Necessity under *Only*

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The problem

*Only, focus and alternatives*

- A focused expression brings into the semantic calculation a set of alternatives of the same type.
- These alternatives can be substituted for the focused expression to yield alternative propositions.
- The meaning of *only* makes reference to these alternatives.

(1) You only went [to Trader Joe’s] today.

Positive implication:
(2) You went to Trader Joe’s today.

Negative implication:
(3) You didn’t go to any store/place other than Trader Joe’s today.

(4) \(\text{Only}(\text{you go to } \text{tj})\)

- Positive implication is an implication to the prejacent of *only*.
- Negative implication is that none of the alternatives to the stated alternative leads to a true proposition.
**Only over a necessity statement**

(5) You only have to go [to Trader Joe’s]$_F$ today.

Positive implication:
(6) You have to go to Trader Joe’s today.

Negative implication:
(7) You don’t have to go to any store/place other than Trader Joe’s today.

(8) $\text{Only}(\Box(\text{you go to } \text{Trader Joe's}))$

- In (5) the prejacent of *only* is a necessity statement.
- Everything else is as in the simple case in (1).

**Meaning of only**

- Horn (1969): *only* presupposes its prejacent.
- On this view, the positive implication, the inference to the prejacent from (1) to (2) and from (5) to (6), can be attributed directly to the presupposition of *only*.
- The negative implication constitutes the assertive/truth-conditional content of *only*.

**Only can weaken a necessity statement**

Goal-oriented necessity:

(9) To get good chocolate, you have to go to Trader Joe’s.
$\sim\text{ You won’t get good chocolate unless you go to Trader Joe’s}$

(10) To see a Picasso, you have to go to Chicago.
$\sim\text{ You won’t see a Picasso unless you go to Chicago}$

**Only + goal-oriented necessity**:

(11) To get good chocolate, you only have to go to Trader Joe’s.
$\Leftrightarrow\text{ You won’t get good chocolate unless you go to Trader Joe’s}$
$\sim\text{ Going to Trader Joe’s is a way for you to get good chocolate}$
$\sim\text{ Going to Trader Joe’s is no big deal}$
To see a Picasso you only have to go to Chicago.
\[ \neg \text{You won't see a Picasso unless you go to Chicago} \]
\[ \sim \text{Going to Chicago is a way for you to see a Picasso} \]
\[ \text{Going to Chicago is relatively easy} \]

The prejacent problem

- (11) and (12) do not support inference to the prejacent.
- (11) and (12) can be true, while (9) and (10) are false.

Sufficiency modal constructions

- von Fintel and Iatridou (2007) first drew attention to the special interaction between only and goal-oriented necessity.
- They dubbed such cases sufficiency modal constructions.
- They identified the prejacent problem as the central problem for a compositional analysis of SMC.
- SMCs appear in construction with purpose clauses, as in (11), (12), and in anankastic conditionals, as in (13), (14).

(13) If you want to get good chocolate, you only have to go to Trader Joe’s.
(14) If you want to see a Picasso, you only have to go to Chicago.

Implications of goal-oriented necessity

- Both anankastic conditionals, If you want \( p \), have to \( q \), and purpose constructions, To \( p \), have to \( q \), convey that it is actually the case that \( q \) is necessary in order to optimally realize \( p \).
- In this talk I will background how the two constructions end up with the same truth-conditional content, despite their distinct compositional makeup, and how the implication above arises from their semantics, but the analysis of goal-oriented modality used here is in part motivated by these considerations.

Upshot

- In SMCs only seems to destroy the necessity.
- In SMCs inference to the prejacent is lost.
- Where does the problem lie?
• How can SMCs receive a compositional analysis based on the semantics of *only* and
the semantics of its prejacent?

**Goal of this talk**

• Show that a standard analysis of *only* and a plausible analysis of goal-oriented
modality can make sense of the special properties of the interaction between *only*
and goal-oriented necessity and can account for the compositionality problem.

**Potential culprits**

*Only*

**An existential presupposition for *only***?

• Attributing an existential presupposition to *only* à la Horn (1996) does not do the
  trick.

