

Seventeenth Amsterdam Colloquium

Universiteit van Amsterdam

Restricting and Embedding Imperatives

Nate Charlow, *University of Michigan Philosophy*

<http://www-personal.umich.edu/~ncharlo/>

17 December 2009

Two kinds of imperative

Ordinary imperatives (OIs) are of the form $!\phi$

- ▶ Shut the window!

Conditional (CIs) are of the form $(if\ \phi)(!\psi)$

- ▶ If the temperature drops, shut the window!

Preview of conclusions

- ▶ CIs demand a new understanding of illocutionary force (as *restrictable*, in a sense to be precisified).
- ▶ This suggests a generalization of Kratzer's claim that *if*-clauses function to restrict the domain of a (default-epistemic) modal operator: *if*-clauses function to restrict the domain of a quantificational modal operator or non-quantificational speech-act operator.
- ▶ Getting the force of CIs right seems to require a modification of Kratzer's (1981) ordering-semantics for obligation modals.
- ▶ The modification can be independently motivated.
- ▶ In paper, but not in talk: evidence for embeddability of under operators (\forall and \wedge) that 'serialize' speech-acts (cf. Krifka 2001, 2004).

Conventional force of imperatives

Performative: imperatives introduce new facts (facts about addressee-obligations) into a discourse

- ▶ OIs introduce obligations of the form $\Box\phi$
- ▶ CIs introduce conditional obligations of the form $(if\ \phi)(\Box\psi)$

Directive: imperatives introduce such facts for the purpose of regulating the intentions of their addressees

Standard models for imperative force

Illocutionary force analogous to propositional attitudes (Stenius 1967, Lewis 1970).

- ▶ Both fit into the schema $S \psi$'s that ϕ
- ▶ Agents issue commands with propositional contents.
- ▶ So, modeling imperative force means saying how a command with content ϕ updates information-states, contexts, etc.

Standard models for imperative force (ctd.)

Lewis (1979) thinks of a context c as characterizing a sphere of permissibility ok_c . An imperative $!\phi$ updates the context so that $ok_{c[!\phi]} = ok_c \cap \llbracket \phi \rrbracket^c$.

Paired with a basic accessibility-relation semantics for obligation-sentences...

$$\llbracket \Box \phi \rrbracket^{c,w} = 1 \Leftrightarrow ok_c \subseteq \llbracket \phi \rrbracket^c$$

...this predicts the conventional force of OIs.

Standard models for imperative force (ctd.)

Portner (2004, 2007) (cf. Han 1998; Potts 2003) thinks of c as supplying, for each agent a , a To-Do List $T_c(a)$ (TDL; a set of propositions).

- ▶ TDLs are ordering-sources (cf. Kratzer 1981) for obligation-modals.
- ▶ $!\phi$ updates c so that $T_{c[!\phi]}(addr_c) = T_c(addr_c) \cup \{\llbracket \phi \rrbracket^c\}$

Paired with the Kratzer (1981) ordering-semantics for obligation-sentences...

$$\llbracket \Box Fa \rrbracket^{c,w} = 1 \Leftrightarrow \{u : \forall v (v \preceq_{T_c(a)} u \Rightarrow u \preceq_{T_c(a)} v)\} \subseteq \llbracket Fa \rrbracket^c$$

where $u \preceq_T v \Leftrightarrow \{p \in T : v \in p\} \subseteq \{p \in T : u \in p\}$

...this also predicts the conventional force of Ols.

Modal analyses and CIs

What about CIs? Schwager (2006) notices we have an off-the-shelf semantics for CIs, if we analyze ! as \Box and use Kratzer's (1981) restrictor semantics for COs.

$$\llbracket (\text{if } \phi)(\Box Fa) \rrbracket^{c,w} = 1 \Leftrightarrow$$

$$\{u \in \llbracket \phi \rrbracket^c : \forall v \in \llbracket \phi \rrbracket^c (v \preceq_{T_c(a)} u \Rightarrow u \preceq_{T_c(a)} v)\} \subseteq \llbracket Fa \rrbracket^c$$

But if imperatives express propositions, why do they lack non-performative interpretations?

