

Nonreferential Complements, Nominalizations, and Derived Objects

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Abstract

I will argue that certain complements in philosophically significant constructions, especially predicative and clausal complements and intensional NPs, should not be analysed as providing an argument for a relation expressed by the verb, but rather as forming a complex predicate together with the verb. Apparent evidence for the traditional relational analyses, namely the possibility of replacing the complement by quantifiers such as *something*, will be shown to be misguided. Quantifiers like *something* rather act as nominalizing expressions introducing ‘new’, derived objects into the semantic structure of a sentence. The resulting analyses will have several philosophical ramifications.

1 INTRODUCTION

Noun phrase complements such as *Mary* or *someone* as in (1), it is universally agreed, serve to provide arguments for the predicate, which expresses a relation:

- (1) a. John saw Mary.
b. John saw someone.

There is a range of complements, though, for which such a *Relational Analysis*, as I will call it, is more problematic, for example, predicative complements, as in (2a):

- (2) a. John became wise.

The Relational Analysis of predicative constructions would take what predicates are supposed to stand for, properties, to act as arguments of the embedding predicate as well.

There is apparent support for the Relational Analysis, namely a limited class of quantifiers and pronouns that can replace predicative complements, for example *something* in

- (2) b. John became something admirable.

I will argue that a relational analysis of predicative complements is deeply problematic, as is an analysis of the replacing quantifiers or pronouns as ranging over possible meanings of predicates. Instead of taking the copula verb *become* to express a relation, I will argue that it has a syncategorematic meaning, acting together with the predicative complement to define a complex property. The quantifier *something* that can replace the predicative complement, moreover, acts as a *nominalizing expression*, in addition to being a quantifier. In its nominalizing function, it helps define a domain of derived objects which would not be present in the semantic structure otherwise, objects one would refer to with familiar nominalizations such as *John's being admirable* or *being admirable*—that is, states or kinds of states. The so introduced objects serve the purposes of quantification, modification, and demonstrative or anaphoric reference, but not the satisfaction of a predicate.

The most important contribution of this paper, however, is not to provide an alternative analysis of copula-predicate/quantifier constructions, but to show that the same arguments against a relational analysis apply to a much wider class of complement constructions, for which a Relational Analysis has been taken for granted. These include clausal complements as in (3a), intensional noun phrases as in (4a), and measure phrases as in (5a), which allow the same quantifiers to replace them:

- (3) a. John thinks that Mary is happy.
b. John thinks something.
- (4) a. John needs a secretary.
b. John needs something.
- (5) a. John weighs 100 pounds.
b. John weighs something.

The replacing quantifier *something* in (3b) ranges over things like thoughts, in (4b) over things like needs, and in (5b) over things like weights, rather than over propositions, over intensional quantifiers or properties, or over numbers. The paper will not give explicit analyses of all such *nonreferential complements*, but will limit itself to some independently motivated suggestions from the philosophical literature. Instead, it will focus on the following two general conclusions:

- 1. Whatever the meanings of the complements in question, they will not themselves figure as objects in the semantic structure of the sentence, but rather only help define a complex property.

2. The replacing quantifiers do not act as ordinary quantifiers, but as nominalizations in an extended sense, introducing new objects into the semantic structure of the sentence.

Thus, the possibility of nonreferential complements and their replacing quantifiers does not require ‘meanings acting as objects’, such as propositions, properties, or intensional quantifiers. The replacing quantifiers require instead other kinds of objects, namely ‘derived objects’ of exactly the same sort as are needed for the semantics of nominalizations. These objects include states or kinds of states, appearances (sense data) or kinds of them, and objects like thoughts or kinds of thoughts. The general picture then emerges that semantic structure divides into two levels: a *primary level* consisting of predicate-argument relations, and a *secondary level*, where derived objects are introduced by nominalizing expressions. Such derived objects have a secondary semantic status that goes along with their secondary (or derived) ontological status.

I will first discuss the problems for the relational analysis of predicative complements and develop an explicit semantic analysis of predicative constructions and of the corresponding nominalizing quantifiers. Then I will show that other complements exhibit exactly the same relevant features and make a number of suggestions as to how they as well as the nominalizing expressions that can replace them can be analysed.

2 THE RELATIONAL ANALYSIS OF PREDICATIVE COMPLEMENTS

The standard analysis of referential and quantificational NPs as in (1) is the *Relational Analysis*, on which the complement is taken to have the function of providing an argument for the relation expressed by the verb, as in the analysis of (1a) and (1b) in (6a) and (6b):¹

- (6) a. *see*(John, Mary)
 b. $\exists x$ *see*(John, x)

The Relational Analysis when applied to predicative complements assumes that predicative APs and NPs denote properties that provide arguments for a relation expressed by the verb, as in (7), for (2a) and (2b):

¹ Syntacticians in fact generally hold that a complement bears a thematic relation to the verb such as agent or patient, a relation which is often taken to just mean that the complement fills in a particular argument position of the predicate, in virtue of playing a particular role in its lexical meaning.

- (7) a. $\text{become}(\text{John}, \lambda x[\text{wise}(x)])$
b. $\exists x(\text{become}(\text{John}, x) \ \& \ \text{admirable}(x))$

A crucial argument for the Relational Analysis of predicative complements comes from *special quantifiers* such as *something* in (2b). Special quantifiers such as *something* in (2) are special in that they seem to be able to range over possible denotations of predicative (or other nonreferential) complements, providing arguments for a relation expressed by the predicate. An alternative view of special quantifiers unless, of course, those quantifiers are taken to be substitutional rather than objectual. Whereas an objectual quantifier ranges over objects that act as values of the variable the quantifier binds, a substitutional quantifier, one can say, acts as a mere instruction to replace the occurrences of the variable it binds by a suitable expression, so that the resulting sentence (a substitution instance) will have to be true (in the case of an existential quantifier just one substitution instance has to be true, in the case of a universal quantifier all have to be true). If, for example, *something* in (2b) was substitutional, then the truth of (2b) would merely require some substitution instance to be true—that is, a sentence of the sort *John became XP*, where XP is a predicative NP or AP.

Since special quantifiers will play a central role in this paper, let me discard the possibility that they are substitutional quantifiers right at the start. First, special quantifiers allow for quantifier restrictions (such as *admirable* in (2b)), which is impossible for substitutional quantifiers as they do not range over a domain of entities at all. Second, special quantifiers do not care about syntactic categories in the way they would have to if they were substitutional. To see what this means consider the special quantifier *something* in (8a) and (8b):

- (8) a. John became something that caused Mary great distress (namely addicted to drugs).
b. John became something I never thought about (namely a pianist).
c. John became something nice (namely a ballet dancer).

In (8a), *something* being a complement of *become*, would require a predicative NP or an AP as substituent, but at the same time binding a variable that acts as the subject with respect to *caused*, it would also require a clause or referential noun phrase as substituent. Clearly, no expression can satisfy these two conditions simultaneously. The same point is made by (8b), where *something* would require its substituent to be a predicative expression (as complement of *become*) and at the

same time a referential NP (as complement of *about*), and also by (8c), where *something* requires a predicative NP or an AP on the one hand and a referential NP (subject with respect to *nice*) on the other hand. Special quantifiers thus must be objectual, and given the standard view about quantifiers, this means that they must range over potential arguments of the predicate.

The Relational Analysis of predicative complements is an obvious generalization of the Relational Analysis of referential and quantificational complements, although it is hard to find such an analysis explicitly in the semantic literature. There is, of course, the type-theoretic account as in Montague (1974), which assumes that copula verbs such as *remain* take an argument of a particular type $\langle e, t \rangle$. I will argue in the Appendix, however, that the type-theoretic account of complements is not truly a relational analysis.

3 PROBLEMS FOR THE RELATIONAL ANALYSIS OF PREDICATIVE COMPLEMENTS

A major problem for the Relational Analysis is certain striking differences in linguistic behaviour between referential NPs and predicative complements.

Referential NPs generally allow for unlimited substitution in extensional contexts. Whenever the NP is replaced by another, picking out the same object, the same truth value for the entire sentence will be preserved (despite the fact that some awkwardness may result). Thus, the sentences in (9) have the same truth value, as long as Mary is the mother of Sue, whom Sue likes, or the entity that . . . (any description to follow):

- (9) a. John likes Mary.
 b. John likes the mother of Sue.
 c. John likes whom Sue likes.
 d. John likes the entity that . . .

But predicative complements do not generally allow for a replacement by a referential or quantificational NP. The result is either unacceptability or a different reading of the verb. Thus, (2a) does not imply (10a), which like the sentences (10b–10d) is unacceptable (that is, could not possibly be true, except in certain contexts of metaphysical fantasy):

- (10) a. # John became the property of being wise / some property.
 b. # John became the same property as Mary, namely a lawyer.

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- c. # John became every property Mary is—nice, beautiful, intelligent.
- d. # John became every property he wanted to become.

Let me call this the *Substitution Problem*.

When a predicative complement is replaced by a referential NP such as *every property*, the reading of the verb changes, resulting in the reading it would have when taking ordinary referential NPs—such as the identity reading in (11):

(11) John became Bill.

Let me call this the *Objectivization Effect*.²

Failure of substitution of a predicative complement such as *wise* by *the property of being wise* could not be explained by something like the ordinary speaker's lack of knowledge that the denotation of a predicate is a property, or his lack of knowledge of the proper use of such metasemantic terms as *property*. Even when a particular speaker knows that the denotation of a predicate is a property, the sentences in

² Predicative complements differ from referential ones also with respect to some syntactic properties.

First, predicative complements behave unlike referential complements and like adjuncts with respect to extraction from weak island, e.g. *that*-clauses in the scope of negation. This is seen in the contrast between the ambiguous (1a) and the unambiguous (1b) and the contrast between (2a) and the unacceptable (2b) (cf. Rizzi 1990):

- (1) a. It is for this reason that I believe that he was fired *t*.
b. It is for this reason that I don't believe that he was fired *t*.
- (2) a. It is unhappy that I think John became.
b. * It is unhappy that I don't think John became.

Predicative complements are unlike adjuncts, though, not because they are obligatory. Adjuncts can be obligatory, like *badly* in (3a) or *until everyone has left* in (3b) or optional, like *slowly* in (4a) or *until she was exhausted* in (4b):

- (3) a. John behaved badly.
b. The party lasted until everyone had left.
- (4) a. John walked slowly.
b. Mary walked until she was exhausted.]

