Modal Concord is syntactic agreement

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1. Introduction

Expressions consisting of multiple modal expressions normally yield a cumulative reading. The two modal sentences in (1) and (2) contain two modal elements each (*maybe / has to* and *should / allowed*, respectively). Semantically, both (1) and (2) contain two modal operators.

(1)   Maybe Mary has to leave

(2)   John should be allowed to read this file

However, if two modal elements are of the same modal type (epistemic/ deontic/…) and have similar quantificational force (universal/existential), the most salient reading is mostly not a cumulative one but a concord reading, where the semantics seems to contain only one modal operator. This phenomenon has first been observed by (Halliday 1970) and (Lyons 1977) and has been first analysed by (Geurts and Huitink 2006) who have dubbed it *Modal Concord (MC)*.

(3)   You may possibly have read my little monograph upon the subject
        'The speaker thinks that it is possible that you read his little monograph'
        [?]'The speaker thinks that it is possible that it is possible that you read his little monograph'

(4)   Power carts must mandatorily be used on cart paths where provided
        'It is obligatory that power carts are used on cart paths where provided'
        [?]'It is obligatory that it is obligatory that power carts are used on cart paths where provided'

In this paper I attempt to analyse the concord interpretations in (3) and (4). First I argue that the concord readings cannot be the result of an entailment relation and that the phenomenon of Modal Concord is indeed a grammatical phenomenon. In the third section I argue that despite superficial differences Modal Concord behaves strikingly similar to Negative Concord, the phenomenon where two or more morphosyntactically negative element give rise to only one semantic negation. Given this close resemblance, in the fourth section I propose an analysis of Modal Concord that takes it to be the result of a syntactic agreement relation between modal auxiliaries and other modal elements, similar to the way Negative Concord is analysed in (Zeijlstra 2004).

2. Modal Concord is a grammatical phenomenon

An immediate question that arises is whether Modal Concord is a grammatical phenomenon or whether the concord readings can be derived by entailment. In this section I provide three arguments to demonstrate that Modal Concord is indeed a grammatical phenomenon.

The first argument is adopted from (Geurts and Huitink 2006) who have argued that if Modal Concord readings can be semantically derived via entailment, this entailment is restricted to the domain of epistemic modality and does not apply to the domain of deontic modality. The fact that epistemic modality may allow for concord readings is due to the fact that the Principles of Veridicality (5) and Positive Introspection (6) apply.

(5)   Veridicality:
        $\Box \phi \rightarrow \phi$ (knowledge is factive)

(6)   Positive Introspection:
        $\Box \phi \rightarrow \Box \Box \phi$ ($\equiv \Diamond \Diamond \phi \rightarrow \Diamond \phi$)

Thus, the concord reading of (3) is a result of the application of the Principle of Positive Introspection. However, (5) and (6) do not hold for deontic modality. If something is obligatory or desirable, its truth is not guaranteed, and likewise, if something is obligatory, it is not necessarily the case that it is obligatory that it is obligatory. Hence, the instances of deontic Modal Concord as in (4) demonstrate that Modal Concord readings, at least for deontic modality, cannot be explained by entailment as a consequence of (5) and (6).

Moreover, it is even doubtful whether Veridicality always applies to epistemic modality in natural language. Take for instance the following examples:

(7)   This must be Alesia

(8)   This is Alesia

Clearly, (7) does not entail (8). Therefore the principles of Veridicality and Positive Introspection cannot be the cause of the existence of Modal Concord readings.

Note that postulating weaker principles than (5) or (6) would not explain Modal Concord either as a result of semantic entailment. Suppose one would adopt (9).

(9) $\Box \Box \phi \rightarrow \Box \phi$

According to (9), if it is obligatory that something is obligatorily the case, this is obligatorily the case. The principle in (9) does not hold for deontic modality either. Suppose that according to European law, Germany should introduce a maximum speed for on its highways, it is not guaranteed that Germany will actually do so.

A second argument is that Modal Concord can only be established between a modal auxiliary and another modal element as is shown in (10)-(14). An expression consisting of two non-auxiliary modal elements of the same type cannot yield a Modal Concord reading. This also strongly indicates that Modal

Concord is a grammatical phenomenon since the syntactic status of modal auxiliaries appears to be relevant.

