weak and strong NPIs, and therefore capture the distribution of *ni*.

¹⁷For details on when and why contradictions give rise to ungrammaticality, we refer the reader to Gajewski (2002) and (Chierchia 2013:42-54).

4.2 Deriving the distribution of *ni*

Gajewski (2011) and Chierchia (2013) propose that the difference between weak and strong NPIs lies in the choice of exhaustification mode. In the case of weak NPIs like *any*, the exhaustification operator defined in (41) only looks at the truth-conditional component of meaning. In contrast, in the case of strong NPIs, the exhaustification operator, O_{ALT}^S , considers both the truth-conditional and the non-truth-conditional components of meaning (i.e., presuppositions and implicatures). Once presuppositions and implicatures are factored into meaning, if exhaustification leads to a contradiction, the sentence is ungrammatical. If however it gives rise to a semantically coherent meaning, the NPI is licensed. To see how this captures the distribution of strong NPIs, consider again the sentence in (44). The assertive component of (44) is given in (44a). Given that *every* presupposes that its restriction is non-empty, (44) presupposes that there is some child that drinks tea or coffee, as shown in (44b). Combining both components of meaning, we obtain the enriched assertion in (44c). Given that the presuppositional component is not DE, the D-ALT to the enriched assertion in (44d) are not entailed by the assertion. As a result, the exhaustification operator O_{ALT}^S negates all the alternatives yielding an inference that contradicts the assertion, as shown in (44e).

- (44) *Chaque enfant qui boit du thé ni du café sera énérvé.
 every child who drink of.the tea nor of.the coffee be.FUT irritated
- a. Assertive component:
 Every child who drinks tea or coffee will be irritated
 - b. Presuppositional component:
 There is some child who drinks tea or coffee
 - c. Enriched assertion:
 Every child who drinks tea or coffee will be irritated \wedge
 There is some child who drinks tea or coffee
 - d. D-ALT:
 {Every child who drinks tea will be irritated \wedge There is some child who drinks tea,
 Every child who drinks coffee will be irritated \wedge There is some child who drinks coffee}
 - e. After exhaustification:
 Every child who drinks T or C will be irritated \wedge There is some child who drinks T or C
 $\wedge \neg$ (Every child who drinks T will be irritated \wedge There is some child who drinks T)
 $\wedge \neg$ (Every child who drinks C will be irritated \wedge There is some child who drinks C)
 =
 Every child who drinks T or C will be irritated \wedge There is some child who drinks T or C
 $\wedge (\neg$ Every child who drinks T will be irritated $\vee \neg$ There is some child who drinks T)
 $\wedge (\neg$ Every child who drinks C will be irritated $\vee \neg$ There is some child who drinks C)

Next, we demonstrate how implicatures may interfere with exhaustification by looking at example (45). In this example, *ni* occurs under the scope of *peu* ('few'). *Peu*, as other scalar elements, has both D-ALT and σ -ALT. Its D-ALT consist of subsets of the relevant quantificational domain, as in (45b) and its σ -ALT are obtained by replacing *few* with expressions of the same Horn-scale, and in particular *no*, as shown in (45c). Combining the alternatives of *few* with the D-ALT of *ni* (given in (45d)), we obtain (45e) as the total set of alternatives of the sentence in (45). The exhaustification operator O_{ALT}^S considers this set ALT and negates the alternatives not entailed by the assertion. In

particular, O_{ALT}^S negates all the alternatives that contain the quantifier *no*, as shown in (45f). (45f) means that in any D' , there have to be children that drink tea and children that drink coffee, which contradicts the assertion. Thus, sentence (45) is expected to be ill-formed.

- (45) *Peu d'enfants boivent du thé ni du café.
 few of-children drink of.the tea nor of.the coffee
- a. Assertion: few_D children drink tea or coffee
 - b. D-ALT of *few*: { $few_{D'}$ children drink tea or coffee, $D' \subseteq D$ }
 - c. σ -ALT of *few*: { no_D children drink tea or coffee }
 - d. D-ALT of *ni*: { few_D children drink tea, few_D children drink coffee }
 - e. ALT: { $few_{D'}$ children drink tea, $D' \subseteq D$ } \cup { $few_{D'}$ children drink coffee, $D' \subseteq D$ }
 \cup { $no_{D'}$ children drink tea, $D' \subseteq D$ } \cup { $no_{D'}$ children drink coffee, $D' \subseteq D$ }
 - f. After exhaustification: few_D children drink tea or coffee
 $\wedge \neg no_{D'}$ children drink tea $\wedge \neg no_{D'}$ children drink coffee
 $= few_D$ children drink tea or coffee
 $\wedge some_{D'}$ children drink tea $\wedge some_{D'}$ children drink coffee (for any D')

A consequence of this proposal is that strong NPIs can only be licensed by operators that are both non-presuppositional and end-of-scale elements. This turns out to be the case for sentential negation, *without*, *never*, etc., thus explaining why these operators can license strong NPIs, and in particular, NPI *ni*. We are not aware of any other account of negative polarity that derives the distribution of strong NPIs in a principled manner. We take this to be an advantage of alternative-based accounts. However, as already mentioned, our proposal for *ni* does not rely on this type of account. One can adopt their favorite (existential) analysis of NPIs as long as it captures its restricted distribution.

We end this section by discussing another environment in which *ni* is not licensed. Recall that *ni* cannot occur in subject position, unless it is c-commanded by negation, as illustrated again in (46).

- (46) a. *Sonia ni Kristell n'aime pas le thé.
 Sonia nor Kristell NE-likes not the tea
- b. Jamais Sophie ni Lucas ne viendront à sa fête.
 never Sophie nor Lucas NE will.come to his party
 'Sophie and Lucas will never go to his party.'

In this case, what has been assumed for *any* is that the subject cannot reconstruct below negation (see Fălăuș and Nicolae (2016) for a recent discussion of this). Similarly, we assume that the coordination phrase in (46a) cannot reconstruct and the only structure this sentence can have is the one given in (47). Given that *ni* occurs in a non-DE environment, the insertion of the exhaustification operator leads to a contradiction and the sentence is ungrammatical. In contrast, when *ni* is c-commanded by negation (*jamais* in (46b)), the insertion of O_{ALT}^S yields a coherent meaning and *ni* is thus licensed.

- (47) [O_{ALT}^S [Sonia $ni_{[-D]}$ Kristell] n'aime pas le thé]

To sum up, we provided in this section a novel disjunctive analysis of NPI *ni* that captures its restricted distribution. The crucial difference between our proposal and previous disjunctive analyses of *ni* (de Swart 2001, Mouret 2007) lies in the claim that *ni* can take scope at a higher level than its surface position. This capacity to take wide scope is an independently observed property of connectives, as we discuss next.

4.3 Connectives and wide scope readings

The claim that connectives can take scope at a higher level than their surface position has been discussed in the literature for some time (Rooth and Partee 1982, Hendriks 1993, Szabolcsi 2004, Szabolcsi and Haddican 2004, Schlenker 2006, Brasoveanu and Farkas 2011, Lungu et al. 2019, a.o.). In particular, examples (48)-(49) (from Brasoveanu and Farkas (2011) and Hendriks (1993) respectively) show that when co-occurring with quantifiers, the disjunction *or* and the conjunction *and* can either take narrow scope relative to these quantifiers or wide scope relative to them. Example (48) allows a third reading because it involves two quantifiers. In addition to having the narrowest scope and the widest scope, *or* can take intermediate scope, as in (48c), providing additional evidence that it can take scope at a higher level than its surface position.

- (48) Every₁ student read every₂ paper that Mary or Jane recommended.
- a. For every student *x*, for every paper *y* such that Mary or Jane recommended *y*, *x* read *y*.
 $\forall_1 > \forall_2 > or$
 - b. One of Mary or Jane is such that, for every student *x*, for every paper *y* that she recommended, *x* read *y*.
 $or > \forall_1 > \forall_2$
 - c. For every student *x*, there is a person that is either Mary or Jane such that for every paper *y* that she recommended, *x* read *y*.
 $\forall_1 > or > \forall_2$
- (49) John sold and bought a car.
- a. There is a car *x* that John sold and bought.
 $\exists > and$
 - b. There is a car *x* that John sold and there is a car *y* that John bought.
 $and > \exists$

Similarly, sentences containing both connectives and negation are ambiguous between a narrow scope and a wide scope reading of the connectives. This is illustrated in (50) for the disjunction *or* and in (51) for the conjunction *and*. These examples again show that the capacity to take wider scope than what we see on the surface is a property shared by all connectives.

