*Dutch Modals and their Predicates**
Two puzzles for compositionality

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1. INTRODUCTION

Modals with verbal predicates:

(1)   John must go home.

Modals with non-verbal predicates[1]:

(2)   a. Marie muss nach Hause.   German
          Marie must to   house
          'Mary is obliged to go home.'
       b. Hun skal hjem.   Danish
          she must home   (Vikner 1988:17)
          'She must go home.'
       c. De muur moet rood.   Dutch
          the wall must red
          'The wall must become red.'

Common Germanic phenomenon:

   ✓ Prepositional/Particle predicates present in Afrikaans, Dutch, Frisian,
     German, Luxembourgish, Swiss-German, Danish, Norwegian,
     Swedish;
   ✓ Adjectival predicates present in Afrikaans, Dutch, Frisian, and
     German.

Exceptions: English & Icelandic[2]:

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[1] Sentential (i) and nominal (ii) predicates are not discussed as they are not in a direct predication relation with the subject; for an analysis of these types of sentences see Barbiers (1995), Van Dooren (2014).
       (i)   Jan wil   dat Marie weggaat.
              Jan wants that Mary away-goes
              'Jan wants Mary to go away.'
       (ii)   Jan mag een boek.
              Jan may a book
              'John may have a book.'
[2] Note that the phenomenon was present in older stages of these languages (iii)-(iv)(Van Dooren 2014):
       (iii) a. ǧif hi motan to helle.   Middle English
              if they must to hell   (1150-1250; Morris 1969; *Lambeth Homilies*)
              'if they must go to hell.'
              b. heo sceal aweg   Old English

(3)   a. Mary must *(go) away.   Modern English
           b. Harald geta *(fara) heim.   Modern Icelandic
               Harald must   go   home
               'Harald will go home'

But compare: Intensional transitive verbs[3] (Larson et al. 1997, Harves 2008, Harves & Kayne 2008)

(4)   I want/need him to leave.
(5)   a. I want/need him on my boat.
           b. I want/need my coffee cold.

Goal: Give a compositional analysis of modals with non-verbal predicates.

Starting point: semantically empty verb *be* (Russell 1919).

(6)   a. De muur moet geel   zijn.   b. De muur moet geel.
              the wall must yellow be   *the wall must yellow*
              'The wall must be yellow.'   'The wall must become yellow.'

           a'.   Mod'$_{<<t>>}$ b'.   Mod'$_{<<t>>}$

Mod°$_{<<st,t>>}$ vP$_{<<\mathbf{st}>>}$ Mod°$_{<<st,t>>}$ SC$_{<<\mathbf{st}>>}$
     moet   DP   VP$_{<<se,st>>}$ *moet*   DP$_{<<se>>}$ AP$_{<<se,st>>}$
        de muur   AP$_{<<se,st>>}$V°$_{<<<se,st>><se,st>>>}$ *de muur*   *geel*
            geel   *zijn*

           a." [[must]] = λQ$_{<<s,t>>}$. ∀w'[w' ∈ W → Q(w) = 1]
              [[must]] (the wall be yellow) = ∀w'[w' ∈ W → the wall be yellow = 1]
              'For all possible worlds w, *the wall be yellow* is true.'
           b." [[must]] (the wall yellow) = ∀w'[w' ∈ W → the wall yellow = 1]
              'For all possible worlds w, *the wall yellow* is true.'

Outline:
- Two similarities (section 2)
- Two differences (section 3 & 4)

2. SIMILARITIES BETWEEN NON-VERBAL AND COPULAR PREDICATES

The similarity between modals with non-verbal predicates and with copular predicates works quite well.

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         she shall away   (Grattan 1952; *Anglo-Saxon Magic and Medicine*)
         'it [the disease] will go away'
     (iv)   Spakt   skyldi   it ellzta barn   Old Icelandic
            good-NOM must-3.SG   the oldest child   (ca. 1150; *First Grammatical*
            'the oldest child must be good'   *Treatise*; translation George Walkden)
[3] Interestingly, these verbs cannot occur directly with a PP or AP complements:
      (v)   a. * I want/need to home.
             "I want/need to go home"
           b. * The child wants/needs clean."
            "The child wants/needs to get clean"

2.1. The predicate

Deontics with copular and non-verbal predicates have a restriction on the predicate (Barbiers 1995):

(7)   De fles moet   vol/ leeg   (zijn).   deontic
       the bottle must full/empty   be
       'The bottle must be full/empty.'

