

## 6

## Reifying Terms

Natural languages display various sorts of referential noun phrases that serve to introduce an entity on the basis of a non-referential expression. One such noun phrase was discussed in Chapter 1, namely *explicit property-referring terms*, noun phrases introducing a property either as in (1a) on the basis of a predicate (*wise*), or on the basis of an expression plurally referring to tropes (*wisdom*), as in (1b):

- (1) a. the property of being wise  
b. the property of wisdom

Other noun phrases that introduce entities on the basis of non-referential expressions were discussed in Chapter 2, namely *explicit fact-referring terms*, as in (1c), and *explicit state-referring terms*, as in (1d). Possibility-referring terms as in (1e) were not explicitly discussed, but they belong to the same type:

- (1) c. the fact that John is wise  
d. the state of John's being wise  
e. the possibility that it might rain

Such noun phrases introduce facts and states on the basis of (non-referential) clausal complements (*that*-clauses or gerunds).

NPs that serve to introduce entities on the basis of non-referential expressions are generally definite NPs composed of a sortal noun (*property, fact, state*) followed by a non-referential expression. In Chapters 1 and 2, I sketched an account according to which such NPs introduce objects whose properties can be read off true sentences in which the relevant non-referential expression occurs. That is, NPs of the sort in (1) obtain their referents by reifying, in a certain way, the use or meaning of the non-referential expression that follows the sortal. Thus, they can be called *reifying terms*. Reifying terms do not describe their referents or refer to them directly; rather they introduce them in a way that is reflected in their syntactic structure.

The class of reifying terms includes another important type of NP besides the one exemplified by (1a–d), namely NPs like the following:<sup>1</sup>

<sup>1</sup> Reifying terms of this sort have not received a lot of attention in the linguistic literature. Aside from the article of Jackendoff (1984) (who does not use a particular term for the construction), they have been

- (2) a. the name “John”  
b. the poet Goethe  
c. the fictional character Sherlock Holmes
- (3) a. the numeral “four”  
b. the number four
- (4) the color green
- (5) a. the metal gold  
b. the kind human being
- (6) a. the truth value true  
b. the direction north  
c. the concept horse

Those NPs, I will argue, all introduce their objects of reference on the basis of a non-referential expression or non-referential occurrence of an expression, the expression following the sortal head noun. In all cases, I will argue, they introduce their object of reference on the basis of the mention rather than the use of the expression following the sortal. In the most interesting cases (2c), (3b), (4), (5), and (6a–c), this introduction consists in the reification of the meaning or use of a non-referential expression, that is, in the introduction of an abstract object on the basis of an expression not referring to an abstract object or any object.

The goal of this chapter is to give a syntactic characterization of reifying terms, to sketch a general semantics for them, and to discuss in some detail particular kinds of reifying terms, namely those involving reference to numbers, colors, and expression types. The chapter will also introduce new criteria for what I call *quasi-referential referential terms*, expressions which can take the position of referential NPs, but which do not in fact have a referential semantic function. They include simple numerals, color adjectives, and *that*-clauses as they occur in reifying terms.

## 1. The general structure and semantics of reifying terms

The general linguistic structure of reifying terms consists of a definite determiner, followed by a sortal noun, followed by a non-referential or non-referentially used expression. I will call the latter the *denominative complement*, since it serves, in a sense, to

discussed mainly in the French linguistic literature (Kleiber 1984, van de Velde 2001) as “binominal denominative structures.”

A term used for the particular case of (2b) is “close apposition.” This does not mean, though, that the syntactic relation between the sortal and the following expression is one of apposition (Jackendoff 1984). Kleiber (1984) uses the term “inverted apposition.”

The existing literature restricts itself generally to reifying terms expressing an apparent identity of referents, as in (2b), or to categorized mentions, as in (2a). The present focus is on such terms in their reifying function best exemplified by the examples (4), (5), and (6).

name the entity that the reifying term refers to.<sup>2</sup> The reifying terms in (2)–(6) in particular have the following structure:

- (7) definite determiner—sortal noun—denominative complement

In (2a), the denominative complement is not used referentially, but rather is quoted. I will argue that even in (2b), the proper name that acts as the denominative complement is not used referentially. This is also the case in (2c), allowing the reifying term to introduce a fictional character as its object of reference based on the pretend use of the name in the story. Similarly, not only in (3a), but also in (3b) the numeral is not used referentially. In fact, simple numerals, I will argue, are non-referential expressions not only when occurring as determiners or noun modifiers, but also when occurring in apparently referential position. In (4), an explicit color-referring term, the denominative complement *green*, can itself function both as an adjective and as a bare noun, but even in the latter case it retains a non-referential status, or so I will argue. The kind-referring term *the kind human being* in (5) was discussed already in Chapter 1, where I argued that a bare mass noun like *human being* is not a referential singular term, but a modalized plural term, referring to the various instances of the kind in the different circumstances. In (6a–c), the denominative complements are adjectives and nouns and thus not referential expressions.

The sortal in reifying terms has a particular semantic role that is different from its standard semantic role as a sortal. In the context of a reifying term, it does not just express a property specifying identity conditions for an object (the standard semantic role of a sortal), but rather it has an object-introducing (“reifying”) function. It serves to introduce an object, in one way or another, based on the denominative complement, possibly together with a particular context in which the denominative complement may occur. Different reifying nouns introduce objects in that way differently, which I will come to shortly.

Reifying terms divide into two distinct formal types, which I will call *type 1 reifying terms* and *type 2 reifying terms*. Type 1 reifying terms are those in (1). Type 2 reifying terms are those in (2)–(6). Reifying terms of both types consist of the same components: the definite determiner *the*, a sortal noun, and a non-referential or non-referentially used expression. They also introduce their objects of reference in similar ways. However, they have somewhat different syntactic properties.

The main difference between type 2 reifying terms and type 1 reifying terms concerns the denominative complement. In type 2 reifying terms, the denominative

<sup>2</sup> The term “denominative complement” should not imply that the two terms in the construction stand in an ordinary relation of complementhood. McCawley (1998) points out that the sortal can itself take an ordinary complement:

(i) the former president of the US and one-time Hollywood actor Ronald Reagan

The relation between the sortal head noun and the denominative complement is thus not that of an ordinary complement.

complement is not subject to any conditions whatsoever on its syntactic category or syntactic features. It can be an NP, but also an adjective or a determiner. In fact, it can be of any syntactic, morphological, or phonological category whatsoever. It can even be a mere sound (*the sound pff*). Moreover, it can be an expression from a different language (*the French adjective rouge*) or a mere symbol (*the symbol &*). To unify those various cases, the denominative complement in type 2 reifying terms is best considered mentioned, not used. Contexts of quotation, and only those, do not impose any constraints whatsoever on the sorts of expressions they can accept. If the denominative complement is mentioned rather than used, this means that the denominative complement does not itself act as an expression-referring term, but rather simply “presents itself” with all its linguistic features: its syntactic, morphological, phonological, and phonetic form, as well as its meaning, and possibly referent and context of use. By contrast, in type 1 reifying terms, the denominative complement must be a clause or the complement of a preposition (*of*). Moreover, in type 1 reifying terms, the denominative complement is not mentioned but used with its usual denotation, such as in (1a) a property, in (1b) the plurality of instances of wisdom, and in (1b) and (1c) a proposition, that is, the configuration of propositional constituents given by the embedded sentence (Chapter 4).