  – Consider (12) and suppose that the alternatives to Chicago are your nearby

  – Presupposition: one of the alternatives, including the stated alternative, is true,
in other words, (15) holds.

  – Assertion: none of the alternatives to the stated alternative is true, in other
  words, (16) holds.

  – Presupposition + assertion: inference to the prejacent, in other words, (17)
  holds.

\[(15) \Box (\text{you go to Chicago}) \lor \Box (\text{you go to nearby town}) \lor \Box (\text{you go to New York}) \lor \Box (\text{you go to Paris})\]

\[(16) \neg \Box (\text{you go to nearby town}) \land \neg \Box (\text{you go to New York}) \land \neg \Box (\text{you go to Paris})\]

\[(17) \Box (\text{you go to Chicago})\]

**Decomposition + split scope for *only***

• von Fintel and Iatridou (2007) argue that we need an extra weak presupposition for
SMCs and that we can get it by having the presupposition trigger take extra narrow
scope, in effect over the modal prejacent.

• vF&I propose that *only* is decomposed into negation + EXCEPT.

• EXCEPT comes with an existential presupposition and associates with the element
in focus, which gives it scope under the modal in SMCs.
• The negation appears where only appears, hence with scope over the modal.
  – Considering (12) again, the presupposition is as in (18).
  – The assertive content is as in (19).
  – Presupposition + assertion amount to goal-oriented possibility, as in (20).

\[
(18) \quad \Box (\text{you go to Chicago} \lor \text{you go to nearby town} \lor \text{you go to New York} \lor \text{you go to Paris})
\]

\[
(19) \quad \neg \Box (\text{you go to a nearby town} \lor \text{you go to New York} \lor \text{you go to Paris})
\]

\[
(20) \quad \Diamond (\text{you go to Chicago})
\]

**Objections**

• Alonso-Ovalle and Hirsch (2018, 2021) argue that there is no negative component to only and that outside of SMCs the weak presupposition is too weak. They advocate a strong presupposition à la Horn (1969).

• Krasikova and Zhechev (2006) point out that vF&I’s analysis allows both (9) and (21) to be true and felicitous if going to the corner store (least effort, best alternative) and going to TJ’s are no big deal and both stores have good chocolate.

(9) To get good chocolate, you only have to go to Trader Joes.

(21) To get good chocolate, you only have to go to your corner store.

**Scalar only operating over degrees**

• Krasikova and Zhechev (2006) bring in scalarity but propose a construction specific analysis of only in SMCs.

• Only combines with (i) a measure function mapping propositions to their degree of likelihood (which is equated with the degree of effort of realizing them), (ii) the prejacent of the modal (which is mapped to a degree), (iii) with the modal modified by the purpose clause.

• The assertive content of To p, only have to q says that nothing less likely (more effortful) than the modal prejacent q is necessary for the goal p.

• The presupposition is that something is necessary for the goal to be achieved.

• Since the modal and its prejacent are given as independent arguments to only, the modal operating on its prejacent is not part of the compositional makeup of SMC.

• The analysis equates ranking of possibility of two propositions with the ranking of the effort of realizing them under the assumption that the more effort it takes to make a proposition true the less likely it is to become true.
• Presuppositional content + assertive content of only + quantity implicature regarding falsity of more likely (less effortful) alternatives to $q$ yields (22).

• A relevance implicature is then necessary to derive that $q' = q$.

(22) There is a proposition $q'$ with the same degree of likelihood as $q$ (the proposition expressed by the prejacent of the modal) and $q'$ is sufficient for $p$.

Weaker prejacent

Covert at least

• Alonso-Ovalle and Hirsch (2018, 2021) propose that a covert scalar operator at least can optionally appear under only.

• Only presupposes its prejacent à la Horn (1969).

• If at least is present, there is no prejacent problem.

(23) $\text{Only}(\Box(\text{at least}(\text{you go to TJ})))$

• at least has a scalar presupposition: the alternatives are ranked and the stated alternative is the lowest amongst the alternatives.

• The ranking is supposed to be effort-based but why?

• at least asserts that one of the alternatives is true

• SMCs have two presuppositions: one from at least and one from only.
  – Considering (12) again, the presupposition is as in (24).
  – The assertive content is as in (25).
  – Presupposition + assertion amount to goal-oriented possibility, as in (26).

