Unifying Three Notions of Concepts*

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There isn’t universal agreement as to what ‘concept’ means. Indeed, the present discussion might seem circular, since it may come across as an investigation into the concept of ‘concept’ and so presupposes an understanding of the technical term concept. But I’ll try to avoid circularity in what follows by considering how certain primitive entities, or entities known under a different name, could reasonably be called ‘concepts’.

I shall assume that concepts, whatever they are, (can be used to) characterize entities in some way. In particular, I’ll discuss three notions of concept: Fregean Begriffe, the primitive concepts of Leibniz’s ‘calculus’, and Fregean senses, all of which characterize entities. Though these kinds of concepts characterize objects in somewhat different ways, they can all be unified within object theory (Zalta 1983, 1988). For the purposes of this paper, I assume familiarity with that theory and, in particular, with its distinction between exemplification predication \( (F^n x_1 \ldots x_n) \) and encoding predication \((xF)\).

If the notion of concept used in cognitive science doesn’t fall among the three notions just mentioned, then I believe it can be analyzed in some other way within object theory. For example, I think some cognitive scientists use ‘concept’ to refer to word types (as opposed of word tokens). If that is what they mean, then there is a way to analyze that notion in object theory, namely, by taking types (e.g., word types, sentence symbols and, in general, symbol types) to be the abstract objects that encode just the defining properties exemplified by the tokens of that type. At other times, cognitive scientists use ‘concept’ to mean certain mental tokens, possibly mental tokens in some language of thought. If that is what they mean, then object theory would analyze only the content of those tokens as Fregean senses, i.e., in terms the second notion of concept that arises from Frege’s work. So I hope that the notion of concept used by the cognitive scientists will be covered in what follows.

1 Frege’s Notion of Begriff

Frege (1892a) distinguished concepts (Begriffe) and objects; today we similarly distinguish properties and individuals. The former are predicative entities (or, as Frege would say, unsaturated entities), while the latter aren’t predicative. Frege analyzed predication (‘x exemplifies F’ or ‘Fx’) by saying that x falls under the concept F. He explicitly says (1892a, 51) that the concepts under which an object falls are its properties.

But Frege identifies concepts as functions that map objects to truth values and defines: x falls under F just in case F maps x to the truth-value True. He thereby analyzes predication as functional application. By contrast, the second-order predicate calculus takes relations and predication as basic: the sentence form \( \forall x (F^n x_1 \ldots x_n) \) is atomic and, in the 1-place case, ‘Fx’ asserts x exemplifies property F. Russell used such a calculus to identify functions as special relations, namely, as those relations R such that \( \forall x \forall y \forall z (Rxy & Rxz \rightarrow y = z) \).

So if your notion of concept is Frege’s notion of Begriff, then I’ll simply refer to such entities in what follows as properties (or relations). Since I take predication to be more fundamental than functional application, I’ll start with second-order quantified (modal) logic, with quantification over properties and relations, as a background framework. I include the second-order comprehension principle for relations as part of this framework (restricted only to forestall the assertion of paradoxical relations constructed with encoding subformulas). I plan to steer clear of the debate about interpreting the second-order quantifiers in terms of plural quantification; I’m quite happy to suppose that logic requires a primitive

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*Copyright © 2019, by Edward N. Zalta. This paper comprises my keynote presentation at the 2nd Context, Cognition and Communication Conference (“Contexts, Concepts, and Objects”), held at the University of Warsaw, June 16–20, 2019. The goal of the presentation was to introduce object theory, by way of three connected applications, to an interdisciplinary audience consisting of philosophers, linguists, and cognitive scientists. So my focus was to show how the themes of the conference can be understood in object-theoretic terms rather than on presenting the latest developments of the theory. I’m indebted to the organizers of the conference, and especially to Tadeusz Ciecierski, Paweł Grabarczyk, and Maciej Sendak, for inviting me to speak there and for their kind assistance throughout the days I spent in Warsaw.