While there is a range of rather diverse kinds of reifying terms, they have a common syntactic structure and semantics. In all cases, the function of the sortal is to introduce an object of reference on the basis of the (generally) non-referential denominative complement (and possibly its context of use). The strategies of introducing objects of reference are different, though, for different sortals. Sortals in their reifying function differ in the way they exploit different aspects of the presentation of the denominative complement. They take into account the formal aspects of the denominative complement in the case of expression-referring terms, and its referent in the case of *the poet Goethe*.<sup>3</sup> In the case of *the fictional character Sherlock Holmes*, it is the pretend use of the name in the story; and in the case of *the number four*, it is the non-referential, “adjectival” use of the numeral in arithmetical contexts, given what Dummett calls the “Adjectival Strategy” (Section 5).

The latter two strategies of introducing objects are particularly interesting philosophically. Introducing objects such as fictional characters or numbers on the basis of

<sup>3</sup> The close apposition *the poet Goethe* simply picks up the referent of the mentioned name *Goethe*. As was pointed out to me by O. Matushansky, it differs in that respect from noun phrases like *Goethe the poet* or *Goethe as a poet*. The latter appears to introduce a new object of the sort “Goethe qua being a poet” or “Goethe from the point of view of being a poet” (as opposed to the point of view of being a neighbor or a lover), which would involve another form of reification. Thus, whereas (ia) is perfectly fine, (ib) and (ic) sound peculiar because the predicate has nothing to do with Goethe being a poet:

- (i) a. The poet Goethe was a nice man.
- b. ? Goethe the poet was a nice man.
- c. ? Goethe as a poet was a nice man.

non-referential expressions or uses of expressions means introducing objects that are not subject to empirical investigation, objects whose nature is exhausted by the constitutive conditions that go along with the strategy of introducing them. This raises a range of questions of rather fundamental sorts, questions that generally arise with theories that allow objects to be introduced on the basis of expressions or concepts, such as the theory of pleonastic entities of Schiffer (2003) and Fregean and neo-Fregean approaches to numbers as entities introduced by principles of abstraction from concepts (Wright 1983, Hale 1987).<sup>4</sup>

One question that such theories raise is: what guarantees that the so-introduced objects exist, and in what sense do they exist, given that they are not part of the empirical world? Another question is: how can it be decided if the introduced objects have particular properties that are not fixed by the strategy of introducing them, properties that would not be fixed on the basis of the relevant expressions (or their uses) or concepts?

A third question that the theories raise is whether the introduced objects are to be considered dependent on language, and in particular, the existence and use of a reifying term. Schiffer (1996) has pointed out that the view that the properties of a pleonastic entity can be read off the contexts in which a particular expression occurs non-referentially does not mean that the object-introducing term *creates* the object. In Schiffer's terms, the introduced objects are "language-created," but "language-independent" objects (Schiffer 1996). They would exist even if no one used or created the corresponding object-introducing term, as long as the conditions are satisfied that make the various contexts true in which the non-referential correlate may occur. The use of the object-introducing terms simply enables epistemic access to the objects that depend on those contexts (Schiffer 1996). Thus, fictional characters depend entirely for their existence and identity on the story and its origins. However, this does not mean that fictional characters themselves are "created." Rather, once the story occurring in the story exists in a world, the fictional character occurring in the story exists there as well, whether or not anyone conceived of it or referred to it. Once there is the story, an object that is a fictional character occurring in the story exists as well. This view naturally carries over to the other cases of reifying terms.

A fourth question concerns general constraints on strategies for introducing entities based on non-referential expressions or concepts. One general constraint that has been proposed is conservativity (Schiffer 1996): the introduction of the new entities should lead to a conservative extension of the existing theory, that is, roughly, it should not

<sup>4</sup> The latter approaches are meant to apply to natural language expressions that I do not think introduce objects based on non-referential expressions or concepts. Schiffer (2003) takes *that*-clauses to be referential terms whose referents, "pleonastic propositions," are introduced on the basis of sentences, and he takes properties generally to be introduced by predicates. Frege and neo-Fregeans take numbers to be introduced by concepts, which in turn is taken to be reflected in the linguistic structure of terms like *the number of planets*. My own view is that *that*-clauses do not act as referential terms (Chapter 4) and that *the number of planets* does not refer to a number, but rather to a "number trope" (Chapter 2).

lead to new truths except for statements involving the reifying terms themselves that are in question.

I will not address in greater depth questions like these, which the semantics of reifying terms will raise. The purpose of this chapter is simply to identify a syntactic category of reifying terms as terms whose semantics involves strategies of introducing objects on the basis of non-referentially used expressions occurring in those terms.

Often, the denominative complement of a reifying term has a quasi-referential status. In general, the expressions acting as the denominative complements can occur in syntactic positions in which also referential terms can occur. This holds for quotations, number words, and simple color words, as well as of course bare adjective nominalizations and *that*-clauses. Syntactically, such expressions look like referential terms (and have often been mistaken for referential terms), but semantically they in fact do not have that status, as we will see. Rather they are *quasi-referential terms*. This means also that predicates that can be true with quasi-referential terms do not really express a property of objects, but rather have a syncategorematic status. If the same predicates are true with corresponding reifying terms, this is because the predicates have a secondary, categorematic meaning, a semantic role in which they do express properties of objects. Three “degrees of objecthood” associated with the use of terms thus can be distinguished. The first degree involves the use of quasi-referential terms that do not have objects as referents. The second degree involves the use of reifying terms, which involves the introduction of objects of reference on the basis of linguistic structure. The third degree involves reference to “real” objects not driven by language or concepts.

In what follows, I will first present a further range of syntactic properties of reifying terms and present criteria showing the referential status of reifying terms. Then I will discuss in detail three specific kinds of reifying terms: those introducing expressions, numbers, and colors. Finally, I provide syntactic evidence for the non-referential status of the denominative complement in reifying terms, in particular quotations, numerals, and color words.

## 2. Linguistic properties of reifying terms

Reifying terms of the two types share a number of syntactic properties, besides containing a sortal head noun and a denominative complement:

[1] Restriction to the pleonastic determiner

Both types of reifying terms require a definite determiner. Moreover, the determiner must be the simple definite determiner *the* and cannot be, for example, a quantifier or the demonstrative *that*:

- (8) a. ??? that name ‘John’  
 b. ??? every philosopher Strawson  
 c. ??? John has never heard a name ‘Joelle’.

- (9) a. ??? some color green  
 b. ??? a certain color turquoise
- (10) a. ??? the fact that it is raining  
 b. ??? a fact that someone left  
 c. ??? a certain fact that someone left

The simple definite determiner *the* in reifying terms is in fact the pleonastic determiner, a simple definite determiner that fails to convey definiteness, but rather occurs in contexts where definiteness is ensured already independently (such as with proper names in those languages that require a determiner with a proper name) (Longobardi 1994).<sup>5</sup>

[2] No restrictive modifiers

Both types of reifying terms resist restrictive modifiers. Thus, the examples below are impossible:

- (11) a. ??? the first philosopher Strawson I met  
 b. ??? the lightest color green  
 c. ??? the white metal gold  
 d. ??? the first fact that someone failed the exam

Non-restrictive modifiers, by contrast, are unproblematic (*the popular color red, the beautiful metal gold*); neither are adjectival modifiers that modify the sortal only (*the German name 'Gretchen', the classical composer Haydn*).

[3] Alternation with reifying predicates

Both types of reifying terms alternate with predicative constructions in which the denominative complement acts as the subject and the sortal introduces the predicate (which itself then allows for an indefinite determiner).<sup>6</sup>

- (12) a. That S is a fact I was not aware of.  
 b. That S is a possibility I have not thought of.
- (13) a. Wisdom is a property that is admirable.  
 b. Generosity is a property that is nice.

