3.1 GENERAL INFORMATION ABOUT PROJECT B04

3.1.1 Project title: Negative scope mismatches in coordination

3.1.2 Research areas

104-01 Comparative Linguistics, Semantics, Syntax

3.2 SUMMARY

This project investigates scope interactions of coordination and negation. We investigate instances of "negative coordination", where a negating element precedes the conjoined or disjoined structure interacting with the coordinator, with respect to scope. More concretely, we look at various coordinated structures where scope interactions can be observed. First, we consider data as discussed in Szabolcsi & Haddican (2004). The authors investigate sentences where a negation c-commands a coordinated DP and where languages appear to differ with respect to scope of the coordinator (conjunction and disjunction), which in some languages can outscope the negation. We will extend the language sample discussed in Szabolcsi & Haddican (2004) and consider not only further European intonation languages but also West African tone languages. By doing this, we expect to develop a new perspective on the various theories that have been proposed. The second data set that we consider in this project includes Gapping sentences where negation in the first conjunct may or may not scope over the second conjunct, as discussed by Repp (2009). We will investigate whether these different interpretations - in a single language, but also cross-linguistically - correlate with the different scope mismatches observed in the first part of the project.

The third part of the project investigates coordinated sentences without ellipsis where negation within the first conjunct has the option to take scope over the second conjunct. This observation suggests that the principles as formulated for Gapping by Repp (2009) might not be restricted to elliptical sentences.

In sum, the main research question of this project concerns identifying the source of the scope mismatches between negation and the coordinator in various coordination constructions. The central question of the project is whether these mismatches are caused by the negation (along the lines of the Neg-Plus hypothesis), the coordinator (along the lines of the Neg-Only Hypothesis), or a combination of both. Hence, we directly address the main research question of area B of the CRS:

QB: How can we explain similarities and interactions between negation and other grammatical categories?

The specific questions that this project aims to answer are: (i) What triggers apparent scope mismatches in negative coordination? (ii) Do languages exhibit cross-linguistic variation in this domain? (iii) To what extent are those scope mismatches (anti-)licensed by stress, focus or other grammatical effects? Any theory will have to consider multiple, interacting components, thus addressing the Negation Paradox. In the second and third funding periods, we will also look at related phenomena (such as constructions like *neither … nor*) and extend the typological basis.

3.3 RESEARCH RATIONALE

3.3.1 Current state of research and preliminary work

Instances of negative coordination, both negative conjunctions and negative disjunctions, give rise to readings that are unexpected under their surface scope (e.g., Horn 1989, Szabolcsi & Haddican 2004, Hendriks 2004, Den Dikken 2006, Wurmbrand 2008, Arsenijević 2011, Gajić 2020). Consider the following examples from Szabolcsi & Haddican (2004), S&H for short:

(1) Mary didn't take hockey and algebra.
  a. ¬[take(m, h) ∧ take(m, a)]
  b. ¬[take(m, h)] ∧ ¬[take(m, a)]

In English, this can mean that it is not the case that Mary took both subjects. She either took one (1a) or didn't take either of them (1b). The latter reading is enforced if *and* is accented, as we will discuss below. However, in a language like Hungarian, the readings are different, see (2). The first reading of the English example (1a) where Mary took only one subject, is not available in Hungarian (2a). (2) can only mean that Mary didn't take hockey and didn't take algebra (i.e., she did neither, (2b)), see S&H.

(2) Mari nem járt hokira és algebrára.
  Mari NEG went hockey-to and algebra-to
  'Mary didn't take hockey and didn't take algebra.'
  a. *¬[take(m, h) ∧ take(m, a)]
  b. ¬[take(m, h)] ∧ ¬[take(m, a)]

A similar contrast can be observed with respect to negated disjunctions. English *or*, when negated, allows both the *not both*-reading (3a), and the *neither*-reading (3b). Hungarian *vagy* ('or'), however, only yields the *not both*-reading (4a), the *neither*-reading is excluded (4b).

(3) Mary didn't take hockey or algebra.
  a. ¬[take(m, h)] ∨ ¬[take(m, a)]
  b. ¬[take(m, h) ∨ [take(m, a)]

(4) Mari nem járt hokira vagy algebrára.
  Mari NEG went hockey-to or algebra-to
  'Mary didn't take hockey or Mary didn't take algebra.'
  a. ¬[take(m, h)] ∨ ¬[take(m, a)]
  b. *¬[take(m, h) ∨ take(m, a)]

These different patterns can also be attested in other languages. German, for instance, patterns with English, while Russian, Italian, Japanese align with Hungarian.

S&H, basing themselves on Szabolcsi (2002), argue that the behavior of the Hungarian disjunction can be accounted for in terms of polarity-sensitivity. If the Hungarian disjunction is taken to be a Positive Polarity Item (PPI), it can, by definition, not take direct scope below negation and thus must raise across it (as is the case with *some* in sentences like *I didn't see some student*, which can only mean that there is some student that I didn't see).

A problem for S&H, acknowledged by themselves, is that the behavior of the disjunction in Hungarian is fully compatible with the PPI-account, but that of conjunction is not. The reason is that PPIs in general can be licensed under negation if this negation appears in a downward entailing environment itself. In English, *some* can, for instance take scope below negation in an *if*-clause, as shown by the translation in (5):

(5) If you don't see some student, the class can be cancelled.
'If you don't see any student, the class can be cancelled.'

This is also the case for the Hungarian disjunction *vagy* (6), confirming its PPI-hood, but not with the Hungarian conjunction *és* (7). Similar observations can be made for other languages that display the Hungarian pattern (cf. Gajić 2020, see also Spector 2017, Nicolae 2017 for discussion of different types of PPI disjunctions and rescuing).