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\[ x \forall y (Rxy & Rxz \rightarrow y = z) \]
domain of relations for the second-order quantifiers to range over. Indeed, object theory doesn’t require ‘full’ second-order logic; second-order logic under general, Henkin models will suffice for the applications in the main part of this paper. And for the theory of Fregean senses discussed at the end, typed object theory under general, Henkin models will suffice.

Of course, many people are still influenced by Quine’s reluctance to endorse properties (or other intensional entities like relations and propositions) on the grounds that they are ‘creatures of darkness’ (1956, 180), whose principle of individuation is ‘obscure’ (1956, 184). He also suggests that intensions are ‘less economical’ than extensions such as truth values, classes, relations-in-extension (1956, 184). But none of this applies to the object-theoretic conception of properties. Here is why.

Object theory not only includes a second mode of predication, but includes a comprehension principle for abstract (A) object that asserts, for any formula \( \varphi \) with no free \( x \), that there exists an abstract object \( x \) that encodes all and only the properties \( F \) satisfy the formula \( \varphi \). We write this as:

\[
\exists x(A!x \& \forall F(xF \equiv \varphi)), \text{ where } x \text{ doesn’t occur free in } \varphi.
\]

The quantifier \( \forall F \) here ranges over (hyperintensional) properties, i.e., properties more fine-grained than Montague’s intensions. The above principle not only guarantees that there is an abstract object that corresponds to every expressible condition on properties, but also, as a special case, that for every property \( P \), there is an abstract object that encodes just \( P \) and nothing else. Hence, if identity were a primitive of the language, one could prove that \( G = H \equiv \forall x(xG \equiv xH) \). To see this, we need only examine the right-to-left direction, since the left-to-right direction is trivial, given the substitution of identicals. For the right-to-left direction we have to prove \( \forall x(xG \equiv xH) \rightarrow G = H \). So suppose \( \forall x(xG \equiv xH) \) and, for reductio, \( G \neq H \). Now consider an abstract object, say \( a \), that encodes all and only the properties identical to \( G \). Then \( a \) encodes \( G \) but not \( H \). But, by our hypothesis, \( a \) encodes \( G \) iff \( a \) encodes \( H \). Hence \( a \) encodes \( H \). Contradiction.

So, if identity were primitive, object theory would yield, as a theorem, that properties are identical whenever they are encoded by the same objects. But in the standard formulations of object theory, identity is not taken as a primitive. Instead we define property identity by saying:

\[
F = G =_{df} \forall x(xF \equiv xG)
\]

And in a modal setting, the definition becomes:

\[
F = G =_{df} \Box \forall x(xF \equiv xG)
\]

Given the modal logic of encoding (\( \Box xF \rightarrow \square xF \)), one can then prove, in the modal setting, that \( \forall x(xF \equiv xG) \) is sufficient for proving \( F = G \).

Thus, the identity and individuation of properties in object theory isn’t obscure.\(^1\) The more one understands the richness of (the applications of) object theory, the better one understands why the definition of property identity gives us an insight into their nature. One may consistently assert, for some properties \( F \) and \( G \), both that \( \Box \forall x(Fx \equiv Gx) \) and \( F \neq G \). So one can consistently assert that the following concepts are distinct despite being necessarily equivalent:

- Being a barber who shaves all and only those who don’t shave themselves.
- \([\lambda x Bx \& \forall y(Sxy \equiv \neg Syy)]\)
- Being a dog and not a dog.
- \([\lambda x Dx \& \neg Dx]\)

These properties are exemplified by the same objects (namely, no objects) at every possible world and so they are necessarily equivalent. But they aren’t identical. And the same applies to many other pairs of properties that are necessarily equivalent (in the classical sense), but intuitively distinct.

These results make the object-theoretic conception of properties hyperintensional, given the recent usage of that term. So if your preferred notion of concept is that of a hyperintensionally-conceived property, then object theory’s second-order comprehension principle for properties and definition for the identity of properties jointly yield a precise theory of concepts.

