Everyone except possibly Ann*

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Abstract This paper deals with the interaction of modals and exceptives as in *Every student passed, except possibly Ann*. Arguments are put forward motivating a parse for at least some such sentences combining features of the two standard analyses for exceptive constructions, namely the phrasal and clausal analyses. A novel approach based on the well-known idea of exception as set subtraction coupled with exhaustification contributed by an operator *EXH* is proposed. Crucially, on this approach the prejacent *S* of *EXH* is conjoined with *[modal EXH S]*. That is, the modal is only present in the second conjunct where it takes scope over the clause *EXH S*, which is partially elided. This leads us to consider further data suggesting that the *EXH* used in such constructions does not assert the prejacent but rather only excludes alternatives. That is, it is the first conjunct alone that contributes assertion of the prejacent.

Keywords: exceptives, modals, exhaustivity, conjunction, ellipsis

1 The puzzle

1.1 The basic phenomenon

Modal expressions, such as *possibly*, can be found within exceptive constructions introduced by *except*, as illustrated in (1) (Moltmann 1995; García Álvarez 2008). Generally, modal operators require a propositional argument to combine with. In (1), the appropriate argument is not explicitly provided, given that what follows *possibly* is a DP (*Ann*).

(1) Every student passed, except possibly Ann.

This poses a puzzle for the classic analysis of exceptive constructions, according to which exceptives subtract a set introduced by the DP following them from the restrictor set (Hoeksema 1987; Fintel 1993). By analogy with comparatives, this

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analysis can be classified as phrasal because it assumes that syntactically what follows an exceptive is a DP. ¹

The phenomenon is quite general, and a wide range of modal expressions can appear in that position. Some illustrative examples are given below.

- (2) a. Every student passed, except probably Ann.
 - b. Every student passed, except I think Ann.

Moreover, modal expressions can occur in *except*-phrases immediately adjacent to the restrictor.

(3) Every student, except possibly Ann, passed.

1.2 A clausal analysis

The phrasal analysis contrasts with the clausal analysis, which suggests that the occurrence of *possibly* in (1) is expected, as *except* can also contain traces of a clausal structure, making it a clausal exceptive (Vostrikova 2019, 2021; Potsdam & Polinsky 2019). In (4a), what follows *except* is a PP, and in (4b), *except* hosts two distinct syntactic elements that do not form one syntactic constituent (Moltmann 1995; Vostrikova 2021).

- (4) a. I got no presents except from my mom.
 - b. Every boy danced with every girl except John with Mary.

Furthermore, Vostrikova (2019, 2021) observes that NPIs are licensed inside *except*-clauses providing exceptions to positive *every*-claims but are not licensed in *except*-clauses providing exceptions to negative claims, as the contrast between the two sentences in (5) shows.

- (5) a. John danced with everyone except with any girl from his class.
 - b. * John danced with no one except with any girl from his class.

- (i) a. Every student passed, but Ann.
 - b. * Every student passed, but possibly Ann.

¹ Notably, the classic phrasal analysis was initially designed for exceptives introduced by *but*, like the one in (1a). Such exceptive constructions cannot accommodate modal phrases, as shown in (1b), providing support for the phrasal analysis (Vostrikova 2021).

Vostrikova (2019; 2021) proposes that the underlying structures of these sentences are as shown in (6), wherein only the *except*-clause in (6a) contains negation, and their surface structure is derived via ellipsis. Given this structure, local NPI licensing by negation is predicted in (6a). However, due to the absence of negation in the *except*-clause and the position of *any* not being in a downward entailing environment globally in (6b) (see von Fintel 1994; Vostrikova 2021), NPI licensing is not expected.

- (6) a. John danced with everyone except John did not dance with any girl from his class.
 - b. * John danced with no one except John danced with any girl from his class.

As per this analysis, the underlying structure of (1) is as shown in (7). Given that what follows *possibly* is a full clause, *possibly* is correctly predicted to be able to occur in this position (Vostrikova 2021).²

(7) [[every student passed] [except [possibly [not [Ann passed]]]]]

1.3 The puzzle: collective predicates

The puzzle addressed here concerns sentences with collective predicates. A modal can follow *except* even when a collective predicate is used, as shown in (8).

(8) All the students gathered, except possibly Ann.

On the clausal analysis, the second clause in (8) is not expected to have a defined meaning. This is because *gather* is a collective predicate that requires a plural individual. The semantics of *gather* as presented in (10) incorporates this

- (i) a. John danced with everyone except Mary at the party.
 - b. ?? John danced with everyone except with Mary at the party.
 - c. * John danced with everyone except with any girl from his class at the party.

Given that modals can appear in *except*-phrases adjacent to the restrictor, their behavior doesn't align with other tests that track the clausal structure in exceptives.

² Vostrikova (2021) and Crnič (2021) allow the possibility of both phrasal and clausal exceptives with *except*. Additionally, Stockwell & Wong (2020) argue that restrictor-adjacent *except*-phrases are phrasal, while sentence-final ones are clausal based on their ability to serve as antecedents to *why*-sluices. Other evidence seems to support this distinction as well. If the *except*-phrase does not occur in sentence-final position, a preposition within the *except*-phrase, as in (ib), leads to degradedness relative to an example without a preposition, as in (ia). NPI-licensing makes the sentence even worse, as shown in (ic).

requirement, implemented as a condition of definedness $(x \prec X \text{ holds just in case } x \text{ is a part of } X)$. Thus, (8) is predicted to be unacceptable, contrary to fact.