Predicative complements differ from (optional and obligatory) adjuncts in that they generally disallow extraction of *wh*-phrases:

- (5) a. * Who did the party last until Mary talked to *e*?
b. * Who did John do while Mary talked to *e*?

Predicative complements, by contrast, allow for extraction of *wh*-phrases:

- (6) Who is John proud of *e* ?

It is for this reason that nonreferential complements are generally taken to be assigned theta roles (cf. Chomsky 1981).

In generative syntax, there are various theories concerning such extraction facts, ultimately, it appears using semantic distinctions. Rizzi (1990), for example, argued for a distinction among two domains of entities.

(10b–d) are bad: they are just as bad for a philosopher or semanticist as for anyone else. There is always a clear difference between the kind of unacceptability arising from substituting a nonreferential complement by a metasemantic description of its denotation and the kind of unacceptability below arising from replacing a referential NP such as *the tree* by something like *the object referred to by . . .*

- (12) a. John saw the tree.
 b. ? John saw the object referred to by my previous utterance of *the tree*.

Even if not entirely felicitous, (12b) is still acceptable in a technical extension of English (and as such is a valid inference from (12a)). There are, moreover, needless to say, many contexts in ordinary English in which an NP with *property* as head noun is a perfectly acceptable complement. Finally, failure of substitution can be observed also with descriptively empty nouns such as *entity*, *object* or *thing*, the latter hardly requiring any technical semantic knowledge:

- (13) # John became some entity / some object / some thing (namely wise).

The reason for the unacceptability of referential NPs on the relevant reading also cannot be that the verbs do not select such NPs syntactically. That is because special quantifiers or, more generally, *special noun phrases* can replace nonreferential complements without leading to the Substitution Problem or the Objectivization Effect. Special NPs include combinations of a quantifier with the morpheme *thing*, which, depending on whether the determiner attracts the morpheme, occurs either bound as in *something*, *everything*, or *nothing*, or free, as in *many things*, *two things*. Special NPs also include the relative pronouns *what* and *whatever*, as well as the singular demonstratives or anaphors *that*, *this*, and *it*. Special NPs also occur with adjectival or relative clause modifiers as in *something interesting* or *nothing that is of any interest*.^{3,4} The following examples don't display the Substitution Problem or the Objectivization Effect:

³ Special NPs do not include plural pronouns, since they cannot anaphorically relate to predicative complements even when they are conjoined and would define a plurality of properties. It is only when properties are referred to by referential NPs that they go along with plural pronouns:

- (1) a. John became wise and calm. Mary would never become that / # them.
 b. John has the property of wisdom and the property of calm. Mary does not have them.

⁴ According to Ken Hale (p.c.), in some languages, special NPs do not form a subset of ordinary quantificational or anaphoric NPs.

- (14) a. John became something Mary already is.
b. John became nothing interesting.
c. John became the same thing as Mary. Sue became that too.

Special NPs as in (14) do not act as predicates, but rather seem to quantify over or refer to the denotations of NPs used predicatively (i.e. properties).

The contrast between special and ordinary NPs is particularly striking below, where *become* in (15a) has a predicative reading and in (15b) displays the Objectivization Effect:

- (15) a. John became something admirable.
b. John became some admirable thing.

One can easily verify that special NPs behave like ordinary NPs in all syntactic respects and thus do not constitute their own syntactic category. In fact, formally, special NPs can occur also in all contexts in which ordinary NPs occur, for example with relational predicates (as in *John ate something* or *something bothered John*).

Besides the special noun phrases above, there are certain other NPs in English that can replace predicative complements without leading to the Objectivization Effect. These NPs contain certain *special nouns* as head, such as *colour*, *size*, *shape*, and *height*, as in the following examples:⁵

- (16) a. John's house is red.
b. Mary's house is the same colour.
- (17) a. The shirt became much smaller.
b. The shirt became the same size as the other one.
- (18) a. The vase is cylindrical.
b. That vase is the same shape.
- (19) a. John is ten feet tall.
b. John is the same height as Mary.

NPs such as *the same colour* or *the same shape* clearly are referential, which means that the complement position of copula verbs does not resist referential NPs as such (that is, let's say, a syntactic category).

⁵ The observation that NPs of this sort can replace predicative complements has been made by Williams (1982).

4 POSSIBLE EXPLANATIONS OF THE FAILURE OF SUBSTITUTION AND THE OBJECTIVIZATION EFFECT WITHIN THE RELATIONAL ANALYSIS

Given that there is no straightforward syntactic explanation of the Substitution Problem and the Objectivization Effect, the most obvious alternative would be a semantic one.

Such an explanation would naturally take recourse to the common view that predicative complements do not *refer* to entities in the way referential NPs do, but instead *express* or *denote* them. The distinction between referring to an entity and expressing or denoting it, has had a long tradition in the philosophy of language, for example in Frege's distinction between sense (what is expressed) and reference (what is referred to). The relational view thus would say that even though predicative NPs do not refer to objects in the way referential NPs do, being *nonreferential complements*, they express or denote certain kinds of entities that will act as arguments of the relation expressed by the predicate. The problem with this kind of explanation is, however, how once an entity *d* acts as an argument, the relation between *d* and the expression that denotes or refers to it could make a difference to the logical form of the sentence.

For a semantic explanation to work, one would have to go further and appeal to a distinction between the kinds of entities referred to by referential NPs and those denoted by predicative complements. This can be called a *Fregean Explanation*, since it was Frege's (1892) view that there is a fundamental difference between *objects* on the one hand—the kinds of things referential NPs refer to—and *concepts* (or functions) on the other hand—the denotations of predicates. Whereas objects are saturated, not inherently requiring some other object for their completion, concepts are unsaturated, requiring another object as an argument to form a proposition. This distinction among objects correlates strictly with the syntactic roles of a predicate and of a referential complement or subject. Thus, NPs of the sort *the concept horse* or *the property of being a horse*, which only act as subjects or referential complements, will not refer to a concept, but rather to an object.

There is the following general problem with the Fregean Explanation, however. It is obviously possible for philosophers and semanticists to refer to the entities in question (concepts or functions)—however unsaturated they may be. Moreover, the descriptions used by them are themselves part of the object language or at least an extension of the object language. It should therefore be possible to replace predicative complements by those descriptions, picking out

exactly the same arguments of the relation expressed by the verb. However, sentences such as *John remained the concept of being a lawyer* are simply impossible on the intended reading.

It must be said that what I called a Fregean Explanation may not do justice to Frege himself. It is not clear that Frege had in mind that the distinction among objects and concepts was to be made entirely on the basis of the nature of two kinds of entities (which happen to be associated with different syntactic categories or roles) or whether it rather concerned the role of the contribution of different syntactic functions to a proposition. Moreover, Frege did not discuss the possibility of concepts acting as arguments of a predicate. Perhaps acting as arguments would not even be a possibility for concepts in his sense.

More recently there have been attempts to construe the distinction between objects and concepts formally in set-theoretic or type-theoretic terms (Chierchia 1984; Chierchia & Turner 1988; Turner 1989). Objects would be primitive objects or ‘urelements’, whereas concepts would be complex or higher-order objects, functions in the set-theoretical sense. Such an account obviously faces the same problem as the Fregean Explanation: why should functions elude reference by description, since we are obviously able to talk about them?

There is also an internal problem with construing the distinction between concepts and objects in terms of primitive vs. higher-order objects. It arises from the possibility of self-application of properties in natural language, as in the analysis in (20), which has been observed and discussed extensively in the literature (Bealer 1982; Chierchia 1984; Chierchia & Turner 1988; Turner 1989):

- (20) a. To be nice is nice.
b. Everything has the property of being selfidentical.
Thus, the property of being selfidentical is selfidentical.

If infinitival clauses such as *to be nice* express the same property as the predicate *nice*, then (20a) ascribes this property to itself (cf. Chierchia 1984). If a property is construed as a function from objects (relative to a world and time) to truth values, then such self-application of properties means application of a function to itself—which is impossible given the set-theoretical notion of a function.

Generally, the following strategy has been taken to solve the problem of self-application of properties (cf. Chierchia 1984; Chierchia & Turner 1988; Turner 1989): when a predicate applies to a property, it does not apply to a higher-order object, a function. Instead it

applies to a primitive object which only ‘corresponds’ to that function. This is made possible by positing a *nominalization function* that maps functions onto primitive objects. Since, mathematically, there are always more functions than primitive objects, the nominalization function can map only a subset of the functions onto primitive objects.

The problem is that this solution to the problem of self-application of properties undermines the Fregean Explanation of the Substitution Problem and the Objectivization Effect. If only primitive objects can be the proper arguments of predicates, then they would also be what predicative complements provide as arguments of copula verbs. Thus, the distinction between concepts and objects in terms of primitive vs. higher-order objects cannot do both explain the Substitution Problem and the Objectivization Effect and solve the problem of the self-application of properties. Therefore either the identification of properties with functions needs not be given up or no Fregean Explanation can be given. Since it is hard to see how the Fregean distinction between objects and concepts could be formally construed otherwise than by identifying concepts with functions, it appears that the Fregean Explanation is in further trouble.⁶

5 SYNCATEGOREMATIC EXPRESSIONS AND THEIR MEANING

I have argued that the relation between a predicative complement and the copula verb should semantically be understood not as that between a relation and its argument, but rather syncategorematically. That is, only the predicative complement and the copula verb together will express a relation. Syncategorematic expressions can be characterized as expressions that do not themselves express a concept, but whose formal presence instead has a semantic effect on the overall meaning of a larger constituent.⁷ Formal presence may include the phonological

⁶ There are problems anyway with construing properties as functions mapping objects onto truth values, or better, mapping a possible world onto a function that maps objects onto truth values. For then necessarily coextensional properties are identified, for example being sold and being bought or being half-empty and being half-full. A more adequate way of construing properties as functions is to take them to be functions mapping objects onto propositions, where propositions are taken to be primitives (cf. Thomason 1980). However, as we will see in Section 6, analogous data require a distinction between two sorts of propositions: propositions denoted by *that*-clauses and propositions referred to by NPs of the sort *the proposition that S*. In terms of the function-object distinction, the former would be zero-place functions, whereas the latter would be objects. But if propositions are always primitive, then there is no way of distinguishing them in terms of higher-order vs. primitive.