Finally, as to the last of Quine’s criticisms mentioned above, I think a theory that starts with objects, hyperintensionally-conceived relations,
and axiomatizes two modes of predication is no less economical than a theory that starts with truth-values and classes, takes \( x \in y \) as a primitive (of the form \( Rxy \)), and axiomatizes the membership relation. For Quine wasn’t suggesting that we abandon the classical form of predication when asserting that intensions are less economical than extensions. Quine regarded the axioms of set theory as a first-order theory expressible in the predicate calculus, with its single form of predication \( \lambda x Fx \). I don’t see why an ‘economy’ that postulates a distinguished membership relation. A number of axioms (including comprehension conditions) for sets, see why an ‘economy’ that postulates a distinguished membership relation. For Quine regarded the axioms of set theory as a first-order theory expressible in the predicate calculus, with its single form of predication \( \lambda x Fx \).

The way Leibniz speaks suggests that if \( x \) is the concept red and and \( y \) is the concept bicycle, then \( x \oplus y \) is the concept red bicycle. But we can’t interpret Leibniz’s concepts as properties, for suppose we attempted to do so and modeled Leibniz’s theory as follows:

\[
\text{The concept } F \equiv \lambda x Fx \\
F \text{ contains } G \ (\langle F \geq G \rangle) \equiv \lambda x (Fx \Rightarrow Gx)
\]

Then the theorem mentioned above, \( x \geq y \equiv x \oplus y = y \), becomes:

\[
F \Rightarrow G \equiv [\lambda x Fx \& Gx] = G
\]

This seems clearly false as a principle about properties, if the latter are hyperintensionally conceived. For take the two properties we discussed earlier as being necessarily equivalent but distinct: \( [\lambda x Bx \& \forall y(Sxy \equiv \neg Syy)] \) and \( [\lambda x Dx \& \neg Dx] \). Each of these necessarily implies the other, but we wouldn’t want to say that their conjunction is identical to one of the conjuncts. So Leibniz’s notion of concepts can’t really be modeled as properties.

In Zalta 2000a, I suggested that Leibnizian concepts be analyzed as abstract objects that encode properties:

\[
\text{Concept}(x) \equiv A!x
\]

Then concept summation, \( x \oplus y \), can be defined as the abstract object that encodes not only every property \( x \) encodes but also every property \( y \) encodes:

\[
x \oplus y \equiv \lambda z (\text{Concept}(z) \& \forall F(zF \equiv xF \lor yF))
\]

And concept inclusion, \( x \preceq y \), holds whenever every property \( x \) encodes is one that \( y \) encodes:

\[
x \preceq y \equiv \forall F(xF \Rightarrow yF)
\]

This produces an interesting mereology of concepts. Indeed, Leibniz’s axioms for \( \oplus \) (idempotence, commutativity, and associativity), and his definition and theorems for \( \preceq \) (reflexivity, anti-symmetry, and transitivity), all fall out as theorems (Zalta 2000a).

In addition, a natural analysis of Leibniz’s containment theory of truth presents itself, at least if we restrict our attention to ordinary (i.e., non-abstract) objects. For suppose we let \( u, v, \ldots \) range over ordinary individuals. Then we can define the concept of an ordinary individual \( u \), written \( c_u \), as the concept that encodes just the properties \( u \) exemplifies:

\[
c_u \equiv \lambda x (\text{Concept}(x) \& \forall F(xF \equiv Fu))
\]

To take an example, we might designate the concept of Alexander the Great as \( c_a \). Then from any premise of the form Alexander exemplifies \( F \), it becomes provable that \( c_a \) encodes \( F \).
Now we can extend our theory to analyze the concepts of properties: the concept of the property \( G \) is the abstract object (i.e., concept) that encodes all and only the properties necessarily implied by \( G \), i.e.,

\[
  c_G = \text{df} \ (x(\text{Concept}(x) \& \forall F(x F \equiv G \Rightarrow F)))
\]

To take an example, we might designate the concept of being a king as \( c_K \). Then from any premise of the form, being a king exemplifies \( G \), it becomes provable that \( c_K \) encodes \( G \).

Now since concept containment is the converse of concept inclusion, we may define:

\[
x \geq y \equiv \text{df} \ y \subseteq x
\]

Given the definition of \( y \subseteq x \), this implies that \( x \) contains \( y \) if and only if \( x \) encodes every property \( y \) encodes.