- (50) Mary didn't invite Lou or Suzi to the conference.
- a. Mary neither invited Lou nor Suzi to the conference.
 $\neg > or$
 - b. Either Mary did not invite Lou to the conference or Mary did not invite Suzi to the conference.
 $or > \neg$
- (51) Mary didn't take hockey and algebra. (Szabolcsi and Haddican 2004)
- a. Mary did not take both hockey and algebra.
 $\neg > and$
 - b. Mary did not take hockey and Mary did not take algebra.
 $and > \neg$

It is worth noting that the availability of these two readings is subject to cross-speaker variation (variation that we observed in the case of *ni* as well) and cross-linguistic variation (Szabolcsi 2004, Szabolcsi and Haddican 2004, Lungu et al. 2019, a.o.). The extent and the source of this variation is outside the scope of this paper and would deserve a paper on its own. Nonetheless, we can conclude from this section that the capacity of *ni* to take scope at a higher level than its surface position is due to its connective nature. In what follows, we demonstrate how our proposal derives the challenges discussed in Section 3 in a principled manner.

5 Capturing the challenging behavior of *ni*

5.1 Deriving challenge 1: under the scope of *sans* ('without')

Recall that when *ni* is embedded under negation and *sans* ('without'), the sentence receives a conjunctive reading (Doetjes 2005). That is, example (18) (repeated in (52)) can only be uttered in a context in which the meeting has started with both Quentin and Arthur.

- (52) La réunion n'a pas commencé sans Quentin ni Arthur.
 the meeting NE.has not started without Quentin nor Arthur
 'If the meeting started, it was with both Quentin and Arthur.'

As mentioned in Section 3.2.1, we assume a decompositional analysis of *sans* into negation and the preposition *avec* ('with'). When a phrase headed by *sans* combines with a verb v , it modifies the event denoted by v , as shown in (53).

$$(53) \quad \llbracket [{}_{vP} v \text{ sans } \alpha] \rrbracket = \lambda e.v(e) \wedge \neg \text{with}(\alpha)(e)$$

To illustrate this analysis in more detail, let us first consider the sentence in (54a). When *sans* combines with an e -type DP, we propose to analyze it as in (54b). Combining (54b) with the DP *Quentin*, we obtain (54c) as the meaning of the prepositional phrase. This phrase in turn combines with the predicate, and we derive (54d) as the interpretation of the whole sentence.¹⁸

- (54) a. La réunion a commencé sans Quentin.
 the meeting has started without Quentin
 'The meeting has started without Quentin.'
 b. $\llbracket \text{sans} \rrbracket = \lambda x_e.\lambda e.\neg \text{with}(x)(e)$
 c. $\llbracket \text{sans Quentin} \rrbracket = \lambda e.\neg \text{with}(q)(e)$
 d. $\llbracket (54a) \rrbracket = \exists e[\text{starting-the-meeting}(e) \wedge \neg \text{with}(q)(e)]$

Let us then consider sentence (55a) in which *sans* combines with a quantificational DP *quelque professeur que ce soit* ('any professors'). Because *quelque professeur que ce soit* is an NPI, it has to take narrow scope relative to *sans*. Given that there is no clausal node where a quantifier can raise within the prepositional phrase, we propose that the NPI is interpreted in situ. There are many ways to allow quantifiers to be interpreted in situ (Montague 1974, Hendriks 1993, Heim and Kratzer 1998, a.o.). One possible implementation consists in lifting the type of the verb or preposition the quantifier combines with so that it expects a quantifier instead of an e -type argument. Following this approach, we propose to analyze *sans* as in (55b). Combining (55b) first with the NPI (as in (55c)) and then with the rest of the sentence, we obtain (55d) as the interpretation of sentence (55a).

- (55) a. La réunion a commencé sans quelque professeur que ce soit.
 the meeting has started without some professor that it is.SUBJ
 'The meeting has started without any professors.'
 b. $\llbracket \text{sans} \rrbracket = \lambda P_{\langle et, t \rangle}.\lambda e.\neg P(\lambda y.\text{with}(y)(e))$
 c. $\llbracket \text{sans quelque professeur que ce soit} \rrbracket = \lambda e.\neg \exists y[\text{professor}(y) \wedge \text{with}(y)(e)]$
 d. $\llbracket (55a) \rrbracket = \exists e[\text{starting-the-meeting}(e) \wedge \neg \exists y[\text{professor}(y) \wedge \text{with}(y)(e)]]$

Now that we have provided an analysis for *sans*, we can come back to the sentence containing *ni* in

¹⁸For simplicity sake, we ignore tense in our derivations.

(56). On our proposal, this sentence should in principle allow the two construals in (57). In (57a), *ni* takes surface scope, namely, the narrowest scope. This construal is associated with the disjunctive reading (i.e., if the meeting has started, it was with only one person present, either Quentin or Arthur). In addition, *ni* can take wider scope than what we see on the surface. In particular, it can take wide scope with respect to *sans* while still scoping under sentential negation, as in (57b). This second construal gives rise to the conjunctive reading (i.e., if the meeting has started, it was with both Quentin and Arthur). Details about how the readings in (57) are derived will be provided soon.

(56) La réunion n'a pas commencé sans Quentin ni Arthur.
 the meeting NE.has not started without Quentin nor Arthur
 'If the meeting has started, it was with both Quentin and Arthur.'

(57) a. O_{ALT}^S *pas sans ni*
 $\forall e[\textit{starting-the-meeting}(e) \rightarrow (\textit{with}(q)(e) \vee \textit{with}(a)(e))]$
 b. O_{ALT}^S *pas ni sans*
 $\forall e[\textit{starting-the-meeting}(e) \rightarrow (\textit{with}(q)(e) \wedge \textit{with}(a)(e))]$

On the first construal, sentence (56) asserts (58a). The feature carried by *ni* activates a set of D-ALT (among other alternatives) given in (58b). Since the D-ALT are not entailed by the assertion, O_{ALT}^S negates all the D-ALT, as shown in (58c). Now, because the subject of this sentence refers to the unique relevant meeting that took place in the past, there exists only one event which was a starting event of that meeting. In other words, there is only one event that makes the antecedents of the conditionals true in (58c). Given this, the strengthened meaning leads to a contradiction. This rules out the configuration in (57a), and therefore captures the unavailability of the disjunctive reading.

(58) a. Assertion: $O_{ALT}^S \neg \exists e[\textit{starting-the-meeting}(e) \wedge \neg(\textit{with}(q)(e) \vee \textit{with}(a)(e))]$
 $\equiv O_{ALT}^S \forall e[\textit{starting-the-meeting}(e) \rightarrow (\textit{with}(q)(e) \vee \textit{with}(a)(e))]$
 b. D-ALT = $\{ \neg \exists e[\textit{starting-the-meeting}(e) \wedge \neg(\textit{with}(q)(e))],$
 $\neg \exists e[\textit{starting-the-meeting}(e) \wedge \neg(\textit{with}(a)(e))] \}$
 $= \{ \forall e[\textit{starting-the-meeting}(e) \rightarrow \textit{with}(q)(e)],$
 $\forall e[\textit{starting-the-meeting}(e) \rightarrow \textit{with}(a)(e)], \}$
 c. After Exhaustification: $\forall e[\textit{starting-the-meeting}(e) \rightarrow (\textit{with}(q)(e) \vee \textit{with}(a)(e))]$
 $\wedge \neg \forall e[\textit{starting-the-meeting}(e) \rightarrow \textit{with}(q)(e)]$
 $\wedge \neg \forall e[\textit{starting-the-meeting}(e) \rightarrow \textit{with}(a)(e)]$

That other NPIs are not licensed in the same environment confirms that the configuration in (57a) is not licit. Unlike *ni*, NPIs like French *le moindre* and English *any* cannot take scope at a higher level than what we see on the surface. Therefore, the sentences in (59) only allow the configuration O_{ALT}^S *not without NPI* – configuration that has just been ruled out.¹⁹

¹⁹The sentences in (59) are well-formed when used in a denial context. In this case however, they may not have the same structure. In particular, we believe that when used in a denial context, they allow the construal *pas* O_{ALT}^S *sans NPI*. The fact that the sentence containing *ni* in (56) can have a disjunctive reading when used in the same type of context confirms that a different structure is involved.

(i) a. A: Hier, la réunion a commencé sans Jean ni Pierre.
 'Yesterday, the meeting started without Jean or Pierre.'
 b. B: Non, la réunion n'a pas commencé sans Jean ni Pierre. J'ai vu Pierre rentrer dans la salle juste avant que ça commence.
 'No, the meeting didn't start without Jean or Pierre. I saw Pierre entering the room just before it started.'

- (59) a. *La réunion n'a pas commencé sans le moindre professeur.
the meeting NE.has not started without the least professor
b. *The meeting hasn't started without any professor.

