Free choice: Semantics vs. Pragmatics

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1. The Problem

Kamp (1973)

1.1 ...as such

(1) **Chris may take an apple or a banana.** free choice sentence
⇒ **Chris may take an apple** free choice effect
⇒ **Chris may take a banana.** free choice effect

BUT:
A general

Free Choice Principle

(FC) ***C* may *A* or *B* ⇒ *C* may *A* and *C* may *B*.**

leads to absurdity*), given two standard assumptions of logical semantics
[+ hidden assumptions about logical form]:

Assumption A
- *or* ≈ ∨ Frege (1879)

Assumption B
- *may* ≈ ∃ Kripke (1963)

1.2 ...and some related observations

☞ Absence of choice effect
(2) **Chris may take an apple or a banana – but I don't know which.**
≠> **Chris may take an apple.** no choice effect
≠> **Chris may take a banana.** no choice effect

☞ Ambiguity vs. indeterminacy
(3) **Chris may take an apple or a banana; Dorothy too.** no mixed reading

☛ *Structural ambiguity?* Kamp (1973)
☛ **Chris [may [take an apple] or [~~take~~ a banana]]]** *choice sentence*
Chris [may [take an apple]] or [~~he~~ [[~~may take~~] a banana]]] *wide disjunction*

☞ Performatives produce choice effects:
(4) **Help yourself: you may take an apple or a banana.**

... with certain exceptions Kamp (1978: 271)
(!) **You may take a peach or a nectarine – or whatever they are.**

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*) $(\exists x)\,[A(x) \vee B(x)] \equiv [(\exists x)\,A(x) \vee (\exists x)\,B(x)]$, but $[\varphi \vee \psi] \Rightarrow [\varphi \wedge \psi]$ iff $\varphi \equiv \psi$.

☞ Epistemic choice effect — Kamp (1978: 281), Jennings (1994: 136ff.)

(5) **Mr X might be in Victoria or in Brixton.**

⇒ **Mr X might be in Victoria.** — epistemic choice effect

⇒ **Mr X might be in Brixton.** — epistemic choice effect

☛ Note that

(FC') ***p* or *q* might be ⇒ *p* might be and *q* might be.**

again leads to absurdity, given:

Assumption B'

• *might* ≈ ∃ — Kripke (1963)

☛ The epistemic choice effect should be explained along the same lines – but not quite the same lines, because:

On the epistemic version, the choice effect cannot be cancelled:

(6) **Mr X might be in Victoria or in Brixton – but I forget which.**

⇒ **Mr X might be in Victoria.** — epistemic choice effect!

⇒ **Mr X might be in Brixton.** — epistemic choice effect!

☞ Choice effect under embeddings — Kamp (1978)

(7) **Usually you may only take an apple. So if you may take an apple or take a pear, you should bloody well be pleased.**

(8) **Eve thinks she may take an apple or a banana, but apples are forbidden.**

☞ Wide disjunctions — Kamp (1978: 273), Jennings (1994: 129)

(9) **Chris may take an apple or he may take a banana.** — deontic version

⇒ **Chris may take an apple** — free choice effect

⇒ **Chris may take a banana.** — free choice effect

(10) **Mr X might be in Victoria or he might be in Brixton.** — epistemic version

⇒ **Mr X might be in Victoria.** — epistemic choice effect

⇒ **Mr X might be in Brixton.** — epistemic choice effect

☞ Periphrastic modals — Forbes (2004)

(11) **He is permitted to speak English or Spanish** — free choice effect

BUT: 'it is hard to hear conjunctive force in:

(12) **He is permitted to speak English or he is permitted to speak Spanish.'** — wide disjunction

2. Pragmatic Solution(s)

Schulz (2004)

By (folklore) definition, a *pragmatic* solution to the free choice problem is, or would be, one that builds on Assumptions A and B and explains the effect in purely pragmatic (e.g. Gricean) terms.

2.1 Basic idea

Free choice *sentences* have disjunctive readings (= literal meanings) only; the free choice effect is an additional pragmatic effect.