(10)   The general demands that the troops must leave   MC

(11)   John must obligatorily read the books   MC

(12)   The general demands that the troops are required to leave   *MC

(13)   John mandatorily obligatorily read the books   *MC

(14)   Inflectional morphemes are required obligatorily by the syntax   *MC

Finally, it can be shown that Modal Concord obeys syntactic locality constraints such as strong islands. The minimal pair in (15) and (16) demonstrates that whereas Modal Concord may be established by a modal verb in the matrix clause and a modal auxiliary in the complement clause, Modal Concord cannot be realised if one of the two modal elements is located in an adjunct.

(15)   [The general demands that [[when the soldiers surrender] they must behave correctly]]
        → MC

(16)   [The general demands that [[when the soldiers must surrender] they behave correctly]]
        → *MC

On the basis of these three arguments I conclude that Modal Concord is a grammatical phenomenon

3. Modal Concord vs. Negative Concord

At first sight, Modal Concord appears to behave on a par with other concord phenomena, such as Negative Concord. Negative Concord is the phenomenon where two negative elements give rise to only one semantic negation, as illustrated in (17).

(17)   Non ha telefonato a nessuno   Italian
        Neg has called to n-body
        NC: 'He hasn't called anybody'

Since Negative Concord is a grammatical phenomenon as well (see (Ladusaw 1996) and (Zeijlstra 2004) for an overview of the literature presenting a number of arguments for this claim), the question comes up as to whether Modal Concord is a unique phenomenon or whether it is similar to Negative Concord. And if so, how can Modal Concord and Negative Concord then be explained in a unified way?
        With respect to the first question, if Modal Concord is similar to negative Concord, any differences between the two kinds of phenomena need an

independent explanation. In this paper I argue that Modal Concord seems to be different in at least three aspects: (i) Modal Concord constructions are not obligatory whereas Negative Concord constructions usually are; (ii) Modal Concord normally yields an emphatic effect whereas Negative Concord usually does not do so; and (iii) not any two modal elements may participate in a Modal Concord relation, which seems to be the case with Negative Concord.

3.1. Modal Concord vs. Negative Concord: Obligatoriness

Negative Concord constructions are normally obligatory, but Modal Concord constructions are not, as is demonstrated for Italian and English in (18)-(19) below.

(18)   Ieri *(non) ha detto niente   Italian
        Yesterday neg has said n-thing
        'Yesterday he didn't say anything'

(19)   All students {must / obligatorily / must obligatorily} register themselves

Whereas in (18) removal of the negative marker renders the sentence ungrammatical, removal of one of the two concordant elements in (19) is not ruled out (it may only alter the semantics of the sentence).

However, this fact can be captured by taking the positions of the (lower) concord elements into account. In (18) the n-word *niente* is located VP-in situ. Sentential negation, however, requires negation of the entire VP, which means that the event variable is closed off existentially (Ladusaw 1992, Herburger 2001, Zeijlstra 2004). In (Herburger 2001) it is demonstrated that if an n-word appears in postverbal position without standing in a Negative Concord relation to a VP-external negative element, it can only contribute a negation that is below the existential quantifier that binds the event variable.

(20)   El bébé no está mirando a nada   Spanish
        The baby NEG is looking at n-thing   (Herburger 2001)
        'The baby isn't looking at anything
        $\neg\exists x\exists e[\textbf{look'}(e) \& \text{Agent}(e, \textbf{b}) \& \textbf{thing'}(x) \& \text{Patient}(e, x)]$

(21)   El bébé está mirando a nada   Spanish
        The baby is looking at n-thing   (Herburger 2001)
        'The baby is staring at nothing'
        $\exists e[\textbf{look'}(e) \& \text{Agent}(e, \textbf{b}) \& \neg\exists x[\textbf{thing'}(x) \& \text{Patient}(e, x)]]$

(Zeijlstra 2004, 2006), following (Ladusaw 1992), argues that n-words are indefinites that are licensed by either an overt or a covert negative operator. In (20) the n-word *nada* is licensed by the overt negative operator *no*, which is outside VP. In (21) no negative marker can be found outside VP, and the n-word is licensed by a VP-internal abstract negative operator, which is therefore outscoped by the existential quantifier binding the event variable. Normally this is ruled out as it leads to a contradiction (a saying event requires that is something is actually said), but under certain conditions, such a sentence can be felicitously uttered (like in (21))

The obligatoriness of NC in (18) is thus related to the fact that the n-word has been base-generated VP-internally due to its argumental status and has not moved out of VP. In fact, in languages like Italian if an n-word is moved out of VP, it may not even be overtly licensed by negation, ruling out Negative Concord in those constructions.[1]

(22)   *Nessuno* (*non) ha telefonato   Italian
       N-body has called
       'Nobody called'

This observation is further supported by the existence of optional NC languages, such as West Flemish and Afrikaans, where the n-word obligatorily scrambles out of VP.

