Properties, entity correlates of properties, and existentials

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1. Introduction*

Setting aside obviously predicative uses of nominals, the claim that predicates can take property-type nominal arguments has been motivated on the basis of two very different kinds of data. On the one hand, Chierchia 1984 discussed cases in which a predicate such as *fun* or *good* can apply to a nominalization such as in the following examples:

(1) a. Fun is fun.
b. Goodness is good.

Such examples, he argued, show that some predicates denote true properties of properties. His analysis, as we will see below in greater detail, technically did not involve assigning nominalizations such as *fun* or *goodness* to type <*e*,*t*> or its intensional counterpart; rather, he chose to treat the nominalization as an ENTITY CORRELATE OF A PROPERTY, a sort within type *e* deeply similar to a Carlsonian kind. Thus, (1a) could be translated as in (2), where **fun** is of type <*e*,*t*> and **f** stands for the entity correlate of the property "fun".

(2) **fun**(**f**)

On the other hand, de Hoop 1992, McNally 1995, Van Geenhoven 1995 and many subsequent works have posited that verbs that denote properties of or relations between what I will call "ordinary" individuals or PARTICULARS[1] can nonetheless combine with property-type nominals via a mechanism which Van Geenhoven termed SEMANTIC INCORPORATION. For example, Van Geenhoven proposed that English bare plurals denote properties and that verbs such as *eat* could be translated not only as in (3a) but also as in (3b), permitting semantic incorporation of a property-type complement as in (3c).[2]

(3) a. $\lambda y \lambda x$[**eat**(x,y)]
b. $\lambda P \lambda x \exists y$[**eat**($x$,$y$) $\wedge$ P(y)]
c. T(*eat cookies*) = $\lambda P \lambda x \exists y$[**eat**($x$,$y$) $\wedge$ P(y)](**cookies**)
= $\lambda x \exists y$[**eat**(x,y) $\wedge$ **cookies**(y)]

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1 While this is an admittedly vague term whose extension might be difficult to decide in extreme cases, for now it is sufficient that the reader take it to include humans and other physical objects.

2 See Dayal 2003, Farkas and de Swart 2003, and Chung and Ladusaw 2004 for different formulations of what is essentially the same kind of semantic composition phenomenon. For most of the purposes of this paper, which formulation we adopt will not be crucial and unless stated otherwise, I will use *semantic incorporation* as a generic term for any analysis on which a predicate that "deeply" selects for an *e*-type argument combines with a property-type one.

There are two differences between these analyses. One is (at least apparently) superficial: Chierchia treated property-type arguments as entities, whileVan Geenhoven formalized them as functions. The other difference is substantial: Chierchia is concerned with predicates that fundamentally (at least can) describe properties, while Van Geenhoven is concerned with predicates that fundamentally describe ordinary individuals but which happen to compose semantically with property-type expressions that provide descriptions of the ordinary individual in question. These differences are not necessarily related. McNally 1998 has a predicate that denotes a true property of properties combine with an <*e*,*t*>-type argument, while Müller-Reichau 2005 presents a version of semantic incorporation based on Farkas and de Swart 2003 which uses an *e*-type formalization for the property argument.

The choice between formalizing a property as an entity or a function might seem to be a technical matter difficult to decide upon on empirical grounds (though see Chierchia 1984, Müller-Reichau 2005 and below for possible empirical arguments). In contrast, in most cases it is intuitively very clear whether a predicate denotes a property of a property or an individual – no one who advocates semantic incorporation for a verb like *eat* would suggest that we eat properties, and it is difficult to imagine the denotation of a noun like *goodness* as anything but an abstract object, though it might be difficult to decides exactly what kind of abstract object it is. But there is at least one class of cases where it is not at all obvious whether true property predication or ascription of a property to ordinary individuals is involved: that of existence statements. When this ambivalence is combined with the possibility of a semantic incorporation analysis, things suddenly get rather murky. Just how murky can be seen in the fact that, while both kinds of property predications have been used to analyze existential sentences in various languages (see e.g. McNally 1992 for an analysis inspired in Chierchia's work; see e.g. Van Geenhoven 1996, Chung and Ladusaw 2004 for semantic incorporation analyses on which the existential predicate denotes a property of ordinary individuals), the fact that these analyses are fundamentally different has arguably not even been noticed, let alone discussed.

The goal of this paper is to examine this class of cases, using the English *there*-existential predicate as a paradigmatic example. I will argue that *there*-existentials are best analyzed as involving true property predications, rather than semantic incorporation. More generally, I wish to encourage more careful thinking about what is semantic incorporation and what isn't, and what kinds of criteria can decide in any given case. The discussion will have two important consequences beyond any it might have for our understanding of semantic incorporation itself. First, it serves as a reminder that there might be cross-linguistic (and even within-language) variation in the semantics of existence statements. The diagnostics I will use for *there*-sentences when coupled with relatively conservative theoretical assumptions predict three general patterns of variation which appear to be attested. Second, the analysis will make use of entity correlates of properties outside of the domain of the analysis of generics/bare nominals, practically the only place they have been used in the literature (with the obvious exception of Chierchia 1984; see also McNally 1992, Müller-Reichau 2005). As will become clear, this use raises questions – largely unanswered here – about how entity correlates of properties and kinds are related.

