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.

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).

(i)  
a. Every student passed, but Ann.

b. * Every student passed, but possibly Ann.
Everyone except possibly Ann

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).

(7) 

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

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).

(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.
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.

\(10\) \[\text{[gather]} = \lambda X. : X \text{ is a plurality}. \ X \text{ gathers} = \lambda X. : X \text{ is a plurality}. \exists y[y \text{ is a location} \land \forall x \prec X[x \text{ goes to } y]]\]

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.

\(13\) 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

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3 We assume that the domain of entities is a join semi-lattice partially ordered by the part-of relation (Link 1983): \(X \preceq Y\) if 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 if 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
    ⇝ Ann is a student  membership
    ⇝ 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.
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.

(19) \[
[[[ all the students MINUS Ann gathered ] MINUS Ann ]
[ except [ possibly [ EXH Alt [ all the students MINUS Ann gathered ] MINUS AnnF ]]]]
\]

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.

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.
Everyone except possibly Ann

Furthermore, \textit{MINUS} is not pronounced. We propose that its presence is triggered by \textit{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, \textit{MINUS Ann} is reconstructed, as indicated by underlining.\(^5\) Finally, \textit{Ann} bears focus-marking.

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

(20) \hspace{1cm} \textit{All the students, except possibly Ann, gathered.}

\subsection*{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 \textit{MINUS} operator.

The meaning of this operator is shown in (21). Given a quantifier with restrictor set \(P\) and given a set \(Q\), \textit{MINUS} forms the complement of \(Q\) in \(P\). But \textit{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 \(X\).\(^6\) In addition \textit{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.\(^7\)

(21) \hspace{1cm} [\textit{MINUS}] = \lambda X. e. \lambda P. \lambda et : \{x : x \leq X\} \subseteq P \cdot P - \{x : x \leq X\}

For student \textit{MINUS Ann} in (19) this means that \textit{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 \textit{MINUS Ann} between the two conjuncts (e.g. Bachrach & Katzir 2009).

\(^6\) This treatment allows for \textit{MINUS} to take plural individuals as in \textit{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).

(i) \hspace{1cm} \textit{If all the students except Ann gathered, the party was a success.}

\(\not\supset ‘\text{All the students not including Ann gathered}’\)

\(\sim ‘\text{Ann is a student}’\)

\(\not\supset ‘\text{Ann did not take part in the gathering}’\)
undefinedness arises.\(^8\) The first conjunct just contributes the quantificational claim with domain subtraction.

\[(22)\]
\[
\semantics{[\text{students} \setminus \text{Ann}_F]} = \{x : x \text{ is a student}\} \setminus \{\text{Ann}\}, \text{only defined if } \{\text{Ann}\} \subseteq \{x : x \text{ is a student}\} = \{x : x \text{ is a student who is not Ann}\}, \text{only defined if Ann is a student}
\]

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 - \(\text{EXH}\) (see in particular Gajewski 2013; Hirsch 2016; Crnič 2021 but also Gajewski 2008). For present purposes the standard definition of \(\text{EXH}\) in (23) suffices. Given a prejacent \(\phi\) and a set of alternatives \(Alt\), \(\text{EXH}\) asserts \(\phi\) and says that all of the innocently excludable alternatives given \(Alt\) and \(\phi\) are false (Fox 2007). The innocently excludable alternatives given \(Alt\) and \(\phi\) are those that are in the intersection of all the maximal sets of alternatives that can be consistently negated with the assertion of \(\phi\). 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.

\[(23)\]
\[
\semantics{\text{EXH}_{Alt} \phi} = \lambda w. \semantics{\phi}(w) = 1 \land \forall p[p \in IE(Alt, \semantics{\phi}) \rightarrow p(w) = 0]
\]

The alternatives are formed by making a substitution of the focus marked element following \(\text{MINUS}\). 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 \(\text{EXH}\) in (19), the resulting set of alternatives would be as shown in (24).

\[(24)\]
\[
Alt \subseteq \{\semantics{\text{all the students MINUS } \alpha \text{ passed}} | \alpha \preceq \text{Ann}\}
\]

Assuming that Ann, Bill, Carl, and Dan are the relevant students, the constituent headed by \(\text{EXH}\) 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.