(23)   … da Valère niemand (nie) ken   West Flemish
       … that Valère n-body (neg) knows
       '… that Valère doesn't know anybody'

Due to the scrambling of the n-word, it is already in a position external to VP and the negative marker does not have to be included either.

As Modal Concord does not involve concord relations between a negative marker and one or more arguments but between a modal auxiliary (located in I° (or Mod°/T°)) and other modal elements (verbs, adverbs), every modal element is already VP external and therefore high enough to operate by itself.[2]

(24)   You may perhaps have read the book

(25)   You may have read the book

(26)   You have perhaps read the book

In (24)-(26) all modals take scope from within IP (or ModP/TP). Consequently, no additional concord relation has to be established in order to enable the modal operator to take scope from the appropriate position. This explains the differences between Modal Concord and Negative Concord with respect to obligatoriness.

A similar mechanism applies to the case of deontic Modal Concord in (27) where the sentence without *obligatorily* in (28) can have the same reading as (27) but where the sentence without *must* cannot receive this reading. Both (27) and (28) indicate that it is obligatory that the students register, but (29) means that apparently some registering event is going on and that this event obligatorily has to take place.

(27)   The students must obligatorily register

(28)   The students must register

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[1]Note that this pattern does not apply to all Negative Concord languages. In fact, in most Negative Concord languages the negative markers must be included as well in constructions such as (19). For a discussion of these facts, see (Zeijlstra 2004).

[2]See (Cinque 1999) for an overview of the position of modal elements in the clausal domain.

(29)   The students obligatorily register

This fact is reminiscent of the facts in (20) and (21) where the negative element appeared to be too low in the structure. Comparing the internal distribution of adverbials (cf. Cinque 1999), the position of deontic adverbs is lower than the position of epistemic adverbs and must be in the same clausal domain where most aspectual adverbs take scope. Similar to aspectual modifiers, the modal adverb *obligatorily* binds the event variable, modifying the event itself rather than expressing that this event must take place. This is how the reading of (29) can be explained. Then it follows that if *obligatorily* is connected with the modal auxiliary *must*, which is in a higher and VP-external clausal position, (27) receives the same interpretation as (28), modulo the emphatic effects. Note that the way the auxiliary functions in (27) is that of a scope marker, just as the negative marker *no* in (20).

3.2. Modal Concord vs. Negative Concord: Emphasis

The second difference between Modal Concord and Negative Concord concerns the fact that Modal Concord constructions always introduce an emphatic effect whereas Negative Concord constructions generally do not.
        However, Negative Concord expressions can also be emphatic. This is for instance the case when particular intonational effects take place but also when Negative Concord is not obligatory, e.g., in Afrikaans or certain dialects of Dutch, as shown in (30)-(33).

(30)   Sij is nooit beskikbaar nie   Afrikaans
        She is n-ever available neg
        'She is never available'

(31)   Sij is nooit nie beskikbaar nie   Afrikaans
        She is n-ever neg available neg
        'She is never ever available'

(32)   Zij heeft niemand gezien   Dutch
        She has n-body seen
        'She didn't see anybody'

(33)   Zij heeft niemand niet gezien   Substandard
        She has n-body neg seen   Dutch
        'She didn't see anybody at all'

Following (Van der Wouden 1994), (Zeijlstra 2004) and (Biberauer 2006), those effects can be explained in terms of pragmatics. As the inclusion of the optional negative element does not alter the truth-conditions of the sentence, the inclusion of the redundant element leads to emphatic effect.
        The same holds for Modal Concord. As discussed above, Modal Concord is not obligatory (although some modal adverbs require an additional modal auxiliary as a scope marker). Therefore, inclusion of an additional modal element not forced upon by grammar should lead to an emphatic effect.

3.3. Modal Concord vs. Negative Concord: restrictions on concord

As has been discussed in sections 1 and 2, Modal Concord can only apply between a modal auxiliary and another modal element. Modal Concord between, for instance, two modal adverbs is ruled out.

Apart from that, at least two other restrictions on Modal Concord apply. First of all, the two modal elements have to share the same quantificational force as well as be of the same modal type. This is shown below.