⁷ The distinction between syncategorematic and categorematic expressions is a very old one going back at least to medieval times (where it seemed to have played a central role in philosophical

form of the expression, its syntactic category, and its syntactic role.⁸ The most familiar cases of syncategorematic expressions are logical connectives, operators, and quantifiers. In all these cases, the contribution of the syncategorematic expression consists in a condition on the evaluation of the constituent with which it combines. Thus, the semantic contribution of a modal operator consists in an instruction to evaluate its scope relative to different possible worlds, the semantic contribution of a logical connective consists in evaluating the overall expression as true in case the expressions with which the connective combines exhibit certain truth value combinations, and the semantic contribution of a quantifier consists in an instruction to evaluate its scope on the basis of individuals assigned to the occurrences of the variables the quantifier binds or else expressions that replace those variables.

Copula verbs like *remain* and *become* can obviously be analysed like temporal operators, manipulating the index of evaluation for the predicative complement. Thus, the verb *remain* would have a syncategorematic meaning in conjunction with a complement like *a lawyer*, as roughly like this:

$$(21) [\textit{remain a lawyer}]^t(d) = 1 \text{ iff for all (relevant) times } t' < t, [\textit{a lawyer}]^{t'}(d) = 1 \text{ and } [\textit{a lawyer}]^t(d) = 1.$$

But do syncategorematic expressions always *have* to be analysed like logical constants, unlike categorematic expressions for which an unanalysable conceptual meaning can generally be acknowledged? Already Ockham (1675), in whose writings the distinction between categorematic and syncategorematic expressions plays an important

discussions about language). Modern semantics tends to blur the distinction because of the dominating type-theoretic outlook, it seems.

The distinction, however, seems to have a correlate in the more recent generative syntactic literature. Within generative syntax, generally a distinction has been drawn between functional and lexical heads. Auxiliaries are functional heads dominated by I, whereas verbs like *remain* or *see* are lexical heads headed by V. It is sometimes assumed that the distinction between the two is that only lexical heads assign theta roles, whereas functional heads don't. Clearly, many lexical heads can take nonreferential complements and thus would not assign a theta role to it. The status of an expression as syncategorematic therefore clearly is not limited to functional heads in the sense of generative syntax.

⁸ The possibility of predicates and complement together having a syncategorematic meaning also undermines the notion of semantic selection as independent of syntactic selection in the generative syntactic literature (cf. Grimshaw 1979). Semantic selection consists in what kinds of objects a predicate requires, whereas syntactic selection consists in what kinds of syntactic categories a predicate requires its complements to be of. Grimshaw argued that the two requirements are independent of each other. Pesetsky (1982) argued that syntactic selection can be reduced to case assignment, leaving semantic selection as the only requirement to be fixed by the lexicon. Clearly, given the present arguments, this view cannot be maintained anymore. For syncategorematic constructions in my sense, the syntactic category of a complement is semantically significant, rather than just required for formal reasons.

role, allowed expressions to be analysed into a conceptual and a syncategorematic component. Thus, for Ockham *mankind* is to be analysed as ‘men necessarily’ or ‘men as men’, with a categorematic element (*men*) and a syncategorematic one (*necessarily*). But does a syncategorematic expression have to be analysed at the level of sentence meaning at all? This need not be the case, as may be known from formal logic. Modal operators need not be treated as quantifiers ranging over possible worlds. On a modalist view, they act as primitives, subject only to general conditions governing their inferential behaviour (see, for instance, Forbes 1985). We will later see that such an account is best suited for certain syncategorematic predicates in natural language.

6 SPECIAL NPS REPLACING PREDICATES

6.1 *The range of special quantifiers replacing predicates: states*

Given that nonreferential complements have a syncategorematic meaning, special quantifiers cannot range over potential arguments of the predicate. But still the function of special NPs is to say things about entities related to what could be expressed by a nonreferential complement—by quantifying over them, as in (22a), attributing properties to them, as in (22b), comparing them, as in (22c), or demonstratively or anaphorically referring to them, as in (22d) (cf. Heal 1997):

- (22) a. John became something.
 b. John became something interesting.
 c. John became the same thing as Mary.
 d. John became that too.

Thus, special NPs share basic functions with ordinary NPs. In what follows, I will present a number of arguments, though, that they act at the same time as nominalizing expressions, leading to a new domain of derived objects (see also Moltmann 2003b).

First, let me present some independent evidence besides the syncategorematic nature of predicative constructions that special NPs do not range over potential arguments when they replace predicates.

Special quantifiers, it appears, can simultaneously stand for (to use the Fregean distinction) concepts and objects, or (type-theoretically speaking) they can occur in such a way as to require specifications for different types simultaneously. Thus, *something* in (23a) relates to

one argument position specified for type $\langle e, t \rangle$ and to another one (the subject position of *interesting*) that is specified for type e . Similarly for (23b):

- (23) a. John became something not very interesting, namely a schoolteacher (type $\langle e, t \rangle$ and type e)
b. John is something very nice, namely generous. (type $\langle e, t \rangle$ and type e)

But what *something* ranges over cannot act as a concept and an object simultaneously, or, in type-theoretic terms, single occurrences of *something* cannot be of different types simultaneously.

The independence of special NPs of the requirements of particular argument positions goes even further. Special NPs can relate even to argument positions that require different kinds of entities (beyond the concept-object distinction). Thus, below in (24a), *something* relates to an argument position of a predicate requiring a property and another one requiring a proposition. In (24b), *something* relates to an argument position requiring a property and another one requiring the type of object associated with the infinitival clause *to be extremely athletic*.

- (24) a. John became something Mary never imagined (namely a schoolteacher).
b. John became something Mary never thought possible, namely extremely athletic.

The special quantifiers here clearly cannot quantify over potential arguments. But what do they quantify over? Instead of quantifying over possible denotations of predicative complements (properties), what they quantify over in such examples is entities of the sort one would refer to with a nominalization. Thus, what *Mary never imagined* in (24a) is predicated of is what one would refer to with *John's being a schoolteacher* (not the property of being a schoolteacher), and what *Mary never thought possible* in (24b) is predicated of would be 'John's being very athletic'. Thus, what *something* in these examples quantifies over is best described not by using a predicate, but by using a nominalization, namely a nominalization of the sort NP's *being XP*.

The way evaluative predicates as in (23) are understood shows the same. In (23a), *not very interesting* is not predicated of the property of being a schoolteacher (since that property may be 'very interesting' even if (23a) is true). Also in (23b), *nice* is not predicated of the property of being generous (since it is not this property that is said to be nice in (23b)). Rather what *not very interesting* is predicated of

in (23a) is the profession of schoolteachers, or the activity in which the property of being a schoolteacher manifests itself or what one would refer to with *being a schoolteacher*. Similarly, in (23b), *nice* is predicated of generous behaviour or the manifestation of the property of being generous in human activities, or what one would refer to with *being generous*. Note that (23a) and (23b) do not even allow for a reading on which *not very interesting* and *nice* are predicated of the mere properties of being a schoolteacher and of being very generous. Thus, (23a) implies (25a), rather than (25b), and (23b) implies (26a), rather than (26b):

- (25) a. Being a schoolteacher is not very interesting.
 b. The property of being a schoolteacher is not very interesting.
- (26) a. Generosity is nice.
 b. The property of being generous is nice.

That special quantifiers do not range over properties is seen also from the applicability of perception and causal predicates, which could not be true of properties:

- (27) a. John is something Mary never noticed (namely he is overweight).
 b. John is something that makes Mary often upset (namely he is sloppy).

In (27a), *noticed* applies to something like John's being overweight, not to the property of being overweight, and in (27b), *that makes Mary often upset* applies to something like John's being sloppy, not the property of being sloppy.

That a special NP like *what Mary became* cannot stand for a mere property can be seen also from the fact that such an NP cannot act as an argument of a predicate taking properties as arguments, e.g. *have* or *instantiate*:

- (28) a. # Sue has what Mary became.
 b. # Sue instantiates what Mary became.

What special NPs in predicative position range over are not properties, but entities that are evaluated like particulars, that can act as the object of perception or certain propositional attitudes, and that have

causal power.⁹ A gerund of the sort *John's being generous* obviously refers to the state of John being generous. States are particulars that can play causal roles and can act as the object of perception. In contrast to *John's being generous*, *being generous* does not stand for a particular state, but instead is best considered a term standing for a *kind* of state, a kind whose instances are particular states of the sort of John's being generous.

6.2 *The semantic status of states*

The next question is, what is the role of such states in the logical form of sentences? In current Davidsonian semantics, states, like events, are generally taken to be primitive entities, acting as additional arguments of verbs. Thus, if special pro-predicative NPs stand for such states, then they would range over possible arguments of copula verbs, and the logical form of (23a) would be as in (29), where '*s*' is a variable ranging over states and '*P*' a variable ranging over properties:

(29) $\exists s \exists P$ (become(*s*, John, *P*) & not very interesting(*s*))

But there are several reasons not to assume that the states that special quantifiers range over are Davidsonian event arguments. First, special quantifiers, as we will see later, can also occur in place of nonreferential complements other than predicative ones, where they could not possibly range over events or states, such as *that*-clauses, intensional NPs, and measure phrases. Clearly, special quantifiers

⁹ There is a notion closely related to that of a state, and that is the notion of a trope or particularized property, a notion which has at various times played a more or less prominent role in philosophy, see Simons (1994) for a recent exposition. A trope would be the kind of thing naturally referred to by a nominalization like *John's wisdom* and a kind of trope the kind of thing naturally referred to by *wisdom*. Tropes differ from states in that their focus is on the property, rather than the mere holding of the property of the object. This manifests itself in the fact that tropes are evaluated differently than states: tropes can be evaluated in the way the property manifests itself in the object, not just on the basis of the property holding of the object. A good indication for this is the contrast between (1a) and the rather strange (1b):

- (1) a. John describes Mary's beauty.
b. ?? John describes Mary's being beautiful.

Whereas in (1a) John describes the particular manifestation of beauty in Mary, (1b) is impossible because the mere holding of a property of an entity can hardly be described (because describing requires an object to have some degree of complexity).