- (9) * All the students gathered, except possibly Ann did not gather.
- (10) $[[gather]] = \lambda X_e : X \text{ is a plurality } X \text{ gathers}$ = $\lambda X_e : X \text{ is a plurality } \exists y[y \text{ is a location } \land \forall x \prec X[x \text{ goes to } y]]$

An idea that one might consider for such cases is that there is a mismatch between the predicate in the antecedent and the predicate in the ellipsis site, with the elided predicate being *took part in the gathering*. Such ellipsis – where full identity between the antecedent and the elided phrase does not hold – has been assumed by Bogal-Allbritten (2013) and Bogal-Allbritten & Weir (2017) for independent reasons. If this is the case, (1) has the underlying structure shown in (11).

(11) All the students gathered, except possibly Ann did not take part in the gathering.

We will discuss two arguments against this idea. The first argument is that this type of mismatch is generally not permitted in ellipsis. This is illustrated by the ungrammaticality of (12), where the predicate *gathered* cannot serve as the antecedent for VP-ellipsis in a sentence whose subject does not denote a plural individual.

(12) * All the students gathered and Ann did not.

The second argument against the analysis in (11) is that it would lead to an incorrect prediction that NPIs would be licensed in *except*-clauses when the main clause contains a collective predicate. This prediction contradicts the observed facts, as shown in (13a). The issue arises because, under the clausal analysis, the predicted underlying structure of the sentence in (13a) contains negation in the *except*-clause, as illustrated in (13b).

- (13) a. * John gathered all the animals except (possibly) any cow.
 - b. * John gathered all the animals except (possibly) John did not include any cow in the gathering.

Another hypothesis that we must dismiss is the notion that, despite *possibly* appearing inside the *except*-phrase, it takes scope over the entire quantificational

³ We assume that the domain of entities is a join semi-lattice partially ordered by the part-of relation (Link 1983): $X \leq Y$ iff there is a Z such that $X \oplus Z = Y$ or X = Y, where $X \oplus Z$ is the join of X and Z. Y is a plurality iff there is a part X of Y such that $X \neq Y$. Y is an atom otherwise. If Y is an atom we write Y. The more detailed lexical representation in the second line of (10) is only an approximation. Its purpose is to show that there is hidden existential quantification inside the meaning of *gather*.

claim. The problem with this idea is that it would result in a meaning for (8) that is too weak. Specifically, it predicts that the *every*-claim is embedded under *possibly* and modified by it. However, this prediction is incorrect. The sentence in (8) does not convey the same meaning as (14) (García Álvarez 2008).

(14) It is possible that all the students gathered except Ann.

Without *possibly*, a sentence with *except* entails three inferences illustrated below.

(15) All the students gathered, except Ann.

→ All the students not including Ann gathered

quantification membership

 \rightsquigarrow Ann is a student

..

→ Ann did not take part in the gathering

exception

In (16), *possibly* exclusively targets the exception inference, while the other inferences remain unaffected and are the same as in the sentence without it.

(16) All the students gathered, except possibly Ann.

→ All the students not including Ann gathered

quantification

→ Ann is a student

membership

→ Possibly, Ann did not take part in the gathering

exception

Hence, the puzzle that we aim to address in this paper can be summarized as follows:

(17) **The puzzle:** Modal expressions occurring inside *except*-phrases support their clausal analysis. However, cases involving collective predicates present a challenge to the idea that the DP inside an *except*-phrase is the subject of a clause with an elided predicate that matches the predicate in the main clause.

This puzzle shares similarities with another linguistic puzzle known as Collins conjunctions (Collins 1988; Bogal-Allbritten 2013; Bogal-Allbritten & Weir 2017; Hirsch 2017; Hirsch & Sauerland 2019), where modal elements like *possibly* can appear with one of the DPs. This remains possible even when the predicate is collective, as exemplified in (18a). In (18a), *possibly*—similarly to (8)—modifies solely the claim that Ann was part of the gathering. A common strategy to address Collins conjunctions involves searching for a hidden clausal structure within the conjunct modified by the modal. For this reason, Collins conjunctions give rise to analogous questions with collective predicates, since the underlying structure of the elided clause cannot be as in (18b).

- (18) a. John, Bill and possibly Ann gathered.
 - b. * Possibly Ann gathered.

2 A mixed phrasal-clausal analysis

In this section we spell out our solution to the puzzle in (17), which combines elements of both clausal and phrasal analysis. Specifically, we suggest that the *except*-phrase does not directly contribute subtraction; instead, it functions as a conjunction, bringing together two clauses: one with domain subtraction and an exhaustified version thereof. The exhaustification accounts for the exception inference. As the domain subtraction and exception are contributed by distinct clauses, *possibly* can exclusively target the latter inference by occurring in the second conjunct.