Having ruled out the configuration in (57a), we now turn to the second construal. On our proposal, *ni* can take scope at a higher level than its surface position. In particular, it can take wide scope relative to *sans*, and the prepositional phrase can have the meaning in (60a). Composing (60a) with the rest of the sentence, we derive (60b) as the meaning of (52) before exhaustification. This corresponds to the second configuration, $O_{ALT}^S pas ni sans$, in (57b). Under this configuration, the sentence in (56) asserts (61a). All the D-ALT in (61b) are now entailed by the assertion and therefore not negated. Exhaustification is vacuous and simply returns the assertion, as shown in (61c). The conjunctive reading of sentence (56) is thus derived.

- (60) a. $\llbracket sans\ Quentin\ ni\ Arthur \rrbracket = \neg with(q)(e) \vee \neg with(a)(e)$
b. $\llbracket La\ réunion\ n'a\ pas\ commencé\ sans\ Quentin\ ni\ Arthur \rrbracket$
 $= \neg \exists e [starting-the-meeting(e) \wedge (\neg with(q)(e) \vee \neg with(a)(e))]$
- (61) a. Assertion: $O_{ALT}^S \neg \exists e [starting-the-meeting(e) \wedge (\neg with(q)(e) \vee \neg with(a)(e))]$
 $\equiv O_{ALT}^S \forall e [starting-the-meeting(e) \rightarrow (with(q)(e) \wedge with(a)(e))]$
b. D-ALT = $\{ \neg \exists e [starting-the-meeting(e) \wedge \neg (with(q)(e))],$
 $\neg \exists e [starting-the-meeting(e) \wedge \neg (with(a)(e))] \}$
 $= \{ \forall e [starting-the-meeting(e) \rightarrow with(q)(e)],$
 $\forall e [starting-the-meeting(e) \rightarrow with(a)(e)], \}$
c. After Exhaustification: $\forall e [starting-the-meeting(e) \rightarrow (with(q)(e) \wedge with(a)(e))]$

The reader may wonder why the sentence in (56) does not allow the construal in (62). Under this construal, the exhaustification process would not give rise to a contradiction and the sentence would get a disjunctive reading (i.e., if the meeting has started, it was either with Quentin or Arthur). And importantly, we do have independent evidence that a construal parallel to (62) is available when a higher clausal negation is involved. Examples (63) show that when sentential negation appears in the matrix clause, NPIs occurring in the embedded clause are licensed. In addition, the sentence containing *ni* in (63a) can this time have a disjunctive reading.

- (62) *pas* O_{ALT}^S *sans* *ni*
 $\neg (\exists e [starting-the-meeting(e) \wedge O_{ALT}^S \neg ((with(q)(e) \vee with(a)(e)))]$

- (63) *doubt* O_{ALT}^S *without* *NPI*
a. Je doute que la réunion ait commencé sans Quentin ni Arthur.
I doubt that the meeting has.SUBJ started without Quentin nor Arthur
'I doubt that the meeting has starting without Quentin or Arthur.'
b. I doubt that the meeting has started without any professors.

We propose that the reason why (56) does not allow the construal in (62) is the following: the exhaustification operator O_{ALT}^S can only be inserted at a clausal node. In examples (63), it can be inserted at the periphery of the embedded clause, giving rise to the configuration *doubt* O_{ALT}^S *without* *NPI*. In contrast, since there is no clausal node between sentential negation and *sans* in (56), the construal

in (62) is not available. In that case, the exhaustification operator has to be inserted at the periphery of the matrix clause, giving rise to the configuration O_{ALT}^S *pas sans ni*.

Examples (64) provide further evidence for this claim. (64a) shows that NPIs like *ever* are licensed when they occur under the scope of *too*. Interestingly, adding negation makes the sentence ill-formed, as shown in (64b). Given that there is no clausal node between sentential negation and *too*, we predict the construal in (65) not to be available. Here again, the exhaustification operator has to be inserted at the periphery of the matrix clause, giving rise to the configuration in (66). Since exhaustifying at this level leads to a contradiction, we explain why sentence (64b) is ill-formed.²⁰

- (64) a. John thinks he is too smart to ever be caught.
 b. *John thinks he isn't too smart to ever be caught.

(65) *not* O_{ALT}^S *too ever* (66) O_{ALT}^S *not too ever*

Taking stock, we proposed in this section that the conjunctive reading of *ni* follows from its disjunctive interpretation and its capacity to take scope above *sans*. The disjunctive reading is not available because *ni* is not licensed when occurring under the scope of two local negations. This behavior extends to other NPIs like *le moindre* and *any* who cannot occur under the scope of two clausemate negations. We turn next to the second challenge.

5.2 Deriving challenge 2: under the scope of *pas tous* ('not every')

The second challenge for disjunctive analyses of *ni* was based on sentences in which *ni* occurs under the scope of *pas tous* ('not every'). Recall that when asked to judge the sentence in (67a), the speakers we consulted divided into two groups. For the first group of speakers, sentence (67a) is ill-formed, suggesting that they interpret *ni* as a narrow scope disjunction. In contrast, the second group of speakers interpret sentence (67a) as in (67b).

- (67) a. %Pas tous les étudiants ne fument ni ne boivent.
 not all the students NE smoke nor NE drink
 b. $\neg(\forall x[student(x) \rightarrow smoke(x)] \vee \forall x[student(x) \rightarrow drink(x)])$
 'Not every student smokes and not every student drinks.'

Under our proposal, *ni* can in principle take both narrow scope and wide scope relative to the universal quantifier. These two readings are given in (68a) and (68b) respectively. The narrow scope reading of *ni* is ruled out because the universal quantifier intervenes between negation and *ni* thus triggering an intervention effect. Speakers who only allow *ni* to have the narrowest scope thus judged sentence (67a) to be ill-formed.

- (68) a. $\neg\forall x[student(x) \rightarrow (smoke(x) \vee drink(x))]$
 'Not every student smokes or drinks.'
 b. $\neg(\forall x[student(x) \rightarrow smoke(x)] \vee \forall x[student(x) \rightarrow drink(x)])$
 'Not every student smokes and not every student drinks.'

²⁰Note that the ungrammaticality of (64b) is not due to the fact that *too* cannot occur under negation. The following example shows that this configuration is attested.

- (i) I am not too proud to admit that.

In contrast, speakers who allow *ni* to take wider scope than what we see on the surface, can interpret the coordination phrase as in (69a). Combining the coordination phrase with the quantificational phrase given in (69b), we obtain (69c) as the interpretation of the sentence in (67a), as expected.

- (69) a. $\llbracket \textit{fument ni boivent} \rrbracket = \lambda R_{\langle e,t,t \rangle}. R(\lambda x. \textit{smoke}(x)) \vee R(\lambda x. \textit{drink}(x))$
 b. $\llbracket \textit{tous les étudiants} \rrbracket = \lambda P_{\langle e,t \rangle}. \forall y[\textit{student}(y) \rightarrow P(y)]$
 c. $\llbracket (67a) \rrbracket = \neg(\forall x[\textit{student}(x) \rightarrow \textit{smoke}(x)] \vee \forall x[\textit{student}(x) \rightarrow \textit{drink}(x)])$

We hypothesize that in this case, the wide scope reading of *ni* is not available for all speakers because it leads to a weaker reading than the narrow scope reading of *ni* given in (68a). Adding this extra typeshifting operation to derive a weaker reading is a last resort operation that may not be available to everyone. In the case of examples involving *sans* (discussed in the previous section), the wide scope reading of *ni* (i.e., the conjunctive reading) was stronger than the narrow scope reading (i.e., the disjunctive reading). As a result, we did not observe the same cross-speaker variation.

We follow the same reasoning to capture the fact that some speakers allow the sentence in (70) to have the reading in (70a). The other reading is also captured by our proposal. In this case, the universal quantifier takes wide scope relative to negation and *ni* is interpreted as a narrow scope disjunction. The wide scope reading of *ni* is not available because *ni* cannot outscope negation: it would not be licensed (i.e., exhaustification would lead to a contradiction) in such a context.

- (70) Tous les animaux ne sont pas approchables ni apprivoisables.
 all the animals NE are not approachable nor tamable
 a. $\neg(\forall x[\textit{animal}(x) \rightarrow \textit{approachable}(x)] \vee \forall x[\textit{animal}(x) \rightarrow \textit{tamable}(x)])$
 b. $\forall x[\textit{animal}(x) \rightarrow \neg(\textit{approachable}(x) \vee \textit{tamable}(x))]$

Crucially, a conjunctive analysis cannot capture the contrast between the two groups of speakers both for sentences (67a) and (70). If *ni* were interpreted as a wide scope conjunction in these sentences, nothing should prevent it from taking the widest scope. That is, such an analysis predicts that all speakers interpret sentence (67a) as in (67b), and sentence (70) as in (70a), contrary to facts. Again, we have shown in this section that the apparent problematic behavior of *ni* follows from its disjunctive interpretation and its capacity to take wide scope with respect to other logical operators.