(34)   It must necessarily be the case   MC

(35)   It may necessarily be the case   *MC

(36)   It is possible that he may enter the room   MC

(37)   It is allowed that he might enter the room   *MC

In (34) *must* and *necessarily* have the same modal type (epistemic in this case). On top of that they also have the same universal quantificational force. If *must* were replaced, however, by a modal auxiliary that can be epistemic as well but that exhibits only existential force, like *may*, Modal Concord cannot be established, as shown in (35).

A similar pattern can be identified in (36)-(37). In (36) epistemic *possible* has established a Modal Concord relation with *may*, which can have an epistemic reading as well. However, *might* is a modal auxiliary that can only be used in epistemic contexts. *Allowed* and *might* in (37) are therefore not of the same modal type, and although they share the same existential quantificational force, they cannot establish a Modal Concord relation, as is shown in (37).

The question is how these restrictions on Modal Concord are to be compared with the restrictions on Negative Concord. Negative Concord may take place between negative elements of different kinds: negative markers, n-words and negative verbs. In (38) Negative Concord takes place between a negative marker and two n-words, in (39) between a negatively flavoured verb and a negative marker/complimentizer and in (40) between a negatively flavoured verb and an n-word.

(38)   Non ha detto niente a nessuno   Italian
        Neg has said n-thing to n-body
        'He didn't say anything to anybody'

(39)   Timeo ne veniat   Latin
        Fear neg comes
        'I fear that he comes'

(40)   Dudo que vayan a encontrar nada   Spanish
        Doubt that will to find n-thing   (Herburger 2001)
        'I doubt that they will find anything'

In most languages all negative elements may establish NC relations, but exceptions are known. Czech and Russian differ with respect to the grammaticality of NC constructions involving *bez* ('without'), as shown in (41)-(42).

(41) Bez *nikoho*   Czech
      Without n-body
      'Without anybody'

(42) *Bez *nikogo*   Russian
      Without n-body
      'Without anybody'

In Afrikaans, Negative Concord may take place between an n-word and one or more negative markers, as in (43) but not between two n-words. The sentence in (44) cannot receive a Negative Concord reading.

(43) Sij is nooit nie beskikbaar nie   Afrikaans
      She is n-ever neg available neg
      'She is never ever available'

(44) Niemand verstaan niks nie   Afrikaans
      N-body understand n-thing neg
      'Nobody understands nothing'

In (Zeijlstra 2004, Zeijlstra 2006) these facts are covered by assuming that Negative Concord constructions consist of one element (possibly phonologically abstract) that is semantically negative ([iNEG]) and one or more elements that are semantically non-negative ([uNEG]) and are required to stand in a particular relation with an element that is semantically active (i.e., which carries a feature [iNEG]). Under such a view a Negative Concord relation may only take place between a single element that carries [iNEG] and multiple elements carrying [uNEG]. The fact that Italian allows multiple n-words to establish a relationship with *non* is then explained by arguing that *non* carries a feature [iNEG] and the n-words carry a feature [uNEG].[3] In Afrikaans, the situation is the reverse. The fact that *nie* may appear more than once in the clause is due to the fact that the feature *nie* carries is [uNEG] and that the n-word carries [iNEG]. It then follows that two n-words, both carrying [iNEG] always induce two semantic negations. Under this view, languages may differ cross-linguistically with respect to which kind of negative elements receive semantically interpretable features and which elements receive the uninterpretable ones.

Now this analysis can be transferred to the realm of modality. Modal elements also come about in different syntactic forms. For instance, one can identify modal verbs (*to require, to demand*), modal auxiliaries (*must, can, may*) and modal adverbs (*probably, obligatorily*). But Modal Concord readings can only be established between a modal auxiliary and another modal element.

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[3]In all cases where n-words are not licensed by *non*, Zeijlstra argues that an abstract operator is responsible for licensing the [uNEG] features of the n-words.

Constructions with multiple modal adverbs and/or modal verbs only yield cumulative readings, as shown in (10)-(14) (repeated as (45)-(49) below).

(45)   The general demands that the troops must leave   MC

(46)   John must obligatorily read the books   MC

(47)   The general demands that the troops are required to leave   *MC

(48)   John mandatorily obligatorily reads the books   *MC

(49)   Inflectional morphemes are required obligatorily by the syntax *MC

Multiple modal auxiliaries cannot appear in a single clause in English, but this is due to particular properties of the syntax of English modals.[4] In other languages Modal Concord relations between modal auxiliaries can be established.