(6) Ha nem látod Katit   vagy Marit   véged.
if   NEG see   Kati.ACC or   Mari.ACC doomed
'If you don't see Katy or Mary, you're doomed.'
($\neg$(see(you,k) $\vee$ see(you,m))) $\rightarrow$ doomed(you)

(7) Ha nem látod Katit   és   Marit,   véged.
if   NEG see   Kati.ACC and   Mari.ACC doomed
'If you don't see Katy and Mary, you're doomed.'
a. ($\neg$see(you,k) $\wedge$ $\neg$ see(you,m)) $\rightarrow$ doomed(you)
b. *($\neg$(see(you,k) $\wedge$ see(you,m))) $\rightarrow$ doomed(you)

For S&H, the data above suggest that, at least for conjunction, a PPI-account cannot hold and, therefore the source for the scopal behavior of conjunction under negation needs to be explained in other terms. However, it is not the case that every PPI can be rescued along the lines sketched above. Iatridou & **Zeijlstra** (2013) and **Zeijlstra** (2017) show that only weak PPIs, i.e., PPIs that are only anti-licensed in anti-additive contexts, are subject to such rescuing, but strong PPIs, i.e., PPIs that are anti-licensed in every downward entailing context, are not. This suggests that if the relevant conjunctions are strong PPIs but the disjunctions weak PPIs, the facts in (7) and (8) are still compatible, see also Spector (2014), Nicolae (2017) and Larralde et al. (2021) for discussion of similar cases in French. A question that remains open, and which we will investigate in this project, is whether Hungarian conjunction may count as a strong PPI.

Be that as it may, the question still arises as to why these elements are PPIs. As is known from the literature (Chierchia 2013, **Zeijlstra** 2022), the source for NPI-/PPI-hood may substantially differ for high vs. low scalar elements. Whereas high scalar NPIs and low scalar PPIs arguably show polarity-sensitivity due to exhaustification requirements (Chierchia 2013), this cannot be straightforwardly the case for low scalar NPIs and high-scalar PPIs (**Zeijlstra** 2022, *pace* Israel 2011). Any account of the scopal differences between Hungarian-like and English-like coordinations in terms of PPI-hood will need to account for why these elements are PPI-like in the first place in one language and not the other, and if the sources for PPI conjunctions and disjunctions are indeed different, why they still apply in tandem (if indeed there are no languages with wide-scope disjunctions and narrow-scope conjunctions or the other way round).

To account for the different behavior of Hungarian disjunctions and conjunctions, S&H argue that homogeneity (Yoon 1996, Löbner 2000, Magri 2014, Križ 2015, Bar-Lev & Fox 2017, Bar-Lev 2018, 2020) plays an additional role. S&H assume that every language has a Boolean negation that is responsible for taking wide scope over the conjunction and thus giving rise to a *not both*-reading, but they argue in addition that conjunctions with two definite DPs and definite plurals are interpreted as denoting pluralities: sets or individual sums. Thus, definite conjunctions exhibit the same kind of homogeneity effect that definite plurals (8) exhibit; for number interpretation in disjunctions, see Himmelreich & **Hartmann** (2023).

(8) She didn't see the girls.
a. *She saw not all of the girls.
b. She saw no girl.

It should not come as a surprise that definite conjunctions display the same effect. The *neither*-reading of negated definite conjunctions then does not follow from a Boolean conjunction taking wide scope over negation but rather from negation taking wide scope over a non-Boolean conjunction in accordance with the particular homogeneity effect of the conjunctive phrase. This way, the absence of the *not both*-reading in Hungarian straightforwardly follows. Note that this also predicts that the *not both*-reading should be available outside negated definite conjunctions. This is indeed the case (S&H:225):

(9) Mari nem olvasott el   minden verset és   minden   regényt.
     Mari NEG read every   poem.ACC   and   every   novel.ACC
     'Mary didn't read every poem and every novel.' = 'Mary didn't read every poem or she didn't read every novel.'

Another way of analyzing cases of negated definite conjunctions is by assuming that obligatory strengthening applies. Note that while conjunctions like *and* normally yield a strong reading, under negation their meaning contribution becomes weak. Parallel to the implicature account of Free Choice readings (Fox 2007, Bar-Lev & Fox 2017), and homogeneity, it could be postulated that negated *and* undergoes obligatory strengthening, thus rendering the scope mismatch delusional. Such readings show a striking parallel with the phenomenon of Neg-Raising (as in cases as *I don't think she'll join* where the matrix negation seems to take scope in the embedded clause, cf., e.g., Gajewski 2007, Collins & Postal 2014, Romoli 2013, **Zeijlstra** 2022) and which may involve strengthening as well (Mirrazi & **Zeijlstra** 2021), see also Project **A05 Sailer & Zeijlstra**. Note that such a strengthening does not only have to apply to negated conjunctions. Disjunction scoping over negative terms could also be strengthened into what looks like a conjunction of negation, as has been proposed by Gajić (2020) for negative coordination with *neither nor*.

However, if homogeneity underlies the meaning of Hungarian negated conjunctions, the question arises why English does not behave the same as Hungarian. English definite conjunctions can also give rise to the *not both*-reading when negated. For S&H, this is due to stress. In English, *and* can take scope under and over negation whereas stressed *and* only gives rise to the surface scopal construal (10a) and the *neither*-reading is lost (10b). Note that the same effect arises if *both* precedes the coordination.

(10) Mary didn't take hockey AND algebra.
      a. ¬[take(m, h) ∧ take(m, a)]
      b. *¬[take(m, h)] ∧ ¬[take(m, a)]

A reason for the exclusion of the *neither*-reading could be that focus on *and* introduces *or* as an alternative, triggering the implicature *take(m,h) ∨ take(m,a)*, Manfred Krifka (p.c.). Interestingly, this effect is lacking in Hungarian, as Hungarian *és* cannot be stressed in the same way. The only kind of stress that *és* may receive is metalinguistic stress. Stress is known to have an effect on the meanings of conjunctions. For instance, stress on *and* renders a conjunction ungrammatical under collective predicates, presumably because the alternative *or* would be ungrammatical for such a predicate.

(11) Kim and/*AND Alex met up yesterday.

S&H thus propose that all languages have a Boolean *and* that operates over quantifiers and also predicates, sentences, etc., which may in principle scope above or below negation, thus giving rise to both *neither*- and *not both*-readings. In the case of conjoined definite DPs, stress on the connective prevents the realization of non-Boolean denotations, which is responsible for the *neither* reading, and so they receive a Boolean interpretation where negation takes wide scope. Languages that do not allow non-metalinguistic stress on connectives lack such a Boolean *not both* reading with definite conjunctions.