\[(25)\]
\[
\semantics{[\text{EXH}_{Alt} \semantics{[\text{all the students} \setminus \text{Ann}_F] \text{ gathered } }] = 1 \iff G(b \oplus c \oplus d) \land \neg G(a \oplus e \oplus d) \land \neg G(a \oplus b \oplus d) \land \neg G(a \oplus b \oplus c)}
\]

\(^8\) Here and below we ignore the plural contribution on \textit{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).
Everyone except possibly Ann

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.\(^9\)

\[(26)\] *Ann, Betty, Carl, and Dan gathered.* $\leadsto$ 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.

\[(27)\] $[\text{possibly} [\text{EXH}_{\text{Alt}} [\text{all the students [MINUS AnnF ] gathered }]]] = 1 \text{ iff } \Diamond (G(b \oplus c \oplus d) \land \neg G(a \oplus c \oplus d) \land \neg G(a \oplus b \oplus d) \land \neg G(a \oplus b \oplus c))$

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.

\[(28)\] $[(19)] = 1 \text{ iff } G(b \oplus c \oplus d) \land \Diamond (G(b \oplus c \oplus d) \land \neg G(a \oplus c \oplus d) \land \neg G(a \oplus b \oplus d) \land \neg G(a \oplus b \oplus c))$

### 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 \textit{gather} should have the entry in (29) with a no-further-contribution conjunct, rather than the one introduced in (10).

\begin{equation}
\text{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\in X \land z \text{ went to } y]]
\end{equation}

(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 \textit{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 \textit{EXH}-operator strengthens it as in (30). Also here, the alternatives vary in the pluralities considered. \textit{EXH} excludes all those alternatives with pluralities of which $a \oplus b \oplus c \oplus d$ is a proper part. In particular, \textit{EXH} excludes the alternative \textit{Ann, Betty, Carl, Dan, and Eve gathered}, which is stronger than the prejacent given the sub-entailments property of \textit{gather}. (30) therefore entails that Eve did not take part in a gathering with the other individuals, as desired. \footnote{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 \textit{EXH} to generate this inference, as well. (i) is a possibility. Assuming the alternatives to \textit{EXH} in the first conjunct are of the form $\alpha \text{ gathered}$ where $\alpha$ 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.}

\begin{equation}
\text{EXH}_{\text{Alt}} \text{ [Ann, Betty, Carl and Dan gathered \textit{I}]}
= 1 \text{ 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]]]
\end{equation}

3.2 Collective predication without sub-entailments: Lift the piano

There are, however, also collective predicates that do not seem to license sub-entailments. \textit{Lift the piano} is a case in point, as shown by (31).

\begin{verbatim}
(i) [[ EXHAlt [ all the students MINUS Ann gathered ]] [ except [ possibly [ EXHAlt [ all the students MINUS Ann gathered ]]]]]
\end{verbatim}
Everyone except possibly Ann

(31) Ann, Betty, and Carl lifted the piano. \(\not\leftrightarrow\) Ann and Betty lifted the piano

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.

(33) 
\[
\begin{align*}
\llbracket (32) \rrbracket & = 1 \text{ iff } LP(b \oplus c \oplus d) \land \\
& \Diamond (LP(b \oplus c \oplus d) \land \neg LP(a \oplus c \oplus d) \land \neg LP(a \oplus b \oplus d) \land \neg LP(a \oplus b \oplus c))
\end{align*}
\]

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

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.\[12\]

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

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 $b \circ c \circ d \circ e$ into parts such that the parts met. This would be made true if all of them together gathered – as before – or if, for instance, $b \circ c$ and $d \circ e$ 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 $b \circ c \circ d \circ e$ 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) \[
[(35a)] = 1 \iff \exists C [C \text{ covers } b \circ c \circ d \circ e \land \forall X' \in C [G(X')]] \land \Diamond (\neg \exists C [C \text{ covers } a \circ c \circ d \circ e \land \forall X' \in C [G(X')]])
\]

1 $C$ 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.
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\[\land \neg \exists C[C \text{ covers } a \oplus b \oplus d \oplus e \land \forall X' \in C[G(X')]]\]

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) \[\text{IP}_4 \text{ except } \text{IP}_3 O_{Alt}'[\text{IP}_2 EXH_{Alt} \text{IP}_1 \text{ anyD cowF } \lambda_1 ['\text{John gathered all the animals MINUS } t_1 '])]]

(40) \[\left[O_{Alt} \phi \right] = \lambda w_5. [\phi](w) = 1 \land \forall p \in Alt[\left[\phi\right] \not\subseteq p \rightarrow p(w) = 0]\]

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

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.