The structure of the paper is the following: After presenting the logically possible analyses for existence statements in section 2, I argue in sections 3 and 4 for the anlysis originally presented in McNally 1992. Section 5 briefly discusses typological variation in existence statements and provides some candidates for

instantiations of this variation.

2. Properties, entity correlates of properties, and the lexical semantics of the *there*-existential predicate

2.1. Two possible lexical semantics for the existential predicate

Strawson (1959:241) identified a crucial property of existence statements which has important implications for the semantics of existence predicates:

> [W]e can…admit the possibility of another formulation of every…existentially quantified statement, and, with it, the possibility of another use of the word 'exists', a use which is equally univocal throughout the range of its applications. We can…reconstrue every such quantified proposition as a subject-predicate proposition in which the subject is a property or concept and in which the predicate declares, or denies, its instantiation.

Strawson's observation can be recast as a hypothesis about the semantics of existence predicates as a class.[3] Such predicates might have one of two general types of semantics, subject to within-language and cross-linguistic variation. The first I will call an "exist"-type semantics. On such a semantics the predicate denotes a property of (or a relation involving, as the relevant argument) a particular, an individual such as my cell phone or my daughter. Thus, a sentence such as (4a) could be translated as in (4b), where for the sake of illustration I treat the indefinite *a white gorilla* as denoting the entity returned by a choice function *f* on the set of white gorillas (see e.g. Reinhart 1997, Kratzer 1998).[4]

(4) a. There was a white gorilla (at the Barcelona Zoo).
b. **exist**($f(\lambda x[$**gorilla**$(x) \wedge$ **white**$(x)])$)

The analyses of *there*-existentials in Barwise and Cooper 1981 and Keenan 1987 exemplify such a semantics, though they differ in details.

The second general type of analysis involves what I will call an "instantiate"-type semantics: The predicate denotes exclusively a property of (or a relation involving, as the relevant argument) a NONPARTICULAR, modelled here as an entity correlate of a property. What is an entity correlate of a property? Chierchia 1984 posited that all first order properties had counterparts in the entity domain in order to analyze cases of self-predication such as (1a) in a system that avoids both the paradoxes associated with self-predication and empirically unmotivated type proliferation. He defined two functions which relate properties-*qua*-functions to their entity correlates: $\cap$, a function from type $\langle e,p\rangle$[5] to type *e*; and $\cup$, in the opposite direction, as shown in (5) (see Chierchia

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[3] I take this class to be broadly construed. For example, in English it might include not only *exist* and *there be* but also the so-called existential *have.*

[4] Reinhart existentially quantifies the choice function variable; Kratzer treats it as free. Here I follow Kratzer.

[5] Chierchia used an intensional property-theoretic semantics on which tensed clauses denoted propositions, which like entities correlates of properties constitute a special sort (represented here as *p*)

1984:149ff. for details).

(5) $\cup\cap$**gorilla** = **gorilla**

Chierchia observed (1984:18) that entity correlates of properties were used by Cocchiarella 1976 to model kinds, and he himself has used them to model kinds in subsequent work (e.g. Chierchia 1998). While we will see shortly that not all expressions that we will take to denote entity correlates of properties are plausible candidates for kind terms, treating kinds formally as a proper subclass of the entity correlates of properties will prove useful.

Using this notion of entity correlate of a property to model Strawson's concept of a nonparticular, an "instantiate" semantics for (4a) would be as in (6).

(6) **instantiate**($\cap\lambda x$**[gorilla**(x) $\wedge$ **white**(x)])

Such an analysis was defended for *there*-existentials in McNally 1992.

If we assume that the only composition operation available is function application and that quantification must be first order (a hypothesis that Chierchia 1984 also argued for), it is simple to distinguish these two analyses empirically. A predicate with an "exist"-type semantics (I will assume that *exist* is one) will combine with expressions that denote particulars or quantifiers over them. The sentences in (7), particularly (7b), ostensibly illustrate these combinatorial possibilities.

(7) a. Tipitina's still exists amidst the devastation in New Orleans.
b. Each building I've shown you a picture of really exists.

In contrast, a predicate with an "instantiate"-type semantics (such as, I will argue below, *there be*) should *not* combine with expressions that denote particulars but rather only with nonparticular-denoting expressions or quantifiers over them. This expectation is borne out by data such as that in (8). S*inging* is a prototypical example of the sort of nominal that Chierchia treated as denoting an entity correlate of a property. The contrast between (8b) and (8c) shows that quantification is possible only over certain kinds of entities, namely those describable by nouns such as *type* but not e.g. *piece*, indicating that quantification over particulars is excluded while quantification over nonparticulars is licensed.