<sup>5</sup> Type 2 reifying terms may alternatively contain a possessive NP in specifier position:

- (i) my brother Bill

I take it that the definiteness that goes along with possessive NPs may be just as redundant as that of a pleonastic determiner. This is supported by the fact that a quantified NP in specifier position could not change the inherent definiteness of the combination sortal-denominative complement:

- (ii) ??? every student's mother Mary

(ii) is impossible even in a context in which every one of the relevant students happens to have a mother named "Mary."

<sup>6</sup> This alternation has been observed for type 2 reifying terms referring to expressions by Kleiber (1984).

- (14) a. “John” is a name that is given to many boys.  
 b. Sherlock Holmes is a fictional character that is well known
- (15) a. Twelve is a number that interests me a lot.  
 b. “Twelve” is a numeral that is simpler than “thirteen.”
- (16) Green is a color that is complementary to red.

As was discussed in relation to predicative and clausal complements, the sortal in this construction has a reifying effect as a predicate, and the subject has a non-referential status. Let me therefore call the complex predicates in (11)–(16) *reifying predicates*.

Type 1 and type 2 reifying expressions differ linguistically in two respects. First, only type 2, not type 1, reifying terms allow for the plural:

- (17) a. the names “John” and “Mary”  
 b. the numbers two and four  
 c. the colors green and red  
 d. the metals gold and silver
- (18) a. ★ the propositions that it will rain and that it will snow  
 b. ★ the facts that John is wise and that Mary is intelligent

This difference, though, does not hold for reifying predicates:

- (19) a. Wisdom and intelligence are properties I appreciate a lot.  
 b. That it will rain and that it will snow are two facts that I was not aware of.

Second, only in type 2 reifying terms does the denominative complement occur in what looks like an intensional (in fact hyperintensional) context. In type 1 reifying terms, the denominative complement does stand for an intensional entity (a property or a proposition), but it does not occur in an intensional context, a context in which an expression would have a different meaning than it usually does. The denominative complement in type 1 reifying terms has the same intensional entity as its meaning (a proposition or property) as it has anywhere else. By contrast, in type 2 reifying terms, the denominative complement occurs in what looks like an intensional or hyperintensional context. Thus, the denominative complement in type 2 reifying terms does not allow for substitution by a description describing the entity it appears to stand for:

- (20) a. ??? Mary’s brother Bill’s father (John = Bill’s father)  
 b. ??? the name Joe’s last name  
 c. ??? the numeral the word two  
 d. ??? the number the smallest prime number  
 e. ★ the color the complementary color of red  
 f. ★ the kind that kind



Expression-referring reifying terms make clear that not only the meaning (and referent) of the denominative complement may matter for specifying the referent, but also its form. Depending on the sortal head noun, the denominative complement may make different sorts of contributions to the fixing of the referent of the entire referential term. In *the poet Goethe*, only the referent of the denominative complement matters. In *the name John* and *the numeral four*, it is its form. In *the kind human being*, *the color green*, *the truth value true*, *the direction north*, and *the concept horse*, it is its meaning. In *the fictional character Sherlock Holmes*, it is its use in a fictional context. These various cases can be unified if the denominative complement is considered as merely mentioned, that is as merely “presenting itself,” with its phonological, morphological, and syntactic form and its meaning, and, if applicable, its referent and context of use.<sup>7</sup> The presentation may also include the (pretend) use of the expression in the story, and its inferential role in the relevant (e.g. mathematical) contexts, as well as various linguistic practices involving it. It will be a matter of the reifying strategy, which of these features of the *presentation* of the expression are exploited.

The denominative complement of type 2 reifying terms is rather special in that it may be of any syntactic category whatsoever. In fact, it need not even be a syntactic unit and thus belong to a syntactic category. It may just be a morphological or phonological unit (as in *the morpheme wer*, *the letter k*), or even just a phonetic unit or a mere sound (*the sound pff*). The denominative complement need not satisfy any syntactic condition whatsoever, such as being case-marked. In fact, the denominative complement enjoys the very same syntactic freedom as any quoted expression.<sup>8</sup>

Since the reifying sortal has the function of mapping the presentation of the denominative complement onto an object, this means that uniqueness of a referent is guaranteed already by the sortal head noun. Therefore, the definite determiner need not make its own semantic contribution, but as a pleonastic determiner is a mere reflection of an independently present semantic contribution of the head noun. It also means that there is simply no role for a restrictive modifier to play.

### 3. The referentiality of reifying terms

In type 2 reifying terms, the denominative complement merely “presents” an expression with its various features and contexts of use, and the sortal head noun has the function of mapping such a presentation onto an object. The different kinds of reifying terms are associated with different kinds of operations of mapping the presentation of the denominative complement onto an object. Which operation will be at play

<sup>7</sup> For the view that the denominative complement is always mentioned rather than used, see also van de Velde (2001).

<sup>8</sup> The denominative complement, just like quotation in general, poses a challenge to syntactic theory, namely how such elements can be integrated into the syntactic structure of the sentence. As far as I know, no account has as yet been developed.

depends on the sortal that is the head noun of the reifying term. The operation may consist in making the mentioned expression the object of reference (*the name John*), in introducing a number as an object on the basis of the determiner meaning of numerals (*the numeral four*), in introducing a color object on the basis of predicative and attributive uses of color words (*the color green*), in introducing a kind object on the basis of a plurality of possible particulars (*the metal gold*), or in introducing a truth value on the basis of the conceptual meaning/application conditions of “true” (*the truth value true*).

An important question that imposes itself is, are reifying terms really referential terms, referring to objects? There are a number of standard criteria for referential terms, such as their ability to “flank the identity sign,” as Frege would put it, or to be replaced by quantifiers (under certain circumstances). However, such standard criteria are not unproblematic in that they are generally also satisfied by quasi-referential terms. There are more convincing criteria for referential terms, namely the applicability of object-related predicates. Unfortunately, though, there does not seem to be a single class of predicates that identify all the reifying terms as referential terms. The reason for that is that some expressions able to act as denominative complement seem to have a referential function in subject position, allowing for the same predicates as the corresponding reifying term.

Let us first look at object-related predicates for reifying terms that stand for facts or properties. One such “predicate” is the verb *exist*. *Exist* is applicable to fact-referring, possibility-referring, and property-referring reifying terms, but not to the corresponding denominative complement, or rather when it is applicable to the latter, as in (22a), it displays a different reading:

- (21) a. The fact that it is raining exists.  
 b. The possibility that it might rain exists.  
 c. ??? That it is raining exists.
- (22) a. The property of wisdom exists.  
 b. Wisdom exists.

(22a) states the existence of an abstract object, but (22b) means “instances of wisdom exist.”

*Exist* thus distinguishes between explicit fact-referring and property-referring terms on the one hand and *that*-clauses and bare nominalizations (both non-referential expressions) on the other hand. *Exist*, however, can apply to explicit expression-referring terms as well as the simple quotations that would make up their denominative complement:

- (23) a. The name “John” exists.  
 b. “John” exists.
- (24) a. The numeral “two” exists.  
 b. “Two” exists.

This indicates that the subject position is a referential quotational context, allowing for quoted expressions to act as expression-referring terms (Section 4).

Another type of predicate that is indicative of true referential terms is evaluative predicates, such as *nice* or *interesting*. When applied to kinds or properties as objects, such predicates evaluate an abstract entity, but they have an instance-related reading with bare plurals and mass nouns. The examples below illustrate the differences:

- (25) a. Human beings are nice.  
b. The kind human being is nice.
- (26) a. Originality is interesting.  
b. The property of being original is interesting.

Unlike in (25a), *nice* in (25b) evaluates a kind as an abstract object, and unlike in (26a), *interesting* in (26b) evaluates a property as an abstract object.