However, stress, definiteness, homogeneity and polarity-sensitivity are not the only factors at stake. While both English negated *and* as well as Hungarian negated *és* give rise to a *neither*-reading, English negated *and* also allows the *not both*-reading for negated definites, which is even obligatory under stress. However, even though both readings are available for examples like (1), repeated below, it turns out that the *not both*-reading is much more prevalent. Most speakers of English prefer the *not both*-reading over the *neither*-reading:

(12) Mary didn't take hockey and algebra.
      a. ¬[take(m, h) ∧ take(m, a)] (preferred)
      b. ¬[take(m, h)] ∧ ¬[[take(m, a)]

A reason for this preference could be that it appears more natural to deaccent the coordinated DP, a result of which is the formation of only one prosodic phrase, which yields the *not both*-reading. But note that if the context forces the conjuncts to form prosodic phrases each, as in (13) (our data), the *neither*-reading becomes more prominent.

(13) Mary didn't take [HOckey] and [ALgebra], she took [SOCcer] and [staTIStics.]

In addition, the *neither*-reading comes about much more easily in the following cases (data from Gajić 2020:39, examples (46)).

(14) a. The president and the janitor didn't sign the petition.
b. Hockey and algebra, Mary didn't take.
c. Of the courses on the list, Mary didn't take hockey and algebra.
d. Mary didn't take math and physics.

In (14a), there is a negated subject instead of a negated object; in (14b) there is a topicalized object; in (14c), hockey and algebra are part of an exhaustified list, and in (14d) math and physics form a stereotypical pair (unlike hockey and algebra). This suggests that except for a core semantic mechanism yielding the different possible readings, other kinds of disambiguating strategies also apply. Some of these may be related to stress (like (13)). Others may be syntactic in nature (subjects arguably take scope above negation). Others again are more pragmatic in nature. This shows that both across and within languages, various factors play a role with respect to whether negation in coordination takes (apparent) wide scope or narrow scope.

Turning to a different area where negation interacts in interesting ways with coordination, Repp (2009) investigates negative scope effects Gapping sentences. She differentiates three scope patterns with the negation taking either distribute, narrow or wide scope, as shown in (15) (Repp 2000:2). In (15a), the negation is interpreted in both conjuncts, which Repp calls 'distributed scope'. In (15b), the 'wide scope' reading, the negation takes scope over both conjuncts, and in (15c), an example of adversative coordination, it takes 'narrow scope' only in the first conjunct.

(15) a. Pete hasn't got a video and John __ a DVD.
$(\neg got(p,v)) \wedge (\neg got(j,d))$
b. Pete didn't clean the whole flat and John __ laze around all afternoon.
$\neg(clean(p,the\ flat) \wedge laze\_around(j))$
c. Pete wasn't called by Vanessa but John __ by Jessie.
$(\neg call(v,p)) \wedge (call(j,j)$

Repp accounts for this variation by assuming a copying theory of Gapping whereby the material is copied to the second conjunct by sideward movement. The decision of how much is copied is guided by the 'Principle of Balanced Contrast', which requires the conjuncts of a Gapping construction "to make the same contribution to a common discourse topic" (Repp 2009:83). This is reminiscent of the theory of Questions Under Discussions (Roberts 2012), which has been argued to also determine the structure of conjuncts of a coordination (**Hartmann** 2000).

The distributed scope reading in (15a) directly follows from this proposal – the gapped verb is copied together with the negation in the second conjunct. For the wide scope reading in (15b), Repp assumes smaller conjuncts such that the negation takes overt scope over both. The narrow scope reading in (15c) is connected to the adversative disjunction, which requires a polarity reversal in the second conjunct. Therefore, the negation is not copied along with the verb. This elegant theory not only accounts for the different readings available for English, but also for variation across languages. Note that negation in German Gapping yields slightly different interpretations. Thus, Repp observes that in the German counterpart of (15a), the repetition of the negation in the second conjunct is preferred (Repp 2009:3):

(16) Hans hat das Buch nicht gelesen und Martha (nicht) die Zeitschrift.
Hans has the book NEG read and Martha NEG the magazine
'Has hasn't read the book and Martha hasn't read the magazine.'

The cross-linguistic differences are traced back to a different syntactic status of the negation element, which is analyzed as a head in English (where at least the head status of *n't*, unlike *not*, is uncontroversial), and as an adjunct in German with consequences for the copying mechanism. Interestingly, negative scope effects are observable in other elliptical coordination as well. In (17), a naturally occurring example, discussed in Krifka (2015:254), the two conjuncts share a subject. For some German speakers at least, the negation has a wide scope reading although it does not take a wide surface scope. We refer to such sentences as "Krifka-sentences". It is unlikely that deletion and copying take place in (17), given that such processes are limited to few specific constructions. A small conjunct analysis is also not without problems either given that the negation appears below the verb in verb second position in the first conjunct and is therefore too deeply embedded. Very interestingly, even though negation applies to both conjuncts, only the stronger and not the weaker reading emerges, just as in Hungarian.

(17) Ich nage nicht am   Hungertuch und muss   nehmen, was kommt.
     I   eat   NEG from.the hunger.cloth and must   take   what comes
     'I'm not starving and don't have to take whatever comes.'

Penka (2011) and **Zeijlstra** (2011), among others, assume that negation is not interpreted in its overt position but indicates a syntactically higher negation operator, which could be responsible for taking high scope in (17), see also Gajić (2020). But note that the existence of such a silent operator does not allow the overt negation to occur freely in the clause. Shifting the negation to the second conjunct leads to a contradictory clause, cf. (18). Thus, even if a high operator is responsible for negative scope over both conjuncts, the obligatory presence of the negation in the first conjunct remains mysterious. In addition, the relation between a high negation operator scoping over both conjuncts and an overt negation element in only one conjunct represents a violation of the Coordinate Structure Constraint, which requires an explanation.

(18) Ich nage am   Hungertuch und muss nicht nehmen, was   kommt.
     I   eat   from.the hunger.cloth and must NEG take   what   comes
     'I am starving and do not have to take whatever comes.' (contradictory)

Yet another scope mismatch is illustrated in (19). In this example, taken from **Hartmann** & Schmitt (2014), the verbs in the two conjuncts are both reflexive, but due to the Right Node Raising (RNR) format, the reflexive pronoun is optional in the first conjunct. Formally, RNR can be derived syntactically or prosodically (**Hartmann** 2000). In any case, the RNR target typically appears in clause-final position taking scope over both conjuncts. In (19), the RNR target is the reflexive pronoun *sich*, which is shared by the verbs in both conjuncts. What is surprising in example (19) is that the negation still follows the reflexive but takes scope only into the second conjunct. The sentence does not have a wide scope interpretation of the negation according to which the actors did not do both. Thus, there is a scope conflict between the negative marker taking narrow scope, and the reflexive pronoun, which takes wide scope.