(8) a. There was singing.
b. There was every type and brand of farm and forestry equipment available.
c. *There was every piece of equipment available.

However, the examples in (9) appear problematic, as neither indefinite DPs nor proper names are intuitive candidates for nonparticular-denoting expressions.[6]

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within type *e*. For our purposes, however, properties could be treated as is usual in a set theoretic extensional semantics.

[6]The fact that (9b) might be usable only in restricted contexts is not relevant here – if it is usable in at least some contexts, it must be interpretable, and we must therefore give an account of its semantics. The same is true of definite descriptions, though unlike the examples in (9), definite descriptions do have natural uses as nonparticular-denoting expressions in at least some contexts in English.

(9) a. There were two buildings standing after the hurricane.
b. There was Tipitina's.

Nonetheless, both types of DPs can be assigned a property-type denotation via the type shifting rules in Parteee 1987, which then can be shifted via $\cap$ to entity correlates of properties. Such cases lead us to adopt the position that kinds are at most a proper subclass of the entity correlate of properties.[7]

2.2. Semantic incorporation and related analyses

If this were all that needed to be said about semantic composition, it would be relatively straightforward to pursue an investigation of the semantics of existential predicates. But things are not so simple. Van Geenhoven's formalization of semantic incorporation and composition rules like Chung and Ladusaw's (2004) "Restrict" rule permit – or in idiosyncratic cases even require – a predicate with an "exist" semantics to combine with a property-type expression (the latter treated by both Van Geenhoven and Chung and Ladusaw as a function rather than as its entity correlate).

An example of West Greenlandic noun incorporation appears in (10); (11) provides Van Geenhoven's (1998:166) analysis. The existential predicate *-qar-* is analyzed by Van Geenhoven as essentially locative, establishing a relation between a particular (represented by the existentially quantified variable *y*) and a location (specified in a step posterior to (11b) by *nillataartarfim-mi*). However, as it is obligatorily incorporating, it will always combine with a property-type located-entity argument.

(10) Nillataartarfim-mi tallima-nik manne-qar-p-u-q
fridge-LOC five-INST.PL egg-have-IND-[-tr]-3SG
'There are five eggs in the fridge.' (W. Greenlandic, Van Geenhoven 1998:164)

(11) a. T(*-qar-*): $\lambda P \lambda LOC \lambda w \exists y[P_w(y) \wedge LOC_w(y)]$
b. T(*manne-qar-*): $\lambda LOC \lambda w \exists y[\mathbf{manne}_w(y) \wedge LOC_w(y)]$

As an alternative to adjusting the verb's semantics in order to resolve what would otherwise be a type mismatch between predicate an argument, Chung and Ladusaw propose a special composition rule they call "Restrict", which allows property-type expressions to act as restrictive modifiers on predicates denoting properties of or relations between particulars. They use Restrict for the semantics of sentences like (12), an example of the Maori existential construction involving the special indefinite *he-* nominal, which Chung and Ladusaw claim is lexically marked to combine only via Restrict. The crucial step is shown in (13) (Chung and Ladusaw 2004:10,53); they apply a general rule of Existential Closure and subsequent negation to arrive at a complete translation for the sentence.

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[7] Krifka 1995, following Pelletier and Schubert 1989, makes a similar distinction between kinds and what he calls "concepts" (a sort of entity properly including the kinds) on the basis of Chinese data, though his analysis is based on examples which involve bare nominals modified by relative clauses (e.g. the Chinese equivalent of 'gentleman who is wearing blue clothes'), which are perhaps closer to prototypical kind terms than those in (9).

(12) Kāhore he taniwha.
T.not a taniwha
'There are no taniwhas.' (Maori, Chung and Ladusaw 2004:53, ex. due to Bauer)

(13) Restrict(λx[**exist**(x)], λx[**taniwha**(x)]) = λx[**exist**(x) $\wedge$ **taniwha**(x)]

Yet another technique for achieving the same result appears in Chierchia 1998, and is based on Carlson's 1977a composition rule for object- or stage-level predicate that combines with kind terms. Chierchia adopts an "exist" semantics for *there*-sentences but allows the existential predicate to combine with entity correlates of properties via what he terms Derived Kind Predication (hereafter, DKP; see also Müller-Reichau 2005, who extends a very similar analysis to Maori *he*). The derivation for (14) is illustrated in (15):

(14) There is a problem.

(15) a. T(*there be*) = $\lambda x_O[x_O = x_O]$

b. $\lambda x_O[x_O = x_O](\cap$**problem**)

c. DKP: If P applies to objects and k denotes a kind, then $P(k) = \exists x[\cup k(x) \wedge P(x)]$

d. $\exists x[\cup\cap$**problem**$(x) \wedge \lambda x_O[x_O = x_O](x)] = \exists x$[**problem**$(x) \wedge [x = x]]$
$= \exists x$[**problem**(x)]

It is important to emphasize that something like DKP is going to be needed no matter what our analysis of existential sentences is. As Carlson noted, at least in English, it is quite generally possible for kind-