The strangeness of (2) shows that special pro-predicative quantifiers stand for things that cannot be evaluated in the way of tropes, but only in the way of states:

- (2) ?? Mary became something that is hard to describe, namely beautiful.

It is for this reason that pro-predicative quantifiers should be considered standing for states, rather than tropes, unlike what I proposed in Moltmann (2003b). However, the special noun *colour*, as we will see below, appears to introduce kinds of tropes rather than states.

in the various contexts in which they may occur should receive a unified semantic treatment. Second, propredicative special quantifiers can range alternatively over states or types of states, and types of states would not be candidates for Davidsonian event arguments. Not only would Davidson himself, for general philosophical reasons, not admit types. But also types are strictly correlated with the meanings of the expressions used to describe them and thus as arguments of verbs would lead to a rather peculiar semantic redundancy: a verb would take as its argument an entity entirely dependent on the meaning of the verb itself (see Moltmann 2003c).

Rather than taking states to be primitives and to act as arguments of predicates, I will take states to be entities that are entirely dependent on or ‘derived from’ properties, objects, and times; that is, states are conceived of as *derived objects*. States, moreover, are not automatically present in the argument structure of a predicate. Rather they are introduced into the semantic structure of a sentence only in the presence of a particular kind of expression, namely either an explicit nominalization (such as *John’s being generous* or *being generous*) or a special quantifier. Special quantifiers thus have the same ability to introduce states as explicit nominalizations and hence act as nominalizing expressions. By being tied to a nominalizing expression, states, moreover, play a secondary role in the semantic structure of sentences. States therefore (like the other ‘derived objects’ I will discuss later) can be regarded as *secondary objects* both semantically and syntactically.

I will follow Kim (1976), Lombard (1986, 1998) and others in characterizing a state in terms of existence and identity conditions involving the objects, properties and times on which the state depends:

- (30) a. A state dependent on an object o , a property P , and a time t , $S(o, P, t)$, exists just in case $P^t(o) = 1$ (the property P holds of o at time t).
- b. A state dependent on an object o , a property P , and a time t is identical to a state dependent on an object o' , a property P' , and a time t' ($S(o, P, t) = S(o', P', t')$) iff $o = o'$, $P = P'$, and $t = t'$.

Since time dependence will play no role in the discussion of this paper, I will henceforth leave out the temporal component. States will then depend only on an object and a property.

If the function S delivers states from properties, objects (and times), the function S_k will deliver kinds of states, from properties (and times), as in (31):

- (31) $S_k(P)$ = the kind k such that for any instance s of k : $s = S(P, o)$ for some object o .

With these notions of a state and a kind of state, we can now give the semantics of explicit nominalizations such as *John's being generous* and *being generous*:

- (32) a. For a predicative phrase W , $[\text{NP}'s \textit{being } W] = S([\text{NP}], [W])$
 b. For a predicative phrase W , $[\text{PRO } \textit{being } W] = S_k([W])$

6.3 *The semantic analysis of special NPs*

The semantics of special noun phrases as nominalizing expressions is more complicated. Special noun phrases perform two functions simultaneously: they nominalize and they quantify or refer. The morpheme *-thing* is characteristic of most special noun phrases (that is, the conditionally bound morpheme that is distinct from the noun *thing*, in that the former, when possible, attaches to the preceding quantifier). Thus it appears that the nominalizing function of special noun phrases is associated with the morpheme *-thing* and their quantificational or referential function with the quantificational morpheme (*some-*, *no-*, *every-* etc.).

On my analysis, sentences with special noun phrases have a particular representation at the level of Logical Form, where Logical Form is understood in the sense of Generative Grammar as the syntactic representation of a sentence that is input to semantic interpretation and possibly distinct from the sentence's surface form (cf. May 1985). The proposal is that when a special quantifier replaces a nonreferential complement, the morpheme *-thing* will move and adjoin to the verb, forming a unit with it; that is, *-thing* will be incorporated. Syntacticians generally take incorporation to involve head movement, that is, movement in which a lexical category moves to a sufficiently close head in a higher position and adjoins to it. Overt incorporation of a noun into the verb can be found across many languages (cf. Baker 1988). But it has also been advocated as an operation at LF only (for example by van Geenhoven 1998). With incorporation of *-thing* into the verb, the representation of (33a) will be as in (33b):

- (33) a. John remained something admirable.
 b. John [thing [remained]_V]_V [some [[e]_N admirable]]_{NP}

The complex predicate *thing-remained* will then be interpreted either as a relation between individuals and states or as a relation between

individuals and kinds of states. The definition of these relations below is based on the meaning of *remain* when taking a predicative complement, that is, it is based on the meaning of *remain W*, where *W* is a predicative phrase:

- (34) a. $[thing_1\text{-remain}] = \{\langle x, y \rangle \mid \exists W \in \text{Pred(ENGL)}(x \in [remain\ W] \ \& \ y = S(x, [W]))\}$
 b. $[thing_2\text{-remain}] = \{\langle x, y \rangle \mid \exists W \in \text{Pred(ENGL)}(x \in [remain\ W] \ \& \ y = S_k([W]))\}$

In order to obtain both relations as possible interpretations of *thing-remain*, I have assumed that *-thing* is ambiguous, with *thing₁* yielding the relation between individuals and states and *thing₂* the relation between individuals and kinds of states. Pred(Engl) is the set of predicative expressions in English, or better a possible extension of English in the widest sense (since an entity can remain something ‘for which one cannot find words’ or even ‘which is beyond description’).

The restricted quantifier *some e admirable* can now apply to any of those relations in the way quantifiers apply to a relation with respect to its second argument position, as in (35b), where the simpler application of a quantifier to two sets is given in (35a):

- (35) a. For sets X and Y , $[some](X)(Y) = 1$ iff $X \cap Y \neq \emptyset$
 b. For a set X and a two-place relation R , $[some_{obj}](X)(R) = \{x \mid [some](X)(\{y \mid \langle x, y \rangle \in R\}) = 1\}$

One of the denotations of *remained something admirable* will then be as follows:

- (36) $[remained\text{-}thing_2\ e\ admirable] = ([some]([admirable]))([thing_2\text{-}remain]) = \{x \mid \exists y \exists W \in \text{Pred(ENGL)}(y = S_k([W]) \ \& \ x \in [remain\ W] \ \& \ y \in [admirable])\}$

This semantic analysis is entirely compositional: The copula and *thing* together have a syncategorematic meaning, which in turn is based on the syncategorematic meaning of the copula verb with a predicative complement.

A question yet to be answered is, why should *-thing* be incorporated into the verb when the special quantifier that it is part of replaces a nonreferential complement? A good reason is provided by the principle of Full Interpretation, the requirement that at LF all syntactic elements need to have a semantic interpretation (cf. Chomsky 1986). A verb that takes a nonreferential complement has an interpretation,

a syncategorematic interpretation. But it would not be interpretable without such a complement, e.g. when it takes a special NP as complement. Only by incorporating *-thing* will another interpretation be available, one of those given in (34).

Note then that it is not in the nature of *-thing* to have to adjoin to the verb. Rather, it must be the verb that will attract *-thing*. When a quantifier like *something* occurs in a referential argument position (or even as subject), there is no reason for *-thing* to move up to the verb. In this case, *something* will rather be interpreted as a quantifier ranging over whatever entities there may be (with *-thing* perhaps then being deleted at the level of LF).

Free relative clauses such as *what Mary is*, I will assume, involve an implicit morpheme *THING*. Thus, *what Mary is* will have the denotation below, where *what* is taken to act as a description operator:¹⁰

$$(37) [\textit{what Mary THING-is } e] = \iota x[\exists W \in \text{Pred}(W) (\text{Mary} \in [\textit{is } W] \& x = S_k([W]))]$$

For a sentence like (38a), another implicit occurrence of *THING* for the matrix sentence needs to be posited, since only the representation in (38b) is interpretable:

- (38) a. John remained what Mary is.
 b. John THING-remained [what Mary THING-is *e*]

The interpretation of (38b) is straightforward, given (35) and (37).

¹⁰ Pseudoclefts as in (1) below at first sight pose a problem, identifying a special free relative clause with a nonreferential complement:

- (1) What John is is nice.

An analysis in terms of 'is' of constitution is not plausible in this case. One reason is that the pseudocleft construction also goes with PPs or adverbials, categories one would not necessarily want to have to act as characterizers of abstract entities:

- (2) How John walks is fast / with great speed.

Another reason is that explicit identity statements with a referential NP denoting the required sort of abstract object are impossible:

- (3) # What John is is the property of being nice.

Perhaps a solution to the puzzle of pseudoclefts can be obtained on the basis of a different syntactic analysis than the one that seems so obvious at first sight. Kayne (class lectures NYU, fall 1997) suggested that pseudoclefts underlyingly display a full sentence on the right side, as in (4):

- (4) What John is is John is nice.

Such an underlying syntactic structure can be semantically interpreted by taking *what* to be a propositional abstractor and *John is nice* to act as a characterizer of a proposition. (4) then would be an identity statement concerning a proposition.

The analysis of special quantifiers as ranging over states does not imply that from *John is the same thing as Mary*, it should follow, incorrectly, *John is the same state as Mary*, leading to the same Substitution Problem again. The inference is invalid because *same thing* acts as a nominalizing quantifier, whereas *same state* is a referential NP, which must stand for an object that will act as an argument of the predicate, and in this case the predicate does not take any arguments at all (being syncategorematic).

We can now turn to other special nouns, such as *colour*. *Colour* is a second-order predicate of properties, or rather kinds of particularized properties (or ‘tropes’, cf. Simons 1994). For example, *colour* is a predicate that is true of red, which in turn is a kind that is instantiated by the red of the apple or the red of the sky.¹¹ As a predicate of kinds of particularized properties, *colour* can at the same time act as a nominalizer. In this case, *colour* will also be subject to incorporation at LF. Thus (39a) will have the representation in (39b), whose interpretation will then be based on (39c) and (39d) (where T_k is the function that maps a property P to the kind whose instances are particularized properties such as d 's P ness):

- (39) a. The house is some colour.
 b. The house [colour [is]_V]_V [some [e]_N]_{NP}
 c. [colour-is] = {⟨ x, y ⟩ | $\exists W \in \text{Pred(ENGL)}(x \in [\textit{is } W] \ \& \ y = T_k([W]) \ \& \ y \in [\textit{colour}])$ }
 d. [is some colour] = [colour-is some e] = [some]([is-colour]) = { x | $\exists y \exists W \in \text{Pred(ENGL)}(x \in [\textit{is } W] \ \& \ y = T_k([W]) \ \& \ y \in [\textit{colour}])$ }

Thus, *colour-is* denotes the relation that holds between an agent x and a kind of particularized property y such that some predicate W holds of x and y is obtainable by T_k from W and is in the extension of *colour*. The meaning of the complex predicate *colour-is* thus is based both on the meaning of *is* when taking a predicative complement and on the categorematic meaning of *colour*. As a nominalizer, *colour* thus incorporates both a syncategorematic and a categorematic meaning (just as *mankind* did for Ockham).