This series of definitions leaves us in a position to formalize Leibniz’s containment theory of truth, and we do this by way of an analysis of the sentence ‘Alexander is king’. According to Leibniz’s containment theory, this sentence is true just in case:

\[
'\text{Alexander is king}' \quad \text{is true in case there is a world where x itself exemplifies the property F, and the Lewisian view that ‘\( \diamond Fx \)’ is true in case there is a world where some counterpart of \( x \), not \( x \) itself, exemplifies the property \( F \). The Kripkean view is built into the semantics of object theory, whereas the Lewisian view becomes reconstructed at the level of concepts. This is something suggested by a number of Leibniz scholars, as a way to think about the modal metaphysics of (Leibnizian) complete individual concepts.}

I’ll conclude this discussion by noting that mathematical concepts are to be found among the Leibnizian concepts. To sketch the point as briefly as possible, we may capture the conceptual (or inferential) role of mathematical constants and predicates if given, as data, the judgments made in mathematical practice. First, we treat mathematical judgments as relative to some theory that grounds the use of the terms. So, for example, we might point to mathematical judgments such as the following, where ‘PA’ stands for Peano Arithmetic and ‘ZF’ stands for Zermelo-Fraenkel set theory :

\[
\begin{align*}
\text{PA} & \vdash 2 < 3 \\
\text{ZF} & \vdash \emptyset \in \{\emptyset\}
\end{align*}
\]

Since mathematicians always avail themselves of property talk, the above judgments imply the following judgments:

\[
\begin{align*}
\text{PA} & \vdash [\forall x \ x < 3]2 \\
\text{ZF} & \vdash [\forall x \ x \in \{\emptyset\}]\emptyset
\end{align*}
\]

The strategy for identifying mathematical objects, developed in previous work, is two-fold:

1. analyze each mathematical theory \( T \) as an abstract object that encodes propositions (namely, the theorems of \( T \)), so that object-theoretic statements of the form \( T[\lambda y \ p] \) (‘\( T \) encodes the property being such that \( p \)’) can serve as the definiens for the definiendum \( T \models p \) (‘\( p \) is true in \( T \)’).
(b) where $\Pi$ is a metavariable ranging over predicates, and $\kappa$ is a metavariable ranging over individual terms, import the unanalyzed judgment of the form $T \vdash \Pi \kappa$ as an object-theoretic, analytic truth of the form $T \models \Pi \kappa_T$, where $\kappa_T$ is the expression $\kappa$ indexed to $T$.

Consequently, we may import the specific judgments mentioned above as the following encoding claims:

\[
\begin{align*}
PA &= \{\lambda x. x < 3\}_{PA} \\
ZF &= \{\lambda x. x \in \emptyset\}_{ZF}
\end{align*}
\]

Then we may assert the following as a principle, not as a definition:

\[
\kappa_T = \lambda x (\lambda ! x \land \forall F (xF \equiv T \models F \kappa_T))
\]

That is, the object $\kappa$ of theory $T$ is the abstract object that encodes all and only the properties that $\kappa_T$ exemplifies in $T$. This applies to any well-defined individual term of any mathematical theory. Thus, we have the following two examples, in which we identify the number Zero (0) of Peano Arithmetic and the null set ($\emptyset$) of Zermelo-Fraenkel set theory:

\[
\begin{align*}
0_{PA} &= \lambda x (\lambda ! x \land \forall F (xF \equiv PA \models F \emptyset_{PA})) \\
\emptyset_{ZF} &= \lambda x (\lambda ! x \land \forall F (xF \equiv ZF \models F \emptyset_{ZF}))
\end{align*}
\]

In this way, mathematical objects become formally identified as Leibnizian concepts.4

3 Fregean Senses

A third notion of concept is that of a Fregean sense. Frege introduced senses (Sinne) in his 1892b, and Burge (1977) nicely summarizes the roles they play in Frege’s philosophy of language, namely, as (a) modes of presentation (i.e., content associated with a term by which the person using the term cognizes the denotation of the term), (b) that which determines the denotation of the term, and (c) the entities denoted in belief and other intensional contexts. I’ll assume that these roles apply both to the senses of individual terms and the senses of terms that denote relations.

