Toward a New Theory of Content

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Frege's puzzle has proven to be a highly recalcitrant puzzle about content: if two sentences arise from one another by substitution of co-referential proper names, how can the two sentences express different propositions?

Many people advocate a pragmatic solution according to which such sentences must have the same literal meaning, attributing apparent differences in meaning to pragmatic confusions. I will assume that this sort of response is unacceptable. A correlative puzzle is how co-referential proper names can fail to be intersubstitutable *salva veritate* in propositional-attitude contexts. These two puzzles may be thought of as instances of an underlying puzzle about the reference of 'that'-clauses: how can ⌜that $A(a)$⌝ and ⌜that $A(b)$⌝ refer to different propositions when the names ⌜a⌝ and ⌜b⌝ are co-referential?

Frege's solution, which is based on his theoretical distinction between *Sinn* and *Bedeutung*, has been undermined by the arguments of Donnellan and Kripke.[1] They argue that proper names do not have descriptive senses. But if names do not have descriptive senses, what could the sense of a name be? How could co-referential names have different senses? How could we have epistemic access to such senses? No satisfactory answer to these questions appears to be forthcoming.

To solve Frege's puzzle and related puzzles about content, one must have the right sort of background theory of intensional entities (properties, relations, and propositions). There are four main theories: the possible-worlds theory, the propositional-function theory, the propositional-complex theory, and the algebraic theory.

Elsewhere I have argued that only the last of these is satisfactory.[2] At the heart of many of the problems confronting the other three is the fact that they are reductionistic: each attempts to reduce intensional entities of one kind or another to extensional entities – either sets or extensional functions.[3] My view is that this extensional reductionism has hampered the solution to the indicated family of puzzles and that what is needed is a theory which treats intensional entities as irreducibly intensional. This is what the algebraic theory offers.

The purpose of this paper is to lay out the algebraic theory and then

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[1]Donnellan 1970 and Kripke 1980.

[2]For a defense of this assumption, see Bealer and Mönnich 1989.

[3]Functions f and g are extensional if $\forall x\ (f(x) = g(x)) \rightarrow f = g$.

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to show how it can be implemented in new solutions to a variety of these puzzles about content.[4]

1 The Algebraic Approach

On the algebraic approach, no attempt is made to reduce properties, relations, and propositions. Intuitively obvious truths like the following are accepted at face value requiring no reductionistic explanation. The proposition that $A\&B$ is the conjunction of the proposition that A and the proposition that B. The proposition that not A is the negation of the proposition that A. The proposition that Fx is the result of predicating the property F-ness of x. The proposition that there exists an F is the result of existentially generalizing on the property F-ness. And so forth. Such examples serve to impart a firm intuitive grasp of the indicated logical operations – conjunction, negation, singular predication, existential generalization, and so forth. The aim of the algebraic approach is to systematize the behavior of properties, relations, and propositions (conceived as irreducible entities) with respect to these logical operations.

There is a direct line of development in algebraic logic from Boolean algebras, to transformation algebras, to polyadic and cylindric algebras, and finally to intensional algebras. A Boolean algebra is a structure $\langle D, \mathsf{disj}, \mathsf{conj}, \mathsf{neg}, F, T\rangle$.[5] D is a domain of entities which may be thought of as primitive and irreducible; disj and conj are binary operations which may be thought of as the logical operations of disjunction and conjunction, respectively. The operation neg is a unary operation which may be thought of as the logical operation of negation. F and T are distinguished elements of the domain which may be thought of as falsity and truth, respectively. The operations in a Boolean algebra must satisfy certain standard rules which may be thought of as codifying our intuitive understanding of the operations of disjunction, conjunction, and negation, respectively. Boolean algebras are extensional models of sentential logic: in the simplest case, D would be just the set of truth values $\{F, T\}$ and disj, conj, and neg would be the standard truth functions. Boolean algebras are also extensional models of certain artificial fragments of first-order predicate logic. Consider, for example, a fragment of the monadic predicate calculus in which every atomic formula contains the same variable (and in which there are no quantifiers or individual constants). The following Boolean algebra would be a standard model for this fragment: D would be the power set of some given non-empty set of objects; disj would be the set-theoretical operation of union; conj would be intersection; neg would be complementation; F would be the null set; and T would be D itself. (One usually thinks of Venn diagrams as pictorial representations of this sort of Boolean algebra.) Or consider a fragment of the n-adic predicate

[4] For a more detailed exposition of this theory and for more thorough bibliographical references, see Bealer 1993.

[5] It is more common to write: $\langle D, +, \cdot, -, 0, 1\rangle$. The notation in the text will be more perspicuous for present purposes.

calculus in which every atomic formula consists of an n-ary predicate letter followed by n distinct variables always occurring in the same order (and in which there are no quantifiers and no individual constants). For example, when $n = 3$ we have molecular formulas like '$((Fuvw \vee Guvw) \& \neg Huvw)$'. The following Boolean algebra would be a standard model for this fragment: D would be the power set of the n^{th} Cartesian product of some antecedently given non-empty set of objects; disj would be the union operation; conj would be intersection; neg would be complementation; F would be the null set; T would be D.