(19) Die Schauspieler verbeugten, aber bedankten sich   nicht.
     the actors   bowed   but   thanked   REFL not
     'The actors bowed but didn't thank (the audience).'

Given the paradoxical scope situation between reflexives and negation observed in (20), it is obvious that simple movement approaches (Abott 1976, Bresnan 1974, among others) fail to account for the data given that the RNR-raised element appears in a high right-peripheral position from where it takes scope over both conjuncts. Any element following it will automatically take high scope as well. In a prosodic deletion approach (**Hartmann** 2000), reflexive and negation appear in their canonical positions, however the account predicts that the RNR-element is always right-peripheral. The third approach assumes multi-domination (Goodall 1987, Moltmann 1992, among others), which would have to claim that non-shared constituents may follow shared ones.

Scope mismatches such as those illustrated in the examples (16) to (19) have been observed in the literature (on European languages only) but lack a formal analysis up to date. By identifying the conditions and sources of negative scope mismatches in coordination in general, we aim towards a unified analysis for all of them.

3.3.2   Project- and subject-related list of publications

Abbott, Barbara. 1976. Right Node Raising as a test for constituenthood. *Linguistic Inquiry* 7: 639–642.

Arsenijević, Boban. 2011. Serbo-Croatian coordinative conjunctions at the syntax-semantics interface. *The Linguistic Review* 28: 175–206.

Barros, Matthew & Vicente, Luis. 2011. Right Node Raising requires both ellipsis and multidomination. *University of Pennsylvania Working Papers in Linguistics*: Vol. 17: Iss. 1, Article 2. Available at: https://repository.upenn.edu/pwpl/vol17/iss1/2

Bar-Lev, Moshe. 2018. Free Choice, Homogeneity, and Innocent Inclusion. Ph.D. Thesis, The Hebrew University of Jerusalem.

Bar-Lev, M Moshe. 2020. An implicature account of homogeneity and non-maximality. *Linguistics and Philosophy* 44: 1–53.

Bar-Lev, Moshe & Dani Fox. 2017. Universal free choice and innocent inclusion. In: Burgdorf, Dan, Jacob Collard, Sireemas Maspong & Brynhildur Stefánsdóttir (eds.), *Proceedings of the 27ᵗʰ Semantics and Linguistic Theory Conference*. Washington, DC: LSA. 95–115.

Bresnan, Joan W. 1974. The position of certain clause-particles in phrase structure. *Linguistic Inquiry* 5: 614–619.

Collins, Chris & Paul Postal. 2014. *Classical Neg-Raising: An Esay on the Syntax of Negation*. Cambridge, MA: The MIT Press.

Chierchia, Gennaro. 2013. *Logic in Grammar: Polarity, Free choice, and Intervention*. Oxford: Oxford University Press.

Den Dikken, Marcel. 2006. Either-float and the syntax of co-or-dination. *Natural Language and Linguistic Theory* 24: 689–749.

Fox, Dani. 2007. Free choice disjunction and the theory of scalar implicature. In: Sauerland, Uli & Penka Stateva (eds.), *Presupposition and Implicature in Compositional Semantics*. New York: Palgrave Macmillan. 71–120.

Gajewski, Jon. 2007. Neg-raising and polarity. *Linguistics and Philosophy* 30: 289–328.

Gajić, Jovana. 2020. Negative Coordination. Ph.D. Thesis, Göttingen University.

Goodall, Grant. 1987. *Parallel Structures in Syntax: Coordination, Causatives, and Restructuring*. Cambridge: Cambridge University Press.

Gutzmann, Daniel, **Katharina Hartmann** & Lisa Matthewson. 2020. Verum focus is verum, not focus. *Glossa: a journal of general linguistics* 5(1): 51. https://doi.org/10.5334/gjgl.347

Hartmann, Katharina & Viola Schmitt. 2014. Violations of the right-edge-constraint in right-node-raising. *Snippets* 27: 8–9. http://www.ledonline.it/snippets/.

Hartmann, Katharina. 2015. Coordination. In: T. Kiss and A. Alexiadou (eds.), *Syntax – Theory and Analysis. An International Handbook*. Berlin: Walter de Gruyter Verlag. (= Handbuch zur Sprach- und Kommunikationswissenschaft 42/1-3). 478–513.

Hartmann, Katharina. 2000. *Right Node Raising and Gapping. Interface Conditions on Prosodic Deletion*. Amsterdam: John Benjamins.

Hendriks, Petra. 2004. Either, both and neither in coordinate structures. In: Ter Meulen, Alice & Werner Abraham (eds.), *The Composition of Meaning: From Lexeme to Discourse*. Amsterdam: John Benjamins. 115–138.

Himmelreich, Anke & **Katharina Hartmann**. 2023. Agreement with disjoined subjects in German. *Glossa: a journal of general linguistics* 8(1). https://doi.org/10.16995/glossa.8504

Horn, Laurence. 1989. *A Natural History of Negation*. Chicago: University of Chicago Press.

Iatridou, Sabine & **Hedde Zeijlstra**. 2013. Negation, polarity and deontic modals. *Linguistic Inquiry* 44: 529–568.

Israel, Michael. 2011. *The Grammar of Polarity. Pragmatics, Sensitivity, and the Logic of Scales*. Cambridge: Cambridge University Press.

Križ, Manuel. 2015. Aspects of homogeneity in the semantics of natural language. University of Vienna.

Löbner, Sebastian. 2000. Polarity in natural language: Predication, quantification and negation in particular and characterizing sentences. *Linguistics and Philosophy* 23, 213–308.

Magri, Giorgio. 2014. An account for the homogeneity effects triggered by plural definites and conjunction based on double strengthening. In: Salvatore Pistoia Reda (ed.), *Pragmatics, semantics and the case of scalar implicatures*. London: Palgrave Macmillan. 99–145.

