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TWO KINDS OF UNIVERSALS AND TWO KINDS OF
COLLECTIONS

Natural language, as is well known, seems to involve a rather rich ontology. It easily allows for reference to universals (with nominalizations such as *honesty*) and thus seems to involve a realist ontology, with properties acting as objects. It also allows reference to collections of any sort (with plurals and conjunctive NPs) and thus seems to involve unrestricted composition. In this paper, I will argue that in the context of natural language semantics, two fundamental distinctions need to be made among two kinds of universals and two kinds of collections and moreover that those two distinctions are based on the same underlying parameter. Given those distinctions, only one of the universals and one of the collections truly classify as objects, whereas the other kind has a much secondary status. One kind of universal and one kind of collection, roughly speaking, are treated like ordinary individuals, allowing predicates to be predicated of them in just the familiar way. The other kind of universal and the other kind of collection allow predicates to be predicated only on the basis of properties fulfilled by the next lower-level entities, the instances in the case of universals and the individual members in the case of collections. Whereas nominalizations such as *honesty* refer to universals of the first sort, terms such as *the property of honesty* refer to universals of the second sort. Plurals like *the children*, moreover, refer to collections in the first sense, and collective NPs like *the group of children* refer to collections in the second sense.

The distinction between the two ways of assigning properties to entities might even give a reconstruction of the old philosophical distinction between Platonic universals and Aristotelian universals. Roughly, Aristotelian universals are inherent in the particulars that instantiate them, can be multiply located (located just where the instances are located), and exist only if they have at least one instance. Platonic universals, by contrast, are truly abstract objects: their existence is independent of the particulars that instantiate them, and they are not located in space and time at all. In terms of the two ways of assigning properties to entities, the distinction between those two conceptions of universals can be looked at as follows:



Aristotelian universals are assigned properties only on the basis of properties of or relations among their instances (e.g., an Aristotelian universal has a locational property P just in case some instances of that universal has P), whereas Platonic universals are assigned properties just like ordinary objects (Platonic universals thus can't be located in space and time because there is no particular from which they could inherit a location).

In the case of collections, there is an at least equally old philosophical distinction, discussed in the Platonic dialogues, between two ways of conceiving of group-like objects: as groups that count as 'many', as a multitude of objects, and as groups that count as 'one', as single entities, composed of individuals. The same parameter of how properties are assigned to entities will distinguish the two kinds of collections: The first kind is assigned properties on the basis of individual members, whereas the second is assigned properties directly, as a whole.

In the context of natural language, it appears, universals and collections that are assigned properties on the basis of instances or group members are primary, whereas those that are assigned properties like objects are secondary, obtained from the former by an operation of reification.

The underlying difference in the way properties are assigned explains some crucial facts about nominalizations and plurals, such as different readings of certain classes of predicates, the way existential constructions and intensional predicates are understood, and the possibility of distributive interpretation.

I will make my argument on the basis of English data. However, it is expected that the same distinctions and priorities manifest themselves across human languages in general.

1. THE DISTINCTION BETWEEN TWO KINDS OF UNIVERSALS

1.1. *Basic Assumptions*

Philosophers tend to take adjective nominalizations such as *honesty* when they occur as referential terms as in (1) to stand for properties and thus to involve a realist ontology where properties act as objects:¹

- (1) Honesty is my favorite character trait.

¹ A particularly clear statement of that view is given in Loux (1998, p. 31 ff.). Other philosophers try to reanalyse such terms or sentences involving them in terms of reference to particulars only (see Loux 1998, for discussion), or else they dispute their referential status (for example Dummett 1973, Chapter 4).

My claim will be that nominalizations such as *honesty* are much less involving ontologically and that they act quite differently from rather more technical terms like *the property of honesty*. Even though nominalizations like *honesty* stand for beings that are universals, those beings have a secondary status and do not truly act as objects. This, I will argue, has to do with the fact that *honesty* displays the typical behavior of bare (or determinerless) plurals and mass nouns in general. A brief discussion is therefore necessary about the particular behavior of bare plurals (such as *apples*) and bare mass nouns (such as *gold*).

In linguistics, it has long been observed that bare plurals and mass nouns display different readings with different kinds of predicates. In particular, they display an existential reading with episodic or stage-level predicates (predicates expressing a temporary property), as in (2a,b), and a universal or generic reading with predicates describing a permanent property, that is, individual-level predicates, as in (3a,b) (cf. Carlson 1977; Chierchia 1998):

- (2) a. John found gold.
- b. John bought apples.
- (3) a. Gold is shiny.
- b. Apples are healthy.

Bare mass nouns and plurals display a special behaviour also with intensional verbs such as *need*:

- (4) a. John needs gold.
- b. John needs apples.

The intensional reading that *need* in (4a, b) displays can be paraphrased in terms of quantification over possible objects as follows: (4a) says that John's needs are satisfied only if he has some (possible) quantity of gold, and (4b) that they are satisfied only if John has some (possible) quantity of apples. Crucially, with intensional verbs, bare plurals and mass nouns allow only for an intensional reading, not an extensional one (i.e., one on which (4b) would mean 'there is a particular collection of apples *d* such that John needs *d*') (cf. Carlson 1977).

In existential constructions, as in (5), bare plurals and mass nouns claim the existence of instances and not, as one might have thought, the existence of the (sub-)kind independently of the instances (as something that may not have instances):

- (5) a. Yellow roses exist.
- b. Three-legged dogs exist.

Finally, bare plurals and mass nouns allow for what is generally considered genuine kind predicates such as *extinct*, *rare*, and *widespread*:

- (6) a. Dinosaurs are extinct.
- b. Pink diamonds are rare.
- c. Pigeons are widespread in Europe.

Such predicates characteristically measure the distribution of the instances of the kind, possibly across different times and different actual and counterfactual situations. Let me therefore call those predicates *instance-distribution predicates*.

Linguists are divided as to how to treat the two readings bare plurals and mass nouns display with stage- and individual-level predicates. One account takes bare plurals and mass nouns to be ambiguous between acting as existential quantifiers ranging over individuals or quantities and acting as singular terms referring to kinds (cf. Diesing 1992; Kratzer 1995; Krifka et al. 1995; Longobardi 2002; Krifka 2003). The other account takes bare plurals and mass nouns to always act as terms standing for kinds, relegating the appearance of the two readings to the interpretation of the predicate (cf. Carlson 1977; Chierchia 1998). There is also the view, however, that even though English bare plurals and mass nouns may act like singular indefinites receiving an existential interpretation, all the different readings, including the existential interpretation, are possible when the bare NP is kind-referring, a situation that is replicated in the use of Italian and French plural definites (cf. Zamparelli 2002). This view is made plausible by the fact that the various readings are all available also with certain definite NPs or other NPs that are not bare NPs.

First, as Carlson had himself observed, the readings in question are available with explicit kind-referring NPs, as in (7):

- (7) a. John found this kind of fruit.
- b. This kind of animal is striped.
- c. John needs this kind of metal.
- d. This kind of animal exists.

Second, they are available with the quantifier *something* (or related quantifiers such as *several things* or the *thing*), which can replace bare plurals and mass nouns and trigger the same readings of the relevant predicates:

- (8) John found something that is rare, not often needed, and very expensive, namely pink diamonds.

In (8), *something*, which replaces a bare plural, relates (in fact simultaneously) to an episodic, an instance-distribution, an intensional, and an individual-level predicate, triggering the same readings as the bare plural would on its own.

I will henceforth assume that the different readings of the five classes of predicates are available when the bare mass noun or plural is kind-referring, while allowing other interpretations of bare mass nouns and plurals to be available as well.

1.2. *Properties and Kinds of Tropes*

Bare adjective nominalizations like *honesty* are also bare mass nouns, and they do indeed behave just like other bare mass nouns in triggering the same readings of the four classes of predicates. Bare adjective nominalizations differ in that respect from other terms that are often held to refer to the same thing, namely what I will call *explicit property-referring terms* such as *the property of being honest* or *the property of honesty*. The latter terms obviously belong to a rather technical part of English. Nonetheless they are perfectly well formed and as such trigger quite clear intuitions, and not just among speakers used to using such terms.² But explicit property-referring terms also include somewhat more ‘natural’ terms such as *the virtue of humility* or *the attribute of shyness*.

Bare nominalizations contrast in the same way not only with explicit property-referring terms, but also with very general terms, meant to refer to what the latter terms refer to, e.g., *that property* or even *that entity* or *that thing*. The relevant contrast is therefore a more general one between bare nominalizations and *property-referring terms* (rather than terms of a philosophical vocabulary that is rather limited in use).