To obtain an extensional model of first-order predicate calculus (without quantifiers and without individual constants) in which the indicated restriction on the variables is dropped, one considers algebras $\langle D, \mathsf{disj}, \mathsf{conj}, \mathsf{neg}, \tau, F, T\rangle$ which resemble Boolean algebras. The main difference is that there is a new element τ, and D has more structure.[6] In particular, for some antecedently given non-empty set d of entities, D is the union of the truth values $\{T, F\}$ and the set of n-ary relations-in-extension over d (for all $n \geq 1$). (That is, $D = \{T, F\} \cup \bigcup_{n\geq 1} \mathcal{P}(d^n)$.) And τ is a set of auxiliary logical operations intended to be semantical counterparts of syntactical operations such as repeating the same variable one or more times within a given formula and of changing around the order of the variables within a given formula. For example, τ would contain an operation conv which maps the relation-in-extension $\{xy : x \text{ loves } y\}$ to its converse $\{yx : x \text{ loves } y\}$; and τ would contain the operation reflex which maps the relation-in-extension $\{xy : x \text{ loves } y\}$ to its reflexivization $\{x : x \text{ loves } x\}$. To obtain an extensional model of the predicate calculus with quantifiers (but without individual constants), one considers structures $\langle D, \mathsf{disj}, \mathsf{conj}, \mathsf{neg}, \mathsf{exist}, \tau, F, T\rangle$ that are like the previous structures except that they contain an additional operation, exist.[7] This operation is to be thought of as the logical operation of existential generalization. For example, it takes a binary relation-in-extension (e.g., $\{xy : x \text{ loves } y\}$) to an appropriate unary relation-in-extension (e.g., $\{x : (\exists y)x \text{ loves } y\}$). All the above algebraic ideas are standard nowadays.

To obtain an *intensional* model for the predicate calculus (without individual constants), one considers closely related algebraic structures $\langle D, K, \mathsf{disj}, \mathsf{conj}, \mathsf{neg}, \mathsf{exist}, \tau, F, T\rangle$. Here the domain D is the union of denumerably many disjoint subdomains $D_{-1}, D_0, D_1, D_2, D_n, \ldots$. The subdomain D_{-1} is to be thought of as being made up of particulars; D_0, propositions; D_1, properties; D_2, binary relations-in-intension; D_n, n-ary relations-in-intension. The elements of D are to be thought of as primitive, irreducible items. The new element K is a set of *possible extensionalization functions.*

[6] These structures $\langle D, \mathsf{disj}, \mathsf{conj}, \mathsf{neg}, \tau, F, T\rangle$ are closely related to Halmos's transformation algebras (Halmos 1962: 27f.). For related ideas, see Quine 1960.

[7] These structures are closely related to cylindric algebras (see Henkin *et al.* 1971) and polyadic algebras (see Halmos 1962). For similar approaches to algebraic models for the predicate calculus, see Quine 1960 and William Craig 1974.

Each extensionalization function $H \in K$ assigns to the elements of D an appropriate extension as follows: for each proposition x (i.e., for each $x \in D_0$), $H(x) = T$ or $H(x) = F$; for each property x (i.e., for each $x \in D_1$), $H(x)$ is a subset of D; for each n-ary relation-in-intension x (i.e., for each $x \in D_n$), $H(x)$ is a subset of the n^{th} Cartesian product of D; in the case of particulars x (i.e., $x \in D_{-1}$), let $H(x) = x$. Among the possible extensionalization functions in K there is a distinguished function G which is to be thought of as the *actual* extensionalization function; it tells us the actual extension of the elements of D. The operations conj, neg, and so forth in an intensional algebra behave in the expected way with respect to each extensionalization function $H \in K$. For example, for all x and y in D_0, $H(\mathsf{conj}(x,y)) = T$ iff $H(x) = T$ and $H(y) = T$. For all x in D_0, $H(\mathsf{neg}(x)) = T$ iff $H(x) = F$. And so forth. For ease of presentation I will hereafter write simply $\langle D, K, \tau\rangle$ with the understanding that D and K are as indicated and τ is an ordered set of operations including, in order, disj, conj, neg, exist, and those in τ. No harm is done if τ contains further operations in addition to those indicated; so this will be permitted. Finally, for convenience, F will be identified with the null set and T with the domain D. With these details in place one can say what it takes for one of these algebras $M = \langle D, K, \tau\rangle$ to be *intensional*: there are elements in some $D_i \subset D$, $i \geq 0$, which can have the same possible extension and nevertheless be distinct. That is, M is intensional iff, for some x and y in $D_i \subset D$, $i \geq 0$, and for some $H \in K$, $H(x) = H(y)$ and $x \neq y$. For example, if x and y are in D_0, perhaps $G(x) = G(y) = T$ but $x \neq y$.

