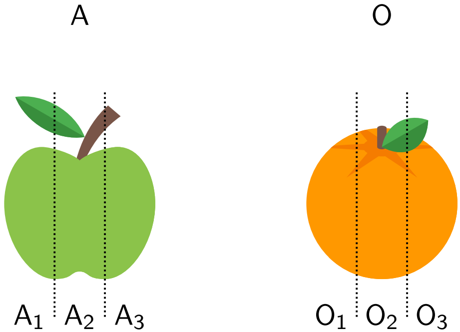
Only wholes, but also their parts

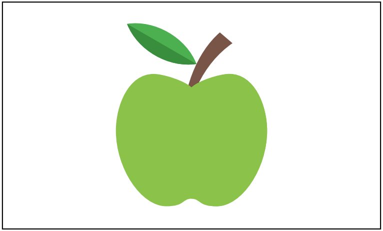
Martín Abreu Zavaleta
Syracuse University
mabreuza@syr.edu

https://martinabreu.net/ow.pdf

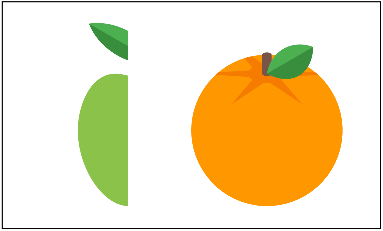
Université Côte d'Azur
January, 2025


A
O
A1 A2 A3
O1 O2 O3

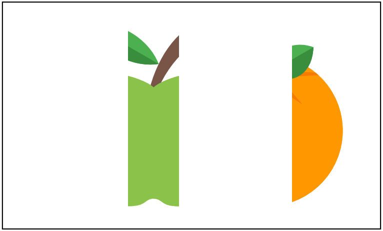
What's in the box?



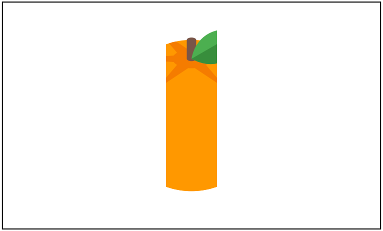
What's in the box?



What's in the box?



What's in the box?



What's in the box?

(1) Only A is in the box. [Assumption]

(2) So A is in the box. [From 1]

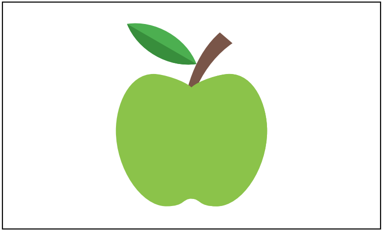
(3) If A is in the box, then at least one of A_1, A_2 and A_3 is in the box. [Assumption]

(4) So at least one of A_1, A_2 and A_3 is in the box. [From (2), (3)]

(5) A_1, A_2 and A_3 are numerically distinct from A. [By Lebiniz's Law]

(6) So there are at least two things in the box; i.e., A and at least one of A_1, A_2 and A_3. [From (2), (4), (5)]

(7) So not only A is in the box. [From (6)]



Plan

Against the inference from (6) to (7)

Domain shift

A scalar analysis

Against the inference from (6) to (7)

If the inference is valid, then (6) should be inconsistent with (1).

To show: (6) is consistent with (1).

Against the inference from (6) to (7)

Felicitous rejection: If S and S' are inconsistent, then it is felicitous to reject S with S'.

Against the inference from (6) to (7)

Examples:

(8) X: Grass is blue.
Y: # No, grass is short.

Against the inference from (6) to (7)

Felicitous Rejection entails that (6) and (1) are consistent (inspired by Kratzer (2012)).

(1) Only A is in the box.

(9) # No, A's undetached parts are also in the box.

(10) # No, A_1 is also in the box.