Five kinds of predicates can be distinguished that display different readings or acceptabilities with property-referring terms and bare nominalizations:

i. *Episodic Predicates*

- (9) a. John has encountered hostility.
 b. John has encountered the property of being hostile.

² A discussion of intuitions associated with terms like *the property of being honest* and *the property of honesty* can also be found in Woltersdorff (1970, Chapter 3). Woltersdorff assumes that *honesty* and *the property of honesty*, as well as *the property of being honest* are synonymous, but notices differences between state names like *being honest* and *the property of being honest* (John can possess the latter, but not the former), which Woltersdorff, nonetheless, is willing to attribute to the use of the two kinds of terms, rather than the entities themselves that are denoted.

- (10) a. Generosity is rarely reciprocated.
- b. The property of being generous is rarely reciprocated.

Whereas (9a) is true if John has encountered an instance of hostility, (9b) could not possibly be true at all, or rather, more accurately, it could only be true in a metaphysical fantasy, let's say about Plato's heaven where John has encountered the abstract object that is the property of being hostile. The same kind of contrast holds for (10), except that it is hard to think even of circumstances of fantasy in which (10b) could be true.

ii. *Predicates of Evaluation*

- (11) a. Friendliness is nice.
- b. The property of being friendly is nice.
- (12) a. Ordinariness is boring.
- b. The property of being ordinary is boring.

Whereas the application of *nice* to friendliness in (11a) must be based on the evaluation of instances of friendliness (friendly people, gestures, behaviour) being nice, *nice* in (11b) evaluates the abstract object (implying e.g., that it has nice formal properties). *Nice* in (11b) could not possibly be understood as evaluating the instances. Similarly for (12).

iii. *Intensional Predicates*

- (13) a. John is looking for honesty.
- b. John is looking for the property of being honest.
- (14) a. John needs efficiency.
- b. John needs the property of being efficient.

Whereas John's search according to (13a) is satisfied if John finds an instance of honesty, the satisfaction of his search in (13b) requires him to find the abstract object. (13a) displays only an intensional reading, but (13b) naturally has an existential reading, presupposing the existence of the abstract object. Similarly for (14).

iv. *Existential Predicates*

- (15) a. Generosity exists.
- b. The property of being generous exists.

(15a) is true just in case there is an instance of generosity. By contrast, (15b) is true just in case the abstract object as such exists, regardless of its instantiations.³

In the cases discussed, normally, the reading of the a-example is not available for the b-example, and vice versa. There is a way, though, to also understand the b-examples in the way of the a-examples, and that is when the topic of conversation was already about the property in question or about properties in general. When the conversation was about what properties of behavior should be studied for a particular project, then an utterance of (11a) can in fact be understood just like (11b).

v. *Instance-distribution Predicates*

- (16) a. Honesty is rare.
 b. Sloppiness is widespread.
 (17) a. ??The property of being honest is rare.
 b. ??The property of being sloppy is widespread.

In the case of instance-distribution predicates, we do not get different readings with the two kinds of terms. Rather they are perfectly acceptable with one kind of term, namely bare adjective nominalizations, as in (16), but not with explicit property-referring terms as in (17), which at least many speakers dislike.

Earlier I mentioned that property-referring terms should also include less technical terms such as *the attribute of honesty*, *that property*, *that entity* or *that thing*. (18) illustrates that the four types of predicates behave with those terms as with explicit property-referring terms:

- (18) a. John never encountered the attribute of honesty/that property/that entity/that thing.
 b. The attribute of honesty/That property/That entity/That thing is interesting.
 c. John needs the attribute of honesty/that property/that entity/that thing.
 d. The attribute of honesty/that property/that entity/that thing is rare.

(18a) fails to display an existential reading involving instances, and (18b) and (18c) only provide a second-order reading on which an abstract

³ The observation that a sentence like (15a) claims the existence of instances only has been made independently by Strawson (1953–1954, 1959) and Woltersdorff (1960, 1970, Chapter 7).

object is evaluated. (18d) with an instance-distribution predicate is as unacceptable as it would be with an explicit property-referring term.

Let me summarize. Whereas predicates apply to what property-referring terms stand for just as they do when they apply to ordinary individuals, they apply to what bare nominalizations stand for only by, in some way, targeting the instances first and only derivatively the kind. Thus, an episodic predicate applies to a kind on the basis of some instance fulfilling the property that is the ‘literal meaning’ of the predicate; an evaluative (that is, individual-level) predicate applies to a kind on the basis of all instances (or rather all suitable, typical instances under suitable circumstances) fulfilling the property that is the ‘literal meaning’ of the predicate. An intensional predicate applies to a kind with the sort of meaning the predicate has when it acts as an intensional verb taking an indefinite singular NP complement (*John is looking for an instance of honesty*). The existential verb *exist* applies to a kind in the way it would apply to a property, stating a nonempty extension at the relevant index. Finally, instance-distribution predicates semantically select only kinds, not properties. To summarize then, bare nominalizations behave just like bare underived mass nouns, which, given that they are in fact bare mass nouns, is hardly surprising.

Bare adjective nominalizations thus should stand for kinds. But kinds of what? The instances of qualities like honesty or beauty are best taken not to be individuals or quantities, but rather particularised properties or what philosophers now commonly call *tropes* – that is, precisely the kinds of things adjective nominalizations with definite determinees stand for, such as *John’s honesty* or *Mary’s beauty*. Tropes are concrete instantiations of properties, such as the particular hostility of John’s gesture or the particular beauty that Mary manifests.

That tropes are the instances of at least certain universals (qualitative universals) is a view that goes back as far as Aristotle and then the Middle Ages, but it also has numerous modern defenders (cf. Stout 1952; Williams 1954; Campbell 1990; Simons 1994; Lowe 1998). It is a view that is in fact rather nicely reflected in language: whereas the bare nominalization *hostility* stand for a kind, an NP such as *the hostility of that act* or *the hostility of John* with a determiner and a complement refers to an instance of the kind.⁴ The various readings that the four classes of predicates display with bare adjective nominalizations moreover involve tropes as instances

⁴ The view that terms like *the wisdom of Socrates* stand for tropes can also found in Strawson (1953–1954) and in Woltersdorff (1960, 1970, Chapter 6). Woltersdorff also recognizes that there is another reading of such terms on which they stand for sub-kinds, as in *John has the wisdom of Socrates and the strength of Goliath*.

in just the way underived bare plurals and mass nouns involve individuals or quantities as instances. For example, (9a) displays existential quantification over things like the hostility of particular acts or attitudes, and (11a) displays universal quantification over things like the friendliness of Mary or the friendliness of a gesture.

In recent metaphysics, tropes are mainly used for a reconstruction of properties, namely as sets of resembling tropes, so that *honesty* would denote the set of ‘honesty tropes’ (cf. Williams 1953; Campbell 1990; Simons 1994; Bacon 1995). One problem for this view is that it does not get the modal properties of the denotation of *honesty* right. Honesty might have more, less, or different instantiations than it actually has (cf. Loux 1998). On the present view, this is accounted for in that kinds do not have a single extension, but are associated with an intension, a function from worlds and times to sets of tropes. The intension of *honesty* would thus be the function from world-time pairs to a relation between tropes and individuals as in (19):

$$(19) \quad \text{int}(\textit{honesty})(w, t) = \{ \langle d, d' \rangle \mid \llbracket \textit{honesty} \rrbracket^{w,t}(\langle d, d' \rangle) = 1 \}$$

Note that this intension is formulated with the help of the two-place predicate *honesty*, which denotes a relation between tropes and individuals.

Should kinds simply be identified with such an intension? For the kinds denoted by adjective nominalizations this seems a rather adequate step. However, it is much more problematic for the kinds denoted by bare plurals and mass nouns, at least when they denote natural kinds. Given the arguments by Putnam and Kripke about kind terms being rigid designators, natural kinds cannot be identified with the meaning or intension of the natural kind term, but rather involve the relation ‘being of the same kind as’ with respect to some actual instance. I will therefore leave it open how kinds should exactly be conceived, except by saying that they are associated with an intension.

The contrast discussed in the previous sections between *honesty* and *the property of honesty* is replicated, in an even more forceful way, in the analogous contrast between property-referring terms and underived bare mass nouns and plurals (*the property of being water* vs. *water* and *the property of being a lion* vs. *lions*).