(8) # De olifant   moet groot/ziek (zijn).   deontic
       the elephant   must big   ill   be
       'The elephant is obliged to be big/ill.'

(9) # De olifant   moet van mij groot/ziek zijn.   deontic
       the elephant   must from me big   ill   be
       'I oblige the elephant to be big/ill.'

(10)   De olifant   moet groot/ziek zijn.   epistemic
       the elephant must big   ill   be
       'The elephant must be big/ill.'

Deontic modals and imperatives have the restriction of *responsibility* (Farkas 1988): "Do not attempt to put a proposition *p* on someone else's To-Do List if you believe that she will not make *p* true even if asked or ordered to do so." (Ninan 2005: 168)

✓ No individual-level predicates

(11) a. #Wees   intelligent!
          be-IMP intelligent
          'Be intelligent!'
      b. #Jan moet intelligent (zijn).   deontic
          Jan must intelligent be

✓ No stage-level predicates for which the subject/addressee cannot be responsible

(12) a. #Wees   ziek!
          be-IMP ill
          'Be ill!'
      b. #Marie moet ziek.   deontic
          Mary must ill

Support: Problematic predicates become available when the subject/addressee can be responsible for the result.

(13) a. #Van mij moet de olifant   groot (zijn).   deontic
          from me must the elephant big   be
          'I oblige the elephant to become big.'

    b.   Van mij moet de   ballon groot (zijn).   deontic
        from me must the balloon big be
        'I think that the balloon should become big.'
    c. (in a drawing:) De olifant   moet groot/klein/dik/dun (zijn).   deontic
                      the elephant must big small fat   thin be
                      'The elephant must become big/small/fat/thin.'

2.2.   Directionality

Deontics with copular and non-verbal predicates can refer to a realized and a non-realized situation:

(14) De muur moet geel (zijn).   deontic
       the wall must yellow be
       i. 'The wall should become yellow.'   non-realized
       ii. 'The wall should be yellow.'   realized
(15) This wall must be yellow...   deontic
       i. '... because the color it has now is depressing.'   non-realized
       ii. '... because it cheers up the patients this way.'   realized

(16) a. De hond moet buiten (zijn) voordat je   de kat binnenlaat. non-realized
         the dog must outside be   before you the cat inside-let
         'The dog must be outside before you let in the cat.'
    b. Omdat   de hond zo agressief   is, moet hij altijd   buiten (zijn).realized
        because the dog so aggressive is must he always outside be
        'Because the dog is so aggressive, it must always be outside.'

3. First Puzzle for a Compositional Analysis: States and Events

Modal verbs with non-verbal predicates have repetitive readings when modified by a quantified temporal adverbial phrase.

(17) a. **Elke ochtend om acht uur** moet het afval   buiten.   repetitive
       every morning at eight hour must the garbage   outside
       'Every morning at eight o'clock the garbage must be put outside.'
    b. **Elke ochtend om acht uur** moet het afval   buiten **zijn**. ¬ repetitive
       every morning at eight hour   must the garbage outside be
       'Every morning at eight o'clock the garbage must be outside.'

<u>Claim</u>: Modal verbs with non-verbal predicates differ semantically from modal verbs with copular predicates, as the sentences with non-verbal predicates are eventive in nature while the sentences with copular predicates are stative (Maienborn 2005).

Further support for eventivity: the availability of manner adverbs (Maienborn 2005)

(18) De muur moet **geleidelijk** geel   (*zijn).
   *the wall must gradually   yellow be*

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'The wall must gradually become yellow.'

(19) Jan moet **dramatisch** van het toneel af (*zijn).
Jan must dramatically from the stage off   be
'John must go off the stage dramatically.'

But both copular predicates and non-verbal predicates are states. Do we give up compositionality?

Well, no.