Larralde, Cécile, Alina Konradt & Kriszta Eszter Szendrői. 2021. Information structure and scope interactions: Disjunction wide scope induced by focus. *Frontiers in Communication* 5. doi: 10.3389/fcomm.2020.595799

Mirazzi, Zahra & Hedde Zeijlstra. 2021. Non-lexical Neg Raising. *Proceedings of SICOGG 23*.

Mitrović, Moreno & Uli Sauerland. 2014. Decomposing coordination. In: Iyer, Jyoti & Kusmer, Leland (eds.), *Proceedings of NELS 44/2*. Amherst, MA, GLSA. 39–52.

Moltmann, Frederike. 1992. Coordination and Comparatives. Ph.D. Thesis, MIT.

Krifka, Manfred. 2015. Fünfzig Jahre Satzsemantik – am Beispiel der Negation. In: Eichinger, Ludwig (ed.) *Sprachwissenschaft im Fokus. Positionsbestimmungen und Perspektiven*. Berlin: De Gruyter. 247–275.

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Magri, Giorgio. 2014. An account for the homogeneity effects triggered by plural definites and conjunction based on double strengthening. In: Pistoia Reda, Salvatore (ed.), *Pragmatics, Semantics and the Case of Scalar Implicatures*. New York: Palgrave Macmillan. 99–145.

Nicolae, Andreea Cristina. 2017. Deriving the positive polarity behavior of plain disjunction. *Semantics and Pragmatics* 10: 5. doi: 10.3765/sp.10.5.

Penka, Doris. 2011. *Negative Indefinites*. Oxford: Oxford University Press.

Payne, John R. 1985. Complex phrases and complex sentences. In: Timothy Shopen (ed.), *Language typology and syntactic description, vol. 2: Complex Constructions*. Cambridge: Cambridge University Press.

Repp, Sophie. 2009. *Negation in Gapping.* Oxford: Oxford University Press.

Roberts, Craige. 2012. Information structure in discourse. Towards an integrated formal theory of pragmatics. *Semantics and Pragmatics* 6(5): 1–69.

Romoli, Jacopo. 2013. A scalar implicature-based approach to neg-raising. *Linguistics and Philosophy* 36: 291–353.

Stassen, Leon. 2000. AND-languages and WITH-languages. *Linguistic Typology* 4: 1–54.

Spector, Benjamin. 2014. Global positive polarity items and obligatory exhaustivity. *Semantics and Pragmatics 7*: 1–61.

Szabolsci, Anna & Bill Haddican. 2004. Conjunction meets negation: A study in cross-linguistic variation. *Journal of Semantics* 21: 219–249.

Wurmbrand, Susi. 2008. Nor: neither disjunction nor paradox. *Linguistic Inquiry* 39: 511–522.

Yoon, Youngeun. 1996. Total and partial predicates and the weak and strong interpretations. *Natural Language Semantics* 4: 217–236.

Zeijlstra, Hedde. 2011. On the lexical status of negative indefinites in Dutch and German. *Journal of Comparative Germanic Linguistics* 14: 111–138.

Zeijlstra, Hedde. 2017. Universal Quantifier PPIs, *Glossa: a journal of general linguistics* 2(1): 91. doi: https://doi.org/10.5334/gjgl.220

Zeijlstra, Hedde. 2018. Does neg-raising involve neg-raising? *Topoi* 37: 417–433.

Zeijlstra, Hedde. 2022. *Negation and Negative Dependencies*. Oxford: Oxford University Press.

3.4   PROJECT PLAN

GOALS AND OBJECTIVES

The overall goal of this project is to contribute to the overarching question of this CRC, whether negation is always part of a larger accumulation of participating expressions, the Neg-Plus Hypothesis, or whether it is a simple truth-reversal operator that regularly interacts with other operators and functional elements in its vicinity, the Neg-Only Hypothesis. This project evaluates both hypotheses from the perspective of coordination (conjunction and disjunction), which represents an important testing ground for two reasons: On the one hand, there is control over the involved players given that only two connectives, negation and conjunction, interact with each other. On the other hand, there is fascinating empirical variation concerning the readings that result from this interaction. Thus, the project aims to answer the central question of area B of the CRC and directly addresses QB.3:

QB: How can we explain similarities and interactions between negation and other grammatical categories?

QB.3: How do negation and other grammatical categories interact within and across languages?

Currently, the cause of the observed cross-linguistic differences is not well understood. Various lines of argumentation have been proposed, however, none appears to be able to account for the full range of patterns observed. The major contribution of this project is to investigate the effects in a broader array of languages from different families. We will carry out thorough research of all potentially influential factors of the observed interaction: the syntax of conjunction and disjunction (**Hartmann** 2015), the nature of the conjoining element, (positive) polarity, plurality and homogeneity, the ability to assign stress, split scope, etc.

In order to achieve our goal, we define three working packages:

WP1 (Zeijlstra): Extension of the empirical landscape: European languages

The current literature on negated coordination has led to a somewhat paradoxical situation. On the one hand, the source of the wide-scope reading for disjunction is taken to be different from the source of the wide-scope reading for conjunction in languages like Hungarian. At the same time, it has hitherto been observed that languages that exhibit wide-scope readings

for disjunction also do so for conjunction. That suggests that the sources should be the same. However, there is no principled reason why one source, the alleged PPI-status of disjunctions, should always correspond to, for instance, the absence of non-metalinguistic focus on conjunctions. This leads to the empirical question as to whether these scopal properties of negated disjunctions and conjunctions always go hand in hand. We will first investigate that for a related set of languages spoken in Europe. The reason for this is that it will allow us to look at the scopal differences with respect to negative coordination in these languages while still being able to control for other factors. If indeed a shift between two closely related languages in the scopal properties of disjunctions corresponds with a similar shift in the scopal properties of conjunctions, one can conjecture that the two indeed correlate. In that case, a unified source for these scopal properties should be identified.

Several potential sources for this suggest themselves. One of them is polarity-sensitivity. Could it be the case that in languages like Hungarian both disjunctions and conjunctions are PPIs, even though the latter is not subject to PPI-rescuing in the same vein as disjunctions? And can the PPI-hood for disjunctions and conjunctions be motivated independently? Much here depends on the source of the polarity-sensitivity, which is currently not clear for either disjunctions or conjunctions.