Modal analyses and CIs (ctd.)

According to Schwager, imperative utterances at c are infelicitous unless c 's speaker:

- ▶ Has exhaustive knowledge, à la Groenendijk & Stokhof (1984), about relevant parameters of c , so that he 'utters a necessity proposition he *cannot be mistaken about*.'
- ▶ Affirms the preference expressed a good 'maxim for acting.'

These presuppositions force a performative interpretation.

But there are problems.

- ▶ If the speaker of c isn't mistaken, the relevant obligation-sentence is already true at c . This vitiates the *performative* aspect of imperative force.
- ▶ No account of what performative interpretation consists in (esp. in cases where a CI is uttered). So no progress.

Back to the standard model

How do CIs update the context? Two options, neither appealing.

Deferred update (narrow-scoping): $(if\ \phi)(!\psi)$, the ordinary discourse-effect of $!\psi$ is made conditional on ϕ . (Roughly, $[(if\ \phi)(!\psi)] = [!\psi] \cap \{\langle c, c' \rangle : \llbracket \phi \rrbracket^c = 1\}$.)

- ▶ Problem: even when ϕ is false at both c and $c'[(if\ \phi)(!\psi)]$, we will typically have $(if\ \phi)(\Box\psi)$ true at $c'[(if\ \phi)(!\psi)]$. This is not predicted by this account.

Immediate update (wide-scoping): $[(if\ \phi)(!\psi)] := [!\chi]$, for some χ . For instance, $[(if\ \phi)(!\psi)] := [!(\phi \supset \psi)]$

- ▶ I suspect no one is tempted by this, but in case you are, see the paper for an empirical problem.

Questioning the standard model

Modeling the conventional force of CIs requires an update on TDLs that is performed regardless of the antecedent's truth then.

But according to the standard model, this requires wide-scoping:
 $[(if\ \phi)(!\psi)] := [!\chi]$, for some χ .

Conclusion: CIs push us away from the standard model.

Restricting illocutionary operators

Guiding intuition: ! can be restricted.

- ▶ OIs are a trivially restricted species of CI. $[\!|\phi|] = [(if \top)(\!|\phi|)]$.
- ▶ CIs are non-trivially restricted.

TDLs are functions from contingencies to plans (sets of propositions the agent is committed to realizing in that contingency): they furnish different practical 'recommendations' depending on the situation the agent finds herself in.

A **contingency plan** (CP) is a pair of a plan with a contingency.

- ▶ $[\!|\phi|]$ adds $[\phi]$ to every CP.
- ▶ $[(if \phi)(\!|\psi|)]$ adds $[\psi]$ to some restriction of the CPs.

Key question: what are contingencies, and how do antecedents restrict the contingency plans that get updated?

Restrictor analysis: first pass

Contingencies are *worlds* (cf. Mastop 2005), so:

$$T_{c[(if\phi)(!\psi)]}(addr_c) = \lambda w. \begin{cases} T_c(addr_c)(w) \cup \{[\psi]^c\}, & \text{if } w \in [\phi]^c \\ T_c(addr_c)(w) & \text{otherwise} \end{cases}$$

Problem: no update of the TDL at $\neg\phi$ contingencies. So we have only a *metalinguistic* analogue of the desired prediction:

If $w \in [\phi]^c[(if\phi)(!\psi)]$, then (normally) $w \in [\Box\psi]^c[(if\phi)(!\psi)]$

But we want CIs to introduce *object-language* COs, regardless of the truth of ϕ at c or $c[(if\phi)(!\psi)]$.