1.3. *Other Terms Referring to Kinds of Tropes and Related Objects*

Earlier we saw that the behavior of bare underived mass nouns is matched by explicit kind-referring terms like *this kind of metal* and *this kind of animal*. This is also the case for bare adjective nominalizations:

- (20) a. John never encountered this kind of behavior.
- b. This kind of behavior is interesting.
- c. John does not need this kind of behavior.
- d. This kind of behavior is rare.

Even with constructions that formally match those of explicit property-referring terms can we get the typical kind behavior of predicates, namely with NPs that have nouns as head nouns other than *property* or *attribute*, for example *character trait* or *quality*:

- (21) a. John never encountered the character trait of shyness/the quality of honesty.
- b. John likes the character trait of shyness/the quality of honesty.

(21a) and (21b) naturally have a reading involving concrete instances rather than an abstract property object.

It is also important to observe that there are other definite NPs that refer to kinds of entities – yet not kinds of tropes (or kinds of individuals or quantities), but kinds of other sorts of entities. These NPs display exactly the same kind behavior with the four classes of predicates.

One such NP is *the belief that S*. In Moltmann (2003a, b), I argued that *the belief that S* refers to a kind whose instances are what I called *attitudinal objects*, objects of the sort ‘John’s belief that S’ or ‘Mary’s belief that S’, namely entities individuated both on the basis of the propositional content of S, an agent, and the attitude of believing. The kind-term behavior of *the belief that S* is shown below:

- (22) a. John never encountered the belief that the devil exists.
- b. The belief that the devil exists is unfounded.
- c. John lacks the belief that the devil exists.
- d. The belief that devil exists is widespread.

(22a) involves existential quantification over beliefs, (22b) generic quantification, and (22c) existential quantification relative to counterfactual

situations. (22d), with an instance-distribution predicate, is perfectly acceptable.

Also NPs like *the intention to VP* or *the desire to VP* behave like terms referring to kinds, namely kinds whose instances are entities such as the intention or the desire of a particular person (at a time). The kind behavior with the four classes of predicates is again shown below:

- (23) a. John never developed the desire to become rich.
 b. The desire to become rich is not inborn.
 c. John lacks the desire to become rich.
 d. The desire to become rich is widespread.

The reason why such examples are important is that reference to kinds of entities of whatever sort does not require the particular syntactic form of bare NPs and, in particular, is compatible with the presence of a definite determiner and a singular count noun as head noun.

1.4. *How to Account for the Difference between Kinds of Tropes and Properties*

For the sake of clarity let me henceforth call the properties that property-referring terms refer to *property objects* (as opposed to the properties that predicates express). The crucial question now is: Why do kinds of tropes (or kinds in general) behave so differently from property objects in the way predicates are understood? That is, why do predicates apply to property objects as they do with ordinary objects, but to kinds only in a special way, by targeting the instances only? The reason, I propose, is that kinds simply cannot bear properties (at least not the properties that are the meanings of non-instance-distribution predicates in their normal use). By contrast, property objects are property bearers, just like ordinary objects. Natural language ontology thus makes a fundamental distinction between two kinds of entities: entities that are potential bearers of properties (ordinary objects and property objects) and entities that are not (kinds).

Another important question is, what is the formal semantics of predicates when they apply, in this special way, to kinds? There are two options:

- [1] Predicates apply to kinds in virtue of applying to instances of the kind.
 [2] Predicates, when applying to kinds, express derived properties, properties that hold of the kind on the basis of some or all instances fulfilling the corresponding underived or basic property.

In this paper, I will opt for the second approach. But let me first make precise how the two options are to be understood.

1.4.1. *Derived Applications of Predicates*

Given the first option, predicates, when applying to kinds, retain the same meaning they have when applying to instances of the kind; but rather than attributing the property they express to the kind, they attribute it only to instances of the kind.⁵ To make precise how the first option looks like, let us take predicates to denote functions from individuals to truth values. Then individual-level predicates will apply to kinds as in (24a) and stage-level predicates as in (24b), where ‘k’ is the name of a kind, ‘I’ the name of the instantiation relation (relativized to a world and a time), and ‘Gn’ the generic quantifier (as discussed in Krifka et al. 1995):

- (24) a. $[[P]]^{w,t}(d, k) = 1$ iff $Gn\ d' [d' I_{w,t} k] [P]^{w,t}(d, d') = 1$ if P is a transitive individual-level predicate.
 b. $[[P]]^{w,t}(d, k) = 1$ iff $\exists d' (d' I_{w,t} k \ \& \ [P]_{w,t}(d, d') = 1)$ if P is a transitive stage-level predicate.

That is, an individual-level predicate maps a kind onto the truth-value true just in case it maps (roughly) all normal instances of it onto true. Furthermore, a stage-level predicate maps a kind onto the truth-value true just in case it maps some instance of it onto true.

On this view, a predicate has an extended application to kinds in the sense that the predicate applies to the kind by applying with its familiar meaning to instances of the kind.

In the case of intensional predicates as in (25a), the predicate can be taken to apply to the intension of the kind, just as the same predicate would apply to the property expressed by *an instance of honesty* in (25b), on, let’s say, Zimmermann’s (1992) analysis of intensional verbs (on which intensional verbs take properties as arguments):⁶

- (25) a. John needs honesty.
 b. John needs an instance of honesty.

Assuming that (25a) and (25b) are roughly equivalent (with (25b) taken to be understood against a situationally restricted background), (25a) will then be analysed as in (26), which would also be what the analysis of (25b) would amount to:

- (26) needs(John, int(*honesty*))

⁵ This approach is basically the one pursued by Fine (1982) for arbitrary objects. Arbitrary objects inherit their properties, however, only on the basis of all ‘instances’ (concrete values) satisfying the property in question.

⁶ The reason I use Zimmermann’s (1992) analysis is, in this particular context, convenience. Other analyses propose that intensional verbs take quantifiers as arguments. But this would require a more complicated account of intensional verbs with kind arguments.

Intensional verbs thus apply to a kind as in (27), for an object d and kind k :

$$(27) \quad \llbracket V \rrbracket^{w,t}(d, k) = 1 \text{ iff } \llbracket V \rrbracket^{w,t}(d, \text{int}(k)) = 1 \text{ if } V \text{ is a transitive intensional verb.}$$

Exist can also be treated as an intensional verb, as in (28), for a kind k :

$$(28) \quad \llbracket \text{exist} \rrbracket^{w,t}(k) = 1 \text{ iff } \llbracket \text{exist} \rrbracket^{w,t}(\text{int}(k)) = 1.$$

That is, *exist* in the extended sense applies to a kind on the basis of its literal meaning applying, in the familiar way, to the intension associated with the kind.

Instance-distribution predicates obviously cannot be analysed as applying to a kind in virtue of applying with their usual meaning to instances or the intension of the kind. But instance-distribution predicates can be analysed as quantifiers ranging over instances of the kind. For example, *rare* can be analysed as a binary quantifier ranging over individuals and places so that (29a) has the analysis in (29b), where ‘AT’ is the relation of ‘being spatially at’:

- (29) a. Honesty is rare.
 b. RARE $d p \exists d' (\text{honesty}(d, d') \ \& \ \text{AT}(d, p))$

That is, (29a) is analysed as ‘there are instances d of honesty (of someone d') few places p and such that d is at p' . An instance-distribution predicate then maps a kind onto true just in case a quantificational statement of the latter sort is true, as in (29c):

$$c. \llbracket \text{rare} \rrbracket^{w,t}(k) = 1 \text{ iff } \text{RARE } d p (d \text{ I } k \ \& \ \text{AT}(d, p))$$

Given this first option of treating kind predicates semantically, kind predicates act as functions mapping kinds to truth values based on whether the predicate with its literal meaning is true of the instances of the kind or corresponds to a true quantificational statement involving those instances.

1.4.2. *Derived Predicate Meanings*

On the second approach, a predicate would apply to a kind with a derived meaning, that is, a meaning obtained in one of a limited number of ways from the predicate’s original meaning (the one used when applying to individuals). For example, a kind would be attributed the derived property of being encountered by John just in case the basic property of being

encountered by John holds of an instance of the kind. A kind moreover would be attributed the derived property of being nice just in case all its instances have the basic property of being nice.

Central in this account is a distinction between basic properties and derived properties. Kinds resist basic properties, but can fulfil, derived properties. Only property objects are potential bearers of basic properties, and they in turn can't fulfil, derived properties.