(42) \[ [IP_3] = 1 \text{ iff } (\exists x \in \{c_1, c_2\}[G(\oplus(\{c_1, c_2, p_1, p_2\} - \{x\}))(j)] \land \\
-\exists y \in \{p_1, p_2\}[G(\oplus(\{c_1, c_2, p_1, p_2\} - \{y\}))(j)] \land \\
(\neg \exists z \in \{c_1\}[G(\oplus(\{c_1, c_2, p_1, p_2\} - \{z\}))(j)]) \lor \\
\exists x \in \{p_1, p_2\}[G(\oplus(\{c_1, c_2, p_1, p_2\} - \{x\}))(j)]) \land \\
(\neg \exists y \in \{c_2\}[G(\oplus(\{c_1, c_2, p_1, p_2\} - \{y\}))(j)]) \lor \\
\exists z \in \{p_1, p_2\}[G(\oplus(\{c_1, c_2, p_1, p_2\} - \{z\}))(j)])] \]

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

(43) \[ [IP_2, EXH_{Alt} [IP_2 O_{Alt'} [IP_1 anyD cowF \lambda_1 [John gathered all the animals MINUS t_1 ]]]] \]

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
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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) $\left[IP_{1}\right] = 1$ 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.\textsuperscript{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 $\alpha$ certainly passed.

\textsuperscript{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).
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(46) a. Which students passed?
   b. Ann certainly passed.  \(\rightarrow\) only Ann passed
   c. Ann passed  \(\rightarrow\) only Ann passed

All of this means that \textit{certainly} in (46b) is not vacuous after all. Does that mean that the intuition that \textit{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 \textit{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 \textit{EXH} excludes the \textit{certainly}-alternatives. These alternatives are themselves all strengthened given the presence of the lower \textit{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 \textit{certainly}-alternatives in the third and the fourth lines.

(47)  
\[
[\text{EXH}_{Alt} [\text{certainly} [\text{EXH}_{Alt} [\{\text{all the students} [\text{MINUS Ann}_F]\} \text{gathered}]]]]
\]
\[
= 1 \text{ iff } \square (G(b \oplus c \oplus d) \land \neg G(a \oplus c \oplus d) \land \neg G(a \oplus b \oplus d) \land \neg G(a \oplus b \oplus c))
\]
\[
\land \neg \square (G(a \oplus c \oplus d) \land \neg G(b \oplus c \oplus d) \land \neg G(a \oplus b \oplus d) \land \neg G(a \oplus b \oplus c))
\]
\[
\land \neg \square (G(a \oplus b \oplus d) \land \neg G(a \oplus b \oplus c) \land \neg G(a \oplus c \oplus d) \land \neg G(b \oplus c \oplus d))
\]
\[
\land \neg \square (G(a \oplus b \oplus c) \land \neg G(a \oplus b \oplus d) \land \neg G(a \oplus c \oplus d) \land \neg G(b \oplus c \oplus d))
\]

That is, the higher \textit{EXH} in (47) is vacuous. As a consequence \textit{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 \textit{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.\(^\text{14}\)

(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.

\(^\text{14}\)We thank Nina Haslinger (p.c.) for bringing similar examples with distributive predicates to our attention. Similar issues result with modals like \textit{fortunately}.  

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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.

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

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.

\[ \text{Exp} (\neg G(a \oplus c \oplus d) \land \neg G(a \oplus b \oplus d) \land \neg G(a \oplus b \oplus c)) \]

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.\(^{15}\)

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

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.

\[ G(a \oplus b \oplus c), G(a \oplus b \oplus d), G(a \oplus c \oplus d), G(a \oplus c), G(a \oplus b), G(a \oplus d) \]

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.

\[
\lambda p. \lambda w : Exp(p). p(w)
\]

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.

\[
\lambda p. \lambda w : Exp(p). p(w)
\]

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 excludes 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.

References


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

\(\implies \text{ ‘It was expected that Ann would not participate in the gathering’}\)
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