(50)   *That might could happen

(51)   Dat zou kunnen gebeuren   Dutch
        That would can happen   MC
        'That (really) could happen'

Apparently, only modal auxiliaries are allowed to introduce a Modal Concord reading. Putting it differently, modal auxiliaries do not always seem to introduce a separate modal operator in the semantics whereas all other types of modal elements do so.

        The different behaviour between Negative Concord and Modal Concord could thus also be analysed along the lines of the semantic value of modal features. The data above then indicate that modal adverbs and modal verbs are semantically modal ([iMOD]) whereas modal auxiliaries are not ([uMOD]).

        So far, the fact that that only some configurations yield in a Modal Concord relation is not a unique property of Modal Concord but can also be found in other domains of concord, such as Negative Concord. However, it has remained an open question thus far how the additional restrictions on Modal Concord should be explained. In this section I discuss the restrictions concerning quantificational force. The restriction concerning the type of modality will be discussed in the next section.

        It appears that every instance of Modal Concord is either an instance of two (or more) modal elements sharing universal force or of two (or more) modal elements sharing existential force. Thus, Modal Concord is different from Negative Concord in the sense that Modal Concord is not only an instance of concord with respect to one property (as is the case with Negative Concord) but with respect to two properties. In a way there are (at least) two types of Modal Concord, which could loosely be called Universal Modal Concord and Existential Modal Concord. A property of modal elements is that every modal element is lexically unambiguous with respect to its quantificational force. An auxiliary like

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[4] Note that many English dialects do allow stacking of multiple auxiliaries (cf. Montgomery and Nagle 1993).

must always has universal quantification force, just as a modal element like *can* always has existential quantification force. Consequently, the modal quantificational force must be lexically specified.[5]

But if modal elements are already lexically specified for their modal quantificational force, this amounts to saying that every modal element does not have an arbitrary modal feature ([MOD]) but a more specific modal feature that determines its quantificational force. Such a feature is then either of the form [∀-MOD] or [∃-MOD]. But now, the additional restriction on Modal Concord concerning quantificational force follows immediately. If Negative Concord is a relation between different elements carrying a negative feature (either [iNEG] or [uNEG]) and Modal Concord is analysed in a similar way, then Modal Concord can only take place between two (or more) elements that have the same modal feature. Modal Concord would then either be a relation between one modal element that carries a semantically interpretable feature [i∀-MOD], which establishes a concord relation with elements carrying [u∀-MOD], or a relation between an element carrying an interpretable feature [i∃-MOD], which establishes a concord relation with elements carrying [u∃-MOD].

To conclude, the fact that Modal Concord is subject to further specification than Negative Concord does not imply that the concord mechanism behind it must function in a different way.

3.4. Concluding remarks

The three differences between Modal Concord and Negative Concord that have been mentioned at the beginning of this section can be explained as results of the application of independent grammatical principles. Hence, it can be concluded that Modal Concord and Negative Concord are not fundamentally different, thus paving the way for a unified account.

In the next section I argue that the analysis for Negative Concord, provided in (Zeijlstra 2004) also applies to Modal Concord. It should be noted, however, that (Zeijlstra 2004) is not the only analysis for Negative Concord. The only claim to be made in this paper is that this analysis extends to modality as well. It is an open question, however, whether alternative accounts for Negative Concord, such as (Giannakidou 2000, Herburger 2001, De Swart and Sag 2002), can also be applied to account for the Modal Concord effects.

4. Analysis

In this section I discuss an analysis for Modal Concord, presented in (Geurts and Huitink 2006), and mention a number of problems this analysis faces. After that I present an alternative analysis in terms of syntactic agreement, and I conclude that this analysis overcomes the problems for Geurts and Huitink's analysis.

4.1 Previous analysis: Geurts and Huitink 2006

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[5] This is not universally the case. In Lillooet (St'át'imcets) modal elements like *k'a* are lexically specified for epistemic modality, but not for quantificational force. K'a is ambiguous between epistemic *may* and *must* (cf. (Rullmann, Matthewson and Davis t.a.)).

Geurts and Huitink propose that Modal Concord reduces to the lexical ambiguity of modal adverbs. An adverb like *necessary* denotes either its standard meaning or it is a functional element that checks the type of argument. In order to implement this, they define the following function:

(52) $\|P \div Q\| = \|P\|$ if $\|P\| = \|Q\|$, otherwise undefined (P, Q of type (st)(st))

They also introduce the following operator ©:

(53) $\|©\| = \lambda Q \lambda P.\|P \div Q\|$

Take now the following LF:

(54)   [[©necessarily must][Barney sneeze]]

Here the adverb *necessary* checks whether its argument *must* is semantically identical. If so, the meaning of *necessarily must* becomes *necessarily*. If *must* were absent, © would not have made any semantic contribution.

