FREE CHOICE IN DEONTIC INQUISITIVE SEMANTICS (DIS)

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09.03.2012 34th DGfS Meeting Workshop: Questions in Discourse

FREE CHOICE IN DIS

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PUZZLES

ROSS'S PARADO

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IGNORANCE READI

COUNTERARGUMEN COUNTERED



FREE CHOICE

AN EXAMPLE OF FREE CHOICE

(1) A country may establish a research center or a laboratory.

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FREE CHOICE



Ross's Paradox

AN EXAMPLE OF STANDARD DISJUNCTION

- (2) a. A country established a research center.
 - b. A country established a research center or a laboratory.

AN EXAMPLE OF ROSS'S PARADOX

- (3) a. A country may establish a research center.
 - b. A country may establish a research center or invade its neighbour.

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Ross's parado:

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NON-MONOTONICITY

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ROSS'S PARADOX

CARIANI [2011]

The problem is inheritance:

$$p \models p \lor q$$

 $\Diamond p \nvDash \Diamond (p \lor q)$

Proposed solution: non-monotonicity

NEGATION

AN EXAMPLE OF NEGATED PERMISSION

(4) A country may not establish a research center or a laboratory.

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IGNORANCE READING

AN EXAMPLE OF THE IGNORANCE READING

(5) A country may establish a research center or a laboratory, but I do not know which.

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STRENGTHENING THE ANTECEDENT ANDERSON'S COUNTERARGUMENT



SUMMARY OF THE DATA

SUMMARY OF THE DATA

- Free choice
- Negation
- Ignorance reading
- ► Ross's paradox

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PRAGMATIC MECHANISM

ZIMMERMANN [2000]

Reinterpret deontic disjunction as a conjunction

DOES NOT CORRECTLY PREDICT NEGATION

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PRAGMATIC MECHANISM

IMPLICATURES

ECKARDT [2007]

Implicature-based account

- 1. Informed speaker uses disjunction: $\Diamond(\varphi \lor \psi)$.
- 2. Either disjunct would be more economical.
- 3. Infer that permissions are best described by disjunction because either disjunct would be false.
- 4. Free choice effect: There must be some worlds where $\Diamond \phi \wedge \overline{\Diamond \psi}$ and others where $\overline{\Diamond \phi} \wedge \Diamond \psi$



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IMPLICATIONS



PROBLEMS WITH IMPLICATURE-BASED ACCOUNTS

WHAT IS BEING SAID AND WHAT IS BEING IMPLICATED?

- (6) X is meeting a woman this evening.
- (7) A country may establish a research center or a laboratory.

CANCELLATION

- (8) X is meeting a woman this evening but it's only his mother.
- (9) A country may establish a research center or a laboratory, although in fact a country may not establish a laboratory.

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PROBLEMS WITH IMPLICATURE-BASED ACCOUNTS

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CANCELLATIONS EXPLORED FURTHER

Вотн

(10) A country may establish a research center or a laboratory, but not both.

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Previous accounts

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BARKER [2010]

ISSUES

- 1. Different violations and permissions
- 2. Negation: $\overline{\Diamond \varphi} \vee \overline{\Diamond \psi}$

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ATOMS AND NEGATION

ATOMS

$$\sigma \models^+ p \text{ iff } \forall w \in \sigma : w(p) = 1$$

 $\sigma \models^- p \text{ iff } \forall w \in \sigma : w(p) = 0$

NEGATION

$$\sigma \models^+ \overline{\varphi} \text{ iff } \sigma \models^- \varphi$$
 $\sigma \models^- \overline{\varphi} \text{ iff } \sigma \models^+ \varphi$



FIGURE 1: p

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Informativeness and inquisitiveness

Informative and inquisitive

 φ is informative iff $\bigcup [\varphi]^+ \neq W$. φ is inquisitive iff $\bigcup [\varphi]^+ \notin [\varphi]^+$.

ASSERTIONS, QUESTIONS, HYBRIDS AND RADICAL **ASSERTIONS**

- $\triangleright \varphi$ is an assertion iff φ is not inquisitive.
- $\triangleright \varphi$ is a question iff φ is not informative.
- $\triangleright \varphi$ is a hybrid iff φ is inquisitive and informative.
- $\triangleright \varphi$ is a radical assertion iff both φ and $\overline{\varphi}$ are not inquisitive.