These intensional algebras yield intensional models of the predicate calculus (without individual constants). An intensional interpretation is a function I that maps i-ary predicate letters to i-ary relations-in-intension. Relative to an intensional interpretation I and an intensional algebra M, it is easy to define an intensional valuation function V_{IM} which maps sentences of the predicate calculus (without individual constants) to relevant propositions in D. For example, $V_{IM}(\text{`}\neg(\exists x)Fx\text{'}) = \mathsf{neg}(\mathsf{exist}(I(\text{`}F\text{'})))$. A sentence $\ulcorner A \urcorner$ is true relative to I and M iff its actual extension $= T$. That is, $\mathrm{Tr}(\ulcorner A \urcorner)$ iff $G(V_{IM}(\ulcorner A \urcorner))$ is the truth value T.

So far, however, I have not indicated how intensional algebras can model the predicate calculus *with* individual constants. By 'individual constant' I mean variables with fixed assignments, Millian (or Russellian) proper names,[8] and intensional abstracts. Suppose that the notion of interpretation is extended so that I assigns to each variable a value in M's domain D and to each Millian (or Russellian) proper name a nominatum in D. Then, it would be desirable to be able to assign some proposition in D as the intensional value of open sentences $\ulcorner Fx \urcorner$. Similarly, suppose that $\ulcorner a \urcorner$ is a Millian (or Russellian) proper name. It would be desirable to be able to assign a propositional meaning to the sentence $\ulcorner Fa \urcorner$. Finally, suppose that the language

[8] By 'Millian (or Russellian) proper name' I mean a syntactically simple singular term that is not a variable and that has a rigid denotation and no connotation or sense.

is fitted-out with intensional abstracts.[9] For example, let the 'that'-clause $\ulcorner$that $(\exists x)Gx\urcorner$ be represented by the singular term $\ulcorner[(\exists x)Gx]\urcorner$. It would be desirable to be able to assign a proposition in D as the intensional value of sentences with forms like '$B[(\exists x)Gx]$' (the symbolic counterpart of, say, 'It is believed that something is green'). This threefold problem is solved by restricting ourselves to intensional algebras $M = \langle D, K, \tau\rangle$ in which τ contains an additional logical operation, namely, *singular predication* – pred_s, for short. The operation of singular predication behaves exactly as one would expect. For example, when singular predication is applied to a property and an item, the proposition that results is true iff the item is in the extension of the property. That is, for all $x \in D_1$ and $y \in D$, and for all extensionalisation functions $H \in K$, $H(\mathsf{pred}_s(x, y)) = T$ iff $y \in H(x)$. Using singular predication, one can then assign appropriate intensional values to the three cases: $V_{IM}(\text{`}Fx\text{'}) = \mathsf{pred}_s(I(\text{`}F\text{'}), I(\text{`}x\text{'}))$; $V_{IM}(\text{`}Fa\text{'}) = \mathsf{pred}_s(I(\text{`}F\text{'}), I(\text{`}a\text{'}))$, and $V_{IM}(\text{`}F[(\exists x)Gx]\text{'}) = \mathsf{pred}_s(I(\text{`}F\text{'}), \mathsf{exist}(I(\text{`}G\text{'})))$. Because intensional abstracts may be evaluated in this way, intensional algebras provide models of first-order intensional logic.

My solution to our family puzzles about content will depend on two further developments. The first concerns the kind of predication involved in certain descriptive propositions. The second concerns the distinction between Platonic and non-Platonic modes of presentation.

2 Descriptions

There are four leading theories of definite descriptions: Frege's, Russell's, Evans's, and Prior's.

1. Frege. On this theory $\ulcorner$the $F\urcorner$ is an ordinary singular term having a sense and often a reference. The term $\ulcorner$the $F\urcorner$ has the form $\ulcorner(\iota x)(Fx)\urcorner$, where $\ulcorner(\iota x)\urcorner$ is a unary operator which combines with a formula to yield a singular term. If there is a unique item satisfying the predicate $\ulcorner F\urcorner$, the singular term $\ulcorner$the $F\urcorner$ refers to it; otherwise, $\ulcorner$the $F\urcorner$ has no reference. Truth conditions are as follows:

    (a) if $\ulcorner$the $F\urcorner$ has a reference, $\ulcorner$The F Gs$\urcorner$ is true (false) iff $\ulcorner(\forall x)(Fx \rightarrow Gx)\urcorner$ is true (false);

    (b) otherwise, $\ulcorner$The F Gs$\urcorner$ is neither true nor false.

