Meaning, Reference & Modality. Assignment 2

Andreas van Cranenburgh, 0440949

Sunday, October 25, 2009

Exercise 1

1. Sarkozy might have been the president of the United States
2. Sarkozy might have been Obama
3. Obama might have been the president of France

Kripke:
1. Yes, the statement is true if there is such a counterfactual world.
2. No, this statement is nonsense regardless, because names are rigid.
3. No, this statement still requires there to be such a possible world, which we do not know.

Frege according to Kripke:
1. No 2. No 3. No
The description of Sarkozy would still be something like "prime minister of France". There is no way to match the descriptions in our world with those in the counterfactual world to consider.

If Obama had been baptized 'Sarkozy':
Kripke:
1. Yes, baptisment has a causal influence.
2. Yes, becomes an analytic statement.
3. No, still depends on whether such a possible world exists, where the person Obama (whatever the name) becomes the president of France.

Frege according to Kripke:
1. Yes 2. No 3. No
1 is now an analytic statement. 2 and 3 would still be false, Sarkozy and Obama have different descriptions.

Exercise 2

For Kripke existence is a contingent property, as evidenced by a quote from the introduction of Naming & Necessity. Kripke writes that x=y equals x=x, provided that x exists, in order to:

> ''[waive] fussy considerations that x need not have necessary existence''

And in lecture II:

''I also don't mean to imply that the thing designated exists in all possible worlds, just that the name refers rigidly to that thing.''

The reason for this is the way the model is defined. Firstly each world has its own domain, so an individual in one world need not exist in the other. Secondly predicates have separate extensions in each world. This means that when we consider identity, a non-existing object in a world is not even self-identical in that world.

Stalnaker also talks of existence as a contingent property, as evidenced by his discussion of the counterfactual ‘‘If Aristotle hadn’t existed’’.

Exercise 3

1. <> dagger phi:
for all i,j: [[<> dagger phi]](i,j) == [[<> phi]](j, j)
'<> dagger phi' expresses that along the diagonal there is at least one context-world where phi is true. It could be called the context-independent possibility operator.

<> double-dagger phi:
for all i,j: [[<> ddagger phi]](i,j) == [[phi]](i, i)
The double dagger cancels the possibility operator out, because for every world j in which phi is evaluated, the truth value in world i is actually used. So because of the double dagger the diamond no longer has any effect.

2.
The formula with the dagger is equivalent with <> phi if:
   a) if there is at least one T in the diagonal, then every row of the propositional concept must have at least one T.
   b) if there is no T in the diagonal, then there must be no T in the propositional concept.

The formula with the double dagger is equivalent with <> phi if
on rows where the diagonal is false, the propositional concept has no other cell with T in it on that row (all falsehoods should be necessary). Otherwise <> phi would have the value T whereas <> double-dagger phi would have the value F for that row.

Exercise 4

1. An example of a one-place predicate would be mythical(x), true iff x is a mythical, non-existing creature in a world w.
A two-place predicate could be PlayedBy(x, y), where x is a fictional character as played by y in a play.

2. (i) FG for all x: h(x)
  (ii) G (there is an x: h(x) -> there is an y ~h(y))
Suppose there is a time when both (i) and (ii) are true. According to sentence (i) everyone is happy, this means that there is someone who is happy. But according to (ii) in that case someone must be unhappy. Contradiction. Hence we must withdraw the assumption that (i) and (ii) can both be true.

3. Eternal recurrence:
for all x: G (E(x) -> (F (~E(x) ^ F E(x))))
In words: for all individuals it goes that there will always be an individual such that there will be a time a time that it does not exist and after that a time where it does exist.

Exercise 5

[] there exists an x: Fx -> there exists an x: [] Fx

In words: if there is an individual with property F in all accessible worlds, then there must be an individual in the current world with property F in all accessible worlds.
So the formula expresses the property that the domain of individuals is decreasing, also known as anti-monotonic.
Its frames are functional. Suppose we have a world with access to two worlds, w' and w'':

```
       {Fa, Fb}
          w
         / \
        /   \
       w'    w''
 {Fa, ~Fb}  {~Fa, Fb}
```

Here the antecedent is true, in both worlds there is some individual for which F holds. However, the consequent is not true, because it is not the same individual. For this reason the frames have to be functional, with exactly one world connected to each world.