(24) $\Box(\text{you go to Chicago} \lor \text{you go to New York} \lor \text{you go to Paris})$

(25) $\neg\Box(\text{you go to New York} \lor \text{you go to Paris})$

(26) $\Diamond(\text{you go to Chicago})$

• On both vF&I’s and AO&H’s analysis the combined content of SMCs amounts to goal-oriented possibility.
Objections

- Huitink (2005) points out that the possibility semantics for the SMC cannot validate the transitivity inference seen in (27).

(27) If you want to pass logic, you only have to be able to do deductions. If you want to be able to do deductions, you only have to know the rules of thumb. Therefore, if you want to pass logic, you only have to know the rules of thumb.

- In order to have the scalar presupposition of at least project through the modal, AO&H assume that the ordering of the alternatives is not world-dependent, and therefore either true in all worlds or false in all worlds.

- But ordering of the alternatives depends on the facts and hence needs to be world dependent.

(28) a. If John is in the Midwest, he only has to go to Chicago to see a Picasso.
    b. If he is in France, he only has to go to Paris to see a Picasso.

Varieties of goal-oriented necessity

- Franke (2006) assumes that goal-oriented necessity can be scalar independently of only and that only must be construed with scalar goal-oriented necessity.

- The scalar reading of goal-oriented necessity corresponds to a weaker modal prejacent.

  - For instance, (10) has an interpretation like (29) or (30).
  - In (12), only requires this construal for its modalized prejacent.

(10) To see a Picasso, you have to go to Chicago.
(29) To see a Picasso, you have to go to Chicago, if not even to New York.
(30) To see a Picasso, you have to go to Chicago or further away.
(12) To see a Picasso, you only have to go to Chicago.
(31) Only($\square_{sc}^{\text{Picasso}}$ (you go to Chicago))

- The main idea of scalar goal-oriented necessity is that $\square_{sc}^{\text{Picasso}}$ (you go to Chicago) can be true even if there are alternative ways of seeing a Picasso, as long as these are not preferred to going to Chicago, e.g., in the case at hand, if the museum in the nearby town contains no Picassos.

- Scalar goal-oriented necessity encodes minimize effort, so the presupposition of (31) amounts to a disjunction of necessities only one of which can be true in a given world.
Objections

- It is empirically questionable whether scalar readings exist for goal-oriented necessity without overt qualification. Does (10) really have an interpretation like (29) or (30)?
- Moreover, only is incompatible with overtly marked weak prejacent.
- The requirement on only for weak prejacent is unmotivated.

(32) # To see a Picasso, you only have to go to Chicago if not even to New York.
(33) # To see a Picasso, you only have to go to Chicago or further away.

Explaining away the prejacent problem

Ordering of the alternatives

- A sufficiency modal construction is used in contexts where there are assumed to be alternative potential means for realizing the stated goal ranked according to the “cost” of realizing them, based on, e.g., effort or inconvenience for an agent.
- A context for (11) can encode the assumption that there are alternative actual means for procuring good chocolate.
- (11) conveys that TJ’s is the least effortful among them, which implies that the corner store does not have good chocolate.
- In such a context, (9) would be false, since there are other stores besides TJ’s that have good chocolate, though the cost associated with going there is greater.

(11) To get good chocolate, you only have to go to Trader Joe’s.
(9) To get good chocolate, you have to go to Trader Joe’s.

- An assertion of (34) leads to the inference in (35).
- What (34) communicates that (35) does not is that the way of operating this turntable is easier than potential alternative ways, such as operating it manually by pulling a lever and positioning the tone-arm.

(34) To operate this turntable, you only have to press the button.
(35) To operate this turntable, you have to press the button.

- Contextual assumptions about the status of the alternatives given the facts give rise to variation regarding the inference to the prejacent.
- Can the modality take into account the cost of the alternatives?
Context dependence of *only*'s prejacent

- The modal prejacent of *only* is context-dependent.
- The key contextual parameter of the modal prejacent varying across contexts is the ordering source.
- The content of the ordering source modulates the interpretation of goal-oriented modals in a way that interacts with the ordered alternatives.
- *Only* requires ordered alternatives.