[9] An intensional abstract is a 'that'-clause or a gerundive (or infinitive) phrase. That is, a proposition abstract, a property abstract, or a relation abstract. Because λ–abstracts $\ulcorner(\lambda v)(\text{that}A)\urcorner$ denote propositional functions and because properties are not propositional functions, use of λ–abstracts to denote properties invites confusion. A better notation is $\ulcorner[v_1 \ldots v_n : A]\urcorner$ where $n \geq 0$. Thus, whereas $\ulcorner\{v_1 : A\}\urcorner$ denotes the set of things v_1 such that A, $\ulcorner[v_1 : A]\urcorner$ denotes the property of being a v_1 such that A. Whereas $\ulcorner\{v_1 \ldots v_n : A\}\urcorner$ denotes the relation-in-extension holding among $v_1 \ldots v_n$ such that A, $\ulcorner[v_1 \ldots v_n : A]\urcorner$ denotes the relation-in-intension holding among $v_1 \ldots v_n$ such that A. In the limiting case where $n = 0$, $\ulcorner[A]\urcorner$ denotes the proposition that A. For more on this sort of notation see Bealer 1979 and 1982.

Truth-value gaps are not essential to Frege's theory; to eliminate them, one need only revise clause (ii) as follows: if ⌜the F⌝ has no reference, ⌜The $F\,G$s⌝ is false. In my subsequent remarks I will adopt this revised theory for simplicity of exposition.

2. Russell. On this theory ⌜the F⌝ is an incomplete symbol, meaningful only in the context of a complete sentence. Sentences containing definite descriptions are mere abbreviations for (or transformations from) sentences containing no descriptions. For example, ⌜The $F\,G$s⌝ is an abbreviation for (transformation from)

$$\ulcorner(\exists x)Fx\;\&\;(\forall x)(\forall y)((Fx\&Fy) \rightarrow x = y)\;\&\;(\forall x)(Fx \rightarrow Gx)\urcorner.$$

3. Evans.[10] On this theory 'the x' is treated as a binary quantifier which combines with a pair of formulas to yield a new formula. For example, ⌜The $F\,G$s⌝ has the form ⌜[the x]$(Fx : Gx)$⌝. The truth conditions are Russellian.

4. Prior *et al.*[11] On analogy with ⌜some F⌝ and ⌜every F⌝, ⌜the F⌝ is treated as a restricted quantifier ⌜[the $x : Fx$]⌝ which combines with a formula to yield a new formula. For example, ⌜The $F\,G$s⌝ has the form ⌜[the $x : Fx$](Gx)⌝. The truth conditions are again Russellian.

Each of these four theories can easily be incorporated into the algebraic approach. I will illustrate how to do this in the case of Frege's theory. Consider intensional algebras in which the set τ contains a unary operator the (akin to the Frege-Church operator ι) which takes properties to properties thus: for all properties $u \in D_1$, all $H \in K$, and all items $w \in D$, $w \in H(\mathsf{the}\ (u))$ iff $H(u) = \{w\}$. The values of the are properties that may be thought of as "individual concepts". For example, $\mathsf{the}\ (F)$ may be thought of as the individual concept of being the F. Starting with the property of being G and the individual concept of being the F, how does one form the proposition that the $F\,G$s? This proposition is not the result of a singular predication. When the operation of singular predication is applied to the property of being G and the property of being the F – i.e., $\mathsf{pred}_s(G, \mathsf{the}(F))$ – the result is the proposition that the property of being the FGs. A very different proposition! The relation holding between the property of being G, the property of being $\mathsf{the}F$, and the proposition that the $F\,G$s is therefore not singular predication but rather a quite distinct kind of predication, which may be called *descriptive predication* – pred_d, for short. This relation of descriptive predication is implicit in Frege's informal theory of senses: it is the relation holding between the sense of a predicate ⌜G⌝, the sense of a definite description ⌜$\mathsf{the}\ F$⌝, and the sense of a sentence ⌜The $F\,G$s⌝.[12] To represent Frege's theory of definite descriptions algebraically, one merely need to restrict oneself to intensional algebras in which the set τ contains both the and pred_d, where pred_d behaves thus: for all $u, v \in D_1$, and all $H \in K$, $H(\mathsf{pred}_d(u, v)) = T$ iff $\emptyset \neq H(v) \subseteq H(u)$. So, for example, the proposition that the $F\,G$s $= \mathsf{pred}_d(G, \mathsf{the}(F))$. This proposition is true relative to $H \in K$ iff $\emptyset \neq H(\mathsf{the}(F)) \subseteq H(G)$. That is, relative to H, the proposition that the $F\,G$s is true iff there exists something that is the unique element in the extension of the property of being F and the extension of the property of being F is included in the extension of the property of being G.

The operation of descriptive predication is also used to form other sorts of descriptive propositions within a Fregean setting. For example, consider one of Stephen Neale's number-neutral descriptive propositions: the proposition that whoever shot Kennedy is crazy. Within a Fregean setting this proposition may be represented thus: $\mathsf{pred}_d(C, \mathsf{whe}(S))$, where whe is Neale's number-neutral description operation.[13] This operator takes the property of shooting Kennedy (i.e., S) as argument and gives as value the number-neutral descriptive property being whoever shot Kennedy (i.e., $\mathsf{whe}(S)$). Relative to a possible extensionalization function H, the proposition $\mathsf{pred}_d(C, \mathsf{whe}(S))$ is true iff the extension of $\mathsf{whe}(S)$ is a non-empty subset of the extension of C.

