

# Objects Under Discussion

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Two problems:

- **De Se Problem:** how can *de se* content be communicated?
- **Frege's Puzzle:** how can “*a = a*” and “*a = b*” differ in informativity if *a* and *b* are co-referential singular terms? (singular term: name, indexical, pronoun, demonstrative)

I will:

- explain the *De Se* Problem;
- sketch a solution to it; and
- show how that solution can be generalised to solve Frege's Puzzle.

Two aspects of the account:

- **Pragmatics:** utterance contents and context sets are sets of **sequenced worlds**.
- **Semantics:** singular terms are like **variables**, i.e. they are **assignment-sensitive** (Dever, Elbourne, Cumming, etc.).
- I'll be developing the pragmatic model as I go; the semantics will come at the end.

## 1. The *De Se* Problem

Stalnaker's picture:

- A speaker **presupposes** something iff he accepts it, he accepts that all accept it, he accepts that all accept that all accept it, and so on.
- The **context set** of a conversation is the set of possible worlds in which the presuppositions of the conversational participants are all true.
- **Assertions** remove worlds from the context set.
- The contents of presuppositions, assertions, etc. are possible worlds propositions.

*De se* attitudes and centred worlds:

- Lewis: the content of a *de se* attitude – *I am hungry* – cannot be represented by a possible worlds proposition.
  - Cannot be a singular proposition:  $\{w : \text{DN is hungry in } w\}$ .
  - Cannot be a descriptive proposition:  
 $\{w : \text{the only philosopher named "DN" in } w \text{ is hungry in } w\}$
- Represent using a **centred proposition**:  $\{\langle w, t, x \rangle : x \text{ is hungry at } t \text{ in } w\}$
- I believe that centred proposition just in case I *locate myself* in the set of possible individuals (centred worlds) who are hungry.

*De se* communication? A centred worlds version of Stalnaker's story? The *De Se* Problem:

- When John says to Sue, *My pants are on fire*, the content of the belief he expresses is the centered proposition in which the center's pants are on fire:
  - (1)  $\{\langle w, t, x \rangle : x\text{'s pants are on fire at } t \text{ in } w\}$ .
- Sue understands and accept John's utterance, so we remove from the context set all centred worlds whose centres lack burning pants.
- So both John and Sue presuppose (1). But for *Sue* to presuppose that is for her to presuppose that *her* pants are on fire.

## 2. The sequenced worlds solution

The idea:

- When John and Sue are talking, they are not just *self*-locating, they are *pair*-locating: they are locating the pair of John and Sue in a set of pairs of possible individuals.
- So instead of taking the objects of thought and talk to be sets of possible individuals (centred worlds), we should take them to be sets of pairs of possible individuals (*pair-centred worlds*).
- **Pair-centred world:** a triple  $\langle w, t, \langle x, y \rangle \rangle$  consisting of a possible world  $w$ , a time  $t$  plus a pair of individuals  $\langle x, y \rangle$  who exist at  $t$  in  $w$ . Represents a way for a pair of individuals to be.
- **Pair-centred proposition:** a set of pair-centred worlds.

But what does it mean to say that John believes a pair-centred proposition, e.g. the set of pair-centred worlds in which the first centre's pants are on fire? Does that mean that he believes that his pants are on fire or that Sue's are? Who does each centre represent?

- A **base world** for John and Sue's conversation at time  $t$  in world  $w$ :  $\langle w, t, \langle \text{John}, \text{Sue} \rangle \rangle$
- A base world tells us who each centre of a pair-centred world represents:  $\langle w, t, \langle \text{John}, \text{Sue} \rangle \rangle$  tells us that the first centre represents John, and that the second represents Sue.

A **model** of a conversation now consists of (i) a base world, and (ii) a context set, now a set of pair-centred worlds.

Solving the *De Se* Problem:

- Let the base world be  $\langle w, t, \langle \text{John}, \text{Sue} \rangle \rangle$ .
- John says to Sue, *My pants are on fire*. Content of his utterance:
  - (2)  $\{\langle w', t', \langle x', y' \rangle \rangle : x'\text{'s pants are on fire at } t' \text{ in } w'\}$ .
- If Sue understands and accepts what John says, we will remove from the initial context set all the pair-centered worlds whose first center's pants are not on fire.
- Now Sue presupposes (2), i.e. she presupposes that *John's* pants are on fire.
- So John's *de se* assertion results in Sue's *de te* presupposition. The content of John's *de se* assertion is identical to the content of Sue's *de te* presupposition.

