On Possibility Modals and NPI Licensing

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Possibility modals such as may/might have been taken to be ∃-quantifiers over worlds (Lewis 1973, Kratzer 1986, a.o.). However, this assumption, with the SDE condition on NPI licensing (von Fintel 1999), leads to a wrong prediction regarding the distribution of NPIs in the if-clause of conditionals with possibility modals (CPM). With a Lewis/Kratzer-style semantics, I suggest that this can be solved by assuming that ◊-modals are ∀-quantifiers over a set of worlds selected by a modal choice function from the quantificational domain (Rullman et al. 2008).

**Background:** NPIs such as any and ever are licensed in the if-clause of a necessity conditional.

(1) If he subscribes to any newspaper, he is well-informed.

Building on the assumption that the if-clause serves to restrict the modal quantifier in conditionals (which, in the default case, is the covert necessity operator WOULD (Kratzer 1981; a.o.)), von Fintel (1999) suggests that the licensing of NPIs in the if-clause of conditionals is captured by the semantics in (2) and the NPI licensing condition in (3). Based on (2), the if-clause of a necessity conditional serves to restrict the default ∀-quantifier over worlds that is introduced by WOULD and hence is SDE. Therefore, weak NPIs are licensed in the if-clause in (1).

(2) For any W'⊆W, [WOULD]^A,R,w,W\'(if p)(q) is defined only if i) W'is an admissible sphere in the modal base ∩A(w) with respect to the ordering source R(w), and ii) W'∩p≠Ø;

if defined, [WOULD]^A,R,w,W\'(if p)(q)=1 iff ∀w'∈W'∩p: w'∈q

(3) The Strawson Downward Entailment (SDE) condition on NPI licensing:

An NPI is only grammatical if it is in the scope of a such that [[a]] is SDE; a function f of type <σ, τ> is SDE iff for all x, y of type σ such that x⇒y and f(x) is defined: f(y)⇒f(x)

Nevertheless, this account with the widely endorsed assumption that possibility modals (such as may/might/can) are ∃-quantifiers leads to a wrong prediction on the distribution of NPIs in a CPM. Since the restrictor of an ∃-quantifier is (S)UE and cannot be SDE, von Fintel’s suggestion with the assumption of possibility modals being ∃-quantifiers predicts that NPIs are ungrammatical in the if-clause of a CPM. As shown in (4), this prediction is incorrect.

(4) If John had ever been to Paris, he might have become a good chef.

The contrast between (4) and (5) further shows that possibility modals behave differently from other quantificational elements that have been taken to be ∃-quantifiers. (5) shows that the Q-adv sometimes, unlike possibility modals, fails to license NPIs in the if-clause. While, with the assumption that the existential Q-adv sometimes in (5) is restricted by the if-clause (Lewis 1975; Kamp 1981; Heim 1982; a.o.), the ungrammaticality in (5a) follows from the SDE condition in (3), it is left unexplained why NPIs are licensed in the if-clause in a CPM (see (4)).

(5) a. *Sometimes, if a man feeds a dog any bones, it bites him. (Partee 1993)

b. LF: [[sometimes [a man feeds a dog any bones]] [it bites him]]

Proposal: Following Rullman et al. (2008), I suggest that the presented puzzle can be accounted for by treating possibility modals as ∀-quantifiers involving modal choice functions.

**Modal Choice Functions:** To account for the quantificational variability of modal elements in St’át’imcets (see (6)), Rullman et al. propose that modal elements in St’át’imcets are ∀-quantifiers over a set of worlds selected from the quantificational domain by a modal choice function f, the definition of which is given in (7). According to Rullman et al., with the semantics in (8), the modal element k’a gives rise to a necessity meaning when f maps the quantificational domain W’ to itself and a possibility meaning when f maps W’ to a non-empty subset of W’.

(6) a. t’ak k’a tu7 kents7á ku mixalh

necessity
go.along INFER then DEIC DET bear possibility
already INFER leave (Context: His car isn’t there.) ‘Maybe he’s already gone.’

(7) A function $f_{s,t}$ is a modal choice function iff for any $W_{s,t}$, $f(W) \subseteq W$ and $f(W) \neq \emptyset$.
(8) $[\text{may/might}]^{W}(f_{s,t})(p_{s,t}) = 1$ iff $\forall w' \in f(W')$: $p(w')$

Building on Rullman et al., I suggest that English possibility modals may/might, just like St’át’imcets modal elements, take a modal choice function as an argument and universally quantify over the set of worlds selected by this function from the quantificational domain (see (9)); unlike Rullman et al., I suggest that the modal choice function $f$ in a possibility statement is obligatorily bound by $\exists$-closure (cf. Reinhart 1997; Winter 1999; a.o.).

The lexical distinction between necessity and possibility modals in English is captured by Neo-Gricean Conversational Principle (Dowty 1980): since must is lexically specified as $\forall$ and unambiguously carries a necessity interpretation but may/might is ambiguous between $\forall$ and $\exists$ due to the unspecified value of $f$, may/might is blocked by must in the case of necessity.

I maintain the assumption that the Q-adv sometimes is an $\exists$-quantifier (Lewis 1975; Kamp 1981, Heim 1982; a.o.). The idea of treating possibility modals as $\forall$ but sometimes as genuinely $\exists$ is supported by the fact that, in St’át’imcets, the absence of the quantificational strength distinction occurs only in modals and there is a lexical distinction on Q-adverbials.

Conditionals with Possibility Modals: Building on the semantics in (2), I suggest that a CPM has the LF (10a) and semantics (10b). The possibility modal, based on (10), universally quantifies over the set of worlds selected from $W'$ by the modal choice function $f$, and, along with a Lewis/Kratzer style semantics, the if-clause serves to restrict the possibility modal.

(10) a. $\exists$ $\text{may/might}$ $f_{s,t}$ if $p_{s,t}$ q_{s,t}
b. $[\text{may/might}]^{W}(f_{s,t})(p_{s,t}) = 1$ iff $\forall w' \in f(W')$: $p(w')$

According to (10), the if-clause of a CPM is an SDE context; hence, it follows from the SDE condition (3) that NPIs are grammatical in the if-clause of a CPM. Since NPIs are subject to local licensing, $\exists$-closure on $f$ does not affect the licensing of NPIs in the if-clause in a CPM.

Final Remarks: Although the semantics for possibility modals proposed here ((9-10)) aims to account for NPI licensing, this proposal preserves the desirable consequences the assumption of possibility modals being $\exists$ has. As shown in (11), since $f(W')$ is a subset of $W'$, the proposed semantics of possibility modals predicts that must-$p$ asymmetrically entails may-$p$ as well. Furthermore, the proposed semantics also predicts the consistency between the possibility statements in (12a) with respect to inner negation. I will further show that the proposed semantics is compatible with Klinedinst’s analysis (2006, 2007) of free choice disjunction.

(11) a. You must stay. --> You may stay. b. You may stay. /\ / You must stay.

(12) a. You may stay, but also, you may leave. (assuming that stay=not leave)
b. $\exists f[\forall w' \in f(W')$: $p(w')]$ $\land$ $\exists f[\forall w' \in f(W')$: $\neg p(w')]$

In summary, the proposed semantics provides a solution to the NPI licensing in a CPM and, at the same time, preserves the merits of the assumption of $\exists$-modals being $\exists$-quantifiers.