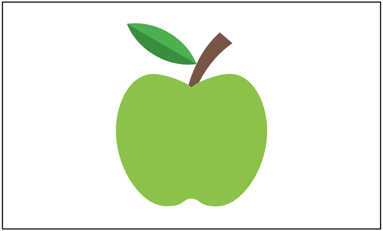
(11) # No, both A and A_1 are in the box.

Against the inference from (6) to (7)

All of (9)–(11) entail that there are at least two things in the box (via Leibniz's Law).

So if (6) were inconsistent with (1), then (9)–(11) should be felicitous (by Felicitous Rejection).

Against the inference from (6) to (7)



Domain shift

Domain shift:

(6) and (1) are interpreted relative to different domains, and this makes the two consistent. The inference from (6) to (7) is a fallacy of equivocation. (Casati and Varzi 1999; Fine 2006; Miller 2021)

Domain shift

A toy semantic value for (1), based on Horn (1969):

$[\![\text{Only A is in the box}]\!]^D$ presupposes that A is in the box.

$[\![\text{Only A is in the box}]\!]^D = 1$ iff $\forall x \in D(x \neq \text{A} \rightarrow \neg x \text{ is in the box})$

Domain shift

$D_1 = \{\mathsf{A}, \mathsf{A}_1, \mathsf{A}_2, \mathsf{A}_3, \mathsf{O}, \mathsf{O}_1, \mathsf{O}_2, \mathsf{O}_3\}$

$D_2 = \{\mathsf{A}, \mathsf{O}\}$

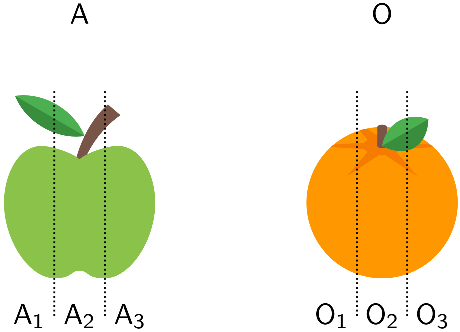
Domain shift

$[\![\text{There are at least two things in the box}]\!]^{D_1}$ is true iff at least A and A_1 are in the box, or at least A and A_2 are in the box, or ...

$[\![\text{Only A is in the box}]\!]^{D_2}$ is true iff O is not in the box.

The two are consistent.

Against the domain-shift analysis



Domain shift

(12) Only A is in the box, so $O_1/O_2/O_3$ is not in the box.

Against the domain-shift analysis

If (1) is interpreted relative to D_2, then (12) should be infelicitous, since it would express an invalid inference. Compare with:

(13) # Of A and O, only A is in the box; so $O_1/O_2/O_3$ is not in the box.

(14) # O is not in the box, so $O_1/O_2/O_3$ is not in the box.

Against the domain-shift analysis

If (7) is interpreted relative to D_2, then (15) should express a valid inference.

(15) #Not only A is in the box, so everything is in the box.

But this inference seems invalid in the present context. Evidence for this is that the following rejection of (15) is fine:

(16) That doesn't follow; $O_1/O_2/O_3$ might not be in the box.

A scalar analysis

S = a state of the conversation

I_S = the conversation's common ground

QUD_S = the question under discussion in the conversation

$\geq_S$ = a contextually determined strength ranking on QUD_S

A scalar analysis

Coppock and Beaver's (2013) entry for "only":

(17) $\mathrm{min}_S(p) = \lambda w.\exists p' \in \mathrm{QUD}_S.p'(w) \wedge p' \geq_S p$

(18) $\mathrm{max}_S(p) = \lambda w.\forall p' \in \mathrm{QUD}_S.p'(w) \rightarrow p \geq_S p'$

(19) $[\![\mathrm{only}]\!]^S = \lambda p.\lambda w : \mathrm{min}_S(p)(w).\, \mathrm{max}_S(p)(w)$

A scalar analysis

$\min_S(p)$ says that some answer to QUD at least as strong as p is true.

$\max_S(p)$ says that no answer to QUD stronger than or incomparable to p is true.