Although the mechanism indeed predicts the concord readings in constructions with Modal Concord between a modal adverb and a modal auxiliary as in (54), this analysis still faces several problems.

First it presupposes that adverbs such as *necessarily* or *must* are semantically identical. This is not the case. The only correspondence between *must* and *necessary* are that both are modal operators with universal quantificational force, where *necessarily* must and *must* may be deontic. But *necessarily* is semantically much richer, which becomes clear if it is compared to other modal adverbs, such as *obligatorily*. Whereas *necessarily* denotes some kind of a necessity, *obligatorily* denotes an external deontic source.

Second, if this mechanism applies to modal adverbs, it would predict that sequences of modal adverbs also give rise to concord readings, contrary to fact. A sentence such as (55) cannot receive a Modal Concord interpretation.

(55)   John necessarily obligatorily registers himself

The problem here seems to be that it is a particular property of auxiliaries that they may be part of a Modal Concord construction (as two modal elements that are not auxiliaries never establish Modal Concord relation), and therefore it is unlikely to encode this property in the lexical semantics of modal adverbs.

Third, since all modal adverbs are taken to be propositional adverbs, the difference in readings between (28) and (29) (repeated as (56)-(57)) are not predicted, since both *much* and *obligatorily* would take scope from the same position at LF.

(56)   The students must register

(57)   The students obligatorily register

Fourth, lexical ambiguity of this kind cannot be used to account for Negative Concord, since Negative concord is never a relation between two

semantically identical elements, but between two elements that share one particular property, namely morpho-syntactic negation.

4.2 Modal Concord is syntactic agreement

In this section I explore an alternative hypothesis, namely that Modal Concord is an instance of syntactic agreement, as is argued for Negative Concord in (Zeijlstra 2004). Adopting the framework proposed in this theory and applying it to modality, every modal element is said to have a particular formal modal feature, which is either semantically active or semantically vacuous. In the latter case, it must be dominated by a modal element that carries a semantically interpretable modal feature. Recall that I have argued that modal auxiliaries carry an uninterpretable modal feature whereas other modal elements carry an interpretable modal feature.

As discussed above, the quantificational force of modal elements is lexically encoded (in the languages under discussion); therefore, it is natural to assume that modal features are only specified for quantificational force. On the other hand, the modal type is determined by the context of the utterance. Therefore, the featural decomposition of modal elements should not exceed the distinction with respect to the modal quantificational force. Hence, the following four modal features are adopted:

(58) $[i\exists\text{-MOD}]$
        $[u\exists\text{-MOD}]$
        $[i\forall\text{-MOD}]$
        $[u\forall\text{-MOD}]$

Following standard feature checking theory (Chomsky 1995), every element that carries a feature $[u\forall\text{-MOD}]$ or $[u\exists\text{-MOD}]$ must have its feature checked against an element carrying $[i\forall\text{-MOD}]$ or $[i\exists\text{-MOD}]$. However, I adopt the view endorsed in (Zeijlstra 2004) that the only configuration under which this feature checking is allowed in these cases, is the checking relation where the interpretable feature c-commands the uninterpretable feature, a view on agreement that in a similar version has also been proposed by (Adger 2003) among many others. Furthermore, I follow (Hiraiwa 2001, Ura 1996) who have argued that a single interpretable feature may check multiple uninterpretable features. Combining these assumptions, Modal Concord reduces to a configuration of the forms in (59) or (60).

(59) $[\dots X_{[i\exists\text{-MOD}]} \dots Y_{[u\exists\text{-MOD}]} \dots (Z_{[u\exists\text{-MOD}]}) \dots]$

(60) $[\dots X_{[i\forall\text{-MOD}]} \dots Y_{[u\forall\text{-MOD}]} \dots (Z_{[u\forall\text{-MOD}]}) \dots]$

Applying this proposal to the examples that have been discussed so far leads to a proper explanation of the facts. Let us first take into account the two cases of Modal Concord with respect to existential quantificational force.