These notions of basic and derived property just have the purpose of distinguishing between property objects and kinds, and do not necessarily correspond to some independently defined notions of 'basic' and 'derived'. The distinction is that between (simple or complex) properties of individuals and the corresponding properties of kinds, as well as properties like being rare or being widespread. Properties of kinds are obviously definable on the basis of basic properties of or relations among instances only: being encountered by John holds of a kind in case an instance is literally encountered by John; being nice holds of a kind in case all instances are literally nice; and properties like being rare, widespread, or extinct are clearly definable on the basis of basic relations such as existing at a particular time and a particular place. But being definable in terms of properties of or relations among individuals is not the right notion. Also property objects can have properties definable that way – for example, having two instances or having instances in different places. Derived properties in the relevant sense should rather be defined as properties obtained from basic properties by a limited number of operations such as existential quantification and generic quantification over instances, as well as the particular operations needed for intensional predicates and those that define the content of instance-distribution predicates.

Except for the case of instance-distribution predicates, the operations yielding kind predicates define *extended meanings* of predicates that apply to kinds. Literal meanings apply to ordinary objects; extended meanings to kinds. This means that a predicate that expresses a basic property (not an instance-distribution predicate) applies to a property object with its literal meaning, requiring the property as an abstract object to fulfil that property. But when such a predicate applies to a kind, it will apply with an extended meaning, a meaning that is now a derived property, construed on the basis of the basic property. Formally, the extended meaning of an episodic predicate will be (30a), the extended meaning of an individual-level predicate

will be (30b), and the extended meaning of a transitive intensional verb will be (30c), for a world w and time t :

- (30) a. $\llbracket V_{\text{ext}} \rrbracket^{w,t} = \{ \langle d, k \rangle \mid \exists d' (d' I_{w,t} k \ \& \ [V]^{w,t}(d, d') = 1) \}$
 b. $\llbracket V_{\text{ext}} \rrbracket^{w,t} = \{ \langle d, k \rangle \mid \text{Gn } d' [d' I_{w,t} k] [V]^{w,t}(d, d') = 1 \}$
 c. $\llbracket V_{\text{ext}} \rrbracket^{w,t} = \{ \langle d, k \rangle \mid \llbracket V \rrbracket^{w,t}(d, \text{int}(k)) = 1 \}$

But what is the status of such predicate extensions? The predicate extensions could either constitute separate predicates or additional predicate meanings or a disjunct of a wider, disjunctive lexical meaning of the same predicate. Good evidence for the latter is that a question such as (31a) can be answered either by (31b) (mentioning an object) or (31c) (mentioning a kind), and thus the occurrence of *buy* like or look for in (31a) should include both the object-oriented and the kind-oriented meaning:

- (31) a. What did John buy/like/look for?
 b. Apples.
 c. My painting.

Predicates will then generally have a disjunction as their meaning consisting of a basic property as one disjunct (the ‘literal meaning’), and as the other disjunct a suitable extension for kinds.⁷

Instance-distribution predicates cannot be handled in terms of predicate extensions, but rather have an original meaning that is derived from basic properties (or rather relations). The property expressed by *widespread*, for example, can be described roughly as the property that holds of a kind k iff for a sufficient number of regions r , there are instances i such that i is located at r , which is a derived property based on the basic relation of ‘being located at’.

I will choose the second option of treating the special application of predicates to kinds, for two reasons. First this option is better amenable for treating predicates that apply to kinds, but express derived properties that are less straightforwardly definable in terms of basic properties. These are, for example, predicates expressing mental evaluations or preferences, as in (32):

- (32) a. John likes honesty.
 b. John prefers honesty to charm.

⁷ I do not mean to say that the two meanings need to be listed separately in the lexicon. Rather, given a more flexible view of lexical meaning, as outlined in Pustejovsky (1995), a single entry may suffice. But still a given occurrence of a verb in a sentence needs to have one or the other interpretation or else have a disjunction of meanings as its interpretation.

(32a) certainly does not mean that John likes all instances or all typical instances of honesty. Yet it also does not mean that John likes the abstract object that is the property of being honest. John's mental state of liking is directed towards concrete instances of honesty, for example instances that caused John's attitude of liking or possible instances John conceives of when making hypothetical judgments. Similarly, (32b) certainly does not require that John prefers any instance of honesty to any instance of charm. Rather his preference may involve comparisons of concrete instances of honesty and of charm in hypothetical circumstances of some sort. Thus, even here the assignment of properties to kinds is based on the assignment of properties to actual or hypothetical instances, but in a way not straightforwardly analysable in terms of quantification over instances, as on the first approach. Rather it can be considered part of a possibly not fully analysable lexical meaning of a predicate.

The second reason I choose option [2] is that it is the only one suited for a parallel distinction between two kinds of groups, where one sort of group also requires derived predicate meanings.

1.5. *Ontological Issues*

The crucial distinction between kinds on the one hand and properties on the other hand, I have argued, is the distinction between being a bearer of (basic) properties and not being a bearer of (basic) properties. How does this distinction relate to the notion of an object in general?

In philosophy, two fundamentally different approaches to the notion of an object are to be distinguished:

- [1] the approach that characterizes the notion of an object in terms of purely ontological conditions independent of language, in particular conditions constitutive of unity
- [2] the Fregean or syntactic conception of an object.

The starting point of [1], as one might say, is to capture our intuitive understanding of the notion of an object, or one may even say, the meaning of the noun *entity*, object, or *thing*. What is required for objecthood in that sense is unity, which is what makes an entity count as one. There are both conditions on synchronic unity (such as having a particular shape, being continuous in space, or satisfying a particular sortal (*tree*, *car*, *person*)) and conditions on diachronic unity (e.g., continuity of change).

The Fregean conception characterizes the ontological notion of an object in terms of the syntactic notion of a referential term (or proper name in Frege's extended sense): an object is what a referential term can refer to

(see especially Frege (1884 and 1892), as well as the extensive interpretations and discussions in Dummett 1973, Hale 1983, and Wright 1987). On that approach, syntax takes priority over ontology: It is the syntactic category of referential terms that tells us what an object is.

The present account certainly would classify properties but not kinds as objects. This is reflected in the simple fact that the nouns *object*, *entity* and *thing* can be used to refer to properties, but not to kinds (cf. Section 1.2.). This means what is characteristic of objecthood in both our intuitive understanding and for the meaning of nouns like *object* is the condition of being a bearer of properties. As we will see both in the case of universals and in the case of collections, this condition may go along with conditions on unity, but it may also be present in entities independently of any manifest condition constitutive of unity.

The present account of objecthood obviously is in conflict with the Fregean conception of an object. Kinds and properties both are objects in the second sense, but not in the first. Since the first notion corresponds much better to our intuitive understanding of what an object is (and the meaning of nouns like *entity*, *object*, and *thing*), I will say that properties (property objects) are *objects*, whereas kinds are *nonobjects*, and similarly for other entities to be distinguished later in the same way. Alternatively, one could say that kinds are only *semantic* objects, in the sense that they are semantic values of terms and arguments of predicates (even bearers of certain, namely derived, properties); whereas kinds are not objects in the sense of being potential bearers of basic properties, and thus do not count as *ontological objects*.

There is then a clear discrepancy between the notion of an object characterized syntactically and the notion understood in a metaphysical sense, and this discrepancy is well reflected in language itself. Semantic structure may diverge from ontological structure in that semantic structure may involve relations between nonobjects and predicates, which do not correspond to relations between true objects and true properties. The ontology of natural language (or at least English) thus involves a domain **D** of entities which is divided into a subdomain **O** of objects and another subdomain **N** of nonobjects:

$$(33) \quad \mathbf{D} = \mathbf{N} \cup \mathbf{O} \text{ (where } \mathbf{N} \cap \mathbf{O} = \emptyset \text{)}$$

The secondary status of entities that are nonobjects is reflected in the fact that such entities will not occur in the states of affairs needed to make the sentences true that contain terms referring to them. This is because predicates apply to kinds only with a derivative meaning analysable in terms of properties of, relations among, or quantification over instances

of the kind. Sentences involving reference to kinds in fact come out as reducible to (in the sense of having the same truth conditions as) sentences only making reference to particulars. For example the truth conditions of sentences with episodic predicates can be stated – rather than with the kind as in (34a) – with the help of the adjective *A* from which the nominalization A_{nom} is derived as in (34b):⁸

- (34) a. $\llbracket P \rrbracket^{\text{w,t}}(d, k) = 1$ iff $\text{Gn } d' [d' I_{\text{w,t}} k \times \llbracket P \rrbracket^{\text{w,t}}(d, d') = 1]$
 b. $\llbracket P \rrbracket^{\text{w,t}}(d, [A_{\text{nom}}]) = 1$ iff $\text{Gn } d' I_{\text{w,t}} k [\llbracket A \rrbracket^{\text{w,t}}(d') = 1 \times \llbracket P \rrbracket^{\text{w,t}}(d, d') = 1]$

But what is the status of a purely semantic object, a nonobject, which as such still acts as the denotation of a term and as a value of variables? Rather than trying to develop a detailed answer to this question, let me simply point out that it is a question that arises similarly in a number of other contexts, for example when it comes to the status of numbers as objects. Their elaborate answers have been developed, such as constructivist and conceptualist views, on which the objects in question are conceived as the result of applying (not necessarily mentally) certain operations to already given entities.