... due to a clausal implicature: Gazdar (1979)
By uttering a free choice sentence $\Diamond A \vee \Diamond B$
the speaker implicates that each disjunct might be true $\neg\mathbf{K}\neg\Diamond A$

... and contextually given speaker authority: Schulz (2004)

Authority Principle Zimmermann (2000); general setting: Groenendijk & Stokhof (1984)
If *the speaker knows what is allowed and* $(\forall p)\,[\mathbf{K}(\Diamond p) \vee \mathbf{K}(\neg\Diamond p)]$
does not exclude that A is allowed $\neg\mathbf{K}\neg\Diamond A$
then: *the speaker knows that A is allowed* $\mathbf{K}\Diamond A$

2.2 Virtues

☞ *Absence of choice effect* Zimmermann (2000)
comes out as denial of authority

☞ *Performatives' preference for choice effects* Zimmermann (2000)
expected because performer should be competent

☞ *Wide disjunctions* Schulz (2004)
are semantically equivalent to choice sentences and hence expected to lead to the same pragmatic effects (non-detachability)

[☞ *Epistemic choice effects* Schulz (2004)
can be treated ± independently along Gricean lines]

2.3 Problems

☞ *Negative clausal implicatures* Gazdar (1979)
must be blocked – otherwise a conflict with Authority arises: Schulz (2004)
By uttering a free choice sentence $\Diamond A \vee \Diamond B$
the speaker implicates that each disjunct might be false $\neg\mathbf{K}\neg\neg\Diamond A$
Hence, given the positive implicature, the speaker cannot be an authority $\neg\mathbf{K}\neg\Diamond A$

☞ *Overgeneration* Condoravdi (p.c.), D. Fox (p.c.)
lurks behind Authority: normally, clausal implicatures outweigh authority presumptions:

(13) **I have an apartment in Frankfurt or in Berlin.**

– so why not in free choice sentences? [However, cf.:

(14) **I live in Frankfurt or in Berlin.** Krifka (p.c.)]

☞ *Scalar implicatures*
must be blocked: choice effects are inferences from disjunctions to conjunctions, but disjunctions are usually taken to implicate the falseness of the conjunction:

(15) **John or Mary rang.**

– so why not in free choice sentences?

☞ *Embeddings*
remain a mystery

☞ *Absence of choice effect*
comes out as indeterminacy

☞ *Periphrastic modals*
are expected to give rise to free choice effects even in wide scope disjunctions (non-detachability!)

3. Semantic Solutions

By (folklore) *definition*, a *semantic* solution to the free choice problem is, or would be, one that replaces *a)* Assumption A, or *b)* Assumption B, or *c)* both by alternative semantic assumptions and explains the effect terms of these alternative assumptions – plus possibly pragmatic (e.g. Gricean) machinery.

3.1 (Some) Existing Proposals

ad *b)* (just for illustration)

- $[\![\blacklozenge\,\varphi]\!] = \{w \mid (\forall w' \sim w)\,[[\![\varphi]\!]^{w'} = 1 \rightarrow w\,\Delta\,w'\}$ [~: suitable closeness; Δ: deontic accessibility]

$\Rightarrow$ $[\![\blacklozenge\,(\varphi \vee \psi)]\!]^w = 1$ iff $[\![\blacklozenge\,\varphi]\!]^w = [\![\blacklozenge\,\psi]\!]^w = 1$

Problem: $[\![\blacklozenge\,\varphi]\!] \not\supseteq [\![\blacklozenge\varphi \vee \blacklozenge\psi)]\!]$ *wide* disjunctions

ad *a)* modal disjunction Zimmermann (2000)
Idea: ***A* or *B*** $\approx$ ***A* might be, and *B* might be** **[but nothing else might be]**

- $[\![\varphi \vee \psi]\!] = \{w \mid [\![\varphi]\!] \cap [\![\psi]\!] \cap \mathbf{K}_w \neq \varnothing\}$ **K**: speaker epistemic modality

[+ $[[\![\uparrow(\varphi \vee \psi)]\!] = \{w \mid [\![\varphi]\!] \cap [\![\psi]\!] \cap \mathbf{K}_w \neq \varnothing \;\&\; \mathbf{K}_w \subseteq [\![\varphi]\!] \cup [\![\psi]\!]\}]$ closure]