5.3 Deriving challenge 3: Q-adverbs and non-anti-additive contexts

The last challenge for disjunctive analyses of *ni* was based on sentences in which *ni* co-occurs with Q-adverbs like *dans la plupart des cas* (‘in most cases’) which create a non-AA function when they occur together with negation. In particular, we have shown that the sentence in (71a) allows the scope splitting reading in (71b).

- (71) a. Dans la plupart des cas, Marie ne lit pas ses cours ni Jean ses exercices.
 in the most of cases Marie NE read not her lessons nor Jean his exercises
 b. $(Q(\neg p) \wedge Q(\neg q))$: ‘In most cases, Marie doesn’t read her lessons and in most cases, Jean doesn’t read his exercises.’

As discussed in Section 3, the availability of the scope splitting construal does not crucially rely on the use of the Q-adverb *dans la plupart des cas*. We tested additional adverbs and found that sentences containing the Q-adverbs in (72) – called Wide Scope (WS) Q-adverbs – all allow the

reading $(Q (\neg p) \wedge Q (\neg q))$.

- (72) *Wide Scope (WS) Q-adverbs:*
dans la plupart des cas ('in most cases'), *deux fois par semaine* ('twice per week'), *généralement* ('generally'), *d'habitude* ('usually'), *la plupart du temps* ('most of the time'), *de temps en temps* ('from time to time'), *parfois* ('sometimes'), *à plusieurs reprises* ('several times')

As far as we can tell, very little is known about frequency adverbs. Moreover, the WS Q-adverbs in (72) do not seem to form a natural class: they vary in quantificational force (e.g., *deux fois par semaine* has an existential force, whereas *dans la plupart des cas* has a universal force) as well as in their frequency (e.g., *de temps en temps* vs. *à plusieurs reprises*). Interestingly however, we show that these adverbs share the following property: when co-occurring with negation, they have to take the widest scope. To illustrate, let us consider the examples in (73) that involve the WS Q-adverb *à plusieurs reprises* ('several times'). If *à plusieurs reprises* were interpreted under the scope of negation, the sentences in (73) should be judged false in context (75), where Marie has played violin four out of seven days. In contrast, this context makes the other reading, given in (74a), true. That both sentences in (73) are judged true in context (75) shows that they both have the reading in (74a). That is, the adverb takes wide scope with respect to negation.

- (73) a. *A plusieurs reprises, Marie n'a pas joué de violon.*
 several times Marie NE.has not played of violin
 b. *Marie n'a pas joué de violon à plusieurs reprises.*
 Marie NE.has not played of violin several times
- (74) a. $Q > \neg$: 'Several times (last week), Marie has not played violin.'
 b. $\neg > Q$: 'It is not the case that Marie has played violin several times (last week).'

- (75) *Context that makes the reading $Q > \neg$ true:*
 Last week, Marie has not played violin three out of seven days (Day 2, Day 4 and Day 6).

| D ₁ | D ₂ | D ₃ | D ₄ | D ₅ | D ₆ | D ₇ |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| yes | no | yes | no | yes | no | yes |

Examples (76) make the same point for the WS Q-adverb *dans la plupart des cas*. Context (78) makes the reading in (77a) false and the reading in (77b) true. Given that both sentences in (76) are judged false in (78), we conclude that they both have the reading in (77a). In other words, *dans la plupart des cas*, just like the WS Q-adverb *à plusieurs reprises*, has to take wide scope relative to negation.

- (76) a. *Dans la plupart des cas, Marie ne lit pas ses cours.*
 in the most of cases Marie NE read not her lessons
 b. *Marie ne lit pas ses cours dans la plupart des cas.*
 Marie NE read not her lessons in the most of cases
- (77) a. $Q > \neg$: 'In most cases, Marie doesn't read her lessons.'
 b. $\neg > Q$: 'It is not the case that Marie reads her lessons in most cases.'

- (78) *Context that makes the reading $\neg > Q$ true:*
 Marie doesn't read her lessons three out of six days (Day 1, Day 2 and Day 3).

| D ₁ | D ₂ | D ₃ | D ₄ | D ₅ | D ₆ |
|----------------|----------------|----------------|----------------|----------------|----------------|
| no | no | no | yes | yes | yes |

This finding is reminiscent of Horn’s (1978) observation that the English adverb *usually* tends to take wide scope with respect to negation, as shown in example (79) (from Horn (1989)).

(79) She doesn’t usually attend church. *usually* > ¬

The precise mechanism that leads to the wide scope reading of *usually* and the status of this reading are still under debate. While Horn (1978) claims that *usually* is a Neg-Raising (NR) expression which allows negation to be interpreted below it, Homer (2015) provides several tests against this proposal.²¹ Using one of these tests, we show that the WS Q-adverbs in (72) also differ from NR expressions. NR predicates are known to operate cyclically (Fillmore 1963; Gajewski 2007). If a negation appears at the top of a sequence of NR expressions, negation can take the narrowest scope, as illustrated in (80). That is, the sentence in (80a) can be interpreted as in (80b).

(80) a. I don’t imagine Mary thinks Fred wants to leave. (Gajewski 2007)
 b. I imagine Mary thinks Fred wants not to leave. imagine > want > ¬

In contrast, the WS Q-adverbs cannot operate cyclically. This is illustrated for the adverbs *à plusieurs reprises* and *dans la plupart des cas* in (81) and (82) respectively. If *à plusieurs reprises* could take wide scope with respect to negation in sentence (81a), it should be compatible with the continuation in (81b) because it would be true that the speaker thinks that several times last month, Zoe didn’t play violin. However, (81a) cannot be followed by this continuation, which shows that negation cannot take the narrowest scope in this sentence. As for *dans la plupart des cas*, it is the availability of the continuation in (82b) that confirms the ban on the narrowest scope for negation in sentence (82a). In particular, if the speaker thinks that Zoe does her homework every other day, it is not true that they think that in most cases, she didn’t do them. The fact that these two WS Q-adverbs do not pass this cyclicity test shows that they differ from NR predicates.

(81) a. Le mois dernier, je ne pense pas que Zoe ait joué du violon à plusieurs reprises.
 the last month I NE think not that Zoe has played of.the violin at several times
 ‘Last month, I don’t think Zoe has played violin several times.’ think > ¬ > Q

b. #Je pense qu’elle en a joué un jour sur deux.
 I think that.she it has played one day over two
 ‘I think that she played violin every other day.’

(82) a. Je ne pense pas que Zoe fasse ses devoirs dans la plupart des cas.
 I NE think not that Zoe does her homework in the most of.the cases
 ‘I don’t think that Zoe does her homework in most cases.’ think > ¬ > Q

b. Je pense qu’elle les fait un jour sur deux.
 I think that.she them do one day over two
 ‘I think she does them every other day.’

Although it is now clear that frequency adverbs like *usually* and the WS Q-adverbs in (72) differ from NR expressions, it is still unclear what these adverbs are and how their wide scope interpretations

²¹We thank a reviewer for bringing these to our attention.

relative to negation are derived in sentences like (73) and (76). No response to these questions has been provided in the literature. What we know is that an extra mechanism (distinct from the NR process) is needed to derive the wide scope interpretation of these adverbs.

In this paper, we propose such a mechanism which derives wide scope interpretations of existential WS Q-adverbs on the one hand, and wide scope interpretations of universal WS Q-adverbs on the other hand. We start with existential adverbs like *à plusieurs reprises*. Let us consider again the sentence in (83a) in which *à plusieurs reprises* co-occurs with negation. This sentence has the underlying structure in (83b) and the simplified truth-conditions in (83c). Now, for existential Q-adverbs like *à plusieurs reprises*, the narrow scope reading of the Q-adverb in (83c) entails the wide scope interpretation in (83d): if it is false that Marie played violin several times last month, then it is true that several times last month, she didn't play violin. Accordingly, the wide scope reading of these Q-adverbs is simply due to an entailment.

- (83) a. Marie n'a pas joué de violon à plusieurs reprises.
 Marie NE.has not played of violin several times
 'Several times (last week), Marie has not played violin.' Q > ¬
- b. [pas [Q Marie a joué du violon]]
- c. ¬Q(p)
- d. Q(¬p)

We now turn to universal WS Q-adverbs like *dans la plupart des cas*. In this case, we propose that the wide scope reading of the adverbs is derived as a local implicature. To illustrate, consider again sentence (84a) where *dans la plupart des cas* co-occurs with negation. Intuitively, our claim is that when a speaker utters this sentence, they imply that Marie did not read her lessons half of the time, because if they believed that Marie had read her lessons half of the time, they would have said so. In other words, just like other quantificational elements, universal WS Q-adverbs give rise to implicatures. For the sake of simplicity, we adopt the same theoretical framework as for NPIs and attribute implicature calculation to an exhaustification operator O_{ALT} (Chierchia et al. 2012, a.o.). On this view, sentence (84a) has the underlying structure in (84b) and asserts (84c). The WS Q-adverb *in most cases* (MOST in (84)) comes with the alternative in (84d) which involves the adverb *half of the time* (HALF in (84)). Because this alternative is not entailed by the assertion, it is negated and we derive for the sentence in (84a) the implicature in (84e). The same mechanism would apply to derive the wide scope readings of other universal WS Q-adverbs in (72).