Generalisation, for conversations with more than two participants:

- For conversations with  $n$  participants, we want **sequenced worlds**, triples  $\langle w, t, g \rangle$  of a world  $w$ , a time  $t$  and an  $n$ -ary sequence of individuals  $g = \langle x_1, \dots, x_n \rangle$  who exist at  $t$  in  $w$ .

- The base world is now sequenced world; both contents and context sets are now sets of sequenced worlds.

Remarks:

- Something like this formal structure may be needed anyway to handle cross-sentential and donkey anaphora: e.g. Heim treats context sets as sets of **files**, where a file is a pair of a world and a sequence of individuals, i.e. a sequenced world.
- We have said nothing about the connection between the semantics of the sentence John uttered – *My pants are on fire* – and (what I claim is) the content of his utterance, viz. (2).

### 3. Frege's Puzzle

Intuitively, utterances of (4)-(8) are potentially informative in a way that (3) is not.

- (3) George Eliot is George Eliot.
- (4) Mary Ann Evans is George Eliot.
- (5) That woman is George Eliot. (pointing at GE)
- (6) She is George Eliot. (pointing at GE)
- (7) I am George Eliot. (spoken by GE)
- (8) That's me! (spoken by GE, pointing at herself in a photograph)

Remarks:

- The standard ‘direct reference’ semantics for these terms associates them all with the same proposition.
- Even if some version of descriptivism about proper names is viable (e.g. *the actual person called “George Eliot”*), we would still need a theory that accounted for the informativity of sentences like (8) and *That ship is the same as that one*.
- Centred worlds don’t seem to give one any added traction on these problems (Cappelen and Hawthorne).

What counts as a solution to the Puzzle?

- Given our theoretical setup, a **solution** would be to have a model where (3) cannot remove worlds from a context set, while (4)-(8) can. That would show that (4)-(8) are *potentially informative*, whereas (3) is not.

**First step:** expand the sequences:

- So far we have only shown how information *about the conversational participants* might be communicated.
- But the obvious way to extend the model to handle information about individuals not present is to add more ‘centres’ to the sequences, one for each of the individuals under discussion.
- If there are  $n$  conversational participants and  $m$  other objects that the participants are talking about, use sequenced worlds of length  $n+m$ . (Convention: list the conversational participants at the beginning of the base world sequence.)

**Example:**

- Participants: John, Sue.
- Other objects under discussion: Betty, Frank.
- Base world:  $\langle w, t, \langle \text{John}, \text{Sue}, \text{Betty}, \text{Frank} \rangle \rangle$
- Initial context set:  $C \subseteq W \times G$ , i.e. some subset of the set of all sequenced worlds.

John first says: “I’m hungry”:

- Base world:  $\langle w, t, \langle \text{John}, \text{Sue}, \text{Betty}, \text{Frank} \rangle \rangle$
- Content:  $\{\langle w', t', g' \rangle : g'(1) \text{ is hungry at } t' \text{ in } w'\}$
- Updated context  $C' = C \cap \{\langle w', t', g' \rangle : g'(1) \text{ is hungry in } w'\}$

Then Sue says: “Frank is making lasagne.”

- Base world:  $\langle w, t, \langle \text{John}, \text{Sue}, \text{Betty}, \text{Frank} \rangle \rangle$
- Content:  $\{\langle w', t', g' \rangle : g'(4) \text{ is making lasagne at } t' \text{ in } w'\}$
- Updated context  $C'' = C' \cap \{\langle w', t', g' \rangle : g'(4) \text{ is making lasagne at } t' \text{ in } w'\}$

As a result of these two utterances, there are no sequenced worlds in  $C''$  whose first member is not hungry nor any whose fourth member is not making lasagne.