Van Riemsdijk's (2002, 2009) *Silent infinitive analysis.*

(20) a. Marie mag naar huis.
Marie may to   house
'Mary may go home.'
b. Marie mag naar huis GAAN.
Marie may to   house GO
'Mary may go home.'
c. ModP
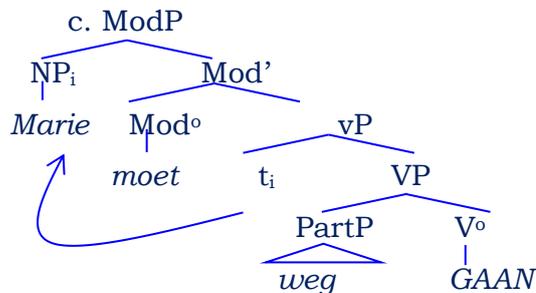
The (Neo-)Davidsonian event variable is in the (dynamic) silent infinitive:

(21) [[Marie moet weg GAAN]] = ∀w'[w' ∈ W → [∃e[AWAY GO(e) & Agent (e, Mary)]] = 1]

4. SECOND PUZZLE FOR A COMPOSITIONAL ANALYSIS: EPISTEMICS

Modal verbs with non-verbal predicates cannot have an epistemic interpretation, while modal verbs with verbal predicates can.

(22) De muur kan geel   **worden/zijn**.
the wall can yellow   become be
i. 'The wall can be/become yellow.'   deontic
ii. 'It is possibly the case that the wall becomes/is yellow.'   epistemic
(23) De muur kan geel.
the wall can yellow
i.   'The wall can become yellow.'   deontic
ii. #'It is possibly the case that the wall becomes yellow.'   #epistemic
(24) De muur kan geel *(worden), want   ik zag Marie net gele   verf kopen.
the wall can yellow become because   I saw Marie just yellow paint buy

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'It is possibly the case that the wall becomes yellow, because I just saw Mary buying yellow paint.'

<u>Claim</u>: The absence of non-verbal complements with epistemic modals is not specific to modals and as such is likely to be due to a general syntactic or semantic constraint.

3.1. Last year's semantic solution

Premise 1: Epistemics are incompatible with future-referring predicates (Iatridou 1990):

(25) Mary must be in Paris next week.
    i. 'Mary is obliged to be in Paris **next week**.'   deontic
    ii. #'It is necessarily the case that Mary is in Paris **next week**.' #epistemic

Premise 2: Eventivity implies futurity:

(26) a. Mary **is living in** Paris, #but she is not living in Paris right now. stative
     b. Mary **is leaving for** Paris, but she is not leaving for Paris right
        now.   eventive

Conclusion: Epistemics are incompatible with eventive predicates

➔ **Prediction 1:** As modals with non-verbal predicates are eventive (section 2), epistemics are unavailable.
➔ **Prediction 2:** Possibility modals should be OK.

Digression: Epistemic possibility and necessity

Only epistemic <u>necessity</u> modals are unavailable with future-denoting predicates (Pranav Anand, p.c.; contra Condoravdi 2002, Klecha 2013)[4]

(27) a. Mary **must** have been in Paris last week.   epistemic
     b. Mary **must** be in Paris right now.
     c. * Mary **must** be in Paris next week..

(28) a. Mary **might** have been in Paris last week..   epistemic
     b. Mary **might** be in Paris right now.
     c. Mary **might** be in Paris next week.

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[4] Similarly, there is a difference between necessity and possibility deontics:
  (i) a. John might/#must have gone to confession last week.   deontic
     b. John might/#must be doing the dishes right now.
     c. John might/must go to confession next week.

Generalization: Epistemic necessity modals cannot combine with predicates expressing a notion of *uncertainty* (Anand & Hacquard 2009, 2013).

- Epistemic necessity modals cannot be embedded under future-denoting attitude verbs:

  (29) a. Jan **denkt/gelooft** dat het een mooie   dag **moet** worden.
          Jan thinks believes that it   a   beautiful day must become
          'John thinks/believes that it is necessarily the case that it will be a nice day.'
       b. *Jan **verwacht/vermoedt** dat het een mooie   dag **moet** worden.
          Jan expects/   suspects that it   a   beautiful day must become

  (30) a. Jan **denkt/gelooft** dat het een mooie   dag **kan** worden.
          Jan thinks believes that it   a   beautiful day can become
          'John thinks/believes that it is possibly the case that it will be a nice day.
       b. Jan **verwacht/vermoedt** dat het een mooie   dag **kan** worden.
          Jan expects   suspects that it   a   beautiful day can become
          'John expects/suspects that it is necessarily the case that it will be a nice day.'

- Epistemic necessity modals cannot be embedded under dubitatives and emotive doxastics.