- (84) a. Marie ne lit pas ses cours dans la plupart des cas.
 Marie NE read not her lessons in the most of cases
 'In most cases, Marie doesn't read her lessons.' Q > ¬
- b. O_{ALT} [pas [Q Marie lit ses cours]]
- c. Assertion: ¬MOST(p) $p : read(\iota x.lesson(x) \wedge of(m)(x))(m)$
- d. ALT: HALF(p)
- e. After Exhaustification: ¬MOST(p) \wedge ¬HALF(p) = MOST(¬p)

Some evidence in favor of this analysis is that just like other implicatures, the implicature associated with Q-adverbs is cancellable. This is shown in (85).

- (85) a. Marie ne lit pas ses cours dans la plupart des cas.
 Marie NE read not her lessons in the most of cases

- b. ... In fact, she reads them half of the time.

To sum up, we proposed two distinct mechanisms to capture the wide scope interpretation of WS Q-adverbs. For existential WS Q-adverbs, we claim that it is due to an entailment, whereas for universal WS Q-adverbs, it is an implicature. Whether these are the only mechanisms responsible for the behavior of these adverbs is a question that needs further investigation. For present purposes, our main goal is to show that the behavior of WS Q-adverbs is due to plausible and independent mechanisms, which ultimately impact the interpretation of *ni*. In particular, let us return to sentence (71a) (repeated below). Gapping has been argued to involve a conjunction of two vPs (Johnson 2009, Dagnac 2016, a.o.). On this view, the sentence in (86) has the underlying structure in (87a). That is, *ni* conjoins two vPs, and the Q-adverb adjoins to each of these vPs. The surface structure is then derived as follows. The Q-adverbs and the verbs move across the board to higher projections, and the subject of the first disjunct asymmetrically moves to Spec,TP, as illustrated in (87b). This structure could in principle give rise to two logical forms (LF): either the adverb could be interpreted in its surface position, as in (88a), or it could reconstruct and take the narrowest scope, as in (88b). The first LF corresponds to the narrow scope disjunction reading. However, recall that although we expect this reading to be available, we could not test whether it is available independently from the scope splitting reading (since the former entails the latter). Under the second LF, sentence (86) asserts (89a) and comes with the alternative in (89b). The scope splitting construal in (89c) is thus an implicature we derive for this sentence.

- (86) Dans la plupart des cas, Marie ne lit pas ses cours ni Jean ses exercices.
in the most of cases Marie NE read not her lessons nor Jean his exercises

- (87) a. [_{pas} [_{CoordP} [_{vP₁} Q Marie lit ses cours] [_{Coord⁰} ni] [_{vP₂} Q Jean lit ses exercices]]]]
b. [_{TP} Q_k [_{TP} Marie_i ne lit_j pas [_{CoordP} [_{vP₁} t_k t_i t_j ses cours] [_{Coord⁰} ni] [_{vP₂} t_k Jean t_j ses exercices]]]]]

- (88) $p : read(\iota x.lesson(x) \wedge of(m)(x))(m)$ $q : read(\iota x.exercise(x) \wedge of(j)(x))(j)$
a. $Q(\neg(p \vee q))$
b. $\neg(Q(p) \vee Q(q))$

- (89) a. Assertion: $\neg(MOST(p) \vee MOST(q))$
b. ALT: $HALF(p) \vee HALF(q)$
c. After exhaustification:
 $\neg(MOST(p) \vee MOST(q)) \wedge \neg(HALF(p) \vee HALF(q)) = (MOST(\neg p) \wedge MOST(\neg q))$

Now that we have shown how we capture the scope splitting reading of sentence (86), we turn to the additional data we provided which does not involve gapping. In that case, recall that speakers divide into two groups: some allow example (90) to have the scope splitting construal in (91a), whereas others do not. For the latter group of speakers, this sentence can only have the reading in (91b).

- (90) Dans la plupart des cas, Marie ne lit pas ses cours ni ses exercices.
in the most of cases Marie NE read not her lessons nor his exercises

- (91) a. $(Q(\neg p) \wedge Q(\neg q))$: ‘In most cases, Marie doesn’t read her lessons and in most cases, Marie doesn’t read her exercises.’
b. $Q(\neg(p \vee q))$: ‘In most cases, Marie doesn’t read her lessons or her exercises.’

Let us start with the first group of speakers, namely speakers who allow (90) to have the scope splitting reading ($Q(\neg p) \wedge Q(\neg q)$). We propose that for these speakers, the sentence in (90) has the structure in (92). That is, the adverb adjoins to vP below negation. Under our proposal, this structure can lead to two different readings: the narrow scope reading of *ni*, given in (93a), and the wide scope reading of *ni*, given in (93b). Reading (93a) is ruled out since the adverb intervenes between negation and *ni* thus triggering an intervention effect. In contrast, when sentence (90) has the reading in (93b), it has the same truth conditions as the sentence involving gapping in (86), and thus gives rise to the scope spitting reading ($Q(\neg p) \wedge Q(\neg q)$). The derivation proceeds as in (89).

(92) [O_{ALT}^S [pas [Q [Marie lit [ses cours $ni_{[D]}$ ses exercices]]]]]

(93) $p : read(\iota x.lesson(x) \wedge of(m)(x))(m)$ $q : read(\iota x.exercise(x) \wedge of(m)(x))(m)$
 a. $\neg(Q(p \vee q))$
 b. $\neg(Q(p) \vee Q(q))$

To summarize, speakers who allow sentence (90) to have the scope splitting reading ($Q(\neg p) \wedge Q(\neg q)$) are speakers who allow *ni* to take wider scope than what we see on the surface. Again, that this reading is only available for some speakers may be due to the fact that it is weaker than the narrow scope reading of *ni* given in (93a).

In contrast, speakers who do not allow the scope splitting construal in (91a) interpret sentence (90) as in (91b). Given that the narrow scope reading of *ni* is ruled out when the sentence has the structure in (92), we suggest that for this second group of speakers, the sentence in (90) has a different structure. In particular, the adverb is adjoined to TP above negation, as shown in (94a), giving rise to the truth conditions in (94b).

(94) a. [Q [O_{ALT}^S [pas [Marie lit [ses cours $ni_{[TP]}$ ses exercices]]]]]
 b. $p : read(\iota x.lesson(x) \wedge of(m)(x))(m)$ $q : read(\iota x.exercise(x) \wedge of(m)(x))(m)$
 $Q(\neg(p \vee q))$

Crucially, the fact that some speakers do not allow sentence (90) to have the scope splitting construal in (91a) is not predicted by a conjunctive analysis of *ni*. If *ni* were interpreted as a wide scope conjunction, we would expect it to be able to take the widest scope in (90). Thus, the sentence in (90), just like the sentence in (86), should be interpreted as in (91a), contrary to fact.

To sum up, we have shown that the scope splitting readings of sentences containing both WS Q-adverbs and *ni* follow from (i) the disjunctive interpretation of *ni*, (ii) its capacity to take wide scope with respect to WS Q-adverbs, and (iii) the behavior of the WS Q-adverbs used in the test sentences. We will see in section 7 that the behavior of WS Q-adverbs explored in this section is not limited to French. In this section, we also captured the contrast between sentences involving gapping and sentences that did not – contrast which cannot be accounted for by a conjunctive analysis. More generally, we have provided a disjunctive analysis of *ni* that accounts for both its distribution and its interpretation. On our proposal, the universal-like behavior of *ni* turns out to be an epiphenomenon. It follows from its disjunctive interpretation as well as its capacity to take wider scope than what we see on the surface. The formal mechanisms through which wide scope readings of connectives are obtained remain controversial. As far as we know, none of the analyses that capture these wide scope readings have looked at negative coordination, even though items like *ni* allow us to evaluate

these analyses. In section 4, we implemented our analysis using typeshifting. In the next section, we discuss alternative ways to derive wide scope readings of *ni*.

6 Alternative proposals for wide scope readings of connectives

There are three main ways of deriving wide scope readings of connectives. As discussed in Section 4, one can adopt a type-shifting approach to raise the type of the coordination phrase. Alternatively, one could adopt a Hamblin semantics for disjunction (Aloni 2003, Simons 2005, Alonso-Ovalle 2006, a.o.) or a Conjunction Reduction approach (Gleitman 1965, Ross 1967, Hankamer 1979, Hirsch 2017, a.o.). This section argues against the latter approach. In particular, we show that in contrast to a Hamblin semantics approach, a Conjunction Reduction approach fails to capture the challenging behavior of *ni*.