Evaluative predicates are useful, however, only when the denominative complement is a plural term. For example, evaluative predicates are equally applicable to simple quotations and explicit expression-referring terms in subject position (which again is indicative of the subject position being a referential quotational context, as will be discussed in Section 4).

Another type of predicate making the distinction is predicates expressing object-related attitudes. Thus, the predicates below appear to distinguish between referential and non-referential expressions:

- (27) a. The possibility that it might rain was the object of John's worry.  
b. ?? That it might rain was the object of John's worry.
- (28) a. The number twelve was the topic of John's article.  
b. ?? Twelve was the topic of John's article.
- (29) a. The color green was the subject of his research.  
b. ?? Green was the subject of his research.

There may be other kinds of predicates in particular cases indicative of the referentiality of reifying terms. In the case of fictional characters, there is an established distinction between “nuclear” properties (properties predicated within the story of the entity the author pretends to refer to) and “extranuclear” properties (properties the fictional character has as an entity in itself). Reifying terms referring to fictional characters are formally of exactly the same sort as other type 2 reifying terms. Thus, one might take the applicability of predicates expressing extranuclear properties to be indicative of the referential status of the reifying term standing for a fictional character. However, predicates expressing extranuclear properties are applicable not only to the semantic values of reifying terms, but also to those of simple proper names, which thus may themselves be able to refer to fictional characters (*Shakespeare created Hamlet/the fictional character Hamlet*). That is, the denominative complement of such reifying terms

can be used to refer to the very same entity as the reifying term itself. This is not so, for example, for reifying terms referring to numbers, colors, properties, or facts.

After these general considerations regarding reifying terms, let me now turn my attention to three particular cases of reifying terms of type 2.

#### 4. Expression-referring terms and quotation

In expression-referring reifying terms, the denominative complement has the status of a quotation. A nearly standard view about quotation is that it involves the formation from an expression *X* of a new referential term referring to *X* (let us say by “silent” quotes). Yet the denominative complement of an expression-referring term could not involve quotation in that sense. In fact, there are several types of quotation that could not involve the formation of an expression-referring term. If quotation amounts to the formation of an expression-referring term, then a quoted expression “*X*” and the term *the expression X* should be interchangeable without change in the meaning of the relevant sentence as a whole. However, in most contexts “*X*” and *the expression X* are in fact not interchangeable.

At least three contexts of quotation should be distinguished: *referential*, *predicative*, and what I will call *presentational contexts*. Only referential quotational contexts involve an expression-referring use of quotation and thus allow the quoted expression to be substituted by an explicit expression-referring term. The subject position in general is a referential quotational context:

- (30) a. “Joe” has three letters.  
       a’. The name ‘Joe’ has three letters.  
       b. “Walk slowly” consists of two words.  
       b’. The expression “walk slowly” consists of two words.

Predicative quotational contexts are those of the complement position of verbs of calling. They involve the attribution of a name to an individual. As illustrated below, they do not permit the substitution of the complement by an explicit expression-referring term:<sup>9, 10</sup>

<sup>9</sup> Matushansky (2008) argued that names in naming constructions as in (31, 32) generally have the status of predicative NPs, rather than referential NPs. In general, they show the syntactic behavior of predicates and in fact, in many languages, they display predicative marking. This means that NPs in a quotational role in contexts such as (31, 32) do not involve quotation in the sense of an operation forming an expression-referring term; rather the expression will figure in a predicative meaning, whatever that may consist in (see Matushansky 2008 for a proposal).

<sup>10</sup> There are also contexts in which an explicit expression-referring term can appear, but not a simple quotation:

- (i) a. They gave him the name “John.”  
       b. ??? They gave him “John.”

- (31) a. They called him “John.”  
 b. ??? They called him the name “John.”
- (32) a. He was baptized “John.”  
 b. ??? He was baptized the name “John.”

Presentational quotational contexts include those of the complement position of verbs of utterance as well as meaning. Some verbs of utterance do not easily allow for a replacement of the complement by an explicit expression-referring term, for example *say*, or *scream*:

- (33) a. John said “I will come”/? the sentence “I will come.”  
 b. John screamed “yes”/? the expression “yes.”

Others, though, do:

- (33) c. John cannot repeat spell/pronounce/write down “Gretchen”/the name “Gretchen.”

Such verbs set up a referential quotational context.

Also the verb *mean* does not allow for a replacement of its complement by an explicit description of an expression or a “meaning”:<sup>11</sup>

- (34) a. The French adjective “rouge” means “red.”  
 b. ??? “Rouge” means the expression “red”/the meaning of “red.”

As (30) and (33c) make clear, the referential quotational role is itself dependent on a syntactic context: it requires a particular kind of predicate if the expression is in object position or else it requires the expression to be in subject position. This means that there is no operation of quotation as such for forming expression-referring terms. There are only *quotational roles* for expressions, licensed by the syntactic and lexical environment in which the expression occurs. One such role is that of acting as an expression-referring term; another role is that of acting predicatively in an act of calling; yet a third role is that of simply presenting itself, with its form and content and perhaps pronunciation. This is what happens in the complement position of *say*, *scream*, and *mean*, but also in the position of the denominative complement of a reifying term.

There is one approach to quotation that is particularly suited for those contexts of quotation, namely an approach according to which quotation amounts to an act of mentioning (Saka 1998)—or in fact the mere presentation of the expression with all its

<sup>11</sup> Note that predicational and presentational quotational contexts allow the quoted expression to be replaced by a special quantifier, as in the valid inferences from (31a), (32a), and (34a) to the sentences below:

- (i) a. There is something they called him.  
 b. There is something he said.  
 c. The French adjective “rouge” means something.

formal, semantic, and contextual aspects. This is thus the approach to be adopted for the quotational context of reifying terms. Note that this means that the semantic analysis of reifying terms will ultimately have to be embedded within a use-theoretic semantics theory based on the sorts of acts performed by uttering expressions in particular syntactic contexts and not just their meaning or reference.

## 5. Number-referring terms and simple numerals

Number-referring reifying terms such as *the number two* constitute a particularly interesting case, with implications for the concept of number itself. Number-referring reifying terms involve two conceptions of numbers with one being more fundamental than the other is.

Number-referring terms are formed with simple numerals as denominative complements. There are several sorts of evidence to the effect that simple numerals do not in general act as referential terms referring to numbers, but rather retain the meaning they have when occurring as determiners or modifiers (as in *two children* or *the two children*). The semantic differences between simple numerals and explicit number-referring terms appear to match a particular view about the nature of numbers in the philosophy of mathematics, namely what Dummett called the *Adjectival Strategy*.

Simple numerals obviously occur primarily as determiners or modifiers of NPs, as in (35a, b) and only secondarily as (apparent) referential terms as in (35c):

- (35) a. Eight women were invited.  
 b. The eight women were invited.  
 c. Eight is divisible by two.

*Eight* in (35c) has the (apparent) status of a referential term both because of its occurrence in the subject position of a sentence and because it occurs with a predicate that also applies to the referents of referential terms (such as *the number eight*).

The common view about occurrences of numerals as in (35c) is that they act as ordinary referential terms referring to numbers as abstract objects. Standard tests for referential terms customary among philosophers seem to support this view, for example Frege's criterion of being able to occur at both sides of the identity symbol and the possibility of replacing the numeral by a quantifier such as *something* (cf. Hale 1987):<sup>12</sup>

- (36) a. The sum of two and six is eight.  
 b. If eight is divisible by two, then something is divisible by two.

However, these criteria are not conclusive as to the semantic role of such terms. There are criteria that distinguish between explicit number-referring terms and simple

<sup>12</sup> Hale's criterion is in fact considerably more complex, but it does involve special quantifiers.

numerals, to the effect that simple numerals should not be regarded as ordinary referential terms, but rather as quasi-referential terms.