1.6. *The Semantics of Property-referring Terms and Exceptional Kind Predicates*

Explicit property-referring terms generally are syntactically complex, composed of the noun *property* (or a similar one such as *attribute*, *virtue*, or *quality*) and a kind-referring NP complement. Such a kind-referring NP complement refers either to a kind of trope (as in *the property of honesty*) or to a kind of state (as in *the property of being honest*). This suggests the following compositional semantics for explicit property-referring terms: The noun, e.g., *property*, expresses a function which maps the kind of trope or state expressed by the kind-referring complement onto the corresponding property object. The noun *property* here has a *reifying* function. But it does not just express reification. Reification rather seems to go along with the primary function of the noun *property* in the context in question, namely that of turning a predicate meaning or kind into a logico-semantic object, an object that can have logical and semantic properties of a sort

⁸ The kind of reduction the account involves needs to be distinguished from the one of Dummett (1973), who takes sentences about abstract objects to be reducible to sentences about particulars in the sense of a contextual definition. It also needs to be distinguished from a deflationist account such as that advocated by Carnap (1956), where referential terms are not required to have semantic values at all.

that kinds can't. This difference between property objects and kinds is well-displayed by the following contrasts:

- (35) a. The property of being honest is complex.
 b. ??Honesty is complex.
- (36) a. The property of being universally recognized is quantificational.
 b. ??Universal recognition is quantificational.
- (37) a. The property of being poor is vague.
 b. ??Poverty is vague.
- (38) a. The property of fatherhood is relational.
 b. ??Fatherhood is relational.

Underived bare mass nouns and plurals lead to the same kinds of contrast, as in (39), due to Manfred Krifka (p.c.):

- (39) a. The property of being a round circle is contradictory.
 b. ??Round circles are contradictory.

I will not try to analyse the meaning of the noun *property*, but just state that, in its functional use, it is subject to the following condition:

- (40) For an entity $d \in \mathbf{N}$, $[\textit{property}]^{w,t}(d) \in \mathbf{O}$.

This condition also provides an account for one class of exceptions to the generalization that (basic) properties cannot be attributed to kinds.⁹ These exceptions are sortal predicates with head nouns like *property*, *attribute*, or *virtue*. (41) shows that such predicates allow for kind-referring terms as subjects:

- (41) a. Courage is an admirable property.
 b. Friendliness is my favourite attribute.
 c. Honesty is a virtue.

There are several possible ways of accounting for such cases.

First, nouns like *property*, *virtue*, and *attribute* might have an extended meaning on which they also apply to kinds. One problem with this is that

⁹ Examples like these are usually cited by philosophers as problems for a reduction of statements about universals to statements about particulars. See the discussion in Jackson (1977), Devitt (1980), and Armstrong (1980).

property should now be able to occur without its reifying force when taking a complement, which it cannot. Another problem is that further attributes modifying the predicate have the reading on which they apply to an abstract semantic object, not a kind, for example *interesting* and *vague* in (42a,b):

- (42) a. Ordinariness is a property that is interesting.
 b. Tallness is a vague property.

Second, the copula might be the *is* of constitution rather than the *is* of predication (a kind of trope, after all, in a way constitutes a property). This might work for (41b), but it won't work for (41a, c). For the account to work for (41a), the NP *an admirable property* would have to be understood as a quantificational, not a predicative NP. That is, (41a) would be interpreted as: for some admirable property P, courage constitutes P. But then the problem arises that when the sentence is negated as below in (43a), *an admirable property* cannot take scope over the negation, with the reading in (43b):

- (43) a. Courage is not an admirable property.
 b. For an admirable property P, courage is not P.

A third alternative is to take sortal predicates to trigger a slight reference shift in the subject, namely a switch from referring to a kind to referring to the reification of the kind: the property. Thus, (42a) would be analysed as in (44):¹⁰

- (44) admirable property (reif([*courage*]))

Courage in (43a) then would be a 'concealed property', in Grimshaw's (1979) terminology.

There are several difficulties or at least implausibilities arising for this proposal. First, on the analysis in (44) it would be quite strange why other predicates, e.g., *interesting*, do not allow for the same reference shift for the subject. Second, such a reference shift seems rather implausible in the first place. A nonrestrictive relative clause as in (45a) requires the head noun to still refer to a kind, rather than a property, which makes it hard to reconcile

¹⁰ Note that *reif* could not be a function mapping all properties to their reification because of well-known cardinality problems. See Chierchia and Turner (1988) for a discussion.

with the alleged reference shift triggered by the predicate. Similarly for (45b), where the pronoun must refer back to a kind, rather than a property:

- (45) a. True courage, which one sees only rarely, is an admirable property.
 b. True courage is an admirable property, even though one sees it only rarely.

The fourth alternative, which I will endorse, assimilates (41a) to the construction in (46):

- (46) the property of courage

The expression *the property of*, given (40), involves reification, the mapping of an entity (a kind) in N onto one in O. Reification will also be involved in (41a), which will roughly be analysed as ‘courage is something whose reification is an object that is admirable’, or better:¹¹

- (47) $\llbracket \text{Courage is an admirable property} \rrbracket = \lambda x[\text{admirable}(\llbracket \text{property of} \rrbracket(x))](\llbracket \text{courage} \rrbracket) = \llbracket \text{admirable}(\llbracket \text{property of} \rrbracket)(\llbracket \text{courage} \rrbracket)$

1.7. Other Applications of the Object-nonobject Distinction: The Distinction between Two Kinds of Kinds

The contrast between objects and nonobjects applies to a distinction among universals other than that between kinds and property objects. It arguably also distinguishes among two sorts of kinds (in obviously a now broader sense of ‘kind’ than has been used so far), namely on the one hand kinds that are the denotations of bare plurals and mass nouns and on the other hand kinds denoted by definite singular NPs such as *the lion*.

¹¹ There is independent support for this analysis, namely other cases where the *of*-construction is related to the predicative construction:

- (1) a. A unicorn is a good example.
 b. the example of a unicorn
 (2) a. Improvement is a necessity.
 b. the necessity of improvement

Again, *example* and *necessity* in (1b, 2b) are better not analysed as predicates, but as functors, mapping an intensional entity (*[a unicorn]*) and a kind (*[improvement]*) respectively onto an object (an example, a necessity).

There are a number of well-known differences between kind-referring bare NPs and kind-referring definite singular NPs (cf. Krifka et al. 1995). Whereas the former can be formed from almost any predicate, the latter is limited to well-established kinds (compare *nice lions* to *the nice lion*, which lacks a generic interpretation). With the different classes of predicates the two kind-referring terms also behave quite differently. Kind-referring definite singular NPs do not allow for existential quantification with episodic predicates, as seen in (48), and they behave differently with intensional predicates, as in (49):

- (48) John found the lion.
 (49) John is looking for the lion.

(48) and (49) do not allow for a generic reading of *the lion* at all. Only generic and individual-level predicates as in (50) allow for a generic interpretation of *the lion*:

- (50) The lion has a mane.

Obviously, in (50) it is not the kind as such that is said to have a mane, but the individual instances. But examples such as (50) seem to be of a quite different sort than those we had with bare plurals and mass nouns. There are severe restrictions on what individual-level predicates are acceptable with kind-referring definite singulars. Only those predicates are acceptable, it seems, that are characteristic or stereotypical of the kind, not any predicates we might know hold of all or most instances of the kind. Thus the following predicates are impossible, though they are fine with bare plurals and mass nouns:

- (51) a. ??The lion breathes regularly.
 b. ??The lion is male or female.