2.1 Assumptions about the syntax

What we are proposing for exceptives introduced by *except* is that, in addition to the clausal analysis along the lines suggested in Vostrikova 2021, and possibly a purely phrasal one (similar to the analysis suggested in Fintel 1993 for *but*), there is an additional parse illustrated in (19). This is the only parse available for (8) with a collective predicate *gather* and *possibly* following *except*,

[[[all the students MINUS Ann_F] gathered] MINUS Ann_F]
[except [possibly [EXH_{Alt} [all the students MINUS Ann_F] gathered]
MINUS Ann_F]]]]

In this structure, *except* functions as a conjunction-like element putting together two clauses. This analysis has both phrasal and clausal characteristics. The phrasal aspect is that what follows the element responsible for the exception (*MINUS*) is a DP and not a full clause. On the other hand, the clausal aspect is that what follows *except* is a full clause. Under this syntactic analysis, *possibly* occurring in the second conjunct gets the clausal type of argument, thus its requirements are satisfied.

The constituent embedded under *possibly* in the second conjunct contains *EXH*. It's prejacent is identical to the first conjunct.

The surface structure of the sentence is derived by moving the *MINUS Ann*-phrase in both of the clauses to the right edge and deleting it in the first conjunct. This is typical of so-called right node raising: in case the rightmost constituents of two conjuncts are identical, the one in the left conjunct can undergo ellipsis (e.g. Hartmann 2000). The remnant of the movement (the quantificational claim) is deleted in the second conjunct (the ellipsis is indicated in (19) by strikethrough). ⁴

⁴ Our analysis draws inspiration from Hirsch and Sauerland's (2019) treatment of Collins conjunctions. They suggest that the underlying structure of (18a) is as shown below. The surface structure is derived by deleting *John*, *Bill* in the second conjunct and performing right node raising of the predicate *gathered*.

⁽i) *John, Bill gathered and possibly John, Bill, Ann gathered.*

Furthermore, *MINUS* is not pronounced. We propose that its presence is triggered by *except* in the second clause and by the requirement of structural identity under ellipsis in the first clause. The trace positions are also unpronounced.

That being said, the rightward-movement involved in this derivation is assumed to have no interpretive consequences. That is, *MINUS Ann* is reconstructed, as indicated by underlining.⁵ Finally, *Ann* bears focus-marking.

Restrictor-adjacent examples like (20) receive a parallel analysis. The only difference to (19) would be that here in addition *gathered* moves rightward across the rightward moved *MINUS Ann* in each conjunct. It undergoes ellipsis in the first conjunct just like *MINUS Ann*.

(20) All the students, except possibly Ann, gathered.

2.2 Assumptions about the semantics

Following von Fintel's (1993) analysis for exceptives, we assume that their core contribution is domain subtraction. In the structure above, this function is performed by the *MINUS* operator.

The meaning of this operator is shown in (21). Given a quantifier with restrictor set P and given a set Q, MINUS forms the complement of Q in P. But MINUS does not take Q as an argument directly. Rather, it takes an atomic or plural individual X. Q conforms to the set of atomic individuals x that are a part of X. In addition MINUS adds the definedness condition that this be a subset of P. This is responsible for the membership inference. Thus, the membership inference is unaffected by the modal because of its presuppositional status.

$$[MINUS] = \lambda X_e.\lambda P_{et} : \{x : x \leq X\} \subseteq P \cdot P - \{x : x \leq X\}$$

For *student MINUS Ann* in (19) this means that Ann is first type-shifted to {Ann}. If this set is a subset of the set of students, it is subtracted from it. Otherwise

⁵ An alternative approach to right node raising would analyze (19) as involving sharing of the rightward-moved constituent *MINUS Ann* between the two conjuncts (e.g. Bachrach & Katzir 2009).

⁶ This treatment allows for MINUS to take plural individuals as in Every student passed, except Ann and Bill.

⁷ This is the only inference that projects from the antecedent of a conditional as shown in (i).

undefinedness arises.⁸ The first conjunct just contributes the quantificational claim with domain subtraction.

[22] [students [MINUS Ann_F]]
$$= \{x : x \text{ is a student}\} - \{Ann\}, \text{ only defined if } \{Ann\} \subseteq \{x : x \text{ is a student}\}$$
$$= \{x : x \text{ is a student who is not Ann}\}, \text{ only defined if Ann is a student}$$

Starting from von Fintel's work, it is standard to derive the exception inference by negating the alternative quantificational claims with other possible domain subtractions. In the most recent version of this theory, the negation of the alternatives is contributed by a separate element - EXH (see in particular Gajewski 2013; Hirsch 2016; Crnič 2021 but also Gajewski 2008). For present purposes the standard definition of EXH in (23) suffices. Given a prejacent ϕ and a set of alternatives Alt, EXH asserts ϕ and says that all of the innocently excludable alternatives given Alt and ϕ are false (Fox 2007). The innocently excludable alternatives given Alt and ϕ are those that are in the intersection of all the maximal sets of alternatives that can be consistently negated with the assertion of ϕ . Unless noted otherwise, the set of innocently excludable alternatives in the following is equivalent with the set of alternatives in Alt not entailed by the prejacent.

$$[EXH_{Alt} \phi] = \lambda w_s. [\![\phi]\!](w) = 1 \land \forall p[p \in IE(Alt, [\![\phi]\!]) \rightarrow p(w) = 0]$$

The alternatives are formed by making a substitution of the focus marked element following *MINUS*. Hirsch (2016) adopts the structural theory of alternatives (Katzir 2007; Fox & Katzir 2011), which posits that an alternative can be at most as complex as the original sentence. For the prejacent of EXH in (19), the resulting set of alternatives would be as shown in (24).