The point is that, in addition to various description operators – the, who, etc. – there is an operation of descriptive predication which combines predicative intensions and descriptive subject intensions to form descriptive propositions. In what follows, I will make use of this aspect of Frege's theory; more specifically, I will make use of intensional algebras in which the set τ contains the operation pred_d. In doing so, I do not wish to commit myself to Frege's theory of definite descriptions. I could instead adopt something more in the spirit of Russell, Evans, or of Prior. I pursue the Fregean option because it is so natural (and because it is of much historical interest).

3 Non-Platonic Modes of Presentation

I have noted that the domain D in an intensional algebra partitions into subdomains D_{-1}, D_0, D_1, D_2, ... We have been thinking of D_1 as consisting of properties. But we could instead think of it as consisting of modes of access or modes of presentation (*Arten des Gegebenseins*). Properties, which are

[10] Evans 1977a and 1977b.

[11] Prior 1963. Paul Grice, Richard Sharvy, and Richard Montague also advocated versions of this theory.

[12] If, instead, one were to formalize Frege's informal theory by identifying the sense of a predicate with a function whose arguments are individual concepts and whose values are propositions, the relation of descriptive predication would collapse into a special case of the relation of application of function to argument. This approach, however, exposes the informal theory of senses to the various flaws of the propositional-function theory. When the propositional-function thesis is divorced from Frege's informal theory, one gets the picture presented in the text.

[13] See Neale 1990a and 1990b. Neale's elegant treatment provides only truth conditions; it does not identify the propositions expressed by such sentences. This remaining task is what is accomplished by the technique being described in the text.

purely Platonic entities, are just one kind of mode of presentation. There are also certain "constructed" entities that present objects to us. For example, pictures do. Certain socially constructed entities also function as modes of presentation. Prominent among these are linguistic entities. Indeed, linguistic entities provide the only access most of us have to various historical figures – for example, Cicero. These entities have the important feature of being *public* entities shared by whole communities.

Historical naming trees (or causal naming chains) are one kind of linguistic entity which fulfill this role. For example, the 'Cicero'-historical naming tree provides us with access to Cicero. A closely related mode of access is our very practice of using 'Cicero' to name Cicero. Another is the name 'Cicero' itself. (Of course, names here must be understood not as mere phonological or orthographic types but as fine-grained entities individuated by the associated practices. E.g, just as our practice of using 'Cicero' to name the Illinois town differs from our practice of using 'Cicero' to name the orator, so the town's name, which is comparatively new, differs from the orator's name, which is much older.) Insofar as these linguistic entities (the tree, the practice, the name) provide us with access to Cicero, they count as modes of presentation of Cicero.[14]

I will now indicate how these three kinds of non-Platonic modes of presentation can lead to candidate solutions to our puzzles. (I should emphasize that these are not the only candidate solutions feasible within the present general framework.) Note that there is a natural one-one map from historical naming trees onto conventional naming practices (the tree may be thought of as the practice "spread out in history"), and there is a natural one-one map from conventional naming practices onto the associated names. Because there exist these natural correspondences, it will make little difference which kind is best – historical naming trees, conventional naming practices, or names themselves. For illustrative purposes, I will fill out the idea with naming practices playing the key role. It will be easy to see how the idea would go if one were to let names or naming trees play that role.

On the Kripke picture, a conventional naming practice typically consists of an initial act of baptism, with or without a baptized object actually present, together with an ongoing convention for using the name with the intention of referring to whatever it was that was referred to by previous uses of the name. Let $P_{\text{‘Cicero’}}$ be our practice of using 'Cicero' to refer to Cicero, and let $P_{\text{‘Tully’}}$ be our practice of using 'Tully' to refer to Tully. The acts of baptism which initiated $P_{\text{‘Cicero’}}$ and $P_{\text{‘Tully’}}$ were baptisms of one and the same object. Accordingly, these two practices provide us with two presentations of one and the same object. Insofar as $P_{\text{‘Cicero’}}$ and $P_{\text{‘Tully’}}$ present an object to us, there are intensional algebras in which they are elements of the subdomain of modes of presentation.

[14]In virtue of what do these modes of presentation present objects? There are variety of plausible answers, e.g., causal, historical, intentional. I need take no stand on which is best.