(61)   You may perhaps have read the book

Sentence (61) contains two modal elements (*may* and *perhaps*). *May* carries a feature [u∃-MOD], and *perhaps* carries [i∃-MOD]. This leads to the following syntactic structure:

(62)   [$_{CP}$ You may$_{[u∃\text{-}MOD]}$ [perhaps$_{[i∃\text{-}MOD]}$ have read the book]]

However, in this case the licensing order of the modal elements is still reversed. In order to enable proper licensing of the modal elements, the modal element *perhaps* must be raised at LF to a position dominating IP. Note that this is in not incompatible with the observation that modal adverbs normally do not raise at LF (since they do not give rise to inverse readings). Movement, also at LF, is only possible if there is a proper trigger for it. Given the fact that such movement can only be triggered by the formal features these adverbs carry, the only possible candidate to trigger movement is an uninterpretable modal feature in a higher position.

(63)   [$_{CP}$ You perhaps$_{[i∃\text{-}MOD]\,i}$ may$_{[u∃\text{-}MOD]}$ [t$_i$ have read the book]]

Now the modal auxiliary can have its feature checked and both the syntax and semantics of (61) is accounted for.
        The same mechanism also applies to the other cases of Modal Concord. The Modal Concord reading of (64) is derived in a similar way as the reading of (61).

(64)   The students must obligatorily register themselves

Must carries [u∀-MOD], and *obligatorily* carries [i∀-MOD]. Again, *obligatorily* raises at LF to a position dominating *must*, and *must* can have its feature checked, yielding the structure in (65).

(65)   [$_{CP}$ The students obligatorily$_{[i∀\text{-}MOD]\,i}$ must$_{[u∀\text{-}MOD]}$ [t$_i$ register themselves]]

Note that in this case the covert raising of the modal adverb is actually traceable as (64) has a different reading than (66) where raising did not have to take place.

(66)   The students obligatorily register themselves

Hence the Modal Concord readings follow from the proposed analysis. A question that immediately arises, though, is what happens if there is only a single modal auxiliary in the sentence. If modal auxiliaries are semantically empty, what is responsible for the modal semantics of (67) and (68)?

(67)   John may be at home

(68)   John must go home

Again, I argue that these facts are similar to the cases of Negative Concord. In languages like Czech, (Zeijlstra 2004) argues that all overt negative elements carry a feature [uNEG]. In sentences as (69) no overt semantically negative element is present.

(69)   Anna není doma   Czech
         Anna neg.is at.home
         'Anna isn't at home'

In these cases (Zeijlstra 2004) argues that the negative marker has been licensed by a covert negative operator, in the line of (Ladusaw 1992), and has an underlying structure as in (70).

(70)   [Anna Op¬[iNEG] není[uNEG] doma]

Note that such an abstract operator may only be assumed if there is a negative marker present in the sentence. In other words, an abstract negative operator may only be assumed to be present in a grammatical sentence if there are overt elements in the sentence carrying a feature [uNEG] which could not have been licensed by any other element in the sentence. This could be rephrased in a more general way as in (71).

(71)   Only if a particular sentence is grammatical and none of the overt elements
         is responsible for the grammaticality of the sentence, must the sentence be
         grammatical due to a covert element.

Now the sentences in (67) and (68) are explained as well. If Negative Concord may involve licensing by abstract negative operators, then Modal Concord may involve licensing by abstract modal operators. Thus if a sentence, in which some modal element carries a feature [u∀-MOD] or [u∃-MOD] is grammatical and there is no visible element carrying an interpretable modal feature [i∀-MOD]/[i∃-MOD], its grammaticality must be due to the presence of a covert modal element carrying [i∀-MOD]/[i∃-MOD]. This leads to the underlying structures (72) and (73) for (67) and (68), respectively.

(72)   John may be home
         [John OP∃-MOD[i∃-MOD] may[u∀-MOD] [VP be home]]

(73)   John must go home
         [John OP∀-MOD[i∀-MOD] must[u∀-MOD] [VP go home]]

Note that this proposal also excludes cases in which two modal adverbs would receive a Modal Concord reading. As illustrated in (74), modal adverbs always contain an interpretable modal feature, and thus inclusion of two modal adverbs in the same clause can only yield a cumulative interpretation.

(74)   John mandatorily[i∀-MOD] obligatorily[i∀-MOD] read the books

Likewise, cases where the two modal elements are of a different quantificational type cannot receive a Modal Concord interpretation either. In those cases the uninterpretable feature of one type cannot be checked by the interpretable feature of the other type as is illustrated in (75).

(75)   *It may[u∃-MOD] necessarily[i∀-MOD] be the case

However, a problem is formed by cases in which no Modal Concord relation has been established because the two modal elements do not match with regard to the modal type.