Obviously the two kinds of kinds, those denoted by definite singular NPs and those denoted by bare mass nouns and plurals, are as entities quite different. Whereas bare plurals refer to entities whose properties, on the present view, are all inherited in different ways from instances, definite singular NPs refer to kinds that may inherit their properties at best from a typical or stereotypical exemplar. Thus, clearly two different kind-forming operations are involved in the two cases.

Moreover, the kind-forming operation associated with kind-referring definite singular NPs goes along with reification. If the kinds that definite singular NPs refer to act as true objects, then their behavior with episodic,

intensional, and existential predicates (as well as individual-level predicates) is immediately explained. This would also account for the fact that *numerous* is impossible with definite singulars, though it is fine with bare plurals:^{12,13}

- (52) a. Lions are numerous.
 b. ??The lion is numerous.

Thus, one can then say that natural language makes reference to kinds acting as nonobjects as well as kinds acting as objects.

2. PLURALS

2.1. *Basic Assumptions*

We now turn to the object-nonobject distinction in another area, that of collections. There are two ways of referring to collections: with a plural NP as in (53a) and with a collective NP as in (53b):

- (53) a. The children are asleep.
 b. The group of children is asleep.

Let me call the kind of collection referred to by a plural a *plurality* and the kind of collection referred to by a collective NP a *group*.

As originally proposed by Sharvy (1980), I will assume that definite plural and singular NPs have an analogous semantics: *the child* stands for the only child in the context; *the children* stands for the maximal collection of children or the sum of the children in the context, as indicated (54):¹⁴

$$(54) \quad \llbracket \textit{the children} \rrbracket^c = \text{sum}(\llbracket \textit{children} \rrbracket^c)$$

¹² However, there are some instance-distribution predicates that are perfectly acceptable with both kind-referring terms, for example *rare* and *extinct*:

- (1) The lion is rare/almost extinct.

They would obviously require a special treatment.

¹³ This account in terms of reification is closely related to Krifka's (2003) proposal according to which definite singular NPs refer to kinds that count as atoms. See the next section (2.5), however, on the relation between the notion of an atom and that of an object (i.e., a property bearer).

¹⁴ See also, for example, Link (1983) and Moltmann (1997) for a defence of that view.

In the majority of cases when a plural NP refers to a plurality composed of the same individuals as the group referred to by a collective NP, the plurality and the group count as distinct entities. For example, the referent of *the orchestra* has different identity and existence conditions from the referent of *the members of the orchestra*. If members of the orchestra are replaced, the orchestra may remain the same, but not what would be referred to as *the orchestra members*, and the orchestra members may still exist even if the orchestra has ceased to be. Generally, such fundamental differences have to do with the fact that singular count nouns, but not plurals, express essential *integrity conditions*, that is, conditions that are constitutive of the unity of the collection and are crucial for its identity and existence. Such conditions of integrity may consist in conditions on the internal structure or organization of the collection, interrelations among the members of the collection that separate them from other entities, or in the overall function the collection plays in a particular context (cf. Simons 1987).

The difference between referents of collective NPs and referents of plurals shows up also in the way groups and pluralities are counted. There is one orchestra, but several orchestra members. A group counts as one, but a plurality as many. This fundamental difference between groups and pluralities has been the subject of philosophical discussions going at least as far back as Plato.¹⁵ But it is a difference that does not come out as such in formal semantic treatments of plurals based on extensional mereology (cf. Simons 1987, Link 1983). Why should a mereological sum count as many, rather than one, when that sum could also be referred to by a collective NP (e.g., *that sum*).

The approach I develop in Moltmann (1997a) does not fare much better in this particular respect. The approach makes crucial use of the notion of an integrated whole. An integrated whole, roughly, is an entity that has a boundary or shape, or displays integrity in some other way. Singular count nouns generally express properties of integrated wholes. By contrast, plurals and mass nouns don't. A plurality of several objects generally is not an integrated whole and a quantity of water is not either. Only if the non-linguistic context specifies relevant integrity conditions can a plurality of objects count, in the relevant context, as an integrated whole. This account also does not get the distinction between collections as one and as many quite right. There are collections that may count as one even in the absence of any manifest integrity conditions; it is still possible to refer to such a collection with *that collection* or *that sum*.

¹⁵ See Harte (2002) for a recent extensive discussion of the distinction in the Platonic dialogues.

This indicates that even for the distinction between the two kinds of collections a primitive notion of unity is needed, making a group a bearer of properties, but pluralities unable to bear properties – just as in the case of the two sorts of universals.

2.2. Analogies with Universals

The observation of interest in the present context is that plural and collective NPs differ in ways strikingly similar to the ways bare nominalizations and explicit property-referring terms differ from one another, that is, they differ in their behaviour with respect to particular classes of predicates (or readings of predicates).

These are the classes of predicates or readings of predicates with which plurals and collective NPs behave differently:

[1] *Distributivity*

Generally only definite plurals, not definite collective NPs allow for distributive interpretations of predicates (that is, of predicates that would allow both a collective and a distributive interpretation) (cf. Moltmann 1997a):

- (55) a. The things are heavy.
- b. The collection of things is heavy.
- (56) a. The team members lifted the piano.
- b. The team lifted the piano.

(55a) and (56a) allow for both a collective and a distributive interpretation, whereas (55b) and (56b) allow for only a collective interpretation.

[2] *Predicates Making Reference to Group Members*

Collective predicates whose content makes reference to group members, but not to the group as a whole, allow only for plural NPs, not collective NPs as complements. The predicates in question include *compare*, *distinguish* (w.r.t. the object argument position), *like each other*, and *similar*. The content of those predicates obviously involves binary relations among group members. The relevant class of predicates also includes *count* and *numerous*, whose content is based on a function applied to all the group members:

- (57) a. John compared the students.
- b. #John compared the class.

- (58) a. The students like each other.
 b. #The class likes each other.
- (59) a. John cannot distinguish the students.
 b. #John cannot distinguish the class.
- (60) a. The students are similar.
 b. #The class is similar.
- (61) a. John counts the students.
 b. John counted the group of students. (means: he counted one)
- (62) a. The students are numerous.
 b. #The class is numerous.

[3] *Predicates of Existence*

With definite plurals, as in (63a) the verb *exist* can claim only the existence of group members. But when *exist* occurs with collective NPs, it can claim the existence of a group as such:

- (63) a. The students do not exist.
 b. The class does not exist.

(63a) denies the existence of the individual students; (63b) denies the existence of the class, as an entity beyond the individual students.

With collective NPs that (unlike *a class*) do not require essential integrity, the relevant examples have a more technical character, as below:

- (64) a. The collection of the students (as such) does not exist.
 b. The sum of the students does not exist.

The sentences in (64) have to be understood as used in a philosophical discourse (which, as I said before, may involve a more technical vocabulary, but is still subject to the same rules of English as a nonphilosophical discourse). As such, those sentences can naturally function as replies to a sceptic concerning the existence of groups, sums, etc., as entities of their own, above the individual members. Crucially, however, such a claim cannot be made by a sentence like (64a). That is, (64a) cannot possibly be used for a statement that a sum or group exists as such, as an entity beyond the individual group members.

The generalizations under [1] and [2] were accounted for in Moltmann (1997a) on the basis of the notion of an integrated whole, namely by what I called the 'Accessibility Requirement'. The Accessibility Requirement

says that predicates or readings of predicates that make reference to the parts (but not the whole) of an argument require the argument not to be an integrated whole in the context of reference (in what I called a ‘reference situation’):¹⁶

(65) *The Accessibility Requirement*

A predicate or reading of a predicate that makes reference to the parts (but not the whole) of an argument (for a given argument position) can apply to an object *d* in a reference situation *s* (with respect to that argument position) only if *d* is not an integrated whole in *s*.

Distributivity obviously makes reference to the parts of a group argument (but not the whole of that argument), and thus it should not be applicable to referents of collective NPs, which are integrated wholes. Moreover, the predicates in (57)–(62) obviously make reference to the parts, but not the whole of the object argument and thus require pluralities (which generally lack integrity), rather than groups (which generally have integrity).

There are three deficiencies, though, with such an account based on the notion of an integrated whole.

First, an account of this sort could not possibly be carried over to the parallel generalizations for the two kinds of universals. Integrity hardly applies to universals and thus could not possibly distinguish the two kinds of universals.

Second, integrity could not possibly account for the behavior of the verb *exist*. There is no reason why a plurality, an entity lacking integrity, should not provide an individual concept as an argument of *exist*.