In what follows, I want to review the object-theoretic analysis of Fregean senses and show how this analysis explains why senses are modes of presentation. But I don’t adopt all of Frege’s views in the philosophy of language; I don’t suppose that the sense of a term determines the denotation of that term — I allow that some terms have senses that underspecify the denotation and that some terms have senses what contain misinformation. Moreover, I don’t accept Frege’s view that sentences denote truth values; object theory takes the denotation of a sentence to be a proposition. Alternatively, if we reserve the term ‘proposition’ for the sense of a natural language sentence, then we might call the denotation of a sentence a state of affairs. I also don’t require that the sense of a term be fixed for all speakers of a language; it seems to me that the sense of a term can vary from person to person. For simplicity and purposes of illustration, it proves useful to consider an ideal language and an ideal community of speakers, in which the sense of each term is fixed for all the speakers in that community.

Object theory provides an analysis of Fregean senses that explains how they can have the roles assigned to them in Frege’s philosophy of language. The analysis presupposes that the terms of a language, and the entities they denote, fall into logical types. Then we can summarize the analysis as follows: if a term $\tau$ has the logical type $t$, then the sense of $\tau$ is an abstract object of type $t$. For example, the sense of an individual term encodes properties of individuals, and the sense of a term denoting a property encodes properties of properties. By encoding properties, the sense of a term can represent the entity denoted by the term. If the encoded properties are sufficiently determinate, the sense of a term can individuate the entity denoted by the term. And the sense of a term is indeed an entity that can serve as the denotation of that term when the term is in propositional attitude and other intensional contexts, for on the above theory, the sense of $\tau$ has the same logical type as the denotation of $\tau$.

3.1 Formalization of the Theory

To develop this theory of Fregean senses, we need to formulate typed object theory, i.e., object theory within the background of a relational type theory. We begin with a definition of the logical types:

\[
i \text{is a type}
\]
\(\langle t_1, \ldots, t_n \rangle\) is a type whenever \(t_1, \ldots, t_n\) are any types \((n \geq 0)\)

So \(i\) is the type for individuals, and \(\langle t_1, \ldots, t_n \rangle\) is the type for relations among entities having types \(t_1, \ldots, t_n\). When \(n = 0\), the empty type \(\langle \rangle\) \(\langle \text{‘}p\text{’} \rangle\) is the type for propositions (or states of affairs).

Using this definition, it is straightforward to type the language of object theory. We have two kinds of atomic formulas:

**Exemplification** formulas of the form \(Fx_1 \ldots x_n\), where \(F\) has any type of the form \(\langle t_1, \ldots, t_n \rangle\) and \(x_1, \ldots, x_n\) have, respectively, types \(t_1, \ldots, t_n\)

**Encoding** formulas of the form \(xF\) where \(x\) is of any type \(t\) and \(F\) is of type \(\langle t \rangle\).

Then we build up the language of typed object theory in the usual way. This means we can now assert a typed comprehension principle for abstract entities:

Where \(t\) is any type, \(x^t\) is a variable of type \(t\) and \(\varphi\) is any condition on properties having type \(\langle t \rangle\) in which \(x^t\) has no free occurrences, the instances of the following are axioms:

\[
\exists x^t (A^{(t)} x & \forall F^{(t)} (xF \equiv \varphi))
\]

So, for example, when \(t = i\), we obtain the comprehension principle for abstract individuals:

\[
\exists x^i (A^{(i)} x & \forall F^{(i)} (xF \equiv \varphi)), \text{ provided } x^i \text{ isn’t free in } \varphi
\]

When \(t = \langle i \rangle\), we obtain a comprehension principle for abstract properties of individuals:

\[
\exists x^{(i)} (A^{(\langle i \rangle)} x & \forall F^{(\langle i \rangle)} (xF \equiv \varphi)), \text{ provided } x^{(i)} \text{ isn’t free in } \varphi
\]

And when \(t = \langle i, i \rangle\), we obtain a comprehension principle for abstract relations among individuals:

\[
\exists x^{\langle i, i \rangle} (A^{\langle \langle i, i \rangle \rangle} x & \forall F^{\langle \langle i, i \rangle \rangle} (xF \equiv \varphi)), \text{ provided } x^{\langle i, i \rangle} \text{ isn’t free in } \varphi
\]

It should be clear that the instances of these principles assert, respectively, the existence of abstract individuals, abstract properties, and abstract relations.