Goal-oriented modality

- The ordering source is a parameter involved in the interpretation of goal-oriented modality: the worlds quantified over are the best worlds, as determined by the ordering source, within the modal base.
- The ordering source for goal-oriented modals is preferential (Franke 2006, Condravdi and Lauer 2016).
- In addition, to the overtly stated goal, there can be other goals an agent can be assumed to have.
- The basic intuition is that, in the contexts in which the sufficiency modal construction is used, one such goal is to minimize the cost of goal realization.
- Following Franke (2006), we can encode this goal into the ordering source.
- Minimization of cost in realizing goal $p$ requires comparison with other possible ways of realizing $p$.
- The idea is that the best worlds would be ones in which you achieve the goal in the least costly way given the facts of the world.
- To ensure that the ordering source contains propositions that stand in an entailment relation, we take it to include the propositions that the agent incurs no more than $d$-amount of cost, for different $d$'s.
- On the order that this kind of ordering source induces on worlds, the worlds in which, for example, you get good chocolate with no more than $d_1$ amount of cost are better than worlds in which you do so with no more than $d_2$ amount of cost, where $d_1 < d_2$. 
Purpose clause

(36) If □_{f,g} corresponds to a goal-oriented modal, then the goal-oriented modal modified by a purpose clause with content \( p \) is □_{f,g}^p, where for any \( w \), \( g^+(w) = \{ p \land r \mid r \in g(w) \} \)

Scalar only

- SMCs involve scalar only.
- The prejacent of only is the stated goal-oriented necessity statement relativated to an ordering source that encodes ‘minimize effort’.
- The alternatives are goal-oriented necessity statement with alternative modal prejacentcs, representing alternative potential ways of realizing the goal.
- The analysis of only offered by Coppock and Beaver (2014) in terms of \( \min \) (presuppositional content) and \( \max \) (assertive content) delivers the implication that stated alternative is the least costly way to realize the goal, given the facts.

(37) \( \min(p) = \lambda w. \exists p' \in \text{Alt}(p) [p'(w) \land p \leq p'] \)
(38) \( \max(p) = \lambda w. \forall p' \in \text{Alt}(p) [p'(w) \rightarrow p' \leq p] \)
(11) To get good chocolate, you only have to go to Trader Joe’s.

Presupposition of (11):

(39) The best worlds are ones in which you get good chocolate and incur at least the amount \( d_{TJ} \) of cost associated with going to TJ’s.

Assertion of (11)

(40) The best worlds are ones in which you get good chocolate and incur no more than \( d_{TJ} \) cost.

Presupposition + assertion of (11):

(41) The best worlds are ones in which you get good chocolate and incur \( d_{TJ} \) cost, by going to TJ’s.

- Crucial in this account is that the modal should be construed relative to the same conversational backgrounds across presupposition and assertion.
- The impression of the lack of inference to the prejacent identified by von Fintel & Iatridou is the result of context equivocation.
- The overall meaning of (11) in (41) is a possible interpretation of (9), when the ordering source encodes ‘minimize effort’.
• On the other hand, (9) need not be construed with an ordering source that encodes cost minimization, in which case, the availability of multiple actual means results in diversity across the best worlds as to how the goal is achieved.

• In contexts where there is only one actual means for goal realization, as in (34), context equivocation has no effect, as the best words do not vary whether or not the ordering source encodes cost minimization.

• Goal-oriented necessities without only do get the ‘minimize effort’ construal in the right context.

• For instance, (42) implies that taking two flights is what is minimally required for me to see a Picasso.

(42) Stop complaining. To see a Picasso, you only have to drive to Chicago. I have to take two flights.

Comparison with Franke (2006)

• Franke recognized that goal-oriented necessity is context-dependent and that only requires a particular contextual resolution regarding the ordering source, namely one that encodes ‘minimize effort’.

• However, he did not connect this context dependence to the prejacent problem.

• Instead he assumed, in addition, that goal-oriented necessity has a scalar reading, corresponding to a weaker modal prejacent.

References