💣 must appeal to Authority

ad *c)* two-dimensional interpretation cf. Aloni (2003); framework: Rooth (1985)

- $[\![\varphi \vee \psi]\!]_\delta = [\![\varphi]\!]_\delta \cup [\![\psi)]\!]_\delta$ *δenotational dimension*
- $[\![\varphi \vee \psi]\!]_\alpha = \{[\![\varphi]\!]_\delta, [\![\psi)]\!]_\delta\}$ *αlternative dimension*
- $[\![\blacklozenge\varphi]\!]_\delta = \{w \mid (\forall p \in [\![\varphi]\!]_\alpha)\; p \cap w\Delta \neq \varnothing\}$
- $[\![\blacklozenge\varphi]\!]_\alpha = \{[\![\blacklozenge\varphi]\!]_\delta\}$

3.2 The Future?

Partiotioning the modal base Geurts (to appear)

or combines two propositions p and q with a propositional operator Γ, which may be expressed overtly or else left implicitly epistemic

$(\exists p')\,(\exists q')\,[\,\Box\,[p' \rightarrow p] \wedge \Box\,[q' \rightarrow q] \wedge \Diamond p' \wedge \Diamond q' \wedge \neg\,\Diamond\,[p' \wedge q'] \wedge \Box\,[\,\mathcal{B}_\Gamma \leftrightarrow [p' \vee q']\,]$

$\mathcal{B}_\Gamma$: Γ's (modal) base

Some advantages:

❀ generalizes to necessity:

(16) **You must eat an apple, or (else) you must eat a banana.**

(16') **You may eat an apple or (else) a banana.**

amount to the same thing (on the relevant readings)

❀ captures ambiguity:

(17) **You may eat an apple or a banana.**

(a) Γ overt: free choice

$(\exists p)\,(\exists q)\,[\,\Box\,[p \rightarrow A] \wedge \Box\,[q \rightarrow B] \wedge \Diamond p \wedge \Diamond q \wedge \neg\,\Diamond\,[p \wedge q] \wedge \Box\,[\,\mathcal{B}_{\blacklozenge} \leftrightarrow [p \vee q]\,]$

(b) Γ covert: epistemic uncertainty

$(\exists p)\,(\exists q)\,[\,\Box\,[p \rightarrow \blacklozenge A] \wedge \Box\,[q \rightarrow \blacklozenge B] \wedge \Diamond p \wedge \Diamond p \wedge \neg\,\Diamond\,[p \wedge q] \wedge \Box\,[\,\mathcal{B}_{\mathbf{K}} \leftrightarrow [p \vee q]\,]$

NB: Authority is not needed, but helps disambiguating!

Generalizing the partition approach

(18) **John is looking for an apple or a banana.** Forbes (2003)

$(\exists P \sqsubseteq A)\,(\exists Q \sqsubseteq B)\,[\,\Diamond\,(\exists x)\,P(x) \wedge \Diamond\,(\exists x)\,Q(x) \wedge$ Zimmermann (ms.)

$\neg\,\Diamond\,(\exists x)\,[P(x) \wedge Q(x)] \wedge max_P\,\text{seek}'(\text{Jones}', P) \sqsubseteq \lambda x\,[P(x) \vee Q(x)]]$

(19) **Most children are eating an apple or a banana.**

$(\exists P)\,(\exists Q)\,[\quad (\forall y)\,[P(y) \rightarrow A(y)] \wedge (\forall y)\,[Q(y) \rightarrow B(y)] \wedge$

$(\exists y)\,P(y) \wedge (\exists y)\,Q(y) \wedge \neg\,(\exists y)\,[P(y) \wedge Q(y)] \wedge$

$(\exists \wp)\,(\text{MOST}\,x\text{: } C(x))\;\;(\exists y)\,[\wp(y) \wedge E(x,y)] \quad \wedge$ not parallel to modal case

$(\forall y)\,[\wp(y) \leftrightarrow [P(y) \vee Q(y)]]\quad]$

(20) **Most kids who have eaten an apple or a banana are now sick.** similar

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