Homogeneity in donkey sentences

Handout with key formulae

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Full slide set available at champollion.com/2016_salt_presentation.pdf

Pragmatics

The Current Issue (≈QUD): a salient question that gives rise to an equivalence relation "≈" on worlds. $w \approx w'$ means that w and w' agree on the current issue.

Sentence S is judged true at w_0 iff it is "true enough":

- that is, if S is True (at w_0), or
- if S is Neither at w_0, True at some $w \approx w_0$, and not False at any $w' \approx w_0$

Otherwise, S is judged false.

Semantics

1. farmer ⇝ λv. λIλO. I=O ∧∀i∈I. farmer(i(v))
   Shorthand: *λv. [farmer{v}]*

2. beats ⇝ λvλv'. λIλO. I=O ∧∀i∈I. beats(i(v),i(v'))
   Shorthand: *λvλv'. [beats{v,v'}]*

3. A *condition* is a test on an input state: λI …

   A. Atomic predicates: R{u} $=_{def}$ λI. ∀ i∈I. R(i(u))

4. A *DRS* relates input to output states: λI λO …

   A. Lifting a condition C into a DRS: [C] $=_{def}$ λI λO. C(I) ∧ I=O

   B. Random and targeted assignments of discourse referents:
      [u] $=_{def}$ λI λO. ∀i∈I ∃o∈O. i[u]o ∧ ∀o∈O ∃i∈I. i[u]o
      u:=x $=_{def}$ λI λO. [u](I)(O) ∧ ∀o∈O. o(u)=x

5. succeeds(D,I) $=_{def}$ ∃O≠ε. D(I)(O)
   D transitions to some non-error state

6. fails(D,I) $=_{def}$ ¬∃O. D(I)(O)
   D does not transition to any output state

7. error(D,I) $=_{def}$ ∃O. D(I)(O) ∧ ∀O. (D(I)(O) → O=ε)
   D only transitions to error states

8. DRS negation checks that a DRS fails on any nonempty substate of the input state:

   ~D $=_{def}$ λI. ∀H≠ε. H⊆I → fails(D,H)

9. DRS disjunction checks that at least one of the disjuncts succeeds:

   D | D' $=_{def}$ λI. succeeds(D,I) ∨ succeeds(D',I)

10. DRS conjunction: apply the two DRSs in sequence

    D ; D' $=_{def}$ λIλO. ∃H. D(I)(H) ∧ D'(H)(O)

11. Maximalization: store as many different entities under column *u* as possible as long as D returns an output

    max_u(D) $=_{def}$ λIλO. (I=O=ε) ∨ ([u] ; D)(I)(O) ∧ ∀K. ([u] ; D)(I)(K) → uK ⊆ uJ
    where uK $=_{def}$ { x : there is an i in K such that x=i(u)}

12. uniformTest(D) $=_{def}$ λI. (D | [~D])

13. uniform(D) $=_{def}$ λI λO. (uniformTest(D)(I) ∧ I=O) ∨ (¬uniformTest(D)(I) ∧ O=ε)

14. it_{u2} ⇝ λP. uniform(P(u_2)) ; P(u_2)

15. brays ⇝ λv. brays{v}

16. Lift(it_{u2}) ⇝ λRλv. uniform(R(u_2)(v)) ; R(u_2)(v)

17. beats ⇝ λv'λv. beats{v,v'}

18. $every_u$ $=_{def}$ λDλD'λIλO.
    (O=I ∧ ∀x. (succeeds(u:=x ; D)(I) → succeeds(u:=x ; D ; D')(I)))
    ∨
    (O=ε ∧ ¬∀x. (succeeds(u:=x ; D)(I) → succeeds(u:=x ; D ; D')(I)) ∧
    ∧ ∃x. (succeeds(u:=x; D)(I) ∧ fails(u:=x ; D ; D')(I)))