$\ulcorner$only $\phi\urcorner$ presupposes that an answer to QUD at least as strong as $[\![\phi]\!]^S$ is true, and asserts that nothing stronger than $[\![\phi]\!]^S$ or incomparable with it is true.

A scalar analysis

a = A is in the box
a_1 = A_1 is in the box
$\vdots$

A scalar analysis

QUD_S = all combinations of $a, a_1, a_2, a_3, o, o_1, o_2, o_3$

A scalar analysis

$$
\begin{tikzcd}
 & ao \arrow[dddr] & & & & \\
 & & & & a_1a_2 \arrow[r] \arrow[ddr] & a_1 \\
 & ao_1 \arrow[dr] & & & & \\
\cdots & & a \arrow[r] & a_1a_2a_3 \arrow[uur] \arrow[r] \arrow[ddr] & a_1a_3 \arrow[uur] \arrow[ddr] & a_2 \\
 & ao_2 \arrow[ur] & & & & \\
 & & & & a_2a_3 \arrow[uur] \arrow[r] & a_3 \\
 & ao_3 \arrow[uuur] & & & &
\end{tikzcd}
$$

A scalar analysis

Predictions using this choice of $\geq_S$:

(20) $[\![\text{Only A is in the box}]\!]^S$ presupposes that at least A is in the box.

(21) $[\![\text{Only A is in the box}]\!]^S$ asserts that nothing stronger than *a* is true. (i.e., none of O, O_1, O_2, O_3 are in the box)

A scalar analysis

(1) is consistent with "$A_1/A_2/A_3$ is in the box"

(1) is consistent with (6)—"there are at least two things in the box [A and A_1, A_2, A_3]".

(1) is inconsistent with "$O/O_1/O_2/O_3$ is in the box"

A scalar analysis

Is there a natural relation between propositions corresponding to this choice of $\geq_S$?

A scalar analysis

Contextual entailment: P contextually entails Q in context S iff Q is true in every world in I_S in which P is true.

Beaver and Clark (2009); Coppock and Beaver (2013); Liu (2017); Schwarzschild (manuscript). Motivated by a similar raised by Bonomi and Casalegno (1993).

A scalar analysis

Common ground info: A_1, A_2 and A_3 are attached to A.

Prediction: (1) presupposes that A, A_1, A_2 and A_3 are in the box. Insofar as sentences are consistent with their presuppositions, (1) is consistent with (6).

A scalar analysis

This choice of $\geq_S$ also predicts that (22) and (23) should be false in the present context, but they seem true.

(22) It might be that only A without $A_1/A_2/A_3$ is in the box.

(23) Only A is in the box and/but $A_1/A_2/A_3$ might not be in the box.

Remember: we don't know what's in the box.

A scalar analysis

More generally, "only" doesn't seem to interact with background information, on pain of weird predictions.

A scalar analysis

Add a third fruit B and its parts. We still want to know what's in the box.

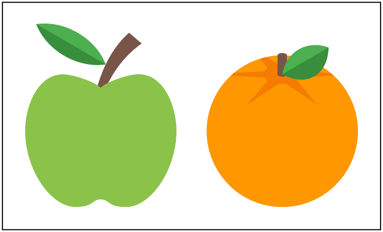
Common ground info: if A is in the box, so is O.

$[\![\text{Only A is in the box}]\!]^S$ presupposes that A and O are in the box.

$[\![\text{Only A is in the box}]\!]^S$ asserts that B is not in the box.

A scalar analysis

The view predicts that, against this background information, (1) should be true in the following situation:



A scalar analysis

Assuming that $\geq_S$ is contextual entailment leads to further weird predictions (assuming there is a third fruit B):

(24) # Suppose that if A is in the box then O is in the box, and only A is in the box.

(25) # Suppose that A and O are in the box, and only A is in the box.

(26) # If A and O are in the box but B isn't, then only A is in the box.