The other examples in (16)–(19) will receive analogous analyses.

¹¹ For the way particularized properties or tropes relate to states see Footnote 7.

7 OTHER NONREFERENTIAL COMPLEMENTS

7.1 *The range of other nonreferential complements*

For predicative complements, the syncategorematic treatment I have argued for is hardly novel. It is only the nominalizing analysis of special propredicative quantifiers that is. The account of predicative constructions that I have given, however, is of greater importance: exactly parallel data can be found with other kinds of complements as well—in fact with all complements that can be considered nonreferential and allow for (special) noun phrases in place of them. The various constructions with such nonreferential complements include predicates taking functional NPs (or a replacing special quantifier) as in (40a), intensional predicates taking NPs as in (41) and in (42) (intensional reading of verbs of sensation), predicates taking *that*-clause and infinitival complements (as well as special quantifiers) as in (43), (44), and (45), predicates taking naked infinitives, as in (46), and measure constructions as in (47):

functional NPs:

- (40) a. John changed his trainer. (i.e. John took a new trainer)¹²
b. John changed something.

intensional verb (modal):

- (41) a. John needs exactly two secretaries.
b. John needs something.

intensional verb (perceptual):

- (42) a. John saw a ghost.
b. John saw something.

propositional attitude verb (*that*-clause complement):

- (43) a. John thought that Mary likes Bill.
b. John thought something.

- (44) a. John imagined that he will win.
b. John imagined something.

¹² Functional NPs in the relevant sense seem to occur only in object position. There are well-known cases in which NPs that at first sight seem to function in the same way in subject position, such as:

- (1) a. The temperature is rising.
b. The number of students increased.

intentional verb (infinitival complement):

- (45) a. John tries to win.
b. John tries something.

perception verb (bare infinitive complement):

- (46) a. John heard Mary leave.
b. John heard something.

measure construction:

- (47) a. John weighs ten kilo.
b. John weighs something.

For all those complements a Relational Analysis is common, if not standard. Functional NPs like *his trainer* in (40a) are usually analysed as denoting functions that will act as arguments of, for example, the change-relation in (40a) (cf. Montague 1974; Löbner 1979), intensional NPs as in (41) as intensional quantifiers (functions from worlds to sets of properties) (cf. Montague 1974; Moltmann 1997) or, plausibly in (42), as properties (cf. Zimmermann 1992; Moltmann 1997). The quantifiers or properties will then act as arguments of, for example, the need-relation in (41a) and the see-relation in (41b). The traditional and most widely accepted view about *that*-clauses as in (43) and (44)—both in philosophy and linguistic semantics—is that they express propositions which act as arguments of the relation expressed by the predicate, for example, the think-relation in (43a) and the imagine-relation in (44a) (see, for example, Schiffer 1982). Infinitival clauses as in (45) are generally assumed to denote either propositions or properties, which will then act as arguments of the relation expressed by the predicate (cf. Chierchia 1984).¹³ Naked infinitives such as *Mary leave*, it has been argued, denote situations or events which will act as arguments of a perceptual relation, for example, the hear-relation in (46a) (cf. Barwise & Perry 1983; Higginbotham 1983). Finally, measure constructions as in (47a) are

- c. The president is elected every four years.

These cases, however, are of a different kind. Here the NPs behave like referential NPs, not allowing a replacement of special NPs in the same way:

- (2) a. # The same thing is elected every four years.
b. He is elected every four years.

(1a–b) involve referential NPs, referring to special kinds of objects, objects with ‘variable constitution’, that is, that have different material manifestations at different times.

¹³ Portner (1997) takes infinitival complements to denote other kinds of entities, but the argument would hold for his view as well.

naturally taken to involve a number (denoted by *ten kilo*), to act as an argument of, in this case, the weigh-relation.

Thus, we have the following logical forms for the sentences (40a)–(47a) (adopting Higginbotham’s account of naked infinitives in (48g)):

- (48) a. $\text{change}(\text{John}, \lambda t[[\text{trainer}]^t(\text{John})])$
 b. $\text{look for}(\text{John}, \lambda w[[\text{exactly two secretaries}]^w])$
 c. $\text{see}(\text{John}, \lambda x[\text{ghost}(x)])$
 d. $\text{think}(\text{John}, [\text{that Mary is happy}])$
 e. $\text{imagine}(\text{John}, [\text{that Mary is happy}])$
 f. $\text{try}(\text{John}, \lambda x[\text{win}(x)])$
 g. $\exists e(\text{hear}(\text{John}, e) \ \& \ \text{leave}(e, \text{Mary}))$
 h. $\text{weigh}(\text{John}, 10)$

Such analyses, however, face the Substitution Problem and the Objectivization Effect, which arise as soon as the complement is replaced by a description of the kind of entity (whatever it may be) that has been taken to act as the argument of the verb. Thus, the following examples are semantically unacceptable, or rather can’t be understood in the same way as the ones above:

- (49) a. John changed this function / some entity / some object (namely his trainer).
 b. John needs this intensional quantifier / some entity / some object (namely exactly two secretaries).
 c. John sees that object / that quantifier / that appearance.
 d. # John thought the proposition / the possibility / the fact that Mary is happy.
 e. John imagined the proposition / the possibility / the fact that Mary is happy.
 f. John tried the property of winning / the action of winning.
 g. John heard the event of Mary’s arrival.
 h. John weighs that number / the same number / the same measure / the same entity as Mary.

Furthermore, the quantifiers in the b-examples above can be shown not to range over the kinds of arguments that have been posited within a Relational Analysis. First, there are data parallel to those with predicative constructions showing that special quantifiers do not quantify over the kinds of objects the relevant predicates require as arguments. Relative independence of syntactic category and semantic type is shown in (50a), where *look for* would require an intensional quantifier, but *obtain* an object; in (50b), where *weighs* would require

a number (measurement), but *expect* a proposition, in (50c), where *said* would require a clausal complement, but *about* an NP; in (50d) where *contrasts* and *with* would require NPs, but *thinks* a clausal complement, and in (50e), where *wants* would require an infinitival complement, but *about* an NP:

- (50) a. John is looking for something quite hard to obtain. (type $\langle s, \langle \langle s, \langle e, t \rangle \rangle, t \rangle \rangle$ and type $\langle \langle e, t \rangle, t \rangle$)
 b. John weighs something I never expected.
 c. John sometimes says something Mary very much dislikes, namely he hates to work. (type $\langle s, t \rangle$ and type e)
 d. Mary will never contrast what John thinks with what Sue thinks. (type e and type $\langle s, t \rangle$)
 e. John wants something I did not know about.

Moreover, as we will see below, the predicates that can act as the restrictions of special quantifiers show that special quantifiers do not range over abstract objects such as functions or propositions, but rather what the corresponding explicit nominalizations (e.g. *thought*, *imagination*, *need*, *weight*) would stand for.¹⁴ The challenge then is to develop an appropriate analysis of the syncategorematic meaning of the verb and of the nominalization process involved with the special quantifier.

7.2 Some suggestive analyses of other nonreferential complements

For some constructions, such as functional NPs with *change*, a syncategorematic analysis may be obvious (*change* would be analysed as a temporal operator, operating on the denotation of the definite

¹⁴ Nonreferential complements also share the relevant syntactic properties of predicative complements. Thus extraction of wh-phrases replacing clausal complements is just as bad, as opposed to extraction of referential complements:

- (1) a. What don't you believe John thinks? (—that he will win the race)
 b. Which proposition don't you believe John believes?
 (2) a. * What don't you believe John is looking for? (—a secretary)
 b. Which person don't you believe John is looking for?
 (3) a. * What don't you believe John changed (—his trainer)
 b. Which person don't you believe John changed.
 (4) a. * What don't you think John heard (that John heard Mary leave)
 b. Which person don't you think John heard?
 (5) a. What do you believe he weighed t (possible answer: 100 kilo)
 b. What don't you believe he weighed t (impossible answer: 100 kilo)

NP). But for many constructions a syncategorematic analysis is not obvious at all, and to give such an analysis for each construction is a task far beyond this paper. Instead I will focus on two cases that are of particular interest, because there are already nonrelational analyses available in the philosophical literature. These analyses, motivated entirely by philosophical, nonlinguistic considerations, can now, given the linguistic facts, be seen in a new light. The two cases are first intensional verb constructions with perception verbs as in (42a) and second attitude verbs as in (43) and (44). Of particular interest is also the measurement construction in (47), which I will give some attention to as well.

7.2.1 Perception verbs with intensional complements The complements of perception verbs in the intensional construction in (42a) do not describe the external object that may be perceived, but rather the way the perceived object appears (allowing for perceptual illusion) or perhaps describe a mere appearance (perceptual hallucination). On a Relational Analysis, intensional *see* would take a property as its semantic argument (or perhaps an intensional quantifier—but let's set this option aside). This property would naturally be taken to characterize the appearance involved in the perceptual experience that is described (since there need not be an external object or no suitable external object). The philosophical view about perception that would match with this analysis would be one on which the direct object of perception, at least in cases of perceptual illusion and hallucination, is a sense datum (the Sense Datum Theory of Moore and others). The Relational Analysis of intensional verbs based on the Sense Datum Theory would thus be as follows, where SEE is the relation of direct perception:

(51) $\langle d, P \rangle \in [see]$ iff for a sense datum a such that $P(a)$, $SEE(d, a)$.

If a relational analysis of complements of intensional verbs is taken for granted, then intensional perception verbs seem to give a good piece of support for the Sense Datum Theory.