  (31) a. Jean **doute** que Marie puisse/*doive   avoir connu son tueur.
          Jean doubts that Marie can-SBJ must-SBJ have known her killer
          'John doubts that Marie may/must have known her killer.'
       b. Jean **craint** que Marie puisse/*doive   avoir connu son tueur.
          Jean fears that Marie can-SBJ must-SBJ have known her killer
          'John fears that Marie may/must have known her killer.'
                                                    (Anand & Hacquard 2013:10)

Support comes from the fact that scheduled futures, or *futurates* (Copley 2002, 2005) can combine with epistemic necessity modals:

  (32) Mary **must** be in Paris **next week** because I saw her plane tickets lying on her desk.   epistemic

End of digression

Problem: As only epistemic necessity modals cannot combine with uncertain/eventive predicates, epistemic possibility modals should be able to combine with non-verbal predicates, contrary to fact.

  (33) De muur **kan** geel.
       the wall can yellow
         i. 'The wall can become yellow.'   deontic
        ii. # 'It is possibly the case that the wall is yellow.'   #epistemic

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3.2. A syntactic-semantic solution

Generalization: Verbs that select for TP complements/scope over tense do not have non-verbal complements.

First case in point: Modals

Epistemic modals scope over tense, while deontic modals scope under tense[5]:

(34) a.   [Epistemic modal   [TP [vP [VP]]]]
      b. [TP   [Deontic modal   [vP [VP]]]]

'To scope over' = evaluation time is not determined by tense but is always <u>now</u>[6]

(35) a. Jack's wife **can't** be very rich.   Stowell 2004
        'It is not possible that Jack's wife is very rich.'
    b. Jack's wife **couldn't** be very rich.
        i.   'It **is** not possible that Jack's wife is very rich.'
        ii. # 'It **was** not possible that Jack's wife is very rich.'

(36) a. Jan moet een boek **hebben gelezen**.   IJbema 2002
     Jan must a   book have   read
     i. 'John is obliged to have read a book. '   deontic
     ii. 'It is necessarily the case that John has read a book. '   epistemic
    b. Jan **heeft** een boek moeten lezen.
     Jan has   a   book must-INF read
     i. 'John was obliged to read a book. '   deontic
     ii. #'It was necessarily the case that John read a book. '   epistemic

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[5] Following Cinque (1999), this might linked to a different height in the clausal spine.

[6] In (i)-(ii) epistemics seem to be able to scope under tense, but this is a Sequence of Tense effect with an underlying *because* (Hacquard 2006) and an instance of free indirect speech, which also functions as an anchor for the temporal interpretation of the modal.
  (i) A : Why did you look in the drawer?   von Fintel and Gilles 2006
     B: My keys might have been in there.
  (ii) Hij kon ziek zijn, haar hulp behoeven.   Boogaart 2007
    he could ill be   her help need
    'He could be ill, need her help.'
A further possible counterexample has been proposed by Eide (2005), but (iii) has to be reanalyzed as involving evidential modality. The facts about the interaction between this types of modality and tense need to be researched further.
  (iii) Er hat kran sein sollen.
     he has sick be   shall
    'They claimed that he was sick.'

Second case in point: Raising verbs

Koring (2006): *Lijken* 'seem[+certainty]' ≈ deontic modal
  Schijnen 'seem[+evidential]' ≈ epistemic modal

> (37) Jan lijkt   naar huis   te zijn.   uncertainty
>   *Jan seems[c] to   house to be*
>   '[Based on what I know] John seems to have gone home.'
> (38) Jan schijnt naar huis   te zijn.   evidential
>   *Jan seems[e] to   house to be*
>   '[Based on what I've heard] John seems to have gone home.'

Lijken scopes under tense, while *schijnen* scopes above tense[7].