### 3.2 How Abstracta Serve as Fregan Senses

To see how the principles just asserted yield a theory of Fregean senses, let’s start with the logical type \(i\) for individuals. I suggest that the sense of the name ‘Samuel Clemens’ for a person \(S\) is an abstract individual that encodes certain properties of individuals (namely, those that \(S\) cognitively associates with the name ‘Samuel Clemens’). On this picture, if \(S\) doesn’t know that Samuel Clemens is Mark Twain, then the sense of the name ‘Mark Twain’ for a person \(S\) is an abstract individual that encodes different properties of individuals (namely, those that \(S\) cognitively associates with the name ‘Mark Twain’). If we think of these abstract objects as *concepts*, then we could say that \(S\) has two concepts of Samuel Clemens (i.e., two concepts of Mark Twain), the one that is the sense of ‘Samuel Clemens’ and the one that is the sense of ‘Mark Twain’.

The very same ideas apply to expressions of type \(\langle i \rangle\), which denote properties of individuals. Here we have to invoke the comprehension principle for abstract properties of individuals. An abstract property is a property of individuals that encodes (as well as exemplifies) properties of properties of individuals. For example, the sense of the predicate ‘is a woodchuck’ for a person \(S\) is an abstract property of individuals that encodes certain properties of properties of individuals (namely, those that \(S\) cognitively associates with the expression ‘is a woodchuck’). On this picture, if \(S\) doesn’t know that being a woodchuck is the same property as being a groundhog, then the sense of the expression ‘is a groundhog’ for a person \(S\) is an abstract property that encodes different properties of properties (namely, those that \(S\) cognitively associates with the expression ‘is a groundhog’). If we think of these abstract properties as higher-order *concepts*, then we could say that \(S\) has two concepts of the property being a woodchuck (i.e., two concepts of the property being a groundhog), the one that is the sense of ‘is a woodchuck’ and the one that is the sense of ‘is a groundhog’.

I hope it is now clear that, for an arbitrary logical type \(t\), an abstract object of type \(t\) can serve as the mode of presentation (or ‘cognitive significance’) of a term of type \(t\). It should be relatively easy to see that an abstract object of type \(t\) can, in principle, determine reference when it serves as the sense of a term of type \(t\). For consider those abstract objects of type \(t\) that encode properties having type \(\langle t \rangle\) that jointly individuate a unique entity of type \(t\). That is, consider those abstract objects \(x^t\) for
which there is a unique $y^\dagger$ that exemplifies all the properties with type $\langle t \rangle$ that $x^\dagger$ encodes. We may define senses, traditionally conceived, as abstract objects that meet this condition. Let $x, y$ be variables of type $t$ and $F$ be a variable of type $\langle t \rangle$. Then we might define:

\[
x \text{ is a sense of type } t \text{ if and only if } \exists y \forall F (xF \rightarrow F y)
\]

Clearly, if a term $\tau$ of type $t$ was associated with a sense of type $t$, as just defined, then the sense of $\tau$ could determine the reference of $\tau$, namely, as the witness to the unique existence claim. This would hold for terms that denote individuals, properties of individuals, relations among individuals, etc.

Though object theory allows us to analyze senses in this way, I don’t think language works this way. I think that the sense of a term may vary from individual to individual, may vary from time to time, may fail to encode properties that jointly individuate a unique entity, and may encode properties that fail to characterize the object denoted by the term. To see why, consider an example I’ve used in other works; it may be instructive to those encountering object theory for the first time.