The Sense Datum Theory is highly controversial as a philosophical theory, however. Without going into detail, the problems concern first the perceptual relation itself which, it has been argued, relates the agent directly to the world, rather being mediated by another objectual level of sense data. Second, they concern the status of sense data as objects: in a number of ways sense data do not behave like ordinary objects with respect to the properties they may be attributed (sense data

may be underdetermined and underspecified with respect to properties normally attributed to objects and may have contradictory properties).

The construction in (42a) gives no evidence for the Sense Datum Theory, however, if it is to be analysed syncategorematically rather than relationally—that is, if in some way *see a ghost* is analysed as a complex predicate rather than a predicate-argument construction. In the philosophical literature, the view about perception that corresponds to such an analysis is the so-called *Adverbial Theory* of perception (Chisholm 1957; Tye 1984, 1989; Audi 1998). The adverbial theory denies that appearances act as intermediary objects between perceiver and object perceived. Instead it takes complements apparently specifying appearances to form part of a complex predicate together with the perception verb. Thus, in *the chair looks green, looks green* acts as a complex predicate, as would *see a ghost* in (42a).

Sometimes, as the name suggests, such complements are taken to act like adverbials, qualifying the experience (rather than as descriptions of sense data) (cf. Tye 1984, 1989; Audi 1998). That is, (42a) would be analysed as something like ‘John saw ghostly’. But linguistically, this seems rather problematic: adverbials like *yesterday* and *quickly* generally can be viewed as expressing properties of events (as on a Davidsonian view), whereas it is quite unclear how *green* in *the chair looks green* or *a ghost* in *John saw a ghost* could be viewed as a property of events: it is certainly not the perception that is green or ghostlike. The complements *green* and *a ghost* rather seem to play the role of predicates in some predicative act involved in the perceptual experience itself. Without further elaborating a philosophical nonrelational analysis of intensional perception verb constructions, it seems fair to say that in such an analysis the complements will play a predicative role, rather than the role of providing an argument (a sense datum) for a perceptual relation.

From a semantic point of view, there is also something right, however, about the Sense Datum Theory. It is certainly objects like sense data that nominalizations as in (52) refer to:

- (52) a. The appearance of a ghost frightened John.
 b. Mary gave the impression of a young girl.
 c. The feeling of an imminent disaster made John nervous.

Moreover, special quantifiers can be used in place of the predicative complements of perception verbs, and then, it appears, they introduce entities that behave just like sense data. This is because first, these entities do not have to correspond to external objects and second, they will be attributed the nonsortal sensory properties that predicative

complements would express. Thus, from (53a) we can infer (53b) and (53c) (but not (53d)):

- (53) a. When John looked at the donkey, he saw a grey horse.
 b. John saw something that was grey and horse-like.
 c. John had a grey horse-like impression.
 d. John saw something that was grey and a horse.

At the same time, appearances can have their own causal properties, as seen in (52a, c) and (54):

- (54) John saw something that disturbed him.

But this is just how sense data behave. Sense data can have two kinds of properties:

1. Sense data share properties of the object they purport to represent (expressed by predicative complements of verbs of appearance)—as long as these properties are sensory (perceivable) and nonsortal, that is, they do not specify a type of object (this is what distinguishes *grey*, which expresses a sensory nonsortal property, from *horse*, which expresses a sortal property).
2. Sense data have their own causal and temporal properties. Special quantifiers, like explicit nominalizations, may also stand for kinds of appearances, appearances different agents may share, as in (55):

- (55) a. John saw the same thing as Mary, namely a ghost.
 b. John and Mary had the same visual illusion of a ghost.

In the context of natural language semantics, I will take appearances to be derived objects that can be ‘obtained’ from a verb of appearance and a predicate—in English or a possible extension of English. Then, sense data or appearances can be characterized in terms of the three conditions in (56a–c) and kinds of appearances as in (56d):

- (56) For any object d , verbs of appearance V and V' and predicates W and W' ,
- a. The appearance $A(d, V, W)$ exists iff $d \in [VW]$
 - b. An appearance $A(d, V, W)$ is identical to an appearance $A(d', V', W')$ iff $d = d'$, $[VW] = [V'W']$, and $[W] = [W']$.

- c. An appearance $A(d, V, W)$ has a nonsortal sensory property P' if $[W]$ entails P' .
- d. $A_k(V, W)$ = the kind of appearance k such that for any instance i of $i = A(d, V, W)$ for some object d .

Thus, *see something* on the intensional reading can be analysed as in (57a), which is obtained by applying [*some*] as given previously in (35b) to the second relation in (57b):

- (57) a. $[see\ something_2] = [see\text{-}thing_2\ some\ e] = \{x \mid \exists y \exists W \in \text{pred(ENGL)} (x \in [see\ W] \ \& \ y = A_k(see\ W))\}$
- b. For a perception verb V ,
- $[V\text{-}thing_1] = \{\langle x, y \rangle \mid \exists W \in \text{pred(ENGL)} (x \in [see\ W] \ \& \ y = A_k(x, V, W))\}$
- $[V\text{-}thing_2] = \{\langle x, y \rangle \mid \exists W \in \text{pred(ENGL)} (x \in [see\ W] \ \& \ y = A_k(V, W))\}$

Explicit nominalizations will be analysed on the basis of the functions A and A_k as well. In English, it happens that nominalizations that stand for appearances, *appearance*, *impression*, *illusion* etc. are not derived from a transitive intensional verb of perception: *appear* does not take an agent as argument, *impression* and *illusion* are not derived from a verb at all in Modern English. Nonetheless it is reasonable to assume that such nominalizations lead to the same entities as special quantifiers with perception verbs. The noun *impression* thus would be analysed on the basis of the intensional verb *see* as in (58a) (denoting a relation between particular appearances and agents) and in (58b) (denoting a set of kinds of appearances). In the absence of an explicit complement, we will have the corresponding denotations in (58c) and (58d):

- (58) a. $[impression_1\ of\ a\ W] = \{\langle x, y \rangle \mid x = A(y, see, W) \ \& \ y \in [see\ a\ W]\}$
- b. $[impression_2\ of\ a\ W] = \{x \mid x = A_k(see, W)\}$
- c. $[impression_1] = \{x \mid \exists y \exists W \in \text{Pred(Engl)} (x = A(y, see, W) \ \& \ y \in [see\ a\ W])\}$
- d. $[impression_2] = \{x \mid \exists W \in \text{Pred(Engl)} x = A_k(see, W)\}$

Sense data on this view are derived objects that do not play an essential role in perceptual relations, but are introduced only by means of a nominalizing expression for the purpose for saying something more about the perceptual process. The linguistic facts thus give justice both to the intuitions of the Adverbial Theory and, in a way, of the Sense Datum Theory.

7.2.2 *Attitude verbs with clausal complements* Let me now turn to attitude verbs. I have discussed and analysed attitude reports in great detail in Moltmann (2003a). In what follows, I will mention only the most relevant aspects of the analysis. That attitude verbs may not allow for the substitution of a clausal complement by a proposition-referring NP has already been observed by Prior (1971) (see also Asher 1993, and Bach 1997). Not all attitude verbs show the Substitution Problem and the Objectivization Effect (for example, *believe* does not).¹⁵ However some, such as *think* and *imagine*, do, and this suffices to make the argument.¹⁶

Think is an attitude verb that displays the Substitution Problem, that is, it does not allow for a replacement of the *that*-clause complement by a description of a proposition (cf. 49e); *imagine* is an attitude verb that displays the Objectivization Effect, that is, when a *that*-clause complement is replaced by a description of a proposition as in (49f), the proposition won't act as the content of the imagination anymore, but rather as the object the imagination is about. As (43b) and (44b) show, neither the Substitution Problem nor the Objectivization Effect show up when the complement is replaced by a special quantifier.¹⁷

In the case of clausal complements, the Substitution Problem

¹⁵ In many cases, a clausal complement can be replaced by certain types of referential NPs, apparently preserving the same meaning of the verb. For example, a clausal complement of *believe* can be replaced by *the proposition that S*, a clausal complement of *remember* by *the fact that S*, and a clausal complement of *fear* by *the possibility that S*:

- (1) a. John believes that he will win.
b. John believes the proposition that he will win.
- (2) a. John remembers that Mary is waiting.
b. John remembered the fact that Mary is waiting.
- (3) a. John feared that he might lose.
b. John feared the possibility that he might lose.

Other attitude verbs that do not allow for any replacement of a *that*-clause complement by a referential NP are *claim*, *know*, *realize* and *hope*:

- (4) a. John knows / realized that snow is white.
b. ?# John knows / realized the fact / proposition that snow is white.
- (5) a. John hopes that he will win.
b. # John hopes the possibility / proposition / fact that he will win.

¹⁶ There are transitive verbs that do not select NPs syntactically. *Wonder*, an often cited example, still allows special NPs (as pointed out to me by Richard Kayne), but *complain* seems to resist any kind of NP:

- (1) a. John wondered whether it is Monday. Mary wondered the same thing.
b. John complained that it is too hot. # Mary complained the same thing.

The common explanation is that verbs like *complain* do not assign case to their complement, clausal complements not requiring or even resisting case (cf. Stowell 1981; Pesetsky 1982).

¹⁷ This fundamental semantic difference between the construction of an attitude verb taking a clausal complement and that of an attitude verb taking a referential NP does not exclude that the

and the Objectivization Effect are even more difficult to account for in terms of a Fregean distinction between concepts and objects. The intuitive distinction between saturated entities (objects) and unsaturated ones (concepts) can hardly be made for propositions. One could at best draw a formal distinction between propositions that are primitive objects (elements of the denotation of the noun *proposition*) and propositions that are complex objects, e.g. structured propositions (the semantic values of *that*-clauses). But if this goes along with making the distinction between properties as primitive objects and properties as functions, another internal problem arises: structured propositions may contain a function f and at the same time act as an argument of f , namely in cases of iterated belief or examples such as (59) (cf. Cresswell 1985):

(59) That the book is interesting is interesting.

On the structured-propositions view, *that the book is interesting* stands for the pair consisting of the property of being interesting and the book. This pair then acts as the argument of the predicate *interesting*. But this is impossible on a functional conception of properties: *interesting* would take as its arguments objects constructed from the property of being interesting and other objects.