Apart from investigating to what extent disjunctions and conjunctions in the languages to be investigated show properties of PPI-hood, another aspect concerns homogeneity, which may account for the behavior of Hungarian negative conjunctions. Clearly, homogeneity effects lead to strengthening and would therefore form a natural explanation for wide-scope readings of conjunctions. But arguably, such homogeneity effects may also be applicable for disjunctions, for instance in strengthening a disjunction prior to it being negated. But the question, again, is whether such homogeneity effects are subject to cross-linguistic variation and to what extent such variation can be independently motivated, see Križ (2015).

As discussed above, any homogeneity or other accounts for these scopal construals has to make reference to the type of coordination (namely whether it is Boolean or not) and the type of disjoined elements: are these definites, or not; are these semantically related (i.e. form natural 'packages') or not, does their grammatical (subject/object/adjunct) or information-structural (topic/focus) status play a role? And what are the focal properties of conjunctions or disjunctions in these languages? Finally, how does the prosodic phrasing of the conjuncts (deaccenting of the whole coordination vs. separated prosodic phrases of each conjunct) impact the interpretations across languages? It is only when these questions are clarified for a well-demarcated set of closely related and accessible languages that further pathways for theoretical explanations for these striking scopal properties of negative coordination can be spelled out. Testing all these factors in a set of well-studied and accessible languages is therefore called for, and this is what we will carry out in this WP. Thus, the working package will contribute to answer QB.2 of area B:

QB.2: To what extent do negation and other grammatical categories behave similarly or
   differently within and across languages?

A broader understanding of the correlation between negation and coordinators will also shed light on negative scope in German negated conjunctions. Very interestingly, and similarly to negative scope in Gapping as investigated by Repp (2009), negation in first conjuncts in Krifka-sentences does not always take wide scope, see (20), our data.

(20) Ich rauche nicht mehr   und kann gut atmen.   (¬A) ∧ (B)
   I   smoke NEG anymore and can well breathe
   'I don't smoke anymore and can breathe well.'

Gapping is not involved in these examples, hence, ellipsis resolution is restricted to the subject if CP-coordination is assumed. Nevertheless, the negation can take wide (17) or narrow (20) scope showing that scope is independent from ellipsis. The question to be investigated concerns the nature of the strategies that decide between a wide scope and a low scope interpretation of the negation if copying is not available. An initial observation that might direct this line of research is that in Krifka-sentences, the two conjuncts apparently do not follow Repps 'Principle of Balanced Contrast'. Rather, the second conjunct seems to express a rhetorical relation to the first that can be explicitly expressed by *daher* ('therefore'). This suggests that syntax may be involved to a stronger extent than in negated Gapping constructions. Again, prosody might also be a factor. Note that in (17), where negation takes wide scope, the coordination forms one prosodic phrase. In (20), on the other side, the conjuncts are phrased individually, which patterns with narrow scope. More research is clearly needed here.

Concerning the RNR-examples in (19), the project will first re-evaluate the existing analytical theories of RNR with respect to the scope paradox observed above. Potentially, a reconsideration of scope effects in RNR calls for a mixed approach to RNR, as for instance proposed by Barros & Vicente (2011). We will also look more closely to what extent similar effects in Gapping constructions, Krifka-sentences and related constructions can be attested in other languages.

WP2 (Hartmann): Extension of the empirical landscape: Niger-Congo / Afro-Asiatic languages

S&H propose that the twofold way of interpreting conjunction and disjunction under negation not only accounts for differences in English and Hungarian, but covers a wider range of languages. They argue that German behaves like English, while Russian, Serbian, Italian, and Japanese align with Hungarian. This project further investigates the existence of the *neither-* and *not both*-readings in a larger set of languages not related to each other, both for conjunctions and disjunctions. We extend the language sample to contest typological parameters with respect to focus and coordination and test whether the theoretical predictions withstand this variation.

One important aspect of S&H's theory is that the availability of *and* triggering a *not both*-reading depends on whether the connective can be focused, which is possible in English but not in Hungarian. The theory as it stands makes strong predictions based on the possibility of stress on the connective, but it is far from clear how languages with focus systems that are not stress-based behave in this respect. We will therefore compare the European intonation languages with African tone languages in order to understand the impact of the modality of focus marking better. Interestingly, it appears that the prosodic type of a language alone is not a decisive factor. A random look at two West-African languages, both tone languages, contests S&H's typological distinction. (21) is from Likpakpaanl, a Mabia (Gur) language spoken in Ghana, and (22) is from Yoruba (Yoruboid) from Nigeria. Whereas the former clearly follows the English pattern (speaker comment: 'She ate one of these, but not both'), the latter is parallel to Hungarian (speaker comment: 'Ayo neither ate yam and maize. It cannot mean that Ayo ate one of both', data p.c., KH).

(21) Adelina   aa   ŋmɔn   linuul   ni   nkawaan.   Likpakpaanl
     Adelna   NEG   ate   yam   and   maize.
     'Adelina didn't eat yam and maize.'

(22) Ayọ (k)o   je   iṣu   ati   agbado.   Yoruba
     Ayo NEG   ate   yam   and   maize
     'Ayo didn't eat yam and maize.'

Given that stress on the conjunction is excluded in both cases due to the tonal properties of the languages, this cannot be the decisive factor to account for the variation. We will also investigate whether phonological phrasing, as effected by tone sandhi for example, is a potential factor influencing the interpretation of the conjunction in these languages. Our working hypothesis is that the African tone languages do not have the possibility of focusing a connective, given that focusing is mostly restricted to lexical (nominal) categories; hence we expect that they should pattern with Hungarian, rather than with English. Note that the presence or absence of the observed scope ambiguities could also be influenced by the nature of the negation. Daakie, an Austronesian language spoken in Vanuatu, for instance, does not have a Boolean negation scoping over conjunction because negation is part of the modal system and expressed by inflection. (We are grateful to Manfred Krifka for pointing this out to us). Thus, we will thoroughly investigate the nature of the negation in the African languages considered in this project, in close cooperation with project B03 (Hartmann & Mursell), in order to be able to relate scope properties of the negation and the coordinating connective to the grammatical properties of these items.