As I outlined before the modal type of modal auxiliaries is not lexically encoded. This means that in all sentences with a modal auxiliary the modal type is contextually determined. In Modal Concord cases, like (63) and (65), the modal type of the modal auxiliaries is empty, as there is no contextual motivation to further specify the modal type of the auxiliary, as it already stands in a concord relation with a modal adverb (in these cases *perhaps* and *obligatorily* respectively).

In cases with a single modal adverb, the uninterpretable modal feature is checked against an abstract modal operator whose modal type will be contextually specified. Therefore the modal auxiliary in (72) will be interpreted epistemically and (73) deontically.

The fact that modal auxiliaries only mark the presence of a particular operator that induces the quantificational force that matches with the uninterpretable modal feature of the auxiliary does not influence how the modal auxiliary will be interpreted with respect to its modal type. This means that modal auxiliaries in a Modal Concord construction do not have to be specified for their modal type, as the modal type of a modal auxiliary is already given by the element that checks its uninterpretable modal feature. But nothing forbids that modal auxiliaries are contextually specified for a modal type in such cases. This becomes clear in the following sentence, which is ambiguous between a Modal Concord and a cumulative reading:

(76)   Perhaps John may become a doctor some day

The Modal Concord reading is the one where there is a good chance that John will be doctor some day. The cumulative reading is the one where there it is possible that John will receive permission to become a doctor. In the first case, *may* is not specified for a modal type. On the latter case, however, although perhaps is an epistemic modal adverb, *may* is contextually specified for deontic modality. The syntactic agreement system underlying Modal Concord only concerns quantificational force. Modal types are sometimes lexically specified (as is the case with adverbs like *perhaps*), sometimes not (as is the case with most, but not all modal auxiliaries).[6]

Following the analysis presented above, the absence of a concord reading in (77) falls out naturally. Although *certainly* is an epistemic modal adverb and *must* may receive an epistemic reading as well, no Modal Concord reading is available in (77).

(77)   Certainly$_{[i\forall\text{-MOD}]}$ John must$_{[u\forall\text{-MOD}]}$ leave the room   *MC

In cases like (77), the Modal Concord reading is unavailable since events embedded under *must* require a deontic reading of *must* rather than an epistemic one. As is well known, the aspectual status of the VP determines the modal type

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[6] *Might* for instance is lexically specified for its epistemic reading

of the selecting auxiliaries. This is shown in (78) and (79) where the interpretation of *must* is dependent of the aspectual status of the VP:

(78)   John must be at home

(79)   John must go home

In (78) the VP denotes a state, and for that reason *must* is interpreted epistemically. In (79), however, the VP denotes an event (in the sense of (Verkuyl 1993), and *must* must receive a deontic interpretation. Therefore the underlying structure of (77) is as in (80), where *must* has its [u∀-MOD] feature checked against *certainly*, but where it receives a deontic interpretation through contextual specification.

(80)   [Certainly$_{[i∀\text{-MOD}]}$ John must$^{DEON}_{[u∀\text{-MOD}]}$ leave the room]

Thise syntactic agreement analysis of Modal Concord is furthermore supported by the fact that Modal Concord is subject to syntactic locality constraints, such as adjunct islands. Syntactic agreement is generally subject to such locality constraints, and there is no reason why the feature checking system underlying Modal Concord should form an exception to that.

(81)   [The general demands that [[when the soldiers surrender] they must behave correctly]]
        → MC

(82)   [The general demands that [[when the soldiers must surrender] they behave correctly]]
        → *MC

To sum up, the proposed analysis of Modal Concord in terms of syntactic agreement (implemented in a feature checking system) accounts for the facts that have been presented and, moreover, analyses Modal Concord in a similar way as Negative Concord.

5. Conclusions

In this paper I have argued that Modal Concord is a grammatical phenomenon and that despite superficial differences, it shows close resemblance to the phenomenon of Negative Concord. I have argued that the approach by (Zeijlstra 2004), who takes Negative Concord to be an instance of syntactic agreement, naturally extends to Modal Concord, and I have provided an analysis for Modal Concord by arguing that modal elements carry a modal feature specified for quantificational force, which is either semantically interpretable or uninterpretable. Furthermore, I have proposed that modal auxiliaries are semantically vacuous in languages like English and Dutch and that they only signal the presence of an abstract modal operator of a particular quantificational force.

By analysing Modal Concord in the same way as Negative Concord, all adopted notions, such as abstract operators, have received an independent motivation. Moreover, a unified analysis for two concord phenomena may open

the way for a general theory of concord phenomena all based on one and the same syntactic principle.

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