6.1 A Hamblin semantics for disjunctions

Following Hamblin’s (1973) insight that there are expressions that denote sets of alternatives as their semantic value, some researchers have recently argued that disjunctions introduce into the derivation the denotation of their disjuncts as alternatives (Aloni 2003, Simons 2005, Alonso-Ovalle 2006, a.o.). On this view, when *or* conjoins two DPs, the coordination phrase denotes a set containing the denotations of each DP, as shown in (95a). Combining this set first with the predicate (95b) and then with the subject via pointwise functional application, this approach derives (95c) as the denotation of *Zoe has read Les Misérables or L’étranger*.

- (95) Zoe has read *Les Misérables* or *L’étranger*.
- a. $\llbracket \text{Les Misérables or L'étranger} \rrbracket = \{m, e\}$
 - b. $\llbracket \text{has read Les Misérables or L'étranger} \rrbracket = \{\lambda x.\text{read}(m)(x), \lambda x.\text{read}(e)(x)\}$
 - c. $\llbracket \text{Zoe has read Les Misérables or L'étranger} \rrbracket = \{\text{read}(m)(z), \text{read}(e)(z)\}$

The sets of alternatives introduced by the disjunction keep expanding until they meet an operator that can select the alternatives and factor them into meaning. One such operator is the existential closure operator defined in (96). This operator can either combine with a predicate (VP-level), as in (96a), or with a proposition (TP-level), as in (96b) (Li and Law 2016).

- (96) a. For $\llbracket \alpha \rrbracket^{g,w} \subseteq D_{\langle e,t \rangle}$, $\llbracket \exists \alpha \rrbracket^{g,w} = \lambda y.\exists P[P \in \llbracket \alpha \rrbracket^{g,w} \wedge P_w(y)]$
 b. For $\llbracket \alpha \rrbracket^{g,t} \subseteq D_t$, $\llbracket \exists \alpha \rrbracket^{g,t} = \exists p[p \in \llbracket \alpha \rrbracket^{g,w} \wedge p_w]$

To derive the interpretation of the sentence in (95), we combine the propositional-level closure operator in (96b) with (95c). As a result, we obtain (97).

- (97) $\llbracket (95) \rrbracket = \exists p[p \in \{\text{read}(m)(z), \text{read}(e)(z)\} \wedge p]$

Now, when disjunction co-occurs with negation, as in (98), the narrow and wide scope interpretations of the disjunction can be captured by applying the existential closure operator at different levels (Li and Law 2016). To derive the narrow scope reading of *or*, the existential closure operator applies at the VP-level below negation, as in (99). In contrast, when the existential closure operator applies at the TP-level, we obtain the wide scope reading of *or*, as in (100).

- (98) Zoe has not read *Les Misérables* or *L'étranger*.
- (99) *Narrow scope reading of or:*
- 'Zoe has neither read *Les Misérables* nor *L'étranger*.'
 - $[_{IP} \text{ Zoe has not } [\exists [_{VP} \text{ read } \textit{Les Misérables} \text{ or } \textit{L'étranger}]]]$
 - $\neg \exists P [P \in \{ \lambda y. \textit{read}(m)(y), \lambda y. \textit{read}(e)(y) \} \wedge P(z)]$

- (100) *Wide scope reading of or:*
- 'Zoe has not read *Les Misérables* or Zoe has not read *L'étranger*.'
 - $[\exists [_{IP} \text{ Zoe has not read } \textit{Les Misérables} \text{ or } \textit{L'étranger}]]$
 - $\exists p [p \in \{ \neg \textit{read}(m)(z), \neg \textit{read}(e)(y) \} \wedge p]$

Wide scope readings of *ni* could be derived in a similar way. Although *ni* must scope under negation (in contrast to regular disjunctions), we have shown that when it co-occurs with yet another scope-bearing expression (e.g., an additional negation, an adverb, or a universal quantifier), it can take wide scope relative to this expression. Examples (101)-(103) illustrate what such an analysis would look like. Recall that the sentence in (101a) which involves the universal quantifier *tous* ('all') can be interpreted as in (101b) by some speakers. This wide scope reading of *ni* can be derived by applying the universal closure operator at the TP-level, between negation and the universal quantifier, as in (102). If the narrow scope reading of *ni* were available, it could be derived as in (103): namely, the existential closure operator could occur at the VP-level combining with the coordination phrase.

- (101) a. %Pas tous les étudiants ne fument ni ne boivent.
not all the students NE smoke nor NE drink
- b. 'Not every student smokes and not every student drinks.'
- (102) *Wide scope reading of ni:*
- 'Not every student smokes and not every student drinks.'
 - $[O_D [\text{pas } [\exists [\text{tous les étudiants } [\text{ne fument ni ne boivent}]]]]]$
 - $\neg \exists p [p \in \{ \forall x [\textit{student}(x) \rightarrow \textit{smoke}(x)], \forall x [\textit{student}(x) \rightarrow \textit{drink}(x)] \} \wedge p]$
- (103) *Narrow scope reading of ni:*
- 'Not every student smokes or drinks.'
 - $[O_D [\text{pas } [\text{tous les étudiants } [\exists [\text{ne fument ni ne boivent}]]]]]$
 - $\forall x [\textit{student}(x) \rightarrow \exists P [P \in \{ \lambda y. \textit{smoke}(y), \lambda y. \textit{drink}(y) \} \wedge P(x)]]$

The analysis we just sketched relies on the fact that universal quantifiers like *tous* and negation cannot select the alternatives and factor them into meaning. This contrasts with Kratzer and Shimoyama's (2002) influential proposal for indefinites. However, we believe that this is a desirable result as it prevents having multiple meanings for such operators.

To conclude, just like the type-shifting approach we adopted in Section 4, an approach based on a Hamblin-like semantics for disjunctions can derive the wide scope readings of *ni* and capture its challenging behavior. We now turn to another approach, namely Conjunction Reduction.

6.2 Conjunction Reduction approaches

There are two main versions of the Conjunction Reduction (CR) approach. At first, researchers have claimed that connectives uniformly conjoin full clauses (Gleitman 1965, Ross 1967, Hankamer 1979, a.o.). We refer to this version as CR_1 .

(104) Connectives uniformly conjoin full clauses. CR_1

On this view, the sentence in (105a) which involves the disjunction *or* has the structure in (105b): that is, *or* underlyingly conjoins two TPs.

(105) a. Zoe likes *Les Misérables* or *L'étranger*.
 b. [$_{CoordP}$ [$_{TP_1}$ Zoe likes *Les Misérables*]] [$_{Coord^0}$ or] [$_{TP_2}$ Zoe likes *L'étranger*]]

Several arguments have been provided against such an analysis. One of them is based on examples like (106) (Hirsch 2017:72, adapted from Rooth and Partee 1982). CR_1 predicts that the sentence in (106a) has the same underlying structure as the sentence in (106b), and therefore predicts the two sentences to be semantically equivalent. However, these two sentences differ in meaning: *and* can only take the narrowest scope in (106a) whereas it has to take the widest scope in (106b), as suggested by the two surface structures.

(106) a. Some company hired a maid and a cook. *some* > *and*
 b. Some company hired a maid and some company hired a cook. *and* > *some*

To overcome this problem, Hirsch (2017) argues for a new version of CR, given in (107).

(107) Connectives uniformly conjoin constituents of type *t*. CR_2

According to CR_2 , the sentence in (105a) has the structure in (108): that is, *or* conjoins two vPs which as full clauses, denote truth-values. For details about how the surface structure is derived, we refer the reader to Hirsch (2017:79).

(108) [$_{TP}$ Zoe_{*i*} [$_{CoordP}$ [$_{vP_1}$ *t_i* likes *Les Misérables*]] [$_{Coord^0}$ or] [$_{vP_2}$ *t_i* likes *L'étranger*]]]

CR_2 predicts that a sentence involving a coordination of two DPs is semantically equivalent to a sentence involving a coordination of two vPs. Assuming that Gapping involves the coordination of two vPs (as in Section 4.2.2. and in Hirsch (2017)), CR_2 predicts the two sentences in (109a) and (109b) to have the same underlying structure (modulo the subject of the second disjunct), and therefore to allow the same readings. This is indeed true for some speakers. For these speakers, both sentences have the scope splitting reading in (109c), which is compatible with CR_2 . However, recall that for others, the sentence in (109b) which does not involve Gapping cannot have such a reading. This constitutes a challenge for CR_2 .

