AN ACCOUNT OF ENGLISH "MAY" BASED ON A
POSTULATE OF MODAL LOGIC

John Newman
Monash University

Sentences with the auxiliary "may" have readings of both permission and possibility
(Case I, e.g. John may come) or only possibility (Case II, e.g. John may want to come)
or only permission (Case III, e.g. May I come?). In some of the Case II sentences, the
exclusion of the permission reading seems to parallel the unacceptability of the corresponding
sentences with "I permit ...":

1(a) It's possible John may come. (= possibility, \( \not= \) permission)
1(b) It's possible John is coming.
1(c)* It's possible I permit John to come.

2(a) John may want to come. (= possibility, \( \not= \) permission)
2(b) It's possible John wants to come.
2(c)* I permit John to want to come.

3(a) John may be coming. (= possibility, \( \not= \) permission)
3(b) It's possible John is coming.
3(c)* I permit John to be coming.

4(a) John may have come. (= possibility, \( \not= \) permission)
4(b) It's possible John has come.
4(c)* I permit John to have come.

From 1(c), 2(c), 3(c) & 4(c) it can be seen that there are restrictions on what can co-occur with
"permit", or at least with the predicate underlying "permit". Let PERM be the three-place
predicate (\( \text{PERM}(a, b, S) \)) where \( b \) occurs in \( S \) in certain ways irrelevant here \( \exists \ a \) permits
\( b \) to do \( x \), where \( S \models b \) does \( x \) which figures in the restrictions on possible phrase-markers
needed to account for the unacceptability of the (c) sentences above. A natural way to
explain the presence or absence of one of the readings is to suppose two homophonous lexical
items - may "PERM" which is inserted for the predicate PERM (as "I permit ..." also can be),
and may POSS, which is inserted for the predicate POSS, like "It's possible that..." can be (cf. the discussion of transitive and intransitive "may" in Ross (1969)). POSS(S) = It is possible that S. Thus the "may" in the (a) sentences above must be may POSS, since general restrictions on the distribution of PERM (as evidenced in the (c) sentences but not investigated here) make it impossible for may PERM to be inserted in these sentences.

Similarly, there are Case III sentences where the difficulty of the possibility meaning matches the strangeness of the corresponding sentences with "It is possible...", e.g.

5(a) You may come. (= permission, ≠ possibility)
5(b) I permit you to come.
5(c) ? It is possible that you come.

Thus there are sentences in which the reading of possibility or permission is excluded because restrictions on possible phrase-markers limit the distribution of the predicates PERM and POSS. But there are sentences in which the reading of possibility is excluded and yet there are no restrictions on POSS in the corresponding phrase-marker. This is the case in interrogatives and antecedents of conditionals:

6(a) John may come. (= permission, = possibility)
6(b) May John come? (= permission, ≠ possibility)
6(c) Might John come?
6(d) Is it possible that John is coming?

Presumably, 6(c) and (d) have as their source a tree like the following:

```
S
  I ask
    POSS(S)
    → Might ...
    → May POSS...
```

Similarly, the exclusion of the possibility reading in 7(a) can not be due to an inadmissible underlying structure, as is shown by the possibility of 7(b):

7(a) If John may come, Harry would be happy. (= permission, ≠ possibility)
7(b) If John were to come, Harry would be happy.
The facts about the distribution of the meanings of "may" are elusive but I believe they are explicable if one makes use of a meaning-postulate relating the predicates PERM and POSS.

The meaning-postulate needed has the form

\[ \text{PERM}(a, b, S) \quad \text{POSS}(S) \]

The postulate follows immediately from the explication of PERM given in Lakoff (1972)\(^1\). In ordinary language it means "If a permits b to do x, then it's possible that b will do x". The possibility arising from the implication from PERM must not be equated with the possibility of the pre-supposition to PERM which might be rendered as "It's possible for b to do x" (\(\text{POSS}(b, S)\)). The POSS(S) of the implication is a one-place predicate which is true when PERM(a, b, S) is true and about which nothing follows when PERM(a, b, S) is false; the POSS(a, S) of the pre-supposition is a two-place predicate which must be true when PERM(a, b, S) is either true or false. To see the difference between POSS(S) and POSS(b, S) compare

If I give permission for John to come, then it follows that John will come. (POSS(S))

If I do not give my permission for John to come, then nothing can be concluded about POSS(S).

If I give permission for John to come, then it must have been possible for John to come, e.g. he must have transport. (POSS(b, S))

If I do not give my permission for John to come, it must still have been possible for John to come. (POSS(b, S))

The postulate provides us with a second source for POSS(S). Let us look at assertional, interrogative, and conditional sentences to see if any conditions must be placed on invoking this postulate.