Restrictor analysis: second pass

Contingencies are world-independent *bodies of information* (cf. Charlow 2009a,b), so:

$$T_{c[(if\phi)(!\psi)]}(addr_c) = \lambda p. \begin{cases} T_c(addr_c)(p) \cup \{[\psi]^c\}, & \text{if } p \subseteq [\phi]^c \\ T_c(addr_c)(p) & \text{otherwise} \end{cases}$$

A different problem: making the desired prediction requires revision of the Kratzer semantics, so that the *if*-clause supplies the relevant contingency, something like:

$$[(if\phi)(\Box Fa)]^{c,w} = 1 \Leftrightarrow$$

$$\{u \in [\phi]^c : \forall v \in [\phi]^c (v \preceq_{T_c(a)([\phi]^c)} u \Rightarrow u \preceq_{T_c(a)([\phi]^c)} v)\} \subseteq [Fa]^c$$

Informally, $(if\phi)(\Box Fa)$ says the **best-on-the-supposition-that- ϕ** ϕ -worlds are worlds where a satisfies F .

Independent motivation for this revision

Consider the following case (from Kolodny & MacFarlane 2009): ten miners are all trapped in a shaft (A or B, but which?) and threatened by rising waters. We can block one shaft or neither, but not both. If we block the shaft they are in, all are saved. If we guess wrong, all die.

Assuming the Kratzer semantics, unless (i) ordering-sources are information-sensitive and (ii) *if*-clauses 'shift' the ordering-source for a modal, (M1), (M2), and (M3) are provably inconsistent. (For the proof, you may see the paper.)

(M1) *If they're in A, must block A* \approx (*if in_A*)($\Box bl_A$)

(M2) *If they're in B, must block B* \approx (*if in_B*)($\Box bl_B$)

(M3) *May block neither* $\approx \neg\Box(bl_A \vee bl_B)$

But most informants (who are not decision theorists!) hear (M1), (M2), and (M3) as, not merely consistent, but *true*.

Waxing philosophical

CIs and COs highlight several issues on which philosophers and linguists can (and should) enrich their work with planning and decision theory:

- ▶ The relevance of information (fixed by modal bases, restricted by *if*-clauses), rather than facts (fixed by the world-index), to practical reasoning (e.g. Weirich 1982).
- ▶ Eventual goal: use ordering-sources—sets of goals, indexed to information—to *characterize* the agent's best plan of action, or a set of good-enough plans of action, relative to a body of information.
- ▶ The process by which the semantics characterizes such plans should resemble the process by which rational agents reason about the pursuit of goals under conditions of uncertainty. This requires a *much* more sophisticated model than Kratzer's.

Thank you!

References

1. Charlow, N. 2009a. Directives. Ms., University of Michigan.
2. Charlow, N. 2009b. What we know and what to do. Ms., University of Michigan.
http://www-personal.umich.edu/~ncharlo/work/what_we_know_what_to_do.pdf
3. Groenendijk, J. & Stokhof, M. 1984. Studies on the semantics of questions and the pragmatics of answers. Ph.D. Diss. ILLC.
4. Han, C. 1999. The structure and interpretation of imperatives. Ph.D. Diss., University of Pennsylvania.
5. Kolodny, N. & MacFarlane, J. 2009. Ifs and oughts. Ms., Berkeley.
6. Kratzer, A. 1981. The notional category of modality. In H. Eikmeyer & H. Rieser (eds.) *Words, Worlds, and Contexts*, 38–74. Berlin: De Gruyter.
7. Krifka, M. 2001. Quantifying into question acts. *Nat Lang Semantics* 9: 1–40.
8. Krifka, M. 2004. Semantics below and above speech acts. Talk delivered at Stanford University.
9. Lewis, D. 1970. General semantics. *Synthese* 22: 18–67.
10. Mastop, R. 2005. What can you do? Ph.D. Diss., ILLC.
11. Portner, P. 2004. The semantics of imperatives within a theory of clause types. *Proceedings of SALT 14*.
12. Portner, P. 2008. Imperatives and modals. *Nat Lang Semantics* 15: 351–83.
13. Schwager, M. 2006. Conditionalized imperatives. *Proceedings of SALT 16*.
14. Stenius, E. 1967. Mood and language game. *Synthese* 17: 254–74.
15. Weirich, P. 1982. Decision when desires are uncertain. In M. Bradie & K. Sayre (eds.) *Reason and Decision*. Bowling Green State University Press.