Suppose, you pass a sign in front of a building which says “Dr. Gustav Lauben, General Practitioner, 8am–5pm” in large print and which also contains some fine print. Depending on one’s interest and needs, a person may or may not read the fine print. Thus, the information one absorbs after reading the sign will differ from person to person. Suppose $A$ and $B$ both encounter the sign for the first time and only after reading the sign will differ from person to person. Suppose $A$ and $B$ both encounter the sign for the first time and only after reading the sign will differ from person to person.

Consider an example I’ve used in other works; it may be instructive to those encountering object theory for the first time.

1. John believes that Woodie is a woodchuck.
   \[
   (a) \quad B(j, [\lambda W w]) \quad \text{(de re)}
   \]
   \[
   (b) \quad B(j, [\lambda W_j w_j]) \quad \text{(de dicto)}
   \]

2. John doesn’t believe that Chuckie is a woodchuck.
   \[
   (a) \quad \neg B(j, [\lambda W c]) \quad \text{(de re)}
   \]
   \[
   (b) \quad \neg B(j, [\lambda W_j \xi_j]) \quad \text{(de dicto)}
   \]

3. Woodie is Chuckie.
   \[
   (a) \quad w = c
   \]

4. John doesn’t believe that Woodie is a groundhog.
   \[
   (a) \quad \neg B(j, [\lambda G w]) \quad \text{(de re)}
   \]

---

\footnote{Indeed, the sense of a term may contain so much misinformation and be so misleading as to individuate an object distinct from the denotation of the term.}

\footnote{I assume familiarity with terms of the form $[\lambda \varphi]$, which we read as ‘that-$\varphi$’. These denote entities of the empty type $p$, and so denote states of affairs.
Unifying Three Notions of Concepts

Edward N. Zalta

15

(b) \neg B(j, [\lambda G_j w_j])  \text{ (de dicto)}

5. Being a woodchuck just is being a groundhog.

(a) \ W = G

If we assume that a simple logic governs these formal representations, then the reading on which (1), (2) and (3) are jointly inconsistent is captured by the fact that the formal representations (1a), (2a), and (3a) are inconsistent, by the substitution of identicals. In addition, the reading on which (1), (4) and (5) are jointly inconsistent is captured by the fact that the formal representations (1a), (4a), and (5a) are inconsistent, by the substitution of identicals.

However, the above offers a reading on which there is a failure of substitutivity. (1b), (2b), and (3a) are not inconsistent; we can’t infer the negation of (1b) from (2b) and (3a). And (1b), (4b) and (5a) are not inconsistent; we can’t infer the negation of (1b) from (4b) and (5a). On the de dicto readings of (1), (2) and (4), the senses of the English expressions ‘Woodie’, ‘Chuckie’, ‘woodchuck’, and ‘groundhog’ are constituents of the states of affairs that play a role in the truth conditions of the belief report. The truth of the reports (1), (2), and (4), as represented by (1b), (2b) and (4b), respectively, depends on whether (or not) John is belief-related to a state of affairs containing abstract constituents. The identity claims w = c and W = G have no bearing on such states of affairs.

Of course, if we distinguish the truth of the belief reported from the truth of the belief report, then we can define the former so that the truth of both the de re and the de dicto belief is tied to the truth of the de re state of affairs. Where \varphi* is the result of removing all the underlines and subscripts from the terms in \varphi, we may define:

\textit{x truly believes} that \varphi if and only if both x believes that \varphi and \varphi*.

Formally:

\[ TB(x, [\lambda \varphi]) \equiv B(x, [\lambda \varphi]) \land \varphi* \]

This yields that the truth of the beliefs represented in both (1a) and (1b) is tied to the truth of the state of affairs that Woodie is a woodchuck, i.e., [\lambda W w]. So, although the truth of the report (1), as represented by (1b), relates John to an intermediate state of affairs that represents [\lambda W w] to John, the truth of belief reported by (1), as represented by (1b), depends on the truth of [\lambda W w]. And analogous remarks apply to (4b).