(24) Alt
$$\subseteq \{ \|a\| \text{ the students MINUS } \alpha \text{ passed} \| \mid \alpha \lesssim \text{Ann} \}$$

Assuming that Ann, Bill, Carl, and Dan are the relevant students, the constituent headed by *EXH* in (19) receives the interpretation in (25). This says that the prejacent is true, i.e., the maximal student plurality excluding Ann gathered, and that all alternatives not entailed by the prejacent are false. That is, the maximal student plurality excluding Bill did not gather, the maximal student plurality excluding Carl didn't either, and the same for the one excluding Dan.

⁸ Here and below we ignore the plural contribution on *student* triggered by -s. If -s directly contributed plurality, subtraction will only remove the individual Ann from the resulting set but not any plurality containing Ann. This issue can be resolved by having plurality be contributed by a *-operator applying to the restrictor after subtraction (see e.g. Beck 2000).

As discussed by Dowty (1987) and as exemplified by (26) gather typically licenses sub-entailments. That is, if $a \oplus b \oplus c \oplus d$ gathered, then $a \oplus b \oplus c$ gathered.

(26) Ann, Betty, Carl, and Dan gathered.
$$\rightsquigarrow$$
 Ann, Betty, and Carl gathered

From the sub-entailment property of *gather* it follows that if Ann (a) did not take part in a gathering with $c \oplus d$, nor with $b \oplus d$, nor with $b \oplus c$, then $a \oplus b \oplus c \oplus d$ did not gather. To see this, assume otherwise. Then by the truth of $a \oplus b \oplus c \oplus d$ gathering it would follow that Ann took part in a gathering with at least one of the pluralities just mentioned. This is incompatible with (25): it says that that Ann did not take part in a gathering with any of the pluralities mentioned. Thus, (25) entails that Ann did not take part in any gathering with $b \oplus c \oplus d$, in other words, it captures the exception inference.

The constituent headed by EXH has the right semantic type to compose with possibly: it takes the intensionalized meaning of this constituent as its argument. With possibly factored in, the interpretation of the second conjunct of (19) amounts to (27), where the diamond operator is used as a shorthand for the meaning of the possibility modal. Given the discussion of (25), (27) simply says that it is possible that $b \oplus c \oplus d$ gathered and that Ann did not take part in this. That is, the modalized exception inference is derived.

[[possibly [EXH_{Alt} [[all the students [MINUS Ann_F]] gathered]]]]] = 1 iff
$$\Diamond (G(b \oplus c \oplus d) \land \neg G(a \oplus c \oplus d) \land \neg G(a \oplus b \oplus d) \land \neg G(a \oplus b \oplus c))$$

We assume that *except* is equivalent to *and*. Given all this, (19) as a whole receives the meaning in (28). The first conjunct contributes for the inference that $b \oplus c \oplus d$ gathered and the second conjunct the one that Ann possibly didn't take part in this. Thus, we propose that the reason why the quantification claim with domain subtraction is not affected by *possibly* is that it is contributed separately by the first conjunct.

3 Predictions and refinements

In the present section some refinements having to do with issues of collective predication and predictions regarding the NPI-data from above are discussed.

⁹ For modifications of this assumption see Champollion 2015 and Kuhn 2020.

3.1 The status of the 'no-further-contribution' inference

There is a potential issue to the reasoning just outlined. Notice that (26) also licenses the inference that no further individuals took part in the gathering. That is, it licenses the inference that Eve did not take part in the gathering. This might be taken to suggest that *gather* should have the entry in (29) with a no-further-contribution conjunct, rather than the one introduced in (10).

(29)
$$[gather] = \lambda X_e : X \text{ is a plurality }. \exists y[y \text{ a location } \land \forall x \prec X[x \text{ went to } y] \land \neg \exists z[z \not\prec X \land z \text{ went to } y]]$$

(29) would have the problematic consequence that the first conjunct in (19) would entail that Ann did not take part in the gathering. That is, the modalized exception inference would be overwritten by this stronger entailment and the good result that we seemed to have gotten would be in danger.

To avoid this issue, we suggest to keep the meaning for *gather* in (10) without the inference that no individual that is not part of X took part in the gathering. Instead, we assume that the no-further-contribution inference of (26) is an implicature. Its literal meaning is as assumed so far. But an EXH-operator strengthens it as in (30). Also here, the alternatives vary in the pluralities considered. EXH excludes all those alternatives with pluralities of which $a \oplus b \oplus c \oplus d$ is a proper part. In particular, EXH excludes the alternative Ann, Betty, Carl, Dan, and Eve gathered, which is stronger than the prejacent given the sub-entailments property of gather. (30) therefore entails that Eve did not take part in a gathering with the other individuals, as desired. Eve

(30) [EXH_{Alt} [Ann, Betty, Carl and Dan gathered]]
= 1 iff
$$\exists y[y \text{ a location } \land \forall x \prec a \oplus b \oplus c \oplus d[x \text{ went to } y]] \land$$

 $\neg \exists X[a \oplus b \oplus c \oplus d \prec X \land \exists y[y \text{ a location } \land \forall x \prec X[x \text{ went to } y]]]$

3.2 Collective predication without sub-entailments: *lift the piano*

There are, however, also collective predicates that do not seem to license subentailments. *Lift the piano* is a case in point, as shown by (31).