> (39) a.   [Schijnen   [TP   [vP [VP]]]]
>   b. [TP   [Lijken   [vP [VP]]]]

'To scope over' = evaluation time is not determined by tense but is always <u>now</u>

> (40) Jan leek   thuis te zijn.
>   *Jan seemed[c] home to be*
>   **In the past**, it seemed that John was at home.'
> (41) Er   scheen minstens   100 man te zijn in Paradiso .
>   *there seemed at-least   100 men to be   in Paradiso*
>   'Right now, it seems that there were at least a 100 people in Paradiso. '
>   # '**In the past**, it seemed that there were at least 100 people in Paradiso. '

Linked to the availability of non-verbal complements

> (42) a. Jan lijkt naar huis **te zijn**.   uncertainty
>   *Jan seems to house to be*
>   'John seems to have gone home.'
>   b. Jan lijkt naar huis.
>   *Jan seems to house*
>   'John seems to have gone home.'
> (43) a. Jan schijnt naar huis **te zijn**.   evidential
>   *Jan seems to   house to be*
>   'John seems to have gone home.'
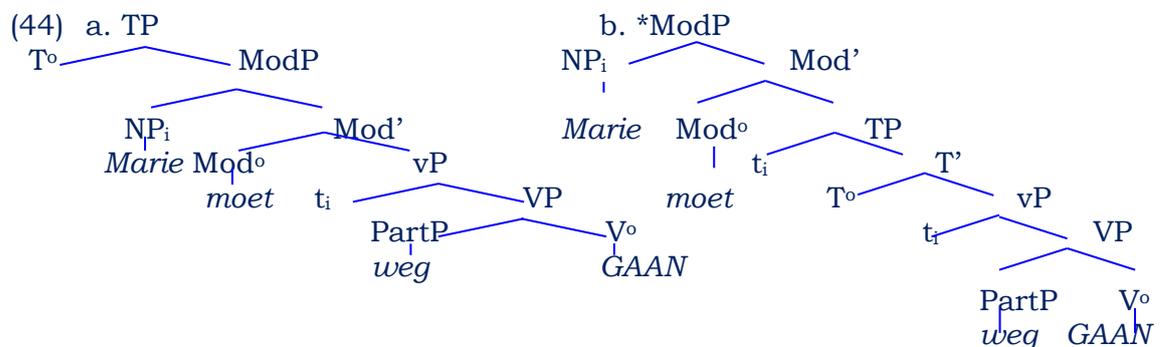>   b. *Jan schijnt naar huis.
>   *Jan seems to   house*

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[7] Koring (2006) reaches the opposite conclusion by looking in to cases like (i). Following up on fn. 6, this sentence again involves free indirect speech, which triggers a Sequence of Tense effect.
>   (i)   In oktober scheen december   nog de koudste maand van het jaar te zullen worden
>   *in October seemed[e] December still the coldest month of   the year to will   become*
>   'In October, December seemed to become the coldest month of the year.'

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Generalization: Verbs that select for Tense complements/scope over tense do not have non-verbal complements.

<u>Follow-up question</u>: What is the link between the size of the complement/ the tense operator and the availability of non-verbal complements?

- Semantics: Epistemics do not contribute to the propositional content, which is marked by their insensitivity to tense (Iatridou 1990). Propositions contain (infinitival) tense, which non-verbal predicates do not have (Eide 2005). Problem: untensed propositions (Caplan 2005).

- Syntax: *Silent infinitive analysis* – silent infinitives need to be licensed by the modal (Van Riemsdijk 2002).

(44) a. TP ... ModP ... NP$_i$ ... Mod' ... *Marie* Mod° ... vP ... *moet* t$_i$ ... VP ... PartP ... V° ... *weg* ... GAAN

b. *ModP ... NP$_i$ ... Mod' ... *Marie* Mod° ... TP ... *moet* ... T' ... t$_i$ ... T° ... vP ... t$_i$ ... VP ... PartP V° ... *weg* GAAN

4. SUMMARY AND CONCLUSION

Modal verbs with non-verbal predicates are eventive and as such require an event variable; this suggests that there is an eventive silent infinitive (Van Riemsdijk 2002).

The absence of non-verbal complements in combination with certain verbs is not specific to the modal case as it also concerns the raising verb *schijnen*.

Follow-up questions:
- What does it mean to 'contribute to the propositional content' and what does Tense have to do with it?
- Is the behavior with respect to Tense the only property that distinguishes the two types of verbs?
- Are there other pairs of verbs that support the generalization between Tense and the availability of non-verbal complements?
- If the pair *lijken* and *schijnen* are comparable to deontic and epistemic modals, what does this mean for the idea that there's only one lexical entry per modal?
- Are the semantics properties similar across the Germanic languages?

Further research topics:
- The difference between necessity and possibility modals;
- The similarity between modals and attitude verbs.

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