Fregean Semantics: Denotation (reference)

All linguistic expressions (proper names, predicates, sentences) denote objects.

- The denotation of a proper name is an **individual**.
- The denotation of a predicate is a **function** (which maps one object as argument to another object as value).
- The denotation of a sentence is a **truth-value**.
- A **concept** is a function whose values are truth-values.

**Example: ‘Bill is wealthy’**

‘Bill’ denotes Bill. \[ \text{Bill} = D(‘Bill’) \]

‘is wealthy’ denotes a function, \( f_1 \). \[ f_1 = D(‘is wealthy’) \]

\[ f_1(\text{Bill}) = \text{The True} \]

That is, \( f_1 \) maps Bill onto The True.

\( D(‘Bill is wealthy’) \) is a function of \( D(‘Bill’) \) and \( D(‘is wealthy’) \).

\[ D(‘Bill is wealthy’) = \text{The True} \]

The denotation of the entire sentence is a function of the denotations of its parts.

**Example: ‘Bill loves Melinda’**

‘Bill’ denotes Bill. \[ \text{Bill} = D(‘Bill’) \]

‘Melinda’ denotes Melinda. \[ \text{Melinda} = D(‘Melinda’) \]

‘loves’ denotes a function, \( f_2 \). \[ f_2 = D(‘loves’) \]

‘loves Melinda’ denotes a function, \( f_3 \). \[ f_3 = D(‘loves Melinda’) \]

\[ f_2(\text{Melinda}) = f_3 \]

That is, \( f_2 \) maps Melinda onto \( f_3 \).

\[ f_3(\text{Bill}) = \text{The True} \]

That is, \( f_3 \) maps Bill onto The True.

\( D(‘Bill loves Melinda’) \) is a function of \( D(‘Bill’) \), \( D(‘Melinda’) \), and \( D(‘loves’) \).

\[ D(‘Bill loves Melinda’) = \text{The True} \]

Again, the denotation of the entire sentence is a function of the denotations of its parts.
Fregean Semantics: Sense

All linguistic expressions (proper names, predicates, sentences) express senses.

- The sense of a predicate is a function from a sense to a sense.
- The sense of a sentence is a thought (i.e., a proposition).

Example: ‘Bill is wealthy’

‘Bill’ expresses $S(\text{‘Bill’}).$
‘is wealthy’ expresses a function, $f_4.$ $f_4 = S(\text{‘is wealthy’})$

\[
\begin{array}{c}
S(\text{‘Bill’}) \\
\downarrow f_4 \\
\text{‘Bill is wealthy’}
\end{array}
\]

$f_4$ maps senses onto thoughts: $f_4 (S(\text{‘Bill’})) = S(\text{‘Bill is wealthy’}).$
That is, $f_4$ maps $S(\text{‘Bill’})$ onto the sense of ‘Bill is wealthy’.

$S(\text{‘Bill is wealthy’})$ is the thought, or proposition, that Bill is wealthy.
$S(\text{‘Bill is wealthy’})$ is a function of $S(\text{‘Bill’})$ and $S(\text{‘is wealthy’}).$

That is, the sense of the entire sentence is a function of the senses of its parts.

Example: ‘Bill loves Melinda’

‘Bill’ expresses $S(\text{‘Bill’}).$
‘Melinda’ expresses $S(\text{‘Melinda’}).$
‘loves’ expresses a function, $f_5.$ $f_5 = S(\text{‘loves’})$
‘loves Melinda’ expresses a function, $f_6.$ $f_6 = S(\text{‘loves Melinda’})$

\[
\begin{array}{c}
S(\text{‘Bill’}) \\
\downarrow f_5 \\
\downarrow f_6 \\
\text{‘Bill loves Melinda’} \\
S(\text{‘Melinda’})
\end{array}
\]

$f_5$ maps senses onto functions: $f_5 (S(\text{‘Melinda’})) = f_6.$
That is, $f_5$ maps $S(\text{‘Melinda’})$ onto $f_6$, the function that is the sense of ‘loves Melinda’.

$f_6$ maps senses onto thoughts: $f_6 (S(\text{‘Bill’})) = S(\text{‘Bill loves Melinda’})$
That is, $f_6$ maps $S(\text{‘Bill’})$ onto the thought that Bill loves Melinda.

$S(\text{‘Bill loves Melinda’})$ is a function of $S(\text{‘Bill’}), S(\text{‘Melinda’}),$ and $S(\text{‘loves’}).$

That is, the sense of the entire sentence is a function of the senses of its parts.