A scalar analysis

If $\geq_S$ were contextual entailment, then $a \geq_S o$ in those contexts, so "only A is in the box" should presuppose that at least A and O are in the box, and thus be compatible with the information in the supposition context. So (24)-(26) should be felicitous.

A scalar analysis

Compare with:

(27) Suppose that Clara used to smoke but she stopped.

(28) If Clara used to smoke, then she stopped.

A scalar analysis

Proposal: $\geq_S$ is local entailment (Yablo, 2006).

A scalar analysis

P **locally entails** Q in *w* iff Q is true in every situation in *w* in which P is true.

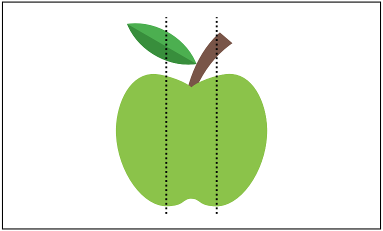
A scalar analysis

Roughly, situations are parts of worlds, and worlds are maximal consistent situations.

A scalar analysis

Local entailment is weaker than Kratzer's (2012) notion of lumping, since lumping requires that the lumping proposition be true.

A scalar analysis



A scalar analysis

Assumption: every situation in w_0 in which A is in the box is a situation in which its parts are in the box. None of O or its parts are in the box.
Then:

> At w_0: a locally entails a_1, a_2, a_3 and their conjunctions.
>
> At w_o: o, o_1, o_2, o_3 and anything that has them as conjuncts locally entail everything.

A scalar analysis

Where $\geq_S$ is local entailment at w_0:

A scalar analysis

$$\begin{tikzcd}
 & ao \arrow[ddr] & & & & \\
 & ao_1 \arrow[dr] & & & a_1a_2 \arrow[r] \arrow[dr] & a_1 \\
\cdots & & a \arrow[r] & a_1a_2a_3 \arrow[ur] \arrow[r] \arrow[dr] & a_1a_3 \arrow[ur] \arrow[dr] & a_2 \\
 & ao_2 \arrow[ur] & & & a_2a_3 \arrow[ur] \arrow[r] & a_3 \\
 & ao_3 \arrow[uur] & & & &
\end{tikzcd}$$

A scalar analysis

A complication

(22) It might be that only A is in the box and A_1 is not.

A scalar analysis

Given our choice of $\geq_S$, "only A is in the box" presupposes that A_1 is in the box. But then (22) should be infelicitous. Compare with:

(29) # It might be that Clara stopped smoking and she never smoked to begin with.

A scalar analysis

Amendment: $\geq$ is world-sensitive.

A scalar analysis

(30) $\min_S(p) = \lambda w.\exists p' \in \mathrm{QUD}_S.p'(w) \wedge \forall w' \in I_S.p' \geq_{S,w'} p$

(31) $\max_S(p) = \lambda w.\forall p' \in \mathrm{QUD}_S.\forall w' \in I_S(p \not\geq_{S,w'} p') \rightarrow \neg p'(w)$

A scalar analysis

$a \geq_{s,w} a_1, a_2, a_3$ in worlds in which A_1, A_2 and A_3 are undetached from A,

$a \not\geq_{s,w} a_1$ in worlds in which A_1 is detached from A.

Conclusion

Diagnosed the problem with the initial argument.

Argued that the domain-shift view is not successful.

Presented a scalar analysis using the notion of local entailment.

Conclusion

Bad news for some restrictions on quantificational domains

Casati and Varzi on inventories (1999, p. 112):

> *[E]very admissible way of drawing up an inventory must satisfy a non-redundancy condition: If x properly overlaps y and y is included in the inventory, then x is not itself to be included. This avoids double counting.*

References I

Beaver, D. and Clark, B. (2009). *Sense and Sensitivity: How Focus Determines Meaning*. Explorations in Semantics. Wiley.

Bonomi, A. and Casalegno, P. (1993). Only: Association with focus in event semantics. *Natural Language Semantics*, 2(1):1–45.