**Second step:** allow for repetition in the base world sequence:

#### A Frege puzzle case:

- Suppose John is acquainted with a certain person in two ways: he knows her as his friend Mary Ann Evans, and he also knows of her via reading the novels published under the name “George Eliot”. (So Mary Ann Evans = George Eliot, but John doesn’t know this.)
- GE was obscuring the fact that she is George Eliot from John so that she could hear his honest thoughts about her latest novel. But she is now about to reveal her true identity to John.

To model this scenario:

- Base world:  $\langle w, t, \langle \text{John}, \text{MAE}, \text{GE} \rangle \rangle$

We note the base world this way simply to keep track of a stipulation we’re making as to which position corresponds to which ‘guise’.

But technically,  $\langle \text{John}, \text{MAE}, \text{GE} \rangle = \langle \text{John}, \text{GE}, \text{GE} \rangle = \langle \text{John}, \text{MAE}, \text{MAE} \rangle$ .

Let  $C$  be the initial context set.

- There are sequenced worlds  $\langle w', t', g' \rangle$  in  $C$  in which  $g'(2)$  is not identical to  $g'(3)$ .

This means that it is not presupposed that MAE is GE.

- $C \subseteq \{\langle w', t', g' \rangle : g'(2) \text{ is called “MAE” in } w', \text{ and } g'(1) \text{ is friends with } g'(2) \text{ in } w'\}$

This means that it is presupposed that that MAE is called “MAE”, and that John is friends with MAE.

- $C \subseteq \{\langle w', t', g' \rangle : g'(3) \text{ is called “GE” in } w', \text{ and } g'(3) \text{ is a novelist in } w'\}$

This means that it is presupposed that GE is called “GE”, and that GE is a novelist.

Now GE utters (7): “I am George Eliot!”

- Base world:  $\langle w, t, \langle \text{John, MAE, GE} \rangle \rangle$
- Content:  $\{\langle w', t', g' \rangle : g'(2) \text{ is } g'(3)\}$
- Updated context  $C' = C \cap \{\langle w', t', g' \rangle : g'(2) \text{ is } g'(3)\}$

**GE's utterance of (7) is informative**, since it removes worlds from the context set.

Suppose instead that  $X$  had uttered (3): “George Eliot is George Eliot.”

- Base world:  $\langle w, t, \langle \text{John, MAE, GE} \rangle \rangle$
- Content:  $\{\langle w', t', g' \rangle : g(3) \text{ is } g(3)\}$
- Updated context  $C' = C \cap \{\langle w', t', g' \rangle : g'(3) \text{ is } g'(3)\}$

Since  $\{\langle w', t', g' \rangle : g'(3) \text{ is } g'(3)\}$  is the set of *all* sequenced worlds (of length 3 or greater),  $C' = C$ .

**GE's utterance of (3) would not have been informative**, since it would not have removed any worlds from the context set.

#### 4. Assignment-sensitivity

**Question:** How do we connect the semantics of (7) to the fact that GE's utterance of it has content  $p$  (relative to base world  $B$ )?

(7) I am George Eliot.

Base world  $B$ :  $\langle w, t, \langle \text{John, MAE, GE} \rangle \rangle$

Content  $p$ :  $\{\langle w', t', g' \rangle : g'(2) \text{ is } g'(3) \text{ at } t' \text{ in } w'\}$

A natural answer to this question emerges if we accept an **assignment-sensitive** semantics for singular terms.

Motivation: singular terms can be bound.

**Indexicals** can be bound:

- (9) (a) Only I did my homework. (Heim)  
 Bound reading  $\approx$  “I did my homework and for all individuals  $x$  ( $x \neq \text{me} \rightarrow x \text{ didn't do } x\text{'s homework}$ ).”
- (b) You're the only one who forgot your wallet  
 Bound reading  $\approx$  “You forgot your wallet and for all individuals  $x$  ( $x \neq \text{you} \rightarrow x \text{ didn't forget } x\text{'s wallet}$ ).”

**Proper names** can be bound (Dever, Geurts, Cumming):

- (10) (a) If a child is christened “Goofy”, and the Disney CEO hears about it, he'll sue **Goofy**'s parents. (Geurts)  
 Bound reading  $\approx$  “For all individuals  $x$ : ( $x$  is a child christened “Goofy” and the CEO hears that  $x$  is christened “Goofy”)  $\rightarrow$  (the CEO sues  $x$ 's parents).”
- (b) There is a gentleman in Hertfordshire by the name of “Ernest”. **Ernest** is engaged to two women. (Cumming)  
 Bound reading  $\approx$  “There is an individual  $x$  such that ( $x$  is a gentleman in Hertfordshire named “Ernest” and  $x$  is engaged to two women).”