The presence of clausal complements and the possibility of replacing them by a special quantifier has widely been taken, both by philosophers and semanticists, to require a relational analysis on which the attitude verb expresses a relation between agents and propositions. The problems for this very common analysis, however, are exactly parallel to the problems we found for the relational analysis of predicative constructions. Once the arguments against such an analysis are accepted for the latter, they must also be accepted for the former. In the case of attitude verbs, it is just much less clear how a syncategorematic analysis should look like. The philosophical literature does provide some proposals, however.

First, there is Hintikka's (1962) view that attitude verbs act like modal operators, universally quantifying over possible worlds compatible with what the agent thinks (or imagines or whatever the attitude is). The problems for that proposal, however, are well-known (i.e. the problems of closure of logical consequences and logical omniscience). Another proposal that is best cast as a syncategorematic analysis is the Measurement Analysis, discussed in Matthews (1994).

sentence *John believes the proposition that S* ascribes a propositional attitude to John where it so happens that *S* also characterizes the mere content of a belief of John.

According to the Measurement Analysis, the *that*-clause does not denote the content of the attitude at all, but only serves to represent the described attitudinal state with respect to its semantic properties (i.e. entailments, truth conditions, aboutness conditions). The attitude verb thus would specify a function that maps the agent's attitudinal state onto the sentence or proposition given by the complement just in case the attitudinal state and the sentence or proposition share their semantic properties. The semantics of attitude reports thus would be assimilated to that of measurement reports such as (47a), and the explanation of the Substitution Problem would be the same in both cases.

The question the Measurement Analysis raises in the present context is, why is the relation between an object and the element chosen to represent its relevant properties not be expressed by verbs in English, leading to a relational semantic structure. One might speculate that English imposes a general condition on what relations can be expressed lexically (categorically). The condition would be that English verbs can express only empirical or natural relations, not relations that are artificially stipulated as holding among objects and measuring entities, that is, elements of some arbitrarily chosen representational system (such as the system of rational numbers with their precedence ordering). I will have to leave it with these remarks. Clearly, the Measurement Analysis requires much further elaboration for which this, however, is not the place.

Russell, finally, once proposed a nonrelational analysis of attitude reports, what is called the 'Multiple Relations Analysis' (Russell 1913, 1918). A 'modern' version of this analysis is developed in Moltmann (2003a). Briefly, the Russellian analysis says that a sentence of the sort *John thought that Mary is happy* is to be analysed as R (John, H, Mary), where R is a three-place thought-relation relating John to the property of being happy and Mary. This relation is 'specified' by the occurrence of the verb *think* in the presence of the complement *that Mary is happy*. In the presence of a different complement, for example *that Bill loves Mary*, a different relation will be specified, namely a four-place think-relation, connecting John to the loving relation, Bill, and Mary. Thus, on the Multiple Relations Analysis, attitude verbs with clausal complements do not express two-place relations relating an agent to a proposition, but rather some n -place relation, connecting an agent to $n-1$ propositional constituents.

Now let us turn to special NPs when they replace the complement of attitude verbs. Here analogous observations can be made as with copula and perception verbs: special NPs with attitude verbs generally

do not stand for pure propositions, but rather for the kinds of things one would refer to with nominalizations such as *the thought that S* or *the imagination that S*. This can be seen from way evaluative predicates are understood, as well as from the possibility of causal predicates:

- (60) a. John thought something daring, namely that S.
 b. The proposition that S is daring.
 c. The thought that S is daring.
- (61) a. John imagined something terrible, namely that S.
 b. The proposition that S is terrible.
 c. The imagination that S is terrible.
- (62) a. John thought something that gave him a lot of confidence.
 b. John's thought gave him a lot of confidence.

Clearly, (60a) and (61a) imply (60c) and (61c), respectively, rather than (60b) and (61b) (which do not make much sense). This clearly means that *something* when replacing a clausal complement of an attitude verb does not range over the kinds of things that have been taken as the meanings of sentences, i.e. propositions. They range instead over things of the sort of thoughts and imaginations.¹⁸

Another set of data gives additional support for that. These data show that predicates cannot participate in the free relative clause construction if they are of different types (that is, if they describe different types of propositional attitudes) (see also Asher 1993):¹⁹

¹⁸ Again, we can see that plural NPs do not count as special (cf. footnote 3). They would not be supported by a conjunction of clausal complements, but only a conjunction of referential NPs referring to facts or propositions:

- (1) a. John remembered that Mary rejected him and that Sue betrayed him. He remembered it/ # them well.
 b. John remembered the fact that Mary rejected him and the fact that Sue betrayed him. He remembered them well.

¹⁹ The generalization that the free relative clause construction requires verbs of the same type has apparent exceptions such as these:

- (1) a. I believe what you claim.
 b. I heard what you said.

The distinction, however, between relational and syncategorematic (uses of) attitude verbs and the fact that free relative clauses like *what you claim* stand for claims can explain such examples. In (1a), *what you claim* stands for a claim, and it is this claim that will act as an argument of the two-place verb *believe*. In (1b), similarly, *what you say* stands for a claim or utterance, which will act as an argument of the two-place verb *hear*. The acceptability of (1a) and (1b) correlates with the acceptability of (2a) and (2b) respectively, and both cases should be analysed as in (3a) and (3b):

- (63) a. John thought what Bill thought (calculated / speculated).
 b. # John thought what Mary imagined, namely that he will return.
- (64) # John thought something that Mary imagined, namely that he will return.

Such data can, to a greater or lesser degree, be found with all kinds of different attitude verbs. Importantly, parallel data can also be construed with explicit nominalizations:

- (65) a. John's thought was also Bill's thought (calculation / speculation).
 b. # John's thought was also Mary's imagination.

There are speakers that accept (65b), but they seem to coincide with those that accept (64). Note that in (65) *John's thought* can't refer to a particular thought of John's, but rather must refer to the kind of thought that is instantiated in John (as well as in Bill).

But what are thoughts and imaginations, or more generally *attitudinal objects*? Given that such entities incorporate the contribution of the attitude verb as well as a propositional content, the Russellian analysis provides a straightforward account: an attitudinal object can be construed as, roughly, the state in which the n -place attitudinal relation holds among the propositional elements that make up the propositional content. Thus attitudinal objects can be characterized by the conditions in (66a) and (66b) and kinds of attitudinal objects as in (66c):

- (66) For n -place attitudinal relations R and R' , $(n - 3)$ -place relations Q and Q' , agents d and d' , and objects $a_1, \dots, a_{n-3}, a'_1, \dots, a'_{n-3}$ ($n > 2$),
- a. an attitudinal object $O(R, d, Q, a_1, \dots, a_{n-3})$ exists iff $R(d, Q, a_1, \dots, a_{n-3})$.
- b. an attitudinal object $O(R, d, Q, a_1, \dots, a_{n-3})$ is identical to an attitudinal object $O(R', d', Q', a'_1, \dots, a'_{n-3})$ iff $R = R'$, $d = d'$, $a_1 = a'_1, \dots, a_{n-3} = a'_{n-3}$.
- (2) a. I believe your claim.
 b. I heard your utterance.
- (3) a. believe(I, your claim)
 b. hear(I, your utterance)

- c. $O_k(R, Q, a_1, \dots, a_{n-3}) =$ the kind k such that for any instance i of k , $i = O(R, d, Q, a_1, \dots, a_{n-3})$ for some agent d .

Attitudinal objects differ in one respect from states. Attitudinal objects also have content-related properties, relating to the truth value of the propositional content, as in (67):

- (67) a. John thought something that implies X and that is true.
b. John's thought implies X and is true.

Thus, thoughts, are particulars, individuated on the basis of both the content of the attitude verb and the content of a *that*-clause—just like appearances were individuated both on the basis of the content of the perception verb and properties of the object the appearance purports to represent. Thoughts, one might say, are contents qua being thought. As such, they are subject to the 'Property-Inheritance Condition' in (68):

- (68) For an attitudinal object $O(R, d, Q, a_1, \dots, a_{n-3})$, if for any truth value-based property P , $\langle Q, a_1, \dots, a_{n-3} \rangle$ has P , then $O(R, d, Q, a_1, \dots, a_{n-3})$ has P .

Explicit nominalizations can similarly be analysed as in (69a) (particular attitudinal objects) and (69b) (kinds of attitudinal objects):

- (69) a. [*thought*₁ *that Mary is happy*] = $\{ \langle x, y \rangle \mid x = O(R, y, H, \text{Mary}) \}$
b. [*thought*₂ *that Mary is happy*] = $\{ x \mid x = O_k(R, H, \text{Mary}) \}$

This was only a sketch of the motivations and the formal development of a 'Neorussellian' account of attitude verbs. For more elaboration the reader is referred to Moltmann (2003a).

Note that the alternative to the Russellian analysis, the measurement analysis, should also be able to give an account of attitudinal objects since measure phrase nominalizations display similar identity conditions as attitudinal objects. That is, what the measure phrase refers to is not an abstract object like a number, but a particular which has corresponding causal and evaluative properties and which includes the contribution of the measure verb:

- (70) a. John weighs something scary, namely more than 200 pounds.
b. ?? 200 is scary.
c. John's weight is scary.

- (71) a. # John's weight is Mary's height.
b. John's weight is Bill's weight.

Scary in (70a) is predicated of the kind of entity that *John's weight* refers to, as in (70c), not the mere number 200, which, as indicated in (70b), leads at least to a different reading. That John's weight is not a mere number is shown also in the contrast between (71a) and (71b): (71a), unlike (71b), is impossible because John's weight includes the particular kind of measurement, which cannot possibly be shared by Mary's height.

7.2.3 *To mean and its complement* Let me finally mention another verb that takes nonreferential complements and obviously plays a central role in the philosophy of language, namely the verb *to mean*. *Mean* takes *that*-clauses as well as special quantifiers as complements. Thus (72a) entails (72b) and (72c):

- (72) a. 'La neige est blanche' means that snow is white.
b. 'La neige est blanche' means something.
c. 'La neige est blanche' means the same thing as 'snow is white'.

But *mean* does not allow the *that*-clause to be replaced by a description and thus displays the Substitution Problem:

- (73) a. ?? 'La neige est blanche' means the proposition that snow is white.
b. ?? 'La neige est blanche' means the meaning of 'snow is white'.