The third shortcoming of the account is that it does not capture the right generalization about distributivity. Obviously, distributive interpretation

¹⁶ Predicates not only making reference to the group members, but also to the group as a whole (for example the organisation or spatial configuration of the group) allow for plural as well as collective NPs (cf. Moltmann 1997a):

- (1) a. The class dispersed.
- b. The students dispersed.
- (2) a. John organised the collection of things on his desk.
- b. John organised the things on his desk.

To anticipate the discussion in Section 2.3., the reason why these predicates are acceptable with collective NPs is presumably that their content is not reducible in the same way to properties of group members, but rather involves a configurational property of the group as a whole. That is, such predicates will count as expressing basic, not derived properties.

consists in applying a predicate to a plurality on the basis of all members of the plurality fulfilling the literal meaning of the predicate (a basic property) – just as in the case of applying individual-level predicates to kinds. However, not only is it the case that collective NPs disallow a distributive interpretation, but also that pluralities require a distributive interpretation with certain classes of predicates, namely predicates expressing size or configuration:

- (66) a. The children are big. (no collective reading)
- b. The group of children is big. (collective reading)
- (67) a. The pictures are large. (no collective reading)
- b. The collection of pictures is large. (collective reading)

At the same time, though, pluralities allow for a wide range of predicates with collective interpretations. These are some rather familiar examples:

- (68) a. The children surrounded the palace.
- b. The men lifted the piano.
- (69) a. The stones weigh 10 kilo.
- b. The pictures take up a lot of space.
- (70) a. The people form an orchestra.
- b. The pictures form a large collection.

The difference in behaviour between the predicates in (68–70) and those in (66–67) obviously resides in their particular descriptive content.

What is crucial about the predicates in (68) seems to be that they describe the participation of a plurality in an event, whereas the predicates in (65–67) don't. In order for (68a) and (68b) to be true, a significant number of the group members each will have to contribute to the causation of the event described by the predicate.

Such an additive relationship between the collection members and a single entity (here an event) specified by the predicate seems crucial. It is also what appears to license the collective readings of the examples in (69) and (70). In (68a) each stone contributes to the overall weight of ten kilo and in (68b) each picture occupies its space in a region that amounts to a lot of space. Also the examples in (70) can be looked at that way. In (70a), each of the people in question contributes to the constitution of the orchestra, and in (70b) each of the pictures contributes to the large collection.

2.3. *An Account in Terms of the Object-Nonobject Distinction*

The data with distributivity, predicates making reference to parts, and the predicate *exist* are strikingly parallel to those we found with the two kinds of universals, and thus invite a unified account. The obvious assumption to make is that pluralities count as nonobjects, whereas groups count as objects. The difference between pluralities and groups will then correlate with the difference between kinds and property objects (as well as kinds acting as objects). This means pluralities have their properties fixed on the basis of properties of or relations among group members, whereas groups have their properties fixed in the ordinary way.

As it stands, the account of meaning extensions that was developed for predicates applying to the two kinds of universals, however, cannot simply be carried over to groups and pluralities. Rather it is necessary to go in detail through the different kinds of predicates and the way they can apply to groups or pluralities.

The lack of a distributive interpretation with collective NPs follows from the object status of groups as the referents of collective NPs. If pluralities have the status of nonobjects, this should mean an obligatory interpretation of an extensional predicate according to which the predicate applies only to group members. Unlike in the case of universals, we only get an interpretation on which a predicate applies to all members of the collection, rather than just some of them, as with episodic predicates applying to kinds. Moreover, a distributive interpretation is obligatory only with predicates of size and configuration.

The more difficult case of the predicates in (68)–(70) involved a crucial additive relationship between the collection members and the entity specified by the predicate. In such cases, the predicate, even on a collective interpretation, can be considered as having a derived property as its content, a property obtained from basic relations which act like an additive function mapping the individual group members to the particular entity the predicate mentions. In this case, one can say, a basic property is *reanalysed* as a derived property.

The final case to account for is that of the predicate *exist* as in (63) and (64), which with pluralities cannot claim the existence of the collection as such, but only the existence of the members of the collection. Here the analogy to kinds does not quite hold: *exist* when applied to kinds, I suggested, gets an extended meaning on which its application to the kind is equivalent to the original meaning of *exist* applying to the intension corresponding to the kind (the function from indices to sets of instances). In the case of pluralities, *exist* does not apply to the intension of a kind. Rather it applies distributively to the intension of each individual group member.

The fact that there are predicates that apply to both groups and pluralities (on a collective interpretation) is again an argument that the relevant notion of a derived property (as the only kind of property applicable to nonobjects) should not be construed as a property reducible to properties of or relations among individuals. Rather a derived property is a property constructed from basic properties either by one of the (rather limited) ways of extending predicate meanings or by the particular way the meaning of instance-distribution predicates is constructed.

2.4. *The Object-Nonobject Parameter and the Mass-Count Distinction*

Now that we have account of the data on the basis of the object-nonobject distinction, the question is what ties to the status of an entity as an object collective NPs? One possibility is that objecthood, that is, being a bearer of properties, is tied to the category of singular count nouns, as opposed to plural and mass nouns. Then the notion of being a bearer of properties would be at the heart of the mass-count distinction and could in fact replace the condition of expressing integrity, which I used for that purpose in Moltmann (1997a, 1998).

The problem with distinguishing singular count nouns from mass and plural nouns on the basis of integrity is that one needs to resort to the notion of a conceived integrated whole for singular count NPs like *the (loose) collection of papers* and NPs with head nouns like *thing, entity, or quantity*, which have the same effect of blocking distributivity and the application of certain predicates as singular count nouns expressing specific integrity conditions, as seen in (71):

- (71) John distinguished that entity. (no internal reading)

The notion of a conceived integrated whole is quite problematic in that no specific connections among the parts need to be even projected or mentally imposed on the entity in question. For at least such cases, it would be good to replace the condition of integrity by that of being a bearer of properties.

This way of characterizing the mass-count distinction semantically is not without problems though. First we already know that there are kind-referring singular count NPs that refer to nonobjects, such as *the belief that S, this kind of material*, and quantifiers like *something* (whose count status is revealed by a plural such as *several things*).

It is moreover quite unclear in what sense mass NPs such as *the water in the bottle* or *the furniture in the room* could fail to be bearers of basic properties and obligatorily inherit their properties from their parts. Quantities have all their subquantities as lower-level entities and thus would always require homogeneous predicates, which is obviously not the case.

I will leave it with these remarks about the mass-count distinction. A more extensive discussion would go far beyond the scope of this paper. I will simply assume that singular count NPs for the most part impose on their referent the condition of being a bearer of a property, if not that of being an integrated whole.

One thing is certain, though, and that is that being an integrated whole (essentially) should imply being a bearer of properties, and among particular individuals, in general, the status of being a bearer of properties should be grounded in the condition of being an integrated whole. So at least the following implication holds:

(72) If a particular d is an integrated whole, then $d \in \mathbf{N}$.

Pluralities generally do not count as integrated wholes. They generally count as nonobjects, that is, the operation *sum* is subject to the following condition:

(73) For a nonempty set $X \subseteq \mathbf{E}$, $|X| > 1$, $\text{sum}(X) \in \mathbf{N}$.

There is one set of cases, which at first sight seems to present a problem for the present account of both kinds and plurals. They involve plural formation with kind-referring terms, as in (74):

- (74) a. ??John cannot distinguish these kinds of apples.
 b. ??There are several things John cannot distinguish.
 c. John cannot distinguish apples, pears, and nectarines.

Distinguish can only apply to a plurality, that is, a collection of *objects* (i.e., property-bearers). But kinds were not supposed to count as objects. Yet they can form a plurality and even, as (74b) shows, be counted. In the contexts in (74), they somehow do count as objects.

The cases resemble strikingly the familiar ones of 'higher-group formation', as in (75a), and those of conjunctions of mass NPs that seem to yield pluralities, as in (75b):

- (75) a. John cannot distinguish the men and the women.
 b. John cannot distinguish the water and the wine.

In both cases, we get readings on which the predicate applies to a plurality whose members are entities (pluralities, quantities) that should not have the status of objects, but that now do count as such. In Moltmann (1997a),

I argued that the entities in question may count as integrated wholes because they are maximal collections/quantities satisfying a given property (and as such would also count as objects). This account is obviously not applicable in the cases in (74). Rather, here a kind seems to be able to undergo reification simply because it is contrasted with other kinds. We may attribute this to a separate operation of the formation of collections from nonobjects or reifying sum formation sum_{reif} , as in (76):

$$(76) \quad \text{For } A \subseteq \mathbf{N} \ A \neq \phi, \text{sum}_{\text{reif}}(A) = \text{sum}(\{\text{reif}(d) \mid d \in A\})$$

That is, when forming a collection from a set of nonobjects, the nonobjects may first be turned into objects.