Semantic framework:

- Semantic values are given relative to a **Kaplan context**  $c$  and a **circumstance**  $i$ .
- A context  $c$  consists of a world,  $w_c$ , a time  $t_c$ , a speaker  $x_c$ , and a variable assignment  $g_c$ . The assignment  $g_c$  of a context  $c$  is a sequence of all and only the individuals under discussion, so **the base world of a context  $c$  is  $c$  with the speaker removed**:  $\langle w_c, t_c, g_c \rangle$ .
- A circumstance  $i$  consists of a world  $w_i$ , a time  $t_i$ , and a variable assignment  $g_i$  (so a circumstance has the semantic type of a sequenced world).

Semantics of indexicals (cf. Heim, Schlenker, Kratzer, etc.):

- Like other pronouns, indexicals bear a numerical index at LF.
- $\llbracket I_j \rrbracket^{c,i}$  is defined iff  $g_c(j) = x_c$ , the speaker of  $c$   
Where defined,  $\llbracket I_j \rrbracket^{c,i} = g_i(j)$
- $\llbracket \text{you}_k \rrbracket^{c,i}$  is defined iff  $g_c(k) = x_c$ 's addressee  
Where defined,  $\llbracket I_k \rrbracket^{c,i} = g_i(k)$

Semantics of proper names:

- Like pronouns and indexicals, proper names carry a numerical index at LF.
- $\llbracket \text{Ernest}_4 \rrbracket^{c,i}$  is defined iff  $g_c(4)$  is Ernest  
Where defined,  $\llbracket \text{Ernest}_4 \rrbracket^{c,i} = g_i(4)$

Remarks:

- Think of the ‘definedness’ conditions as *instructions to the theorist*: e.g. “Don’t assign numerical index  $j$  to ‘I’ unless you’ve made the  $j$ th individual in the variable assignment the speaker of the context.”
- Since a sentence  $\phi$  is true at context  $c$  just in case  $\llbracket \phi \rrbracket^{c,i_c} = 1$ , we get standard predictions as to when **simple** singular term-containing sentences come out true at a context:  
 $\llbracket I_3 \text{ am happy} \rrbracket^{c,i_c}$  is defined iff  $g_c(3) = x_c$ , the speaker of  $c$ .  
Where defined,  $\llbracket I_3 \text{ am happy} \rrbracket^{c,i_c} = 1$  iff  $g_c(3)$  is happy in  $w_c$ .
- Assuming metaphysical modals do not shift the assignment  $g_i$ , we get standard Kripkean predictions for singular terms in modal contexts.

**Answer to our Question:**

- The **content** of a sentence  $\phi$  at a context  $c$  is the set of circumstances at which it is true (Kaplan):  

$$\{\langle w', t', g' \rangle : \llbracket \phi \rrbracket^{c, \langle w', t', g' \rangle} = 1\}$$
- Since the base world is  $B = \langle w, t, \langle \text{John}, \text{MAE}, \text{GE} \rangle \rangle$ , the context of GE’s utterance is  $b = \langle w, t, \text{MAE}, g \rangle$ , where  $g = \langle \text{John}, \text{MAE}, \text{GE} \rangle$ .
- For any circumstance  $\langle w', t', g' \rangle$ ,  $\llbracket I_2 \text{ am GE}_3 \rrbracket^{b, \langle w', t', g' \rangle} = 1$  iff  $g'(2)$  is  $g'(3)$  at  $t'$  in  $w'$ .
- So the content of (7) at  $b$  – the *set* of circumstances at which it is true – is:  

$$\begin{aligned} & \{\langle w', t', g' \rangle : \llbracket I_2 \text{ am GE}_3 \rrbracket^{b, \langle w', t', g' \rangle} = 1\} \\ &= \{\langle w', t', g' \rangle : g'(2) \text{ is } g'(3) \text{ at } t' \text{ in } w'\} \end{aligned}$$

which is content  $p$ .