Mean thus does not take meanings as arguments. Meanings as entities, it appears, come into play only with the use of special quantifiers, or in fact the explicit nominalization (!) *meaning*. Natural language thus gives nice support for views within philosophy of language according to which meanings are not objects (such as use-theoretic views (Wittgenstein)). At the same time, it provides the usual means for reifying meanings, namely nominalizing expressions.

8 COGNATE OBJECTS AND SPECIAL NPS

Special quantifiers, on the analysis I have given, act like nominalizations in that they induce a domain of derived objects just like explicit nominalizations. However, special quantifiers differ from explicit

nominalizations in their semantic role: they don't act as referential complements, but operate on a replacing complement and the content of the verb to obtain their quantification domain.

It can be considered additional support for this analysis that there are occurrences of explicit nominalizations that act just like special quantifiers. These are what is called *cognate objects*. The most discussed (though not presently relevant) case of cognate object occurs with intransitive verbs, as in (74):

- (74) a. John jumped a high jump.
b. John lives a better life.

Such cognate objects seem as if they have the role of making explicit the implicit Davidsonian event argument of the verb (cf. Moltmann 1989).

Cognate objects are possible, however, also with transitive verbs that would take nonreferential complements, such as *think* in (75a) and *dream* (75b) (*that*-clauses) and *weigh* in (75c) (measure phrases):

- (75) a. John thought an interesting thought.
b. John dreamed a nice dream.
c. John weighs the same weight as Mary.

The complements in the examples in (75) do not spell out the event argument of the verb: thoughts and dreams have content-related properties not shared by events (thoughts but not acts of thinking can be true, dreams but not acts of dreaming can become true), and weights certainly are not events at all. Instead, the complements in (75) seem to act just like special quantifiers, ranging not over potential arguments of the predicate, but inducing a domain of quantification on the basis of the content of the verb and a replacing nonreferential complement. Thus, (75a) can be given the same analysis as *John thought something interesting*, as indicated below:

- (76) a. $[think\text{-}thought] = \{ \langle x, y \rangle \mid \exists S (S \in \text{Sent}(\text{Engl}) \ \& \ x \in [think \text{ that } S] \ \& \ y \in [thought \text{ that } S]) \}$
b. $[thought \text{ an interesting thought}] = [think\text{-}thought \text{ some } e \text{ interesting}] = [thought \text{ something interesting}] = [some]([interesting])([think\text{-}thing])$

Cognate objects and special NPs thus can act in the same kind of nominalizing non-argument-providing function.

9 CONCLUSION

This paper has developed the view that derived or ‘secondary’ objects play a secondary role in two ways: first, ontologically and in the analysis of philosophically relevant concepts (e.g. propositional attitudes and perception); second, in the semantic structure of a sentence, by being generally introduced by nominalizations rather than basic expressions. The semantic structure of sentences then naturally divides into two levels: a primary level consisting of basic predicate-argument relations and a secondary level at which secondary objects are introduced by nominalizing expressions.

Nominalizations, it turns out, do not refer to objects that then also function as the meanings of nonreferential complements (properties, functions, propositions). Rather they refer to more concrete things—in the case of predicative complements, states or kinds of them; in the case of intensional perception verbs, sense data or kinds of them; in the case of attitude verbs, attitudinal objects or kinds of them; and similar kinds of objects also in the other cases. Formal semantic objects such as properties and propositions thus seem to come to play a role as objects only when referred to by such rather technical terms as *the property of being P* or *the proposition that S*.

It appears that the area that this paper started investigating, in particular the properties of ‘special NPs’ displays a particularly strong connection between philosophical and ontological issues on the one hand and natural language semantics (and even syntax) on the other hand.

APPENDIX: THE TYPE-THEORETIC ACCOUNT

One way of understanding the Fregean distinction between objects and concept is as an ontological distinction among two sorts of entities. Alternatively, the distinction might be construed as a distinction among the semantic contributions of two sorts of syntactic categories (or syntactic functions) to a proposition. The types of type theory may be understood analogously in the two ways. In this appendix, I will discuss the type-theoretic account with respect to the second, syntactic way of construing the distinction—which seems to me more adequate given the basic assumptions of type theory.

Type theory seems at first sight to allow for a straightforward account of the Substitution Problem and the Objectivization Effect. Since a lot of work in formal semantics makes use of type theory, it is important to see how the type-theoretic account would in fact fare. I think once its basic assumptions are spelled out, there is in fact not really a genuine solution available within type theory.

These, as I understand, are the basic assumptions of type theory. Type theory establishes a close correspondence between syntactic categories and denotations, by specifying that an expression belonging to a category of a given type must have a denotation that comes from a particular domain of entities, the domain that corresponds to that type. There are basic types, such as e and t , which, even though they as types are distinct, may have overlapping domains. For example truth values can both be denoted by sentences and referred to by noun phrases (*the truth value true*). Complex types such as $\langle a, b \rangle$ consisting of types a and b have a domain that consists in functions from entities in the domain of a to entities in the domain of b . The syntactic operation of combining expressions is generally matched with the semantic operation of function application. That is, if an expression A is of type $\langle a, b \rangle$ and another expression B of type a , then the denotation of the combination of A and B , $A^{\wedge}B$, will be the application of the function denoted by A to the semantic object denoted by B , i.e. $[A]([B])$. As a result, $A^{\wedge}B$ will be of type b .

An expression of a category that corresponds to type e will have as its denotation an element of the domain D of entities; an expression of (a category that corresponds to) type $\langle e, t \rangle$ will have as its denotation an element of the domain of functions from D to the set of truth values $\{1, 0\}$; and an expression of type $\langle s, t \rangle$ will have as its denotation an element of the domain of functions from the set of possible worlds W to $\{1, 0\}$.

Applying type theory to natural language requires assigning particular types to syntactic categories. It is well-known, however, that it is not possible to establish a one-to-one correspondence between natural language syntactic categories and types (cf. Williams 1983). For example, NPs can be of type e (referential NPs, which take individuals as denotations), of type $\langle \langle e, t \rangle, t \rangle$ (quantificational NPs, which take as denotations functions from sets of individuals to truth values) or of type $\langle e, t \rangle$ (or $\langle s, \langle e, t \rangle \rangle$) (predicative NPs, which take as denotations functions from (worlds to functions from) objects to truth values). What is required therefore is an assignment of types to syntactic categories when they play a particular semantically relevant syntactic role.

The type-theoretic perspective would account for the Substitution Problem and the Objectivization Effect in the following way: if a predicative complement is substituted by a referential NP, unacceptability or a different reading results because the referential NP is of a different type from that of the predicative complement. Type theory does not (or rather does not on all versions) say that this means that the predicate or

a particular meaning associated with the predicate requires one object rather than another. The acceptable and the unacceptable sentence (or that with a different reading of the predicate) may involve exactly the same object as an argument of the predicate. This is because the same object may belong to two domains of different types: for example, type theory specifies that all referential NPs—including *the property of being P*—are of type e , but it does not prevent an object actually denoted by such an NP to be exactly the same as that denoted by a particular sentence (a proposition)—even though a sentence will be of type $\langle s, t \rangle$. Types, in other words, do not serve to distinguish objects, but rather objects together with the categories of the expressions that denote them. To look at the differentiation among types as an ontological distinction would be a misguided projection of syntactic categories onto ontology.

This means, however, that a type-theoretic account of the Substitution Problem has to assume that the predicate does not really denote a two-place relation (which could be defined in terms of how objects themselves relate to each other), but rather a three-place relation taking objects as well as other objects and a syntactic category as arguments. Or alternatively, only the predicate together with the denotation of the complement and its syntactic category expresses a one-place relation or property. But this is in fact saying that the predicate and the complement by themselves have the status of syncategorematic expressions, expressions that do not themselves have a conceptual meaning, but rather make a semantic contribution to the sentence only relative to the syntactic context in which they occur.

As a further remark we note that the point also carries over to generalized quantifiers, which have been taken as the generalized denotations of quantificational and referential NPs and as such to act as arguments of predicates. It is clear now that generalized quantifiers do not act as arguments of a true relation expressed by a predicate, but rather constitute a syncategorematic meaning which composes with the syncategorematic meaning of the predicate specified for the generalized quantifier type. Otherwise the Substitution Problem would arise with generalized quantifiers as well, that is, the failure of the inference from (1a) to (1b):

- (1) a. John saw someone.
- b. John saw the existential generalized quantifier.

Type theory also fails to offer an explanation of the Objectivization Effect. Type theory would say that a verb like *imagine* is ambiguous, being specified for type $\langle e, \langle e, t \rangle \rangle$ ($\langle \langle \langle e, t \rangle, t \rangle, \langle e, t \rangle \rangle$) as well as for

type $\langle\langle s, t \rangle, \langle e, t \rangle\rangle$. But as a matter of fact *imagine* may take exactly the same *objects* as arguments in the two cases. Moreover, on both the content-related and the object-related reading, *imagine* syntactically selects NPs as arguments. Thus the two lexical meanings cannot be distinguished in terms of categorial selection. That is, the two meanings of *imagine* could not be grounded in syntactic selectional requirements. Which meaning of *imagine* to choose when interpreting a sentence would rather depend on the ‘type’ associated with the argument, where such a type has to be understood as either a partly syntactic object or in some ontological, Fregean way.

Type theory faces another difficulty, namely when trying to account for special NPs. Special NPs behave like NPs in all syntactic respects and thus should not form a separate syntactic category. But since special NPs don’t block substitution and don’t lead to the Objectivization Effect, they would have to be of the same type as the predicative complement. But then special NPs may be of a different type than the syntactic category they belong to. But this would mean a serious deviation from the spirit of type theory in that the assignment of types would not be driven by the syntactic behavior of expressions (their syntactic category and syntactic role), but rather be lexically idiosyncratic.

Even if such deviations were to be allowed, there is a serious problem for type theory, namely the fact noted in Sections 6 and 7 that special NPs cannot be specified for a particular type, but rather may relate to argument positions of two predicates simultaneously that are specified for different types. That is, they must be ‘beyond types’.

Type theory thus does not offer its own account of the Substitution Problem and the Objectivization Effect. Rather, depending on how types are understood, if type theory gives an account at all, this account reduces to the Fregean or the syncategorematic one.

Type theory moreover fails to account for another important generalizations established in this paper, namely that the kinds of entities special quantifiers range over are just the kinds of things explicit nominalizations refer to.

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