### 5.1. *Mathematical and non-mathematical properties*

With certain types of predicates simple numerals and explicit number-referring terms are interchangeable, for example with those below:

- (37) a. Four is divisible by two.  
b. The number four is divisible by the number two.
- (38) a. John added two to four.  
b. John added the number two to the number four.

However, simple numerals and explicit number-referring terms do not share the same range of predicates with which they are acceptable. Three classes of predicates need to be distinguished regarding their behavior with number terms:

- [1] Non-mathematical predicates  
[2] Mathematical predicates  
[3] Predicates describing agent-related mathematical operations.

I will start with non-mathematical predicates, since with them the difference between simple numerals and explicit property-referring terms is particularly striking. The difference is most apparent with relative-clause constructions containing non-mathematical predicates. The latter are strange with simple numerals, but fine with explicit number-referring terms:

- (39) a. ?? Twelve, which interests me a lot, is an important number in religious and cultural contexts.  
b. The number twelve, which interests me a lot, is an important number in religious and cultural contexts.
- (40) a. ?? Twelve, which I like to write my dissertation about, is not a prime number.  
b. The number twelve, which I like to write my dissertation about, is not a prime number.
- (41) a. ?? Twelve, which I thought about a lot, is not divisible by five.  
b. The number twelve, which I thought about a lot, is not divisible by five.

However, relative clauses modifying a simple numeral are fine when the predicate expresses a purely mathematical property:

- (42) a. Twelve, which is divisible by two, is not a prime number.  
b. Two, which is even, is a prime number.

As expected, if the sortal *number* occurs as part of a reifying predicate, non-mathematical predicates with simple numerals are acceptable:

- (43) a. Twelve, which is a number that interests me a lot, ...  
 b. Twelve, which is a number I like to write my dissertation about, ...  
 c. Twelve, which is a number I thought about a lot, ...

The difference between mathematical and non-mathematical predicates also manifests itself in the following constructions:

- (44) a. ?? Twelve is what I write my dissertation about.  
 b. Twelve is a number I like to write my dissertation about.
- (45) a. ?? I like to write my dissertation about twelve.  
 b. I like to write my dissertation about the number twelve.

What characterizes predicates like *interest me*, *write about*, or *think about*? They are intentional object-oriented predicates and thus express relations outside of the mathematical context. In fact, it appears that in general non-mathematical predicates are excluded with simple numerals.

Not all, but only some, mathematical predicates behave differently with explicit number-referring terms and with simple numerals. Before looking at arithmetical statements themselves, let us first attend to one particular number-related predicate, namely the verb *count*, a verb that distinguishes between simple numerals and explicit number-referring terms. *Count* accepts as complements only simple numerals, but not explicit number-referring terms, at least not on the relevant reading:

- (46) a. Every day, John has to count the visitors. Today, he counted ten; yesterday, he counted two; before yesterday, he counted zero.  
 b. ?? John counted the number ten.

In (46a), *count*, with a simple numeral, displays an intensional reading: John may have counted ten, even if there were only nine individuals he tried to count. The reading of *count* in (46a) is quite different. If when counting the visitors, John counted ten, he did not count the number ten. If John counted the number ten, then (if he counted correctly) he must have counted one, rather than ten.

Why does *count* require simple numerals and not allow for explicit number-referring terms on the relevant reading? Given the lexical meaning of *count*, there is a straightforward explanation. *Count* as an accomplishment verb as in (46a) describes an action that results in the attribution of a plural property to a plurality. Counting a plurality does not require assigning it a number as an object, but only attributing a plural property. If the verb *count* expresses counting in the latter sense, this explains the restriction to simple numerals and the resistance of explicit number-referring terms. Only the simple numeral expresses a plural property, but not the explicit number-referring term.

Certain arithmetical statements display the same restriction to simple numerals, and an explanation of the restriction is available for those cases as well. These are in



particular sentences describing mathematical operations on two or more numbers. Thus, whereas (47a) is the natural way of expressing addition, (47b) is very strange:

- (47) a. Two and two is four.  
b. ?? The number two and the number two is the number four.

The examples below display similar if less striking contrasts:

- (48) a. Two plus two is four.  
b. ? The number two plus the number two is the number four.
- (49) a. Two times two is four.  
b. ? The number two times the number two is the number four.
- (50) a. Four minus two is two.  
b. ? The number four minus the number two is the number two.

The contrast holds in the same way for explicit number-referring terms not containing a numeral:

- (48) c. ?? The first number and the second number is the third number.
- (49) c. ? The first number times the second number is the third number.
- (50) c. ? The first number minus the second number is the third number.

The way mathematical formulae like “ $2 + 2 = 4$ ” are expressed in natural language thus does correspond to the syntax of the mathematical formula itself. In the mathematical formula, “2” and “4” are singular terms that stand for numbers as objects, “+” is a two-place functor, and “=” the two-place predicate expressing identity among objects. In arithmetical statements in English, *and* and even *plus* do not seem to act as functors taking singular terms, and *is* does not seem to express identity among objects. Yet, syntactically, *two plus two* occurs as a normal subject, and *is* as a predicate taking *four* as its complement.

This does not mean that arithmetical statements in natural language have a fundamentally different semantics from that of the corresponding mathematical formula. There are also views within the philosophy of mathematics according to which arithmetical formulae do not presuppose numbers acting as objects and numerals do not act as terms referring to numbers. This is what I will turn to now.

### 5.2. *The Adjectival Strategy*

The failure of interchangeability of simple numerals and explicit number-referring terms indicates that simple numerals are simply not terms referring to pure numbers, but rather retain the meaning they have when occurring as determiners or rather noun modifiers. Such a view has been proposed for linguistic reasons by Hofweber (2005a). Hofweber’s motivation was to account for the general linguistic fact that numerals

occur both as determiners and as singular terms. Thus, Hofweber proposed that in arithmetical statements like (51a) the numeral retains its meaning as a quantifier, and the sentence itself is a generic sentence, with a meaning indicated by the paraphrase in (51b):

- (51) a. Two and two is four.  
 b. Two things and two things are four things.

Hofweber argues that numerals undergo “cognitive type shift”: they retain their meaning as (generalized) quantifiers, but syntactically they become singular terms, for the purpose of facilitating arithmetical calculation.

The view that numerals do not semantically act as singular terms referring to numbers has also been explored for purely philosophical reasons by philosophers of mathematics such as Bostock (1974), Gottlieb (1980), and Hodes (1984, 1990). Following Dummett (1995), it has become known as the “Adjectival Strategy.” Given the Adjectival Strategy, (52a) is best paraphrased as below:

- (52) a. If there are (were) two things and two other things, then there would be four things.

The Adjectival Strategy must make use of modality to account for a domain that is too small to make the relevant sentences true (or rather false).

Using plural logic, (52a) can be formalized as in (52b), where “xx” and “yy” are plural variables able to stand for several individuals at once, and “ $\leq$ ” symbolizes the “is/are some of” relation:

- (52) b.  $\Box(\exists xx\exists yy(R_2(xx) \& R_2(yy) \& \neg\exists z(z \leq xx \& z \leq yy)) \rightarrow \forall xx\forall yy(R_2(xx) \& R_2(yy) \& \neg\exists z(z < xx \& z < yy) \rightarrow \exists ww(R_4(ww) \& xx \leq ww \& yy \leq ww \& \neg\exists z(z \leq ww \& \neg z \leq xx \& \neg z < yy)))$

That is: “in any world in which there are two things and a different two things, for any two things and a different two things, there are four things consisting of just them.”