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DISJUNCTION

DISJUNCTION

$$\sigma \models^+ \varphi \lor \psi \text{ iff } \sigma \models^+ \varphi \text{ or } \sigma \models^+ \psi$$

 $\sigma \models^- \varphi \lor \psi \text{ iff } \sigma \models^- \varphi \text{ and } \sigma \models^- \psi$



FIGURE 2: $p \lor q$

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CONDITIONALS

CONDITIONALS

$$\begin{array}{l} \sigma \models^+ \phi \rightarrow \psi \text{ iff } \forall \tau \subseteq \sigma. (\ \tau \models^+ \phi \text{ implies } \tau \models^+ \psi) \\ \sigma \models^- \phi \rightarrow \psi \text{ iff } \exists \tau. (\tau \models^+ \phi \text{ and } \forall \tau' \supseteq \tau. (\tau' \models^+ \phi \text{ implies } \sigma \cap \tau' \models^- \psi)) \end{array}$$

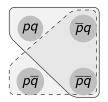


FIGURE 3: $p \rightarrow q$

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CONDITIONALS CONTINUED

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FALSE TAUTOLOGY RECTIFIED

$$(p \rightarrow q) \lor (q \rightarrow p)$$

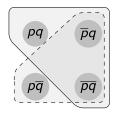


FIGURE 4: $p \rightarrow q$

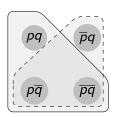


FIGURE 5: $q \rightarrow p$

CONDITIONALS CONTINUED

CONDITIONALS

$$\begin{array}{l} \sigma \models^+ \phi \rightarrow \psi \text{ iff } \forall \tau \subseteq \sigma. (\ \tau \models^+ \phi \text{ implies } \tau \models^+ \psi) \\ \sigma \models^- \phi \rightarrow \psi \text{ iff } \exists \tau. (\tau \models^+ \phi \text{ and } \forall \tau' \supseteq \tau. (\tau' \models^+ \phi \text{ implies } \\ \sigma \cap \tau' \models^- \psi)) \end{array}$$

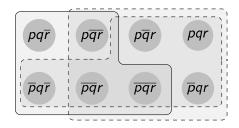


FIGURE 6: $p \lor q \rightarrow r$

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CONDITIONALS

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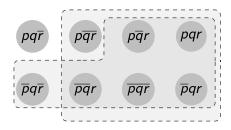


FIGURE 7: $[p \lor q \rightarrow r]^-$

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CONJUNCTION IN INQUISITIVE SEMANTICS



FIGURE 8: $\overline{p \lor q}$



FIGURE 9: $\overline{p \wedge q}$









FIGURE 10: $\overline{p} \wedge \overline{q}$



FIGURE 11: $\overline{p} \vee \overline{q}$

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CONJUNCTION

$$\sigma \models^+ \varphi \land \psi \text{ iff } \sigma \models^+ \varphi \text{ and } \sigma \models^+ \psi$$

 $\sigma \models^- \varphi \land \psi \text{ iff } \sigma \models^- \varphi \text{ or } \sigma \models^- \psi$



FIGURE 12: $p \land q$

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ENTAILMENT

STANDARD INQUISITIVE ENTAILMENT

 $\varphi \models \psi \text{ iff } \forall \alpha \in \lfloor \varphi \rfloor : \exists \beta \in \lfloor \psi \rfloor : \alpha \subseteq \beta$

ENTAILMENT TEST [LEWIS AND LANGFORD 1932]

If φ entails ψ then it's impossible that $\varphi \wedge \overline{\psi}$.

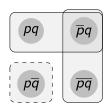


FIGURE 13: $\overline{p} \lor q$

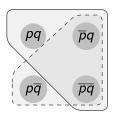


FIGURE 14: $p \rightarrow q$

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STANDARDLY

If $\varphi \models \psi$ then $\overline{\psi} \models \overline{\varphi}$.