Because $P_{\text{‘Cicero’}}$ and $P_{\text{‘Tully’}}$ both present Cicero (= Tully), the extensionalization functions H in such intensional algebras behave accordingly: $H(P_{\text{‘Cicero’}}) = \{\text{Cicero}\} = \{\text{Tully}\} = H(P_{\text{‘Tully’}})$. In these intensional algebras, relevant logical operations would be defined for all modes of presentation – non-Platonic as well as Platonic. So, for example, the operation of descriptive predication pred_d may take as arguments, say, the property of being a person and $P_{\text{‘Cicero’}}$. The result $\mathsf{pred}_d(\text{being a person}, P_{\text{‘Cicero’}})$ would be a proposition. Likewise, for $\mathsf{pred}_d(\text{being a person}, P_{\text{‘Tully’}})$. Note that these non-Platonic modes of presentation (as opposed to descriptive properties formed from them by means of the, whe, or some other description operator) are themselves the arguments in these descriptive predications.

Let us examine the features which these two propositions would have. Given that $P_{\text{‘Cicero’}}$ and $P_{\text{‘Tully’}}$ are distinct, $\mathsf{pred}_d(\text{being a person}, P_{\text{‘Cicero’}})$ and $\mathsf{pred}_d(\text{being a person}, P_{\text{‘Tully’}})$ would be distinct. Next, let us agree with essentialists like Kripke that every person is necessarily a person.[15] Given that $H(P_{\text{‘Cicero’}}) = \{\text{Cicero}\} = \{\text{Tully}\} = H(P_{\text{‘Tully’}})$, it follows that $H(\mathsf{pred}_d(\text{being a person}, P_{\text{‘Cicero’}})) = T$ and $H(\mathsf{pred}_d(\text{being a person}, P_{\text{‘Tully’}})) = T$. Since this holds for all possible extensionalization functions H,[16] our two propositions $\mathsf{pred}_d(\text{being a person}, P_{\text{‘Cicero’}})$ and $\mathsf{pred}_d(\text{being a person}, P_{\text{‘Tully’}})$ would be necessarily true. That is, these two propositions would have the modal value that Kripke *et al.* would like to attribute to the proposition that Cicero is a person and the proposition that Tully is a person.[17]

Furthermore, our two propositions – $\mathsf{pred}_d(\text{being a person}, P_{\text{‘Cicero’}})$ and $\mathsf{pred}_d(\text{being a person}, P_{\text{‘Tully’}})$ – are distinct from all propositions expressible with the use of definite descriptions (with or without actuality operators). For example, $\mathsf{pred}_d(\text{being a person}, P_{\text{‘Cicero’}})$ is distinct from each of the following: the proposition that the thing presented by our conventional naming practice $P_{\text{‘Cicero’}}$ is a person; the proposition that the thing presented by this conventional naming practice is a person; the proposition that the thing actually named 'Cicero' is a person; and so forth. Finally, these propositions – $\mathsf{pred}_d(\text{being a person}, P_{\text{‘Cicero’}})$ and $\mathsf{pred}_d(\text{being a person}, P_{\text{‘Tully’}})$ – are not metalinguistic in the standard senses.[18] First, these propositions are distinct from all propositions expressible by sentences containing metalin-

[15]I.e., for all $x \in D$, if $x \in G(\text{being a person})$, then, for all extensionalization functions $H \in K, x \in H(\text{being a person})$, where G is the actual extensionalization function. "Serious actualists" deny that each person is necessarily a person; instead, they hold that each person is such that, necessarily, if he exists, he is a person. Accordingly, serious actualists would require: if $x \in G(\text{being a person})$, then, for all $H \in K$, if $x \in H(\text{existence})$, $x \in H(\text{being a person})$.

[16]I am taking it for granted that conventional naming practices are "rigid": for example, if there were a practice of using 'Cicero' to refer to someone other than Cicero, it would not be *our* practice (i.e., *this* very practice of using 'Cicero' to refer to *him*).

[17]Likewise, $\mathsf{pred}_d(\mathsf{pred}_d(\text{identity}, P_{\text{‘Tully’}}), P_{\text{‘Cicero’}})$ has the same modal value (i.e., necessity) that Kripke *et al.* attribute to the proposition that Cicero = Tully.

[18]This requirement is insisted upon in Burge 1978: 127 ff., Burge 1979: 97 and Schiffer 1987: 67 ff.

guistic vocabulary. Second, when someone (e.g., a child or an ill-educated adult) is thinking one of these propositions, there is no evident need for the person to be employing any relevant concepts from linguistic theory, e.g., the concept of a conventional naming practice. The two propositions are seamless; only in their logical analysis do metalinguistic modes of presentation appear.[19]

Let me sum up. We have been seeking a theory of propositions in which, for example, the proposition that Cicero is a person and the proposition that Tully is a person should have the following features. They should be distinct from each other. They should be necessarily true. They should not be the sort of proposition expressible by sentences containing definite descriptions. Finally, they should not be metalinguistic in the standard senses. Propositions such as pred_d(being a person, $P_{\text{`Cicero'}}$) and $pred_d$(being a person, $P_{\text{`Tully'}}$) have all these features. Thus, they are promising candidates for the sort of propositions which have been eluding us.