¹⁰ To the extent that (8) can be read as having the inference that no non-student took part in the gathering, the LF in (19) will have to be updated so as to reflect a further EXH to generate this inference, as well. (i) is a possibility. Assuming the alternatives to EXH in the first conjunct are of the form α gathered where α is an expression denoting a plurality having all the students as parts, the first conjunct would then entail that no non-student took part in the gathering.

⁽i) [[EXH_{Alt'} [all the students MINUS Ann gathered]] [except [possibly [EXH_{Alt} [all the students MINUS Ann gathered]]]]]

Consider an example with *except*, *possibly*, and *lift the piano* in it such as (32). The simple-minded approach section 2 predicts the meaning in (33) for it. The second conjunct says that possibly Ann did not contribute to lifting the piano together with $c\oplus d$, nor $b\oplus d$, nor $b\oplus c$. Without the sub-entailment property, this, however, does not entail that it is possible that Ann did not take part in lifting the piano together with $b\oplus c\oplus d$, unlike what we have seen with *gather* in subsection 2.2.

(32) All the students (together) lifted the piano, except possibly Ann.

The discussion in subsection 3.1, however, can guide us here as well. Assume that *lift the piano* receives the literal meaning in (34).

(34) [lift the piano] =
$$\lambda X_e . \forall x \prec X[x \text{ contributed to the lifting of the piano}]$$

With this meaning, the literal meaning of (31) does not entail that no one other than Ann, Betty, and Carl contributed to the lifting. The *EXH*-based treatment of the 'no-further-contribution' inference discussed for *gather* above, however, can be straightforwardly extended to (31). Notice now that if, say, *Ann and Betty lifted the piano* were itself exhaustified along these lines it would entail among other things that Carl did not contribute to the lifting. But this might then be the source of the missing sub-entailment property for *lift the piano*. That is, we do not intuit (31) to have sub-entailments because the target sentences to be entailed would themselves carry 'no-further-contribution' inferences contradicting (31).¹¹

In other words, the sub-entailment property would hold for *lift the piano* on its literal meaning. If this is on the right track, the second conjunct in (33) can be taken to entail that Ann did not take part in the lifting similar to what was seen to hold in the *gather*-case. Of course, further exhaustification would add the inference that no non-student contributed.

3.3 Cover-based collective predication

We now observe that (8), repeated below as (35a), is true in a scenario given in (35b). What the sentence intuitively says when uttered in such a scenario is that Ann did not take part in the meeting of her group. If we simply transpose the meaning in (28) to this scenario, however, the resulting truth-conditions do not reflect this.

¹¹ In principle *gather* should allow for an optional reading without sub-entailments. Indeed, this has been claimed to be the case (see e.g. Krifka 1989).

They would say that all nineteen students who are not Ann gathered and possibly all twenty students together did not gather.

- (35) a. All the students gathered, except possibly Ann.
 - b. **Scenario:** Twenty students have to do group work. For this the individual groups consisting of four students each need to meet.

The issue we are facing here is independent of the present proposal. Intuitively, the reading of the sentence in (35a) we are after is based on what is called covers (Schwarzschild 1996). It says that there is a way of dividing the twenty students in groups such that each student is part of a group and that all groups met but possibly Ann did not take part in the meeting of her group. This can be achieved by having *gather* contribute existential quantification over covers C, as in (36). This entry applied to a plurality X says that there is some way of dividing X into a number of pluralities Y such that Y gathered. (35)

(36)
$$[gather] = \lambda X_e : X \text{ is a plurality }. \exists C[C \text{ covers } X \land \forall X' \in C[X' \text{ gathers}]]$$

In order to keep exposition manageable, let us now assume that there are five students. In addition to Ann, Bill, Carl, and Dan there is now also Eve. Combining the entry in (36) with the present proposal then, i.e., the LF in (19), the meaning in (37) is derived for sentence (35a). This says that there is a way of dividing the plurality $b\oplus c\oplus d\oplus e$ into parts such that the parts met. This would be made true if all of them together gathered – as before – or if, for instance, $b\oplus c$ and $d\oplus e$ met separately. In addition, (37) says that it is possible that there is no way of dividing any plurality consisting of four of the students and including Ann such that all parts of that plurality gathered. Together with the truth of the prejacent requiring that $b\oplus c\oplus d\oplus e$ gathered – albeit potentially separately – it follows that it is possible that Ann did not take part in any gathering. This is because of the sub-entailment property discussed above. This property ensures that if for any plurality of four individuals involving Ann there is no cover C such that all members of C gathered, then there cannot be any cover C' for the full plurality also involving Ann such that all members of C' gathered.

(37)
$$[[(35a)]] = 1 \text{ iff } \exists C[C \text{ covers } b \oplus c \oplus d \oplus e \land \forall X' \in C[G(X')]]$$
$$\land \lozenge(\neg \exists C[C \text{ covers } a \oplus c \oplus d \oplus e \land \forall X' \in C[G(X')]]$$

¹² *C* is a cover of a plurality *X* if and only if (i) *C* is a set whose elements are parts of *X* and (ii) every atomic part of *X* is part of one of the elements of *C* (Schwarzschild 1996). In the case of a collective predicate like *gather* the elements of *C* must all be pluralities themselves, as otherwise the definedness condition of *gather* would not be satisfied.