**Assertional structures.** Given A B. Once A has been asserted, it follows that B is true; in general, A does not also mean B.

\[ \text{D}_1 \]

\[ \text{PERM}(a, b, S) \quad \rightarrow \quad \text{a permits b} \quad \rightarrow \quad \text{a permits b to do something.} \]

\[ \text{T}_1 \]

\[ \text{POSS}(S) \quad \rightarrow \quad \text{It is possible} \quad \rightarrow \quad \text{It is possible that S.} \]

\[ \text{D}_2 \]

Although \(T_1\) implies \(T_2\), it is not the case that the output of derivation \(D_1\) (a permits b to do something) has two meanings, represented by \(T_1\) and \(T_2\). \(D_1\) has only the meaning of \(T_1\), although it implies the truth of the output of \(D_2\).
But now compare the corresponding derivations in which may\textsuperscript{PERM} and may\textsuperscript{POSS} are inserted:

\[
\begin{align*}
D_3 \text{ PERM}\ (a,b,S) & \implies S \quad \text{may}_\text{PERM}\ S \implies b \text{ may}_\text{PERM} \text{ do something.} \\
S & \quad \text{may}_\text{POSS}\ S \implies b \text{ may}_\text{POSS} \text{ do something.}
\end{align*}
\]

Now the utterance of the output of $D_3$ is identical to the utterance of the output of the implied $D_4$. That is, in uttering the output of $D_3$ I am necessarily also uttering the output of $D_4$.

Apparently what we have is a transderivational constraint:

In assertional structures, if there is a derivation $D_1$ with the initial phrase-marker containing PERM($a,b,S$) and a later phrase-marker with may\textsuperscript{PERM} inserted for PERM, then there is another derivation $D_2$ with an initial phrase-marker containing POSS($S$) and a later phrase-marker where may\textsuperscript{POSS} has been inserted for POSS (except where there are general constraints on the distribution of POSS in phrase-markers (as for example in "You may come").) Furthermore the utterance of the output of $D_1$ is identical to the utterance of the output of $D_2$.

In this way we can interpret the dual reading of "John may come" as follows:

\[
\begin{align*}
D_5 \text{ PERM}\ (I, John, John comes) & \implies S \quad \text{may}_\text{PERM} \text{ come} \implies \text{John may}_\text{PERM} \text{ come.} \\
S & \quad \text{may}_\text{POSS}\ \text{come} \implies \text{John may}_\text{POSS} \text{ come.}
\end{align*}
\]

Note that the postulate does not allow $\sim$POSS($S$) to be inferred from $\sim$PERM($a,b,S$):

\[
\begin{align*}
\text{PERM}(a,b,S) & \implies \text{POSS}(S) \\
\sim\text{PERM}(a,b,S) & \not\implies \sim\text{POSS}(S)
\end{align*}
\]

50
"John may not come" does not imply "It is impossible that John is coming":

\[ D_7 \quad \text{Neg} \quad S \quad \rightarrow \quad \text{John may}_{\text{PERM}} \text{ not come.} \]

\[ D_8 \quad \text{Neg} \quad S \quad \rightarrow \quad \text{It's impossible that John is coming.} \]

All the postulate allows us to say is that we can not rightly conclude anything about POSS(S).
And to say POSS(\neg S) is about as close as one can get to saying just this - without being
trivial. The constraint therefore is consistent with the reading of "It's possible that John is
not coming" for "John may not come".

**Interrogative structures.** Given A\( \supset B \). If I question A, then the answer I receive might tell
me something about B, but it does not follow that I am questioning B. Consider (8):

(8) If Harry sings a song, Sue will dance.

If I ask "Will Harry sing a song?", then a yes-answer will tell me something about Sue,
having accepted the implication in (8). A no-answer to "Will Harry sing a song?" does not
imply a no-answer to "Will Sue dance?". That is, in asking "Will Harry sing a song?", it
does not follow that I ask "Will Sue dance?". Hence "May John come?", derived from
may\(_{\text{PERM}}\), does not imply "May\(_{\text{POSS}}\) John come?"

\[ D_9 \quad \text{I ask} \quad \text{PERM} \quad (a, \text{John, John comes}) \quad \rightarrow \quad \text{I ask} \quad S \quad \rightarrow \quad \text{May}_{\text{PERM}} \text{ John come?} \]

\[ T_9 \]

\[ D_{10} \quad \text{I ask} \quad S \quad \rightarrow \quad \text{May}_{\text{POSS}} \text{ John come?} \]

\[ T_{10} \quad \text{POSS} \quad (\text{John comes}) \]

We are not saying that \( T_{10} \) is not a well-formed tree; of course it is. We are only saying here
that a derivation of "May\(_{\text{POSS}}\) John come?" from \( T_{10} \) does not follow from \( D_9 \).