RADICAL ENTAILMENT

 $\varphi \models \psi$ iff

 $\forall \sigma \text{ if } \sigma \models^+ \varphi \text{ then } \sigma \models^+ \psi \text{ and if } \sigma \models^- \psi \text{ then } \sigma \models^- \varphi.$

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VIOLATIONS

Atom v.

DEFINITION OF DEONTIC "MAY"

$$\sigma \models^+ \Diamond \varphi$$
 iff $orall au \subseteq \sigma$.($au \models^+ \varphi$ implies $au \models^- v$ $\sigma \models^- \Diamond \varphi$ iff $orall au \subseteq \sigma$.($au \models^+ \varphi$ implies $au \models^+ v$



FIGURE 15: $\Diamond p$

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$$\sigma \models^+ \Diamond \varphi \text{ iff } \forall \tau \subseteq \sigma. (\tau \models^+ \varphi \text{ implies } \tau \models^- v)$$

$$\sigma \models^- \Diamond \varphi \text{ iff } \forall \tau \subseteq \sigma. (\tau \models^+ \varphi \text{ implies } \tau \models^+ v)$$

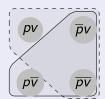


FIGURE 15: $\Diamond p$

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FREE CHOICE

DISJUNCTIVE PERMISSION

(11) A country may establish a research center or a laboratory.

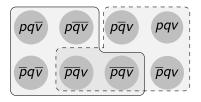


FIGURE 16: $\Diamond(p \lor q)$

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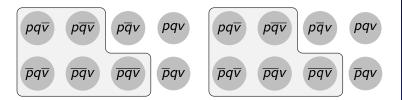
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FREE CHOICE CONTINUED

FIGURE 17: $[\lozenge(p \lor q)]^+$



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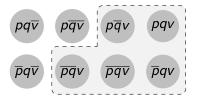
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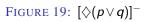
FIGURE 18: $[\lozenge p \land \lozenge q]^+$

NEGATION

NEGATION

(12) A country may not establish a research center or a laboratory.





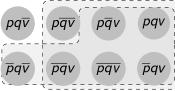


FIGURE 20: $[\lozenge p \land \lozenge q]^-$

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IGNORANCE READING

DISJUNCTION SCOPING OVER "MAY"

(13) A country may establish a research center or a laboratory but I don't know which.

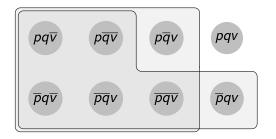


FIGURE 21: $[\lozenge p \lor \lozenge q]^+$

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ROSS'S PARADOX

- (14)A country may establish a research center.
 - A country may establish a research center or invade its neighbour.

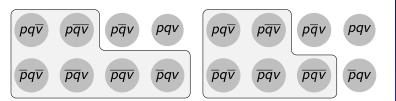


FIGURE 22: $[\lozenge p]^+$

FIGURE 23: $[\lozenge(p \lor q)]^+$

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ROSS'S PARADOX

STRENGTHENING THE ANTECEDENT

STRENGTHENING THE ANTECEDENT

(15) a. You may walk a dog.

b. You may walk a dog and kill the president.

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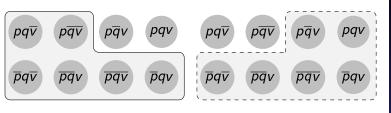
FREE CHOICE PROHIBITION

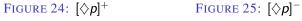
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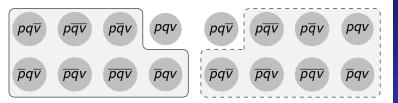


FIGURE 26: $[\lozenge(p \land q)]^+$

FIGURE 27: $[\lozenge(p \land q)]^-$

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ANDERSON [1967]

- 1. $\Box p := \overline{p} \rightarrow v$ 2. p
- 3. <u>p</u>
- 4. $\overline{\overline{p}} \lor v$

- 5. $\overline{p} \rightarrow v$
- 6. $p \rightarrow \Box p$



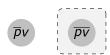


FIGURE 28: $[\overline{\overline{p}} \lor v]^-$

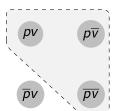


FIGURE 29: $[\overline{p} \rightarrow v]^-$

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FIGURE 30: *♦p*

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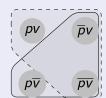


FIGURE 30: $\Diamond p$

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