Hardwiring this contribution in the semantics of *gather* is presumably not quite correct, but it suffices for our immediate purposes.

This cover-based treatment can be straightforwardly extended to the scenario in (35b) with more than five students.

3.4 NPIs in the *except*-clause

The mixed phrasal-clausal analysis that we defend here does not make the unwelcome prediction that NPIs should be licensed after *except* when the predicate is plural in sentences like (13a) repeated below.

(38) * *John gathered all the animals except any cow.*

We follow the standard assumption that *any cow* has the semantics of an existential quantifier, and as such, it cannot be interpreted inside the *MINUS*-phrase due to type incompatibility. We could potentially quantifier raise *any cow* to resolve the type mismatch like it is shown in (39), but the resulting position of *any* would not be in a downward-entailing environment. *EXH* is not an NPI licenser and there is no other potential operator that can create the right kind of environment for *any*.

For concreteness, we adopt the exhaustification-based theory of NPIs (Chierchia 2013). That is, a further exhaustivity operator is applied. In order to differentiate it from *EXH* we refer to this operator as *O*. This operator unlike *EXH* is not contradiction-free. More precisely, it does not just exclude the innocently excludable alternatives but rather all the alternatives that are not entailed by the prejacent. The idea is that an NPI is licensed just in case this operator does not return a contradiction.

(39)
$$[IP_4 \ except \ [IP_3 \ O_{Alt'} \ [IP_2 \ EXH_{Alt} \ [IP_1 \ any_D \ cow_F \ \lambda_1 \ [John \ gathered \ all \ the \ animals \ MINUS \ t_1 \]]]]]$$
(40)
$$[O_{Alt} \ \phi] = \lambda w_s. [\![\phi]\!](w) = 1 \land \forall p \in Alt[\![\phi]\!] \not\subset p \rightarrow p(w) = 0]$$

To illustrate the predictions of the theory in detail, we will focus on the second conjunct. We do so because even though there is no potential NPI licenser in the first conjunct, the whole *MINUS*-phrase is elided, and thus we cannot be certain that there is an NPI and not a simple indefinite in the first conjunct in the position corresponding to the position of *any cow* in the second conjunct. This kind of mismatch is allowed in ellipsis.

We will explore two potential positions for the operator O and demonstrate that both yield an overall contradictory meaning for the sentence. The first one is shown in (39), where O scopes above *EXH* responsible for the exception inference. The second option is that the relative scope of these operators is reversed.

In (39), the prejacent of O receives the interpretation in (41). It is reasonable to assume that EXH makes use of alternatives varying in the restrictor of any to yield an exception inference. Let us assume that the relevant alternative in this case is the one with pig instead of cow. EXH negates this alternative and conjoins it with its prejacent. For simplicity of the exposition, let's also suppose that there are four animals: two cows (c_1 and c_2) and two pigs (p_1 and p_2). The result says that there is a cow such that when subtracted from the set of animals, John gathered all the remaining animals but the same is not true when one of the pigs is subtracted from the set of animals. I.e., John either gathered $c_1 \oplus p_1 \oplus p_2$ or $c_2 \oplus p_1 \oplus p_2$ but he neither gathered $c_1 \oplus c_2 \oplus p_1$ nor $c_1 \oplus c_2 \oplus p_2$.

(41)
$$[IP_2] = 1 \text{ iff } \exists x \in \{c_1, c_2\} [G(\oplus(\{c_1, c_2, p_1, p_2\} - \{x\})(j)] \land \\ \neg \exists y \in \{p_1, p_2\} [G(\oplus(\{c_1, c_2, p_1, p_2\} - \{y\}))(j)]$$

In the next step O excludes the domain alternatives to its prejacent. In (39) and below, D on any is a domain variable. We follow Chierchia (2013) and assume that the alternatives used by O vary relative to the prejacent by having the domain variable be a subset of D. The first alternative says that John gathered $c_1 \oplus p_1 \oplus p_2$ but not $c_1 \oplus c_2 \oplus p_1$ or $c_1 \oplus c_2 \oplus p_2$, and the second that he gathered $c_2 \oplus p_1 \oplus p_2$ but not $c_1 \oplus c_2 \oplus p_1$ or $c_1 \oplus c_2 \oplus p_2$. Negating each of these and conjoining it with the prejacent results in the contradiction in (42). The negated alternatives correspond to disjunctions, as shown there. Notice that the second disjunct of each of these is inconsistent with the exception inference in the prejacent (all the relevant inferences are underlined in (42)). Consequently, for the disjunctions to be true, their first disjuncts must be considered. The two together, however, contradict the first conjunct of the prejacent: it is impossible that there is a cow such that John gathered all animals other than it, but it is not true of each individual cow.