Numerals will then take as their semantic values plural properties. To formalize (52a) as (52b), *and* and the copula *is* need to be treated as a semantic unit, expressing the following three-place relation among number relations:

- (53)  $[and, is] = \lambda R'R''R'''[\Box(\exists xx\exists yy(R'(xx) \& R''(yy) \& \neg\exists z(z \leq xx \& z \leq yy)) \rightarrow \forall xx\forall yy(R'(xx) \& R''(yy) \& \neg\exists z(z \leq xx \& z \leq yy) \rightarrow \exists ww(R'''(ww) \& xx \leq ww \& yy \leq ww \& \neg\exists z(z \leq ww \& \neg z \leq xx \& \neg z < yy)))]$

Both *and* and *is* are thus treated as syncategorematic expressions.

In addition, one-place functors can be accounted for that way. For example, *successor* can be defined as follows:

- (54)  $[successor\ of\ t] = \lambda R'\lambda R''[\forall xx\forall yy(R'(xx) \& R''(yy) \& xx \leq yy \rightarrow \exists!z(s < yy \& \neg z < xx))]$

That is, the successor of a plural property is a plural property that holds of pluralities with just one more element.

The generalization presented in the previous section adds strong linguistic evidence for the Adjectival Strategy. The Adjectival Strategy obviously can apply only to mathematical predicates and functors and not to non-mathematical ones such as intentional object-related predicates. But how can one make sense of the Adjectival Strategy from a linguistic point of view? Hodes (1990) has shown how a formal language of arithmetic can be interpreted within the Adjectival Strategy, so that number terms do not designate numbers, but “encode” quantifiers. Similarly, in the context of natural language, it is possible to take NPs that fulfill a range of criteria for “singular terms” not to refer to objects, but rather to express concepts, a generalized quantifier, or a plural property, or in fact to just have a syncategorematic function. The predicate then will not express a property of objects, but rather, as a syncategorematic expression, act together with the contribution of the NP to yield the overall meaning of the sentence. Thus, the predicate with simple numerals will have a different meaning than when it occurs with referential NPs. As we have seen, *is* with simple numerals has a different meaning than when it occurs with a referential NP as subject. The same holds for *and*, which with numerals will have a different meaning than when it occurs with referential NPs. Natural language predicates and connectives that can occur in arithmetical contexts thus are generally polysemous and display a special meaning when they are used to make arithmetical statements.

Not all arithmetical statements display a restriction to simple numerals, though. One-place mathematical predicates as well as comparative mathematical predicates are shared by simple numerals and explicit number-referring terms:<sup>13</sup>

- (55) a. Ten is even/finite.  
b. The number ten is even/finite.

Explicit number-referring terms are truly referential NPs referring to objects. The question then is: why are at least some mathematical predicates acceptable with explicit number-referring terms and do not require non-referential subjects or objects? To address this question, more needs to be said about the status of the number objects that explicit number-referring terms make reference to.

### 5.3. *Explicit number-referring terms*

The data discussed so far support a particular view of levels of involvement of numbers as objects. At a primary level, that of basic arithmetical operations with natural

<sup>13</sup> Also mathematical one-place functors are applicable both to simple numerals and explicit number-referring terms:

- (i) a. the root/successor/predecessor of four  
b. the root/successor/predecessor of the number four

numbers, the Adjectival Strategy is present and numbers in fact do not occur as objects. At the next level, the level of certain one-place mathematical properties as well as agent-related mathematical operations, the Adjectival Strategy as well as reference to numbers as objects is permitted. Finally, at a third level, that of non-mathematical properties and relations, the Adjectival Strategy is not available anymore, but only reference to numbers as objects.

This picture supports an account assimilating numbers to fictional characters. The parallels with fictional characters are strong, given a view of fictional entities such as that of Kripke (1973), Searle (1979), or van Inwagen (2000). On that view, there is only pretend reference within the story, where “nuclear” properties are attributed to an individual the author pretends to refer to. However, reference to a fictional character takes place as soon as “extranuclear” properties are predicated of the individual described in the story (or better, properties are predicated of the individual from outside the context of the story).<sup>14</sup> “Living on Baker Street” and “being a detective” are nuclear properties of Sherlock Holmes; properties such as “being a frequently cited fictional character,” “being created by Sir Arthur Conan Doyle,” and “existing only in the story” are extranuclear properties. While in purely mathematical contexts, given the Adjectival Strategy, there is neither reference nor pretend reference, mathematical properties certainly side with nuclear properties on the nuclear–extranuclear distinction. Non-mathematical properties, by contrast, side with extranuclear properties, and thus they require reference to numbers as objects. Numbers as objects of reference thus enable the attribution of non-mathematical predicates, just like fictional characters as objects of reference enabled the attribution of extranuclear properties. Numbers as objects can have certain mathematical properties, namely one-place mathematical properties as well as agent-related properties. Fictional characters do not “have” the properties attributed to them in the story (otherwise conflicts might arise with certain extranuclear properties they might have); rather they “hold” the properties, as van Inwagen (2000) puts it. Similarly, numbers, one might say, do not “have” the properties that can be read off the mathematical context, but rather “hold” them.

Fictional characters depend entirely for their existence and identity on the story and its context. However, this does not mean fictional characters themselves are “created.” Rather, as Schiffer (1996) has argued, once the story exists in a world, the fictional character exists there as well, whether or not anyone has conceived of it or referred to it. Fictional characters thus are “language-created, language-independent objects” (Schiffer 1996). The use of a referential term referring to a fictional character does not bring it into existence but simply enables epistemic access to it. The same can be said about a plausible fictionalist account of numbers. Once there are the mathematical

<sup>14</sup> The distinction between nuclear and extranuclear predicates is ultimately better replaced by a distinction between two ways of predication, external predication and internal predication. The reason is that one and the same predicate can be predicated of a fictional character externally, from outside the story, and internally, from inside the story, for example predicates like *is well-known*.

contexts in which numbers have “adjectival status,” numbers as objects can be read off those contexts. The use of explicit number-referring terms simply enables reference to them. Numbers as objects of reference enable the attribution of non-mathematical predicates, just like fictional characters as objects of reference enable the attribution of extranuclear properties.

Returning now to explicit number-referring terms, a remaining question is, why do the numbers they refer to have (or rather “hold”) some mathematical properties but not others?

Both explicit number-referring terms and simple numerals are possible with agent-related mathematical operations. There is a straightforward explanation for that: agent-related mathematical operations involve both the intentionality of actions (and thus a non-mathematical aspect) and a purely mathematical function; the former licenses explicit number-referring terms, and the latter makes simple numerals acceptable. Licensing of simple numerals comes from the arithmetical aspect, licensing of explicit number-referring terms from the intentional aspect.

Predicates like *even* or *finite* are generally defined in terms of mathematical operations, requiring simple numerals. But their content (unlike that of *plus* or *times*) is derivative upon such operations. It can equally well be defined as a property of numbers as objects: the number  $n$  has (or “holds”) a property  $P$  just in case the numeral corresponding to  $n$  plays such and such a role in a particular mathematical operation in terms of which  $P$  is defined.

Numbers as objects of reference of explicit number-referring terms will not systematically obtain all their properties from the corresponding numeral. Rather, like fictional characters, they have properties of their own. Some of them may be definable by using the corresponding numeral; others are simply supervenient on the role that the content of the numeral plays in various possible mathematical contexts and in various mathematical and non-mathematical uses of it.

## 6. Color-referring terms

The case of color-referring reifying terms is not very obvious to handle. The main question is, what kind of object should a color be, and how do *green* and *the color green* differ in reference? I will restrict myself to mentioning a few observations that will impose general conditions on how the referents of the two kinds of color terms are to be conceived.