3.3 Other Features of the Theory

Now that we’ve discussed the ways in which abstract objects of type t have the right features to serve as the Fregean senses of terms of type t, note that we now have a clear solution to the problem that has puzzled a number of recent philosophers, namely, the problem of precisely identifying what Fregean senses are. For example, in D. Kaplan (1969, 119), we find:

My own view is that Frege’s explanation, by way of ambiguity, of what appears to be the logically deviant behavior of terms in intermediate contexts is so theoretically satisfying that if we have not yet discovered or satisfactorily grasped the peculiar intermediate objects in question, then we should simply continue looking.

and in G. Forbes (1987, 31), we find:

My overall conclusion is that a Fregean theory of the semantics of attitude contexts is from the structural point of view the best that is available. Its ultimate viability depends of course on how successful the efforts to develop a detailed theory of the nature of modes of presentation will be.

The model of Fregean senses as abstract entities gives us a detailed theory of the nature of these objects.

It is important to mention again that in object theory, unlike most other intensional logics or type theories, both the denotation and the sense of a term are of the same logical type as the term itself. This works throughout the type hierarchy. If we use senses as the intensions of expressions, then we don’t need the technique of ‘type-raising’ when semantically interpreting contexts that are sensitive to the intensions. We’ve seen an example: we’ve represented both \textit{de re} and \textit{de dicto} beliefs as relations of type \langle i, p \rangle. We don’t have to type-raise for the \textit{de dicto} readings; type-raising isn’t needed to handle failures of substitution. See Zalta (forthcoming) for a number of examples where we can avoid the technique of type-raising to give an analysis of natural language.

Finally, let’s think further about the suggestion that the sense of a term can vary from person to person and, indeed, that the sense of a term for a single person can vary from time to time. Indeed, this is just one way in which the sense of an expression can vary with the context. One might wonder, how can there be communication if persons A and B
use the term \( \tau \) but the sense of \( \tau \) differs for \( A \) and \( B \)? And how can my own beliefs remain stable over time if my sense of \( \tau \) changes over time?

The answer to this question lies first in the recognition that communication is a matter of degree. All things being equal, persons \( A \) and \( B \) communicate to a greater degree the more overlap there is among the properties encoded by \( \tau_A \) and \( \tau_B \). And communication can break down whenever the \( \tau_A \) and \( \tau_B \) encode properties that Frege doesn’t exemplify. \( A \) and \( B \) miscommunicate to some extent if \( \tau_A \) encodes being German and being a logician while \( \tau_B \) encodes being German and being a historian, while \( A \) and \( B \) miscommunicate a bit differently if \( \tau_A \) encodes being German and being a logician and while \( \tau_B \) encodes being Austrian and being a logician. But what is holding communication together is the fact that \( A \) and \( B \) both acquired the name by way of causal communication chains that trace back to the ‘christening’ of Gottlob Frege as ‘Gottlob Frege’. So even \( B \) can truly believe that Frege was a logician despite the fact that \( B \)’s sense of ‘Frege’ (i.e., \( \text{Frege}_B \)) encodes being an Austrian. That’s because the truth of the belief is tied to the \( \text{de re} \) state of affairs (which obtains just in case Frege was a logician); the truth of the belief is not tied to the proposition that \( B \) uses to represent that state of affairs, a proposition in which \( \text{Frege}_B \) is a constituent and represents Frege to \( B \). Here we distinguish the truth of the \( \text{(de dicto)} \) belief report (in which \( \text{Frege}_B \) plays a role) and the truth of the \( \text{(de re)} \) belief being reported (in which Frege plays a role).

These same facts allow us to say that even if my sense of ‘Frege’ varies over time or with the context, then although the truth of \( \text{de dicto} \) belief reports about me will involve different abstract objects at different times and contexts, the truth of the \( \text{de re} \) belief being reported only involve Frege, even as my sense of ‘Frege’ changes over time and between contexts. Thus, we can say that whereas my concept of Frege has changed over time or with the context, my belief that \( \text{Frege was a logician} \) remains true under the same conditions across times and contexts. This is the perspective that object theory brings to bear on context, cognition, and communication in general, and on concepts and objects in particular.

References