$$\begin{split} \llbracket IP_3 \rrbracket &= 1 \text{ iff } (\exists x \in \{c_1, c_2\} [G(\oplus(\{c_1, c_2, p_1, p_2\} - \{x\}))(j)] \land \\ \neg \exists y \in \{p_1, p_2\} [G(\oplus(\{c_1, c_2, p_1, p_2\} - \{y\}))(j)]) \land \\ (\neg \exists z \in \{c_1\} [G(\oplus(\{c_1, c_2, p_1, p_2\} - \{z\}))(j)] \lor \\ \exists x \in \{p_1, p_2\} [G(\oplus(\{c_1, c_2, p_1, p_2\} - \{x\}))(j)]) \land \\ (\neg \exists y \in \{c_2\} [G(\oplus(\{c_1, c_2, p_1, p_2\} - \{y\}))(j)] \lor \\ \exists z \in \{p_1, p_2\} [G(\oplus(\{c_1, c_2, p_1, p_2\} - \{z\}))(j)]) \end{split}$$

In the second possible parse, O takes scope below EXH:

(43)
$$[IP_3 EXH_{Alt} [IP_2 O_{Alt'} [IP_1 any_D cow_F \lambda_1 [John gathered all the animals MINUS t_1]]]]$$

Then, the meaning of the prejacent of EXH is as shown in (44). The prejacent of O corresponds to the first line of (44). It says that when one of the cows is

subtracted from the set of animals, John gathered the maximal plurality made up of the remaining animals. In other words, John either gathered $c_1 \oplus p_1 \oplus p_2$ or $c_2 \oplus p_1 \oplus p_2$. As said above, the alternatives in Alt' used by O differ from the prejacent in that the domain variable denotes a subset of the one in the prejacent, i.e., singleton sets of cows. O excludes both of them as shown by the third and fourth lines in (44). Clearly, this results in a contradiction even before we factor in EXH. $Any\ cow$ is therefore not licensed on the parse in (43).

(44)
$$[IP_1] = 1 \text{ iff } \exists x \in \{c_1, c_2\} [G(\oplus(\{c_1, c_2, p_1, p_2\} - \{x\}))(j)] \land \\ \neg \exists y \in \{c_1\} [G(\oplus(\{c_1, c_2, p_1, p_2\} - \{y\}))(j)] \land \\ \neg \exists z \in \{c_2\} [G(\oplus(\{c_1, c_2, p_1, p_2\} - \{z\}))(j)]$$

To conclude, in both cases, we end up with a contradictory meaning for the sentence. This shows that the proposed theory can successfully explain why NPIs are not licensed after *except* when the predicate is collective.

4 Other modals

4.1 Necessity modals in *except*-clauses

So far we have focused on the epistemic possibility modal *possibly*. The account presented can be immediately extended to the example with epistemic *probably* in 1a). At this point it should, however, be noticed that epistemic necessity modals are less acceptable in the configurations considered here, as shown by (45a) and (45b).

(45) a. #All the students gathered, except certainly Ann.b. #All the students student gathered, except surely Ann.

We will follow the intuition that the epistemic necessity modals in the examples in (45) are vacuous; if the speaker is certain that Ann did not take part in the gathering, they could have simply uttered *Every student gathered*, *except Ann* which would convey the same information.¹³

Since it is moreover structurally simpler, considerations of manner should prefer it. As compelling as this reasoning might be, it raises the question why (46b), for instance, is not equally blocked then. We note that *certainly* is licensed when the full answer to a question under discussion is not known. That is, as a response to the question in (46a) using (46b) does not give rise to the inference that only Ann passed, unlike the variant without *certainly* in (46c). This can be guaranteed through strengthening of (46b) by negating alternatives of the form α *certainly passed*.

¹³ Why is (4a) with *I think* in the *except*-clause acceptable then? Arguably this is due to *think* not being a real universal modal, whereby it would not be vacuous, just like *possibly* (see e.g. Lassiter 2011).

(46) a. Which students passed?

All of this means that *certainly* in (46b) is not vacuous after all. Does that mean that the intuition that *certainly* is vacuous in (45a) is on the wrong track? No. The relevant parse for the second conjunct and its interpretation would be as in (47). Here the first EXH yields as a result the first line in the truth-conditions of (47), i.e., the the exception inference. This says that it is certain that $b \oplus c \oplus d$ gathered and that Ann did not take part in the gathering. The second EXH excludes the *certainly*-alternatives. These alternatives are themselves all strengthened given the presence of the lower EXH. Consider the first negated such alternative in the second line of the truth-conditions. It says that it is not certain that $a \oplus c \oplus d$ gathered and that Ann did not take part in that. This is entailed by the first line, of course. The same holds for the other two negated *certainly*-alternatives in the third and the fourth lines.

```
 [[EXH_{Alt'} [ certainly [ EXH_{Alt} [ [ all the students [ MINUS Ann_F ]] gathered ]]]]]] 
= 1 \text{ iff } \Box(G(b \oplus c \oplus d) \land \neg G(a \oplus c \oplus d) \land \neg G(a \oplus b \oplus d) \land \neg G(a \oplus b \oplus c)) 
\land \neg \Box(G(a \oplus c \oplus d) \land \neg G(b \oplus c \oplus d) \land \neg G(a \oplus b \oplus d) \land \neg G(a \oplus b \oplus c)) 
\land \neg \Box(G(a \oplus b \oplus d) \land \neg G(a \oplus b \oplus c) \land \neg G(a \oplus c \oplus d) \land \neg G(b \oplus c \oplus d)) 
\land \neg \Box(G(a \oplus b \oplus c) \land \neg G(a \oplus b \oplus d) \land \neg G(a \oplus c \oplus d) \land \neg G(b \oplus c \oplus d))
```

That is, the higher *EXH* in (47) is vacuous. As a consequence *certainly* in (45a) is vacuous even after strengthening, unlike what was seen to be the case for (46b).