First, one might think that a color term like *green* should be a term for a kind of trope like *wisdom*, that is, a term plurally referring to the various possible greenness tropes. *The color green* then would reify such a plurality as a single entity, just as *the property of wisdom* does with the plurality that *wisdom* stands for. The problem is that simple color words do not behave like kind terms. They contrast in that respect with the corresponding nominalizations of color adjectives such as *greenness*. Thus, simple color words do not trigger a reading existentially quantifying over instances with episodic predicates, as in (56a), as opposed to (56b):

- (56) a. ?? John noticed green.  
b. John noticed greenness.

Furthermore, evaluative predicates appear to be understood as evaluating the color as a whole rather than its instances, as in (57a), as opposed to (57b), which has a distributive interpretation:

- (57) a. Green is nice.  
b. Greenness is nice.

Moreover, instance-distribution predicates are hardly applicable to simple color words, in contrast to the corresponding adjective nominalization:

- (58) a. ?? Green is rare.  
b. Greenness is rare.

Simple color words like *green* thus differ from adjective nominalizations like *greenness*, in that the latter classify as terms standing for a kind of trope (just like *happiness* or *wisdom*).

There are also semantic differences among the corresponding definite noun phrases, such as *the green of the apple* and *the greenness of the apple*. The former can appear in predicate position, but the latter cannot:

- (59) a. John painted the car the green of this apple.  
b. ??? John painted the car the greenness of this apple.

In fact, *the green of the apple* does not refer to the trope that would be “the greenness of the apple.” Rather it refers to a universal, “green” as instantiated by the apple.

What then do simple color words like *green* stand for? Certainly, they cannot just stand for abstract objects, since they can be quantized:

- (60) a. John added some green.  
b. There is more green in this picture than in that one.

One might speculate that simple color terms stand for kinds of bearer-less tropes, tropes that can be shared by different objects and that can be quantized. Such tropes may in fact just be quantities of paint, as in (60a, b), given that these, arguably, are perceived as bearer-less.

Simple color words and explicit color-referring terms do not differ much in the sorts of predicates or readings of predicates they allow, unlike in the case of terms for numbers and expressions. However, there are some differences here as well. The predicate *contain* as in (61), for example, allows for simple color words, but is less acceptable with explicit color-referring terms:

- (61) a. The mixture of paint contains red and green.  
b. ?? The mixture of paint contains the color red and the color green.

This indicates that the referent of an explicit color-referring term such as *the color green* is in fact more abstract than what the simple color word *green* stands for and does not share the properties of concrete entities that the referent of the denominative complement *green* may have.

## 7. Syntactic indicators for quasi-referential terms

### 7.1. Replacement by special quantifiers

Some of the expressions that can act as denominative complements of reifying terms are non-referential expressions, for example simple numerals, simple color words, and *that*-clauses. Yet those expressions can appear in syntactic positions in which also referential NPs can appear, namely as subjects and as objects of predicates that generally require referential terms. When appearing in such contexts, the expressions thus classify as quasi-referential terms. In their occurrence as quasi-referential terms, they can be replaced by special quantifiers. Examples of special quantifiers taking the place of simple numerals and simple color words are given below:<sup>15</sup>

- (62) a. John prefers green. Mary prefers the same thing.  
b. John added something to something else, namely he added ten to twenty.

However, what do such occurrences of special quantifiers range over? Given that bare numerals do not stand for kinds of pluralities, as we have seen, special quantifiers replacing bare numerals should not range over kinds of pluralities either. Given the last section, it is also not obvious that simple color words stand for kinds. Note, moreover, that special quantifiers can be count quantifiers when replacing simple numerals and simple color words:

- (63) a. John added several things, three, two, and five.  
b. John compared two things, red and yellow.

This is incompatible with the view that special quantifiers are (first-level) plural quantifiers ranging over pluralities of individuals, such as kinds viewed as modalized pluralities. Rather, special quantifiers should range over single objects.

A plausible view of special quantifiers replacing simple numerals and simple color words is that they range over the same objects that would be introduced by the corresponding reifying terms. Given their replacement of quasi-referential terms, such occurrences of special quantifiers should then be considered nominalizing quantifiers, involving the mapping of a possible value of a simple number or color word onto the object that is its reification.

<sup>15</sup> The replacement of *that*-clauses by special quantifiers was already discussed in Chapters 1 and 4, where it was argued that such a replacement generally leads to the introduction of attitudinal objects or kinds of them.

### 7.2. *Syntactic peculiarities of quasi-referential terms*

It appears that referential and quasi-referential terms are also distinguished syntactically in some languages. I mention two syntactic particularities of quasi-referential terms. One of them is their inability to support plural anaphora, a peculiarity that manifests itself particularly well in German. Another consists in a certain choice between two types of relative pronouns in German.

7.2.1. *Support for plural anaphora* A conjunction of quasi-referential terms does not or does not easily support plural anaphora, unlike a conjunction of the corresponding reifying terms. By contrast, the conjunction of the corresponding reifying terms does support plural anaphora. Moreover, a conjunction of quasi-referential terms does support full NPs acting as anaphora, that is, NPs with a suitable sortal as head:

- (64) a. John acquired wisdom and experience. Mary acquired ?? them/ok those properties too.  
 b. John recognized that Mary is gifted and that Sue is ambitious. Bill recognized ??? them/these facts too.
- (65) a. ??? John wrote down “Mary” and “Sue.” Joe wrote them down too.  
 b. John wrote down the name “Mary” and the name “Sue.” Joe wrote them down too.  
 c. John wrote down “Mary” and “Sue.” John wrote these names down too.

There are differences, though, in the degree of unacceptability of a plural anaphor. Conjunctions of bare adjective nominalizations and *that*-clauses truly resist plural anaphora, as do conjunctions of quotations and simple color words. By contrast, intuitions are less sharp about conjunctions of simple numerals and color words. There are also language-particular differences. For example, in English, support of plural anaphora with conjunctions of simple numerals and color words is more acceptable than it is in German. Thus, (66a) contrasts with (66b) and (66c), (67a) with (67b) and (67c), and (68a) with (68b) and (68c), but not so for the English translations:

- (66) a. Fünf und sieben sind nicht durch zwei teilbar. ?? Sie sind auch nicht durch drei teilbar.  
 “Five and seven are not divisible by two. They are not divisible by three either.”  
 b. Die Zahlen fünf und die Zahl sieben sind nicht durch zwei teilbar. Sie sind auch nicht durch drei teilbar.  
 “The number five and the number seven are not divisible by two. They are not divisible by three either.”  
 c. Fünf und sieben sind nicht durch zwei teilbar. Diese Zahlen sind auch nicht durch drei teilbar.



“Five and seven are not divisible by two. These numbers are not divisible by three either.”

- (67) a. ??? Hans addierte zehn und zwanzig. Maria addierte sie auch.  
 “John added ten and twenty. Mary added them too.”  
 b. Hans addierte die Zahlen zehn und zwanzig. Maria addierte sie auch.  
 “John added the numbers ten and twenty. Mary added them too.”  
 c. Hans addierte zehn und zwanzig. Maria addierte diese Zahlen auch.  
 “John added ten and twenty. Mary added those numbers too.”
- (68) a. ??? Hans mag Grün und Rot. Maria mag sie auch.  
 “John likes green and red. Mary likes them too.”  
 b. Hans mag die Farbe Grün und die Farbe Rot. Maria mag sie auch.  
 “John likes the color red and the color green. Mary likes them too.”  
 c. Hans mag Grün und Rot. Maria mag diese Farben auch.  
 “John likes green and red. Mary likes these colors too.”