Thus, the transderivational constraint may not be invoked in interrogative structures.
Conditional structures. Given \( A \Rightarrow B \). If I suppose \( A \), it follows that \( B \) is the case. It does not follow that I also suppose \( B \). Again consider (8). If I suppose that Harry will sing a song, I can conclude on the basis of (8) that Sue will dance. I cannot go on to suppose Sue will dance when I already accept as true that Sue will dance. Hence, a derivation of "If John may come, ..." from PERM does not imply a derivation from POSS of "If John may POSS come, ...":
A lexical item, may^{POSS}, which is substituted for the predicate POSS.

A transderivational constraint, based on the meaning-postulate

\[ \text{PERM}(a,b,S) \Rightarrow \text{POSS}(S) \]

which is operative on assertional structures.

We have not shown why may^{POSS} can not be freely substituted for POSS as in D\textsubscript{14} and D\textsubscript{15}.

\[ \begin{array}{c}
\text{S} \\
\text{I ask} \\
\text{POSS (John comes)}
\end{array} \quad \Rightarrow \quad \begin{array}{c}
\text{S} \\
\text{John may^{POSS} come}
\end{array} \]

(c.f. Might John come?)

\[ \begin{array}{c}
\text{D\textsubscript{15}} \\
\text{If S} \\
\text{POSS (John comes)}
\end{array} \quad \Rightarrow \quad \begin{array}{c}
\text{S} \\
\text{John may^{POSS} come}
\end{array} \]

(c.f. What if John might come?)

Apparently, may^{POSS} has the same distribution as the implication of the transderivational constraint. It is as though the transderivational implication also holds between meanings for a lexical item in the dictionary. In the syntax, we have:

S. Given a derivation with \[ \text{PERM} \Rightarrow \text{may^{PERM}} \], there is another derivation with \[ \text{POSS} \Rightarrow \text{may^{POSS}} \] in assertions.

In the dictionary:

L. Given the dictionary entry "may" with meaning \[ \text{PERM} \], there is another meaning \[ \text{POSS} \] in assertions.

But note how the nature of the implication differs in the syntax and the dictionary, for S is more precisely \[ S' \] and L is more precisely \[ L' \] :

\[ S = S' \text{ (Given a derivation with } \text{PERM} \Rightarrow \text{may^{PERM}} \text{, there is another derivation with } \text{POSS} \Rightarrow \text{may^{POSS}} \text{ ) in assertions.} \]

\[ L = L' \text{ Given the dictionary entry } \text{"may" with meaning } \text{PERM}, \text{ there is another} \]

53
meaning POSS in assertions).

As a consequence of \( L' \), \( D_{14} \) and \( D_{15} \) are inadmissible derivations. That a transderivational constraint based on a meaning-postulate should be so reflected in the dictionary meanings of a lexical item is not astonishing; it is less clear why the bracketings should be different in \( S' \) and \( L' \).

In summary,

Case I sentences allow the dual reading because the initial phrase-marker contains PERM and there is a second derivation proceeding from POSS (by virtue of a transderivational constraint).

Case II sentences exclude the permission reading because of general constraints on the distribution of PERM.

Case III sentences exclude the possibility reading either because of general constraints on POSS or because of a condition \( (L') \) on the insertion of may POSS.

---

FOOTNOTE

1) PERMIT\( (a, b, S) \) is true \( \leftrightarrow (\exists w) (w_o R_2 w \supset S \) is true in \( w \)

The details of this bi-implication are not worked out by Lakoff but obviously any world \( w \) defined by the alternativeness-condition \( R_3 \) must be one in which not only is \( S \) true, but also one in which \( a \) fulfills the conditions of being a permitter and \( b \) fulfills the conditions of being a permittee.

2) POSSIBLE\( (S) \) is true \( \leftrightarrow (\exists w) (w_o R_1 w \supset S \) is true in \( w \)

By definition, for any world \( w \) to be related by the alternativeness-condition \( R_1 \) to \( w_o \), there is no further requirement other than \( S \) be true in \( w \).

Thus any world related to \( w_o \) by \( R_2 \) must necessarily be related to \( w_o \) by \( R_3 \), but not vice-versa, i.e.

\( (\forall w) (w_o R_2 w \supset w_o R_3 w) \)

From (1), (2), and (3) it follows immediately that \(-\) PERMIT\( (a, b, S) \) is true \( \supset \) POSSIBLE\( (S) \) is true.

54
REFERENCES