4.2 Modals of expectation in *except*-clauses

A property of the account discussed above is that the *EXH* in the second conjunct contributing the exception inference asserts the prejacent. A consequence of this is that the prejacent is in the scope of the modal. For the cases seen so far this arguably did not matter, but there are some cases for which this assumption does not seem right. For example, in (48b), this amounts to the expectation that all students gather and that Ann would not take part in this. This does not feel right. Intuitively, what is said to have been expected is only the latter.¹⁴

(48) a. **Scenario:** Ann is completely apolitical and I expected her to not take part in the demonstration. Regarding the other students I had no expectation.

¹⁴ We thank Nina Haslinger (p.c.) for bringing similar examples with distributive predicates to our attention. Similar issues result with modals like *fortunately*.

b. All the students gathered, except, as it was expected, Ann.

One might thus speculate that the exhaustivity operator used in the mixed phrasal-clausal analysis of *except*-constructions only excludes alternatives but does not assert the prejacent, as *EXCL* in (49) does. With this the problematic inference of (48b) is not predicted anymore.

$$[EXCL_{Alt} \phi] = \lambda w_s. \forall p[p \in IE(Alt, \llbracket \phi \rrbracket) \to p(w) = 0]$$

But this cannot be all. With *EXCL*, the predicted modalized negative inference is as shown in (50). This says that it was expected that any plurality of three students with Ann in it would not gather. Unfortunately, this does not entail that Ann was not expected to take part in the gathering. For instance, it being expected that $a \oplus c \oplus d$ would not gather is compatible with not having any expectation regarding Ann as long as it is expected that $c \oplus d$ would not gather.

(50)
$$Exp(\neg G(a \oplus c \oplus d) \land \neg G(a \oplus b \oplus d) \land \neg G(a \oplus b \oplus c))$$

A potential solution to this problem is to ensure that the prejacent of *as was expected* means *Ann did not take part in the gathering* by extending the set of alternatives for EXCL and including the ones where a bigger set is subtracted (those would be structurally more complex alternatives, such as *all the students MINUS Betty and Carl gathered*). Then we could let EXCL negate all defined alternatives not entailed by its prejacent.¹⁵

$$[EXCL_{Alt} \ \phi] = \lambda w_s. \forall \psi \lceil (\psi \in Alt \land \lceil \psi \rceil (w) \neq \# \land \lceil \phi \rceil \Rightarrow \lceil \psi \rceil) \rightarrow \lceil \psi \rceil (w) = 0]$$

All the defined alternatives where a set consisting of Ann and someone else is subtracted are entailed by the prejacent. This follows from the sub-entailment property of *gather*. Assuming again that there are 4 individuals, the defined alternatives not emailed by the prejacent are as shown in (52). By negating all of them, EXCL delivers the inference that Ann was not a part of the gathering without asserting the prejacent.

(52)
$$G(a \oplus b \oplus c)$$
, $G(a \oplus b \oplus d)$, $G(a \oplus c \oplus d)$, $G(a \oplus c)$, $G(a \oplus b)$, $G(a \oplus d)$

Another property of (48b) that sets it apart from the other cases considered above is that it entails both the modalized and non-modalized versions of the exception inference: it was expected that Ann would not participate and Ann did not participate in the gathering. Moreover, as it was expected does not seem to contribute at the assertive level. ¹⁶

¹⁵ This definition assumes that ALT is a set of sentences, not propositions.

¹⁶ The expectation inference projects from the antecedent of a conditional as shown below.

We implement this by giving as it was expected the semantics in (53), where it asserts its prejacent and presupposes that it was expected the prejacent is true.

(53)
$$[as\ was\ expected] = \lambda p.\lambda w : Exp(p).p(w)$$

With these assumptions, the predicted meaning of (48b) is as shown below. We correctly capture the fact that (48b) asserts that the students other than Ann gathered and Ann was not a part of the gathering and presupposes that it was expected that Ann would not participate.

(54)
$$[(48b)] = 1 \text{ iff } G(b \oplus c \oplus d) \land \neg G(a \oplus b) \land \neg G(a \oplus c) \land \neg G(a \oplus c)$$
 is defined only if $Exp(\neg G(a \oplus b) \land \neg G(a \oplus c) \land \neg G(a \oplus c))$

5 Summary

We showed that modals in *except*-phrases when combined with collective predicates should not be accounted for with a simple clausal analysis, as has been proposed for *except*. The reason for this was that it wrongly predicts NPIs to be licensed in such configurations. Instead we proposed a mixed phrasal-clausal account; phrasal because of set-subtraction contributed by a silent *MINUS*-operator, and clausal because of the conjunction brought about by *except*. For this to work, exhaustification has to apply in the second conjunct below the modal. Finally, we saw reason to believe that the exhaustification in such cases is brought about by an operator that excludex alternatives but does not assert the prejacent, termed *EXCL*. The assertion of the prejacent is brought about by the first conjunct of the whole construction, as it were.

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⁽i) If all the students gathered, except, as was expected, Ann, the party was a success.

\[
\sim \text{'It was expected that Ann would not participate in the gathering'}\]

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