(109) a. Dans la plupart des cas, Marie ne lit pas ses cours ni Jean ses exercices.
 in the most of cases Marie NE read not her lessons nor Jean his exercises
 b. Dans la plupart des cas, Marie ne lit pas ses cours ni ses exercices.
 in the most of cases Marie NE read not her lessons nor her exercises
 c. $(Q(\neg p) \wedge Q(\neg q))$: 'In most cases, Marie doesn't read her lessons and in most cases, Jean/Marie doesn't read his/her exercises.'

In addition, to capture the interpretation of sentences like (106a) and (110a), Hirsch (2017) follows Fox (2000) and assumes that ATB-reconstruction is subject to an economy constraint. Specifically, a quantifier can reconstruct only if it reverses its scope relation relative to another scope-bearing element with which it is non-commutative. To illustrate, let us first consider example (106a). In this sentence, the only other scope-bearing element is the existential *a*. Given that two existentials are commutative, *some company* cannot reconstruct, and therefore must take wide scope with respect to the conjunction *and*. In contrast, in (110a), the existential quantifier co-occurs with the universal quantifier *every*. The two being non-commutative, *a guard* can reconstruct and take narrow scope with respect to the universal quantifier. CR_2 thus derives (110b) as the interpretation of (110a).

- (110) a. A guard is standing in front of every church and every mosque.
 b. For every church *x*, there is a guard that is standing in front of *x* and for every mosque *y*, there is a guard standing in front of *y*.

To summarize, this proposal predicts wide scope readings of connectives to be available when the subject of the sentence they occur in can reconstruct. Now, consider the sentence containing *ni* in (111a). The analysis of this sentence depends on the way exhaustification and the economy constraint interact, and more specifically, on their order of application.²² As far as we know, this has not been studied in detail in the literature. If exhaustification applies first, it rules out the LF in (111b) where the universal quantifier intervenes between negation and *ni*. Given that reconstruction gives rise to the only LF yielding a consistent meaning, the economy constraint does not apply and the sentence in (111a) is predicted to be interpreted as in (111c). However, recall that not all speakers allow sentence (111a) to have the reading in (111c). This constitutes a challenge for CR_2 . In contrast, if the economy constraint applies before exhaustification, CR_2 would predict the reading in (111c) not to be available. Because there is no scope-bearing expression in the coordination phrase in (111a), the universal quantifier *tous* cannot reverse its scope relation relative to another element if it reconstructs. The economy constraint is not satisfied, and *tous* should not reconstruct. In this case, CR_2 thus fails to capture the availability of the reading in (111c).

- (111) a. %Pas tous les étudiants ne fument ni ne boivent.
 not all the students NE smoke nor NE drink
 b. $\neg\forall x[student(x) \rightarrow (smoke(x) \vee drink(x))]$
 ‘Not every student smokes or drinks.’
 c. $\neg(\forall x[student(x) \rightarrow smoke(x)] \vee \forall x[student(x) \rightarrow drink(x)])$
 ‘Not every student smokes and not every student drinks.’

To conclude, we have shown in this section that (i) our proposal for *ni* does not rely on an approach to connectives based on type-shifting (as one can also adopt an analysis based on a Hamblin-like semantics for the disjunction) and (ii) that a recent version of the CR approach (Hirsch 2017) cannot capture wide scope readings of all connectives.

To put our proposal in perspective, recall the main questions this paper is addressing: are NPIs existentials interpreted under the scope of negation or universals interpreted outside the scope of negation? And more specifically, are there any universal NPIs? So far, we have argued that the French coordinating particle *ni*, which has been claimed to be interpreted as a conjunction, is in fact interpreted

²²We thank a reviewer for mentioning one of the alternatives.

as a disjunction. We have further shown how our analysis can capture its challenging behavior in a principled manner, thus providing additional support for existential(-like) analyses of NPIs. At this point, the question whether there exists an NPI that is interpreted as a wide scope universal is still open. Other polarity sensitive items that have been claimed to be interpreted as universals include Malayalam *aar-um* ('anybody') and *ent-un* ('anything') (Jayaseelan 2011), Japanese neg-words (e.g., *dare-mo* 'anyone') (Shimoyama 2011) and Korean neg-words (e.g., *amwu-to* 'anyone') (Sells and Kim 2006). In the next section, we show how this paper sheds new light on the interpretation of Japanese neg-words like *dare-mo* ('anyone'). Following a parallel reasoning as the one used in Section 5, we also challenge one of the tests that has been used to argue that Japanese neg-words are universals (cf. Shimoyama 2011).

7 Are there any universal NPIs? Japanese neg-words as another case-study

Before discussing the interpretation of Japanese neg-words, we first provide some background on these expressions and on their licensing conditions. Japanese neg-words are morphologically complex items which are composed of unstressed indeterminate pronouns (e.g., *dare* (person), *nani* (thing)) and the additive particle *-mo*. They have to co-occur with a clausemate sentential negation (regardless of their position in the sentence) to be licensed, as shown in (112). As a result, Japanese has been classified as a strict Negative Concord language (Watanabe 2004, Kuno 2007, a.o.).

- (112) a. Dare-mo ko-*(nakat)-ta. b. John-wa dare-mo mi-*(nakat)-ta.
 who-MO come-not-PAST John-TOP who-MO see-not-PAST
 'Nobody came.' 'John did not see anyone.'

Although they differ in some respects (e.g., neg-words, unlike NPIs, can precede their licensor and can be used as fragment answers to positive questions), several researchers have argued that neg-words are strong NPIs (Laka 1990, Ladusaw 1992, Giannakidou 2000, Fălăuş and Nicolae 2016, a.o.). On this approach, one would expect them to be interpreted as narrow scope existentials, just like other NPIs. However, Shimoyama (2011) argues against such an analysis, and in favor of a universal analysis. Shimoyama's (2011) main argument is based on sentences like (113) which involve the adverbs *hudan-wa* ('usually') and *taitei* ('mostly').²³

- (113) a. Dare-mo hudan-wa sankasi-nakat-ta.
 who-MO usually-TOP participate-not-PAST
 b. Dare-mo taitei sankasi-nakat-ta.
 who-MO mostly participate-not-PAST

Recall that when adverbs like *mostly* and *usually* co-occur with negation, they create a non-AA context which should in principle allow us to tease apart the predictions made by the narrow scope existential and the wide scope universal analyses. While the existence of the reading in (114a) is not informative (because it is equivalent to the reading in (114b)), Shimoyama (2011) claims that the availability of the reading in (114c) would provide decisive evidence in favor of the hypothesis that Japanese neg-words are interpreted as wide scope universals. Because the reading in (114b) entails the reading in (114c), to ensure that the reading in (114c) is available, one needs to test whether it

²³ Shimoyama (2011) discusses examples involving the following Q-adverbs: *hudan-wa* ('usually'), *taitei* ('mostly'), *taitei-no-baai* ('in most cases') and *mettani* ('in almost all cases'). For expository reasons, we limit our discussion to the first two Q-adverbs. However, our claims extend to the other Q-adverbs.

is available independently from the one in (114b).

- (114) a. $Q > \neg > \exists$ b. $Q > \forall > \neg$ c. $\forall > Q > \neg$

The two relevant scopal readings that could be assigned to the sentences in (113) (repeated below) are given in (116a) and (116b) with their respective paraphrases.

- (115) Dare-mo hudan-wa/taitei sankasi-nakat-ta.
who-MO usually-TOP/mostly participate-not-PAST

- (116) a. $Q > \neg > \exists \leftrightarrow Q > \forall > \neg$
‘It was usually/mostly the case that no one did participate.’
b. $\forall > Q > \neg$
‘For every person, it was usually/mostly the case that they did not participate.’

To test whether the scope splitting reading in (116b) is available independently from the reading in (116a), we should consider context (117). This context makes reading (116a) true and the $\forall > Q > \neg$ reading in (116b) false. Shimoyama (2011) claims that (115) is judged true in context (117), and concludes that Japanese neg-words like *dare-mo* are interpreted as wide scope universals.

- (117) Context that makes the scope splitting reading $\forall > Q > \neg$ true:

Suppose that there are three people and six meetings.

Person 1 didn't participate in four out of six meetings (M1, M2, M3 and M4).

Person 2 didn't participate in four out of six (different) meetings (M2, M3, M4 and M5).

Person 3 didn't participate in four out of six (different) meetings (M3, M4, M5 and M6).

| | M1 | M2 | M3 | M4 | M5 | M6 |
|----|-----|-----|----|----|-----|-----|
| P1 | no | no | no | no | yes | yes |
| P2 | yes | no | no | no | no | yes |
| P3 | yes | yes | no | no | no | no |

Crucially however, we found that these adverbs share the same property as French WS Q-adverbs. That is, regardless of their position in the sentence, when they co-occur with negation, they have to take wide scope with respect to it. This is illustrated in (118)-(120) for the adverb *taitei* ('mostly'). If *taitei* were interpreted under the scope of negation, the sentences in (118) should be judged true in context (120), where Hanako does not eat breakfast three out of six days. In contrast, this context makes the other reading, given in (119a), false. The native speakers we consulted judged the sentences in (118) false in context (120), showing that these sentences all have the reading in (119a). That is, *taitei* has to take wide scope relative to negation. We conclude that these adverbs are also WS Q-adverbs.