A further issue concerns the distinction between conjunction and disjunction. According to S&H, languages group according to either the English or the Hungarian pattern. This, however, does not exhaust the list of possibilities. It is expected to find languages that behave like English when it comes to conjunction, and Hungarian when it comes to disjunction, and vice versa. A comparative investigation of various tone and intonation languages will show whether the typology as defined by S&H is fine grained enough or whether it should be extended to cover the expected cases.

	NEGATED CONJUNCTION	NEGATED DISJUNCTION
English pattern	not both / neither	not both / neither
Hungarian pattern	neither	not both
Other pattern (not attested yet)	not both / neither	not both
Other pattern (not attested yet)	neither	not both / neither

This work package will contain research on basic and hitherto under-investigated properties of conjunction and disjunction in several African languages. This could influence the scope behavior of negation, including the nature of the coordinator, positive and negative polarity, verum focus (see Gutzmann et al. 2020), negative scope in comitative structures

(Payne 1985, Stassen 2000) and truly coordinated structures, as well as the relation of negation and focus. By thoroughly investigating these properties, as well as the properties of negation in the African languages in general, we expect to find patterns that will help us to deepen our understanding of the interaction of conjunction and negation, which will contribute to answering QB.3:

QB.3: How do negation and other grammatical categories interact within and across languages?

The choice of languages will be motivated in the section on methodology below.

WP3 (Hartmann & Zeijlstra): Theoretical analysis

The third Working Package in this project concerns the theoretical analysis. In this Working Package we will compare and evaluate the outcomes from the first and second Working Packages and see to what extent a unified explanation for the attested cross-linguistic variation can be provided. The central question here is indeed whether there is a single source for wide or narrow scope of negation with respect to coordination both across and within languages. In addition, it needs to be investigated how the various other grammatical and extra-grammatical factors affect these readings.

At this stage, we cannot provide any concrete hypotheses as for those we first need to examine the empirical results of the first and second Working Packages. However, in parallel to these empirical studies, we will already elaborate to what extent polarity-sensitivity, homogeneity, focus, and also so-called split-scope phenomena may be able to account for the observed facts and how they may interact. In this way, we can ensure that once the empirical outcomes call for a particular hypothesis, and the evaluation of this hypothesis does not have to start out from scratch.

Crucially, our project will address both the syntax and the semantics of negative coordination. As the above text already shows, the semantic questions concern scope and the syntactic questions concern the behavior of negation in ellipsis, Gapping and its kin. It is important that these questions are not to be addressed separately, but that the explanations of the phenomena discussed above are fully compatible. That will also enable us to evaluate between the Neg-Plus and the Neg-Only hypothesis. While the coordination facts so far suggest that semantically, it is rather specific properties of disjunctions and conjunctions that determine their scopal properties, the syntax of negation appears far from trivial in these cases and the Gapping and ellipsis facts may account for a more complex analysis of negation and negative marker, possibly along the lines of current analyses for split-scope effects (see Penka 2011, **Zeijlstra** 2011).

The results of WP1-3 will not only address all the questions outlined above, but also provide a firm base for follow-up studies, such as the study of inherently negative coordinations like English *neither … nor* or their (exclusive) positive counterparts (such as *either … or*). These more complex constructions, even though they have been addressed already rather substantially (see Gajić 2020 Mitrović & Sauerland 2014 for overview and discussion), can only be properly analyzed once the behavior of simple disjunction and conjunction is better understood.

Methodology and language choice

Data elicitation: This project aims at comparing negative scope effects in coordination in the better studied European languages, as well as in a set of African languages. The research will be based on systematically elicited data. This will guarantee comparability of the results across the languages. For the elicitation we will use a questionnaire containing grammaticality judgments as well as translation tasks as the main strategy. The questionnaire will be developed by the project team during the first phase of the project and will be applied to all the languages of the project in a parallel fashion. Given that the data we investigate in this project show reflexes from the syntax-semantic interface, the questionnaire will contain tasks for the elicitation of both syntactic and semantic structure. For the latter, we will use the insights gathered in the journal "Semantics field work methods" (https://ojs.library.ubc.ca/index.php/storyboards/index) from 2019 to present. The collected data will be made available through the database of the CRC as well as in publications in internationally renowned journals.

Language choice: The choice of the project languages is influenced by the two PI's areas of expertise: The intonation languages will be represented by a set of European languages. Here, we will make a selection of 6-8 languages based on the experience of the two PIs and the doctoral researcher that will be involved in Working Package 1 (working with the Göttingen-based PI). In the course of the project we will add 2-3 languages to this set if particular results call for that as well. We will make use of both existing language descriptions in these domains and native informants. It should not be problematic to find informants for these languages from existing networks. We will contact the informants either online or onsite.

The tone languages will be represented by a subgroup of the Kwa (Ewe, Akan) and Mabia (Dagbani, Dagaare, Buli) languages, both Niger-Congo, and both spoken in Ghana, as well as by the Nigerian languages Hausa (Afro-Asiatic) and Yoruba (Niger-Congo). The choice of the African languages is determined by the expertise of the responsible PI Katharina Hartmann. She is presently the PI of the project "The interaction of focus, aspect, and verbal morphology at the VP-periphery in the Mabia languages of Ghana" (DFG HA 2343/1-1c), which lasts until October 2024, see also section 3.6. This project provides fundamental insights into the focus systems of a set of seven Mabia languages and develops basic syntactic analyses of them. The sample includes languages the Dagbani, Dagaare and Buli. Thus, the ongoing project provides a very good base for the research on Mabia languages in this project. Ewe and Akan will be new in the language sample. Both languages are represented by distinguished departments at the University of Education in Winneba, Ghana, as well as in the linguistics department of the University of Accra. The PI has established very good relations with scientists at both institutions, who have agreed to cooperate with us in this project. Concerning Hausa, the PI has substantive expertise due to earlier leadership of the project "Information structure in Chadic languages" within the CRC 632 ("Information Structure"). Given the actual situation with Boko Haram, it is unlikely that fieldwork in Northern Nigeria will be possible. We will therefore recruit Hausa diaspora speakers or work online with existing contacts of the PI. The work on Yoruba will be initiated in cooperation with a doctoral researcher of the PI who resides in Frankfurt.