2.5. *Primitive Unity and the Notion of an Atom in Formal Semantics*

In the case of individuals, it is generally manifest conditions of unity that are constitutive of their status as objects, conditions such as connectedness, a functional role, and persistence through time. The generalizations about pluralities and groups, however, as I argued, are better accounted for in terms of the distinction of properties between being a (potential) bearer of (basis) properties and not being a bearer of properties, a distinction which also captures the analogies between the two kinds of collections and the two kinds of universals. For both kinds of entities, objecthood (being a bearer of properties) generally goes along with other, manifest conditions on unity being fulfilled, but not necessarily.

The notion of an object as a property-bearer shares strong similarities, in its role as well as in its primitive status, with the notion of an atom as it is widely used for the analysis of plurals and mass nouns in linguistic semantics, in particular in Link (1983). For Link, pluralities form a domain that is ordered by a transitive part-of-relation and whose atoms are individuals. Formally, such a domain E constitutes a structure $\langle E, <_i \rangle$, which is a join semi-lattice with atoms. Here $<_i$ is the ‘i-part relation’ (the relation that holds between the members of subgroups of a plurality and the plurality itself). The sum operation applied to a nonempty set $X \subseteq E$ is defined as the least upper bound ($\text{sup } <_i(X)$). Individuals, that is, the elements in the extensions of singular count nouns, are simply defined as the atoms of the structure $\langle E, <_i \rangle$.

The distinction between pluralities and groups is then drawn as follows: Plural NPs such as *the children* stand for sums of individuals, whereas collective NPs such as *the group of children* stand for atoms.

The distinction between the ‘one’ and the ‘many’ would on this account have to be drawn as follows: when a plurality is counted, it is the atoms

(with respect to the *i*-part relation) that are counted. Groups count as one because they have only one atom as *i*-part.

Given that individuals act as atoms with respect to the *i*-part relation, they would themselves require yet a different part relation if reference to their parts was needed. Distributivity for Link consists in quantification over the proper *i*-parts of sums and thus would not be applicable to individuals (including groups), which do not have proper *i*-parts.

Quantities, which form the extension of mass nouns, constitute another joint semi-lattice involving another part relation, a structure $\langle M, \langle_m \rangle$, where M is the set of quantities and \langle_m the *m*-part relation of ‘is a subquantity of’. $\langle M, \langle_m \rangle$ of course is not or not necessarily atomic.

Of course the present generalizations could be stated in terms of the notion of an atom, once it is stipulated that only atoms are bearers of properties and that predicates apply to atoms and nonatoms in just the way they apply to objects and nonobjects on my account. The notion of an atom as it is used for the semantics of plurals and mass nouns within extensional mereology has primarily the function of preventing parts of an atom to count as parts of a larger entity, given the transitivity of the lattice-theoretic part relation. If an extensional mereological part relation is used (more precisely, three different part relations of this sort for individuals, collections, and quantities), then objects (as property-bearers) can be identified with atoms. If that part relation is not used (but rather a single part relation for individuals, pluralities, and quantities, as in Moltmann 1997), then the notion of an object (as a property bearer) will just play a role in influencing the interpretation of predicates.¹⁷

On the extensional mereological account, the notion of an atom is closely tied to the syntactic category of singular count nouns – in fact it can hardly be understood independently of it. On the present account, the notion of a property bearer is a primitive notion and as such need not be tied to a particular syntactic category of nouns.

¹⁷ Landman (1989) gives a somewhat different account of plurals, using set theory. He traces the availability of collective and distributive interpretations to the nature of the argument involved as follows: definite plural NPs denote sets of individuals if the predicate gets a distributive interpretation, and their denotation is lifted to the singleton of that set if the predicate receives a distributive interpretation. Distributivity is thus not traced to the presence of a distributive operator (in the sentence meaning or the content of the predicate), but rather to the nature of the group argument.

This account clearly misses several generalizations this paper has established. For example, it misses the generalization that not just distributivity, but also certain characterizable classes of collective predicates (or predicates on a collective reading) are possible only with plural arguments.

2.6. *The Semantics of Explicit Group-Referring Terms*

We still have to account for complex collective NPs such as *the group of children*. The semantics of such NPs is entirely parallel to that of explicit property-referring terms. More precisely, the role of the expression *group of*, when followed by a definite plural (e.g., *the group of the children*) is basically the same as that of the expression *property* in explicit property-referring terms: it acts as a reifying expression, mapping a plurality (an element of **N**) onto the corresponding group (an element of **O**). As with *property*, though, *group* expresses more than pure reification, generally implying some form of integrity of the group in question. Thus, I will only say:

(77) For an entity $d \in \mathbf{N}$, $\llbracket \textit{group of} \rrbracket^{w,t}(d) \in \mathbf{O}$.

The noun *group* as well as other nouns like *family* or *orchestra* will also have a reifying effect in predicative constructions such as the following:

- (78) a. These children are the group I was talking about.
 b. These people are my family/the orchestra.

Such sentences (like those with kind-referring subjects) are apparent counterexamples to the generalization that pluralities (or kinds) are not direct bearers of properties. However, they can now receive the already familiar analysis which exploits the reifying force of the collective noun, as roughly in (79) for (78a):

(79) *I was talking about*(reif($\llbracket \textit{the children} \rrbracket$))

There are also the constructions *the group of children* and, in the mass domain, *the quantity of water*, where the reifying expression is followed by a bare plural or mass nouns. These constructions require a somewhat more complex analysis with quantification over instances of the kind that the bare plural or mass noun stands for, as in (80):

- (80) a. For any kind $k \in \mathbf{N}$, world w and time t ,
 $\llbracket \textit{group of} \rrbracket^{w,t}(k) = \{o' \mid \exists o (o \in \textit{int}(k)(w, t) \ \& \ o' = \llbracket \textit{group of} \rrbracket^{w,t}(o))\}$
 b. For any kind $k \in \mathbf{N}$, world w and time t ,
 $\llbracket \textit{quantity of} \rrbracket^{w,t}(k) = \{o \mid \exists m (m \in \textit{int}(k)(w, t) \ \& \ o = \llbracket \textit{quantity of} \rrbracket^{w,t}(m))\}$

That is, to get the referent of *the group of children* first an actual instance (a plurality) of ‘children’ is to be chosen and then mapped onto the object that is the group formed from that collection. To get the referent of *the quantity of water*, first an actual instance of the kind ‘water’ is to be chosen and then mapped onto its reification.

The parallelism between explicit group-referring terms and explicit property-referring terms further reflects what appeared to be a profound underlying analogy between the two kinds of collections and the two kinds of universals. Neither collections nor universals are associated with essential integrity conditions and thus they may be conceived of either as nonobjects, as a multitude, or else as objects, as ‘one’, or equivalently either as being able to bear basic properties or as not being able to bear basic properties.¹⁸

3. CONCLUSION

This paper has presented a number of striking analogies between universals and collections that manifest themselves in the context of natural language semantics. Both universals and collections divide into those that behave like true objects and those that act as objects only in the sense of acting as denotations of referential terms and variables (as nonobjects). In both cases, I have argued, the crucial criterion for objecthood is that of being a potential bearer of properties. This condition generally goes along with other conditions an entity may satisfy, such as that of being a logico-semantic object or being an integrated whole. But it may also obtain independently of that, and moreover, it is independent of the mass-count distinction as such.

The arguments in this paper were focused on the semantic data displayed by English. But the issues they involve are of a rather general nature and link up, in quite revealing ways, with long-standing discussions in the history of philosophy, concerning the nature of universals, the status of collections, as well as analogies between universals and collections.

¹⁸ Looking at universals and collections in this analogous way was not uncommon in ancient and medieval philosophy. Take just the characterization of the Aristotelian form of moderate realism in Donagan (1963), ‘... an essence [such as the essence, man] exists in two distinct ways: in *rerum natura* as a many, and in the mind, as a one. The universals term ‘man’ stands for the essence ‘man’ as it exists in the mind abstractly. The essence itself, being neutral with respect to universality and particularity can exist in *rerum natura* as individuated in Socrates, Plato, and other men’.

For a somewhat more recent attempt at looking at universals as wholes with parts see also Stout (1952).

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