- (118) a. Taitei Hanako-wa asa-gohan-o tabe-nai.
mostly Hanako-TOP breakfast-ACC eat-not
b. Hanako-wa taitei asa-gohan-o tabe-nai.
Hanako-TOP mostly breakfast-ACC eat-not
c. Hanako-wa asa-gohan-o taitei tabe-nai.
Hanako-TOP breakfast-ACC mostly eat-not
- (119) a. $Q > \neg$: 'Mostly, Hanako doesn't eat breakfast.'

b. $\neg > Q$: ‘It is not the case that mostly, Hanako eats breakfast.’

(120) Context that makes the reading $\neg > Q$ true:

Hanako doesn’t eat breakfast three out of six days (Day 1, Day 2 and Day 3).

| D ₁ | D ₂ | D ₃ | D ₄ | D ₅ | D ₆ |
|----------------|----------------|----------------|----------------|----------------|----------------|
| no | no | no | yes | yes | yes |

We propose to analyze Japanese WS Q-adverbs like the French WS Q-adverbs. If *hudan* and *taitei* are universal WS Q-adverbs, we derive their wide scope interpretation relative to negation as an implicature. On this view, sentence (115) (repeated below) asserts (121a) and comes with the alternative in (121b). Because this alternative is not entailed by the assertion, it is negated and we derive the implicature in (121c). Again, we claim that the scope splitting reading follows from the behavior of the WS Q-adverbs used in the test.

(121) Dare-mo *hudan-wa/taitei* *sankasi-nakat-ta*.

who-MO usually-TOP/mostly participate-not-PAST

a. Assertion: $\neg \exists x[\textit{person}(x) \wedge \textit{MOST}(\textit{participated}(x))]$

b. ALT: $\exists x[\textit{person}(x) \wedge \textit{HALF}(\textit{participated}(x))]$

c. After exhaustification:

$\neg \exists x[\textit{person}(x) \wedge \textit{MOST}(\textit{participated}(x))] \wedge \neg \exists x[\textit{person}(x) \wedge \textit{HALF}(\textit{participated}(x))]$
 $= \forall x[\textit{person}(x) \rightarrow (\textit{MOST}(\neg \textit{participated}(x)))]$

Crucially, our proposal and Shimoyama’s (2011) proposal make different predictions for sentences like (122) which involve an object neg-word. On our proposal, neg-words like *dare-mo* are interpreted as narrow scope existentials. In addition, in contrast to connective NPIs like *ni* and just like other existential NPIs (e.g., *any*), they cannot take wider scope than what we see on the surface. That is, if *dare-mo* scopes under the adverb on the surface, it must scope below it at LF as well, and therefore, the scope splitting reading should not be available. In contrast, if *dare-mo* is interpreted as a wide scope universal as claimed by Shimoyama (2011), nothing prevents it from taking the widest scope in (122). In other words, while our proposal predicts that sentence (122) does not allow the scope splitting reading in (123), Shimoyama’s (2011) proposal predicts that it can have it.

(122) Hanako-wa *taitei/hudan-wa* *dare-mo mikake-nakat-ta*.

Hanako-TOP mostly/usually-TOP who-MO see.around-not-PAST

(123) $\forall > Q > \neg$

‘For every person, it was mostly/usually the case that Hanako did not see him/her around.’

If sentence (122) allows the scope splitting construal in (123), it should be judged true in context (124). The native speakers we consulted judged (122) to be false in context (124), which provides evidence against the universal hypothesis. Note that as expected under our proposal, the sentence in (122) is judged true in context (125), showing that it has the existential $Q > \neg > \exists$ reading: ‘It was mostly/usually the case that Hannako didn’t see anyone around.’²⁴

²⁴A similar observation has been made for Serbo-Croatian (Gajić 2016). While sentences containing subject neg-words allow the scope splitting construal $\forall > Q > \neg$, sentences containing object neg-words do not.

(124) Context that makes the reading $\forall > Q > \neg$ true:

Suppose that there are three people who are officemates.

Hanako didn't see Person 1 at the office four out of six days (D1, D2, D3 and D4).

Hanako didn't see P2 at the office four out of six (different) days (D2, D3, D4 and D5).

Hanako didn't see P3 at the office four out of six (different) days (D3, D4, D5 and D6).

| | D1 | D2 | D3 | D4 | D5 | D6 |
|----|-----|-----|----|----|-----|-----|
| P1 | no | no | no | no | yes | yes |
| P2 | yes | no | no | no | no | yes |
| P3 | yes | yes | no | no | no | no |

(125) Context that makes the reading $Q > \neg > \exists$ true:

Suppose that there are three people who are officemates.

Hanako didn't see Person 1 at the office four out of six days (D1, D2, D3 and D4).

Hanako didn't see Person 2 at the office four out of six (same) days (D1, D2, D3 and D4).

Hanako didn't see Person 3 t the office four out of six (same) days (D1, D2, D3 and D4).

| | M1 | M2 | M3 | M4 | M5 | M6 |
|----|----|----|----|----|-----|-----|
| P1 | no | no | no | no | yes | yes |
| P2 | no | no | no | no | yes | yes |
| P3 | no | no | no | no | yes | yes |

To sum up, we have shown in this section that the universal-like behavior of Japanese neg-words follows from the presence of WS Q-adverbs in the test sentences. Just like other NPIs, they are interpreted as narrow scope existentials. This provides additional support in favor of existential analyses.

8 Conclusion

A few languages have been claimed to allow polarity sensitive expressions to be interpreted as wide scope universals (Doetjes 2005, Jayaseelan 2011, Shimoyama 2011, Sells and Kim 2006, Gonzalez and Demirdache 2014). In this paper, we have shown that in at least two of these languages (i.e., French and Japanese), these expressions are in fact existential-like elements. In particular, we have argued that the challenging behavior of the French coordinating particle *ni* follows from (i) its disjunctive interpretation, and (ii) its capacity to take scope at a higher level than what we see on the surface – property that is independently observed for other connectives including intricate facts subject to corss-speaker variation, facts that cannot be accounted for on existing conjunctive analyses. Additional empirical arguments in favor of a disjunctive analysis of *ni* have been provided. We further contributed to this debate by showing that one of the tests used in the literature in favor of the universal analysis (Shimoyama 2011) relies on the use of a subset of frequency adverbs, namely WS Q-adverbs. Whether the same adverbs are WS Q-adverbs across languages and whether they share the same property needs to be further investigated to reevaluate the claim that some NPIs are wide scope universals. At this point, the question whether there exists an NPI that is interpreted as a wide scope universal is still open. Nevertheless, recall that most accounts of negative polarity are based on the existential hypothesis (Klima 1964, Ladusaw 1979, Kadmon and Landman 1993, Krifka 1995,

Giannakidou 1998, Lahiri 1998, Zwarts 1998, Chierchia 2013 among many others). Alternative-based accounts even predict that universal NPIs should not exist (Krifka 1995, Lahiri 1998, Chierchia 2013, a.o.). As far as we know, there is no principled way to derive the behavior of NPIs based on the universal hypothesis. It is also unclear how an analysis based on this hypothesis would derive the contrast between weak and strong NPIs. This suggests that truly universal NPIs may indeed not exist, and that other arguments found in the literature in favor of the universal analysis should be reexamined and reassessed.

Another contribution of this paper concerns the derivation of wide scope readings of connectives. Specifically, we have shown that in contrast to approaches based on type-shifting and on an Hamblin-like semantics for disjunctions, Conjunction Reduction approaches cannot capture wide scope readings of *ni*, casting doubt on the viability of this approach for other connectives. There are several questions pertaining to wide scope readings of connectives that are in need of further investigation. One question is whether all connectives allow wide scope readings in the same environments. Another question is to which extent the availability of these readings varies across speakers and across languages. And what is the source of this variation?

Finally, an important question this paper raises concerns the difference between connective NPIs like *ni* and other existential NPIs like *any* in their ability to take wide scope. We have shown that just like other connectives, *ni* can take wider scope than what we see on the surface. However, indefinites like *some* are also known to allow for exceptional wide scope (Fodor and Sag 1982, Reinhart 1997, Winter 1997, Matthewson 1998, a.o.). Why can't NPIs like *any* take wider scope than their surface position as well? In future work, we plan to investigate in more detail the different scopal behavior of all these expressions.

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