Why there are such language-particular differences is puzzling and remains of course to be investigated.

7.2.2. *Two kinds of non-restrictive relative clauses in German* The second indication of the quasi-referential status of an expression comes from the choice between two types of relative pronouns in German. German has two distinct types of relative pronouns. The first type, let us call it *w-pronouns*, consists in the pronoun *was*. *Was* occurs with sortal-free quantifiers as in *alles, was; nichts, was; vieles, was* (“everything that,” “nothing that,” “many things that”). The second type, let us call it *d-pronouns*, consists in *das, der, die* (singular feminine), and *die* (plural). D-pronouns cannot introduce relative clauses modifying a sortal-free quantifier such as *alles, vieles, or nichts*. They can introduce only relative clauses modifying an NP with a sortal as head, as in *der Mann, der* (“the man who”); *die Frau, die* (“the woman who”); *das Kind, das* (“the child that”); *die Leute, die* (“the people that”), or else a proper name, as in *Hans, der* (“John, who”). However, not all NPs with a sortal as head can be modified by relative clauses introduced by a d-pronoun. Predicative NPs with sortal head nouns can be modified only by relative clauses introduced by w-pronouns, not by d-pronouns:

- (69) a. Hans wurde ein erfolgreicher Künstler, was/\*das Maria nicht wurde.  
 “John became an important artist, which Mary did not become.”

In addition, adjectival predicative complements can be modified only by relative clauses introduced by w-pronouns, not by d-pronouns:

- (69) b. Hans wurde weise, was/\* das Maria bereits war.  
 “John became wise, which Mary already was.”

They differ in that respect from explicit property-referring terms (with the sortal *property*), which require d-pronouns:

- (69) c. Hans hat die Eigenschaft, weise zu sein, die/\* was Maria auch hat.  
 “John has the property of being wise, which Mary has too.”

Thus, the two types of relative pronouns distinguish between referential NPs on the one hand and predicative complements on the other hand.

The two types of relative pronouns also distinguish between referential and quasi-referential terms. First, they distinguish simple *that*-clauses from reifying terms like *the fact that S* or *the proposition that S*. The former require w-pronouns, whereas the latter require d-pronouns:

- (70) a. Hans hat erwäht, dass die Sonne schien, was/\* das Maria nicht erwähnt hatte.  
 “John has mentioned that the sun is shining, which Mary has not mentioned.”  
 b. Hans hat die Tatsache, dass die Sonne schien, erwähnt, die/\* was Maria nicht erwähnt hatte.  
 “John has mentioned the fact that the sun is shining, which Mary has not mentioned.”

Furthermore, w-pronouns and d-pronouns distinguish between simple quotations and color words on the one hand and the corresponding reifying terms on the other hand:

- (71) a. “Maria,” was/\* der der Name dieser Frau ist, ...  
 “‘Mary,’ which is the name of this woman ...”  
 b. Der Name “Maria,” der der Name dieser Frau ist, ...  
 “The name ‘Mary,’ which is the name of this woman, ...”  
 (72) a. Grün, was/\* das meine Lieblingsfarbe ist, ...  
 “Green, which is my favorite color, ...”  
 b. Die Farbe Grün, die meine Lieblingsfarbe ist, ...  
 “The color green, which is my favorite color, ...”

Finally, the two kinds of relative pronouns distinguish between simple numerals and explicit number-referring terms:

- (73) a. Zwölf, was/\* das/\*? die eine Zahl ist, die mich sehr interessiert, ...  
 “Twelve, which is a number that interests me a lot, ...”  
 b. Zwölf, was/\* das/\* die durch zwei teilbar ist, ...  
 “Twelve, which is divisible by two, ...”  
 c. Die Zahl zwölf, die/\* was durch zwei teilbar ist, ...  
 “The number twelve, which is divisible by two, ...”

The distinction between w-pronouns and d-pronouns thus classifies *that*-clauses, quotations, simple color words, and simple numerals as non-referential, and given

the occurrences of those expressions in positions in which also referential terms can appear, as quasi-referential.<sup>16</sup>

## 8. Conclusion

The aim of this chapter was to show that reifying terms form a uniform class both formally and semantically. Their formal structure motivates a particular account of their semantics. Reifying terms generally introduce an entity on the basis of their denominative complement, a non-referential occurrence, which is a mere mention of an expression. There is then a variety of ways in which such a presentation of an expression can be taken into account in order to introduce an object, by exploiting its formal, semantic, or contextual aspects.

With the exception of a proper name, the expression acting as the denominative complement is a quasi-referential expression. That is, it can occur with predicates with which also referential expressions can occur; yet its semantic function is not a referential one. The quasi-referential function manifests itself formally, by the choice of free relative clauses in German or their lack of support of plural anaphora.

The form of reifying terms, definite determiner—reifying sortal—quasi-referential term, allows in principle for a range of combinations of expressions. There are some combinations, though, that should form reifying terms, but at least in English do not function that way. Thus, whereas (74a), (75a), (76a), and (76b) are well-formed reifying terms, (74b, c, d), (75b), (77a), and (77b) are not:

<sup>16</sup> There are other singular terms that may classify as non-referential, but whose non-referential status is harder to make sense of. Names for times and certain types of places are cases in point. For example, in German names for years and for cities go with *w*-pronouns, not *d*-pronouns, in contrast to the corresponding close apposition:

- (i) a. 1930, was/\* das ein interessantes Jahr war, ...  
     "1930, which was an interesting year, ..."  
     b. Das Jahr 1930, das mich sehr interessiert, ...  
     "The year 1930, which interests me a lot, ..."
- (ii) a. Paris, was/\* das mir gut gefällt, ...  
     "Paris, which I like a lot, ..."  
     b. Die Stadt Paris, die/\* was mir gut gefällt, ...  
     "The city of Paris, which I like a lot, ..."

Like simple numerals, simple names for years are not suited for referring to the objects of attitudes, unlike the corresponding close apposition:

- (iii) a. ?? 1930, which I thought about a lot  
       b. The year 1930, which I thought about a lot
- (iv) a. ?? I wrote about 1930, which had interested me a lot.  
       b. I wrote about the year 1930, which had interested me a lot.

The question why simple names for places and times behave as quasi-referential terms remains to be investigated.

One might think of an explanation in the case of cities, namely that cities as entities are underspecified (they may be considered either spatial or political units, for example). However, such an explanation could not apply to names for times.

- (74) a. the sentence “Mary likes Bill”  
 b. ★ the sentence that Mary likes Bill  
 c. ★ the fact “Mary likes Bill”  
 d. ★ the possibility “Mary likes Bill”
- (75) a. the word “red”  
 b. ★ the property red
- (76) a. the concept horse  
 b. the concept of a horse
- (77) a. ★ the meaning horse  
 b. ★ the meaning of a horse

Different sorts of constraints appear to be at play in ruling out the unacceptable examples. Some reifying sortals, it appears, can form only type 1 reifying terms (*fact*, *possibility*, *property*) or only type 2 reifying terms (*sentence*, *word*); others can form both sorts of terms (*concepts*); yet others can form neither (*meaning*).<sup>17</sup> The semantic account of reifying terms sketched in this chapter clearly is not yet sufficiently constrained and a proper syntactic analysis of the constructions remains to be developed.

<sup>17</sup> There is also cross-linguistic variation. Thus, in French both (ia) and (ib) are possible, whereas English permits only the construction in (ia):

- (i) a. le mot “mère”  
 the word “mother”  
 b. le mot de mère  
 the word of mother

Moreover, in German, reifying city names are of type 2, whereas in English, they are of type 1:

- (ii) a. die Stadt Berlin  
 the city Berlin  
 b. the city of Berlin