Fieldwork: Our data will be elicited mainly by fieldwork in Europe and West-Africa. The African languages will be elicited during two fieldwork trips to Africa of about 4 weeks each. These trips will be carried out together with project B03 (Hartmann & Mursell), which minimizes the travel expenses for the PI Katharina Hartmann who is responsible for this part of the project. She will also use the network that she has been establishing over the last years in Germany and other European countries to speaker-linguists of several West-African languages in order to complete the language sample. For the Mabia languages, we plan on one fieldwork trip in the second year to the University of Accra for PI Hartmann and one doctoral researcher. Due to the already established connections and the background provided by the project DFG HA 2343/1-1c, we estimate that this will be a good starting point for data elicitation. For the doctoral researcher, we will consider a second fieldwork trip in year 4, again to Accra and, if possible, to Nigeria. The work on the Mabia languages will build upon the language set that the PI Hartmann and her team are investigating in the ongoing project DFG HA 2343/1-1c. In addition, the PI is establishing professional relationships with native speakers of Mabia languages who reside in European countries and who have agreed to cooperate in this project. An important part of establishing and extending the network to African departments and Universities is an exchange between scientists in both directions, which includes the possibility for selected researchers visiting Germany as well. We plan to invite two speakers, one from Ghana and the other from Nigeria, to the GUF (costs are covered by Z-project).

Concerning fieldwork on the European languages, a twofold strategy is envisioned. One the one hand, the doctoral researcher working on the European languages will go on two fieldwork trips within Europe of one week each. In addition, we will invite informants for these languages to the Universities of Frankfurt and Göttingen to elicit data. The exact choice for these languages is still open and it will depend on the theoretical hypotheses to be developed in Working Package 1.

Work Plan

Working packages 1 and 2 run more or less in parallel. This allows us to develop the hypotheses on the European intonation languages and the African tone languages in permanent agreement. We start by a thorough literature review on the relationship between coordination (conjunction and disjunction) and negation. With respect to the African languages, our expectation finding relevant literature on this interaction is rather low. Here, the basic structures of negation and coordination will be our core interest. We will work with grammars and use the typological information on negation in WALS. We will also cooperate closely with project B03 on this aspect. Very early in the project, we will start to develop elicitation methods for the central phenomena investigated, including syntactic and semantic fieldwork methods. Fieldwork will take place every year at our two universities with invited informants as well as abroad, as outlined above, see also the tables showing the financial plans. Along with the fieldwork, we will start analyzing our data and preparing the publications.

Working package 3 takes place in the second half of the project. It strongly focuses on the theoretical analyses of the empirical findings. There will still be a possibility to test the hypotheses of this theoretical work given the two fieldwork trips that fall into this second project phase. Within WP3, we will also organize an international workshop (financed by the Z project) in order to discuss and evaluate our results with international colleagues. The work plan of the project is visualized in the following chart:

	2024				2025				2026				2027			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
WP1																
lit. search	▓	▓	▓													
methodology		▓	▓	▓	▓	▓	▓	▓	▓							
fieldwork			▓				▓				▓			▓		
data analysis				▓	▓	▓	▓	▓	▓	▓	▓	▓				
publication								▓	▓	▓	▓	▓	▓	▓	▓	▓
WP2																
lit. search	▓	▓	▓													
methodology		▓	▓	▓	▓	▓	▓	▓								
fieldwork			▓				▓				▓			▓		
data analysis				▓	▓	▓	▓	▓	▓	▓	▓					
publication								▓	▓	▓	▓	▓	▓			
WP3																
lit. search								▓	▓							
methodology									▓							
fieldwork										▓				▓		
data analysis									▓	▓	▓	▓	▓			
publication									▓	▓	▓	▓	▓	▓		

3.5 ROLE WITHIN THE COLLABORATIVE RESEARCH CENTRE

The project is situated in Area B of the CRC. This area investigates negation in relation to other operators with the aim to gain a better understanding of the commonalities and differences between negation and other functional elements and their potentially universal interactions.

This project will benefit from the other projects and institutions of the CRC. Starting with the general structures of the CRC, we will profit from the service projects of the CRC. The central INF-project will support us by providing us with the technical details and support for the sustainable storage of our data by integrating them into the general data bank of the CRC. We will maintain a close relationship to the projects of Areas A and B of the CRC as well as to project C01 (Bader/Kügler) from Area C. On the one hand, we share research interests with individual projects on specific research questions. Project A04 (Sailer/Zeijlstra) on Neg-Raising is intimately related with our project given that the strengthening effect observed with Neg-Raising is potentially responsible for the unexpected reading of negated conjunctions and maybe also of negated disjunctions, thus accounting for the attested scope mismatch in terms of strengthening. We also share close research interests with project B01 (Bader/Bargmann/Webelhuth), which investigates negation, scope, and word order in non-coordinated sentences in German. Project B03 (Hartmann/Mursell) looks into negation and its interaction with functional categories in Niger-Congo languages and is therefore directly relevant for the African part of our project. With B03 we also share the use of fieldwork for data collection. Given that stress on the coordinator is one theoretical option to account for the non-Boolean readings (cf. S&H) and given the potential influence of prosodic phrasing on the availability of the readings in intonation languages, we also want to cooperate with project C01 (Bader/Kügler), which investigates negation and prosody under various focus conditions.

3.6 DIFFERENTIATION FROM OTHER FUNDED PROJECTS

As already mentioned, Katharina Hartmann is the PI of the DFG funded project "The interaction of focus, aspect, and verbal morphology at the VP-periphery in the Mabia languages of Ghana" (DFG HA 2343/1-1c), see https://mabia-vp.com/tiki-index.php. This project, which will go on until September 30th, 2024, is the first project in theoretical linguistics that investigates the complex interaction of focus and verbal morphology in this group of languages. The project does not investigate negation and it therefore does not compete with the actual plans. PI Zeijlstra is currently overseeing five DFG Sachbeihilfe projects and is the spokesperson of RTG 2636 'Form meaning mismatches' (https://www.uni-goettingen.de/de/635554.html). These projects do not overlap with this current proposal.

3.7 RELEVANCE OF SEX, GENDER AND/OR DIVERSITY

No register-variation depending on sex and/or gender has been reported for the languages to be investigated in the project.