In a wholly analogous way fine-grained names and historical naming trees could be incorporated into intensional algebras as non-Platonic modes of presentation; doing so would yield other candidate propositions with the desired characteristics. Besides these three proposals – practices, names, naming trees – there are others based on other candidate types of non-Platonic modes of presentation. It would be premature to declare any one of these proposals to be best; rather, one should canvass the full range of proposals and let the data determine the best. Nevertheless, because this general approach provides such a rich array of finely discriminated propositions, my conjecture is that at least one of these proposals provides a formally adequate solution to our family of puzzles. For the remainder of the paper I will assume that this conjecture is correct.[20]

Notational convention On each proposal I have considered, there is a regular connection between expressions and associated non-Platonic modes of presentation – for example, between 'Cicero' and our conventional linguistic practice $P_{\text{`Cicero'}}$. Suppose that on the proposal that validates my conjecture (just stated) – one of the above three proposals or some further proposal – there is a regular connection like this. In this case, the following notational convention may be introduced: if e is an expression and m is the non-Platonic mode of presentation to which e bears the indicated regular connection, then m will be denoted by the expression that results from enclosing e in double quotation marks. So, for example, "Cicero" would be our

[19]Thus, although no metalinguistic *sentences* express these propositions, there are metalinguistic *descriptions* – i.e., 'pred_d(being a person, $P_{\text{`Cicero'}}$)' and '$\mathsf{pred}_d$(being a person, $P_{\text{`Tully'}}$)' – which provide correct logical analyses of them.

[20]Note that this conjecture does not take a stand on how to formulate the semantics for the sentences in our problem area. My goal has simply been to show how to provide a rich enough array of propositions to underwrite a formal semantical treatment of our puzzles.

conventional linguistic practice $P_{\text{`Cicero'}}$, or some other non-Platonic mode of presentation, depending on which candidate proposal is correct.

I have been discussing non-Platonic modes of presentation that have regular connections with names. But there are also non-Platonic modes of presentation that have regular connections with predicates (e.g., our conventional linguistic practices of using a given predicate to express a relevant property or relation; intentional predicating trees; etc.) The above notational convention is also intended to apply to predicates. So, for example, '"chew"' and '"masticate"' are to denote relevant non-Platonic modes of presentation.

4 Some Applications

These ideas put us in a position to suggest candidate solutions to a variety of further puzzles about content.

1. Kripke's puzzle about Pierre's beliefs.[21] Upon seeing a picture of a pretty-looking city labeled 'Londres', Pierre states 'Londres est jolie'. Later, after living in an unattractive section of London, he states 'London is not pretty'. But it does not seem that Pierre believes a contradiction. Why not? The solution is that on the first occasion the proposition he asserts and believes on the first occasion is pred_d(being pretty, "Londres") whereas the proposition he asserts and believes on the second occasion is neg(pred_d(being pretty, "London")).[22] These two propositions are not in contradiction, for pred_d(being pretty, "London") $\neq$ pred_d(being pretty, "Londres"). This is so because "London" $\neq$ "Londres".[23]

2. The traditional problem of negative existentials: how can a sentence like 'Pegasus does not exist' express a true proposition given that 'Pegasus' lacks both a reference and a descriptive sense? The proposed solution is that the sentence expresses (something like) the true proposition neg(pred_d(existing, "Pegasus")).

3. An analogue of Frege's puzzle involving predicates rather than names. The problem is to explain why, e.g., 'There exists something that chews

[21]Kripke 1979.

[22]Or he might mean – and believe – neg(pred_s(being pretty, London)). This proposition does not contradict the one he stated and believed originally. After all, "London" $\neq$ "Londres"; moreover, singular predications and descriptive predications are always distinct.

[23]Kripke poses a second puzzle. Peter makes a certain pair of apparently contradictory assertions about a musician Polish Prime Minister named 'Paderewski'. I am inclined to the view that Peter's assertions and beliefs really are contradictory and that what the example shows is that a person's rationality is determined, not by *all* of the person's beliefs, but only by a certain privileged subset of them. People who disagree with this assessment seem to me to be focusing on *auxiliary* beliefs that Peter must have had rather than on the two beliefs that Peter actually articulated when he sincerely asserted the relevant sentences with the intention of speaking literally. Suppose, however, that I am mistaken and that Peter's two beliefs are *not* contradictory. In this case, the framework in the text could be extended in obvious ways to provide the relevant propositions.

and does not masticate' and 'There exists something that masticates and does not chew' intuitively do not mean the same thing even though chewing is the same property as masticating. A candidate solution is to invoke distinct non-Platonic modes of presentation of this property (e.g., "chew" and "masticate") to explain the indicated difference in meaning. For example, perhaps 'There exists something that chews and does not masticate' means exist(conj("chew", neg("masticate"))) whereas 'There exists something that masticates and does not chew' means exist(conj("masticate", neg("chew"))).[24]