Casati, R. and Varzi, A. C. (1999). *Parts and Places: The Structures of Spatial Representation*. MIT Press.

Coppock, E. and Beaver, D. I. (2013). Principles of the Exclusive Muddle. *Journal of Semantics*, 31(3):371–432.

Fine, K. (2006). Arguing for non-identity: A response to king and frances. *Mind*, 115(460):1059–1082.

Fine, K. (2017). A theory of truthmaker content i: Conjunction, disjunction and negation. *Journal of Philosophical Logic*, 46(6):625–674.

References II

Horn, L. R. (1969). A presuppositional analysis of only and even. *Proceedings from the Annual Meeting of the Chicago Linguistic Society*, 5(1):98–107.

Kratzer, A. (2012). An investigation of the lumps of thought. In *Modals and Conditionals*, pages 112–159. Oxford University Press, New York.

Liu, M. (2017). Varieties of alternatives: Mandarin focus particles. *Linguistics and Philosophy*, 40(1):61–95.

Miller, E. (2021). Non-piecemeal pluralism. *The Monist*, 104(1):91–107.

Schwarzschild, R. (manuscript). Why some foci must associate.

Yablo, S. (2006). Non-catastrophic presupposition failure. In Thomson, J. and Byrne, A., editors, *Content and Modality: Themes from the Philosophy of Robert Stalnaker*, chapter 8, pages 164–190. Clarendon Press.

Appendix

Following Fine (2017) let a modalized state space be a triple $\langle S, S^{\Diamond}, \sqsubseteq \rangle$ such that:

$S \neq \varnothing$ and each subset of S has a least upper bound in S.

$S^{\Diamond} \subseteq S$ such that if $s \in S^{\Diamond}$ and $t \sqsubseteq s$, then $t \in S^{\Diamond}$.

$\sqsubseteq$ is a partial order on S.

Appendix

Intuitively,

S is a set of situations.

$S^{\Diamond}$ is the set of *possible*/*consistent* situations.

$\sqsubseteq$ is a parthood relation on S.

Appendix

Where $X \subseteq S$ with members $x_1, x_2, \ldots$, we let $x_1 \sqcup x_2 \sqcup \ldots$ be their least upper bound, i.e., their **fusion**.

Appendix

Possible worlds are maximal consistent fusions of situations.

I.e., $w \in S$ is a possible world iff $w \in S^{\Diamond}$ and any state in $S^{\Diamond}$ is either part of w or incompatible with w.

Appendix

Propositions are ordered pairs of sets of situations.

Appendix

$$P = \langle P^+, P^- \rangle$$

P^+ is the set of P's verifiers/truthmakers.

P^- is the set of P's falsifiers/falsemakers.

Appendix

$[\![\cdot]\!]$ is an interpretation function from sentences of a given language to propositions, such that:

If ϕ is atomic, then $[\![\phi]\!] = \langle X, Y \rangle$ for $X, Y \subseteq S$.

$[\![\neg\phi]\!] = \langle X, Y \rangle$ such that $[\![\phi]\!] = \langle Y, X \rangle$.

$[\![\phi \wedge \psi]\!] = \langle X, Y \rangle$ such that:

(i) $X = \{s \sqcup t : s \in [\![\phi]\!]^+ \text{ and } t \in [\![\psi]\!]^+\}$
(ii) $Y = [\![\phi]\!]^- \cup [\![\psi]\!]^-$

$[\![\phi \vee \psi]\!] = \langle X, Y \rangle$ such that:

(i) $X = [\![\phi]\!]^+ \cup [\![\psi]\!]^+$
(ii) $Y = \{s \sqcup t : s \in [\![\phi]\!]^- \text{ and } t \in [\![\psi]\!]^-\}$

Appendix

$$\mathsf{P}^+(w) = \{s \in \mathsf{P}^+ : s \sqsubseteq w\}$$

$$\mathsf{P}^-(w) = \{s \in \mathsf{P}^- : s \sqsubseteq w\}$$