4. Consider an English speaker who is familiar with the name 'Phosphorus' but not 'Hesperus'. Suppose that by pure chance the person makes the stipulation that 'Hesperus' is hereafter to be another name for Phosphorus. By an adaptation of Kripke's meter-stick example, Kripke would be committed to holding that the person would know something *a priori*. But what? Would the person know *a priori* that Hesperus = Phosphorus? That is, would the person know *a priori* the oft discussed necessity? If so, Kripke's famous doctrine that this necessity is essentially *a posteriori* would collapse. But we have on hand tools for solving this problem. The familiar *a posteriori* necessity is a descriptive prediction formed from one of our *standing* non-Platonic modes of presentation. By contrast, the necessity which the person knows *a priori* is a descriptive prediction formed instead from a *new* non-Platonic mode of presentation associated with the person's stipulation. Because these non-Platonic modes are distinct, so are the two propositions. So goes the solution. I believe that something like this is required to solve the problem and, more generally, to reconcile Kripke's scientific essentialism with the sort of *a priori* knowledge associated with stipulative definitions.

5. The foregoing ideas might also provide raw materials for treating demonstratives. Suppose that I see an object x directly in front of me and simultaneously see the same object x (without realizing that it is the same) through a complicated lens set-up on my left. Suppose that, while glancing straight ahead, I sincerely assert 'This is a pencil' with an intention of speaking literally. Intuitively, I would mean – and believe – something different from what I would mean – and believe – if, while glancing to the left, I sincerely assert 'That is a pencil'. What is the difference? The above theory provides a range of promising answers. The simplest is this. When I assert 'This is a pencil', the proposition I mean and believe is pred_d(being a pencil, "this"), and when I assert 'That is a pencil', the proposition I mean and believe is pred_d(being a pencil, "that"). The idea is that "this" and "that" are limiting cases of the sorts of non-Platonic modes of presentation discussed above: for example, perhaps "this" = my act of referring to x by uttering 'this' on the indicated occasion, and perhaps "that" = my act of referring to x by uttering 'that' on the indicated occasion. In this case "this" $\neq$ "that", and therefore, pred_d(being a pencil, "this") $\neq$ pred_d(being a pencil, "that"). Perhaps this is the intensional distinction we are seeking. Now although this idea cannot be the whole story (e.g., it does not deal with phenomena such as pronoun anaphora descending from an initial use of a demonstrative), it might be a first step toward a successful treatment of demonstratives.

[24] Analogously, perhaps the non-Platonic mode of presentation "arthritis" is responsible for the oblique use of 'arthritis' discussed in Burge 1979.

5 Conclusion

The foregoing is really only the outline of a theory. No doubt there are problems, and the theory will need to be modified in various ways. But I hope these ideas make it plausible that, despite recent doubts, a theory of properties, relations, and propositions can provide a promising general framework for the theory of content.[25]

[25] I wish to extend my warm thanks to Paul Hovda for his expert help in readying this paper for publication.

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On Nonsense on Reference

Herbert Hochberg

1 Searle's Unsatisfied Intentions: Or How Terminology Replaces Ontology

In 1910-11, G. E. Moore took a belief to be essentially connected to a fact, whose existence provided its truth ground. He suggestively called attention to the transparency of the connection by holding that if the blanks in

(M) 'the belief that... refers to the fact that...'

are filled by tokens of the same sentence the result is an obvious or necessary truth. In the 1950s, Gustav Bergmann, separating particular acts of belief from their contents, which he took to be properties exemplified by (particulars in) acts, claimed that his version of (M), 'the thought that... *means* the fact that...' was an *analytic* pattern. In recent years, Searle has repeated the theme by claiming that a belief is intrinsically or internally a representation of its conditions of satisfaction.

Searle is rightly concerned, as was Russell long ago, to avoid a regress resulting from introducing a further mental act or state or agent to make the connection. This is one reason he speaks of the connection being intrinsic or internal. But he provides no resolution of basic philosophical problems involved in talk of an intrinsic connection, for he provides no analysis or ontological assay of the fact that intentional states and contents intrinsically represent conditions.

One problem concerns the implicit appeal to propositional entities. Suppose John, Peter and Saul believe that-*p*. The belief that-*p* is common to them. But, what is the belief and what is it for it to be common to various individuals or intentional states? Moore, seeking to avoid propositions, implicitly treated the belief as a universal property of individual acts of belief. Searle talks of representational contents and propositional contents as if he recognizes propositional type entities or content properties. But, he also speaks of intentional states being "realized in the neurophysiology of the brain" and of propositions expressing contents. His symbolic representation of an intentional state as 'Believe (It is raining)' raises questions about the representational roles of both the parenthetical sentence and the juxtaposition of it and the term 'believe'.

Bergmann took an intentional state or mental act to be a basic particular exemplifying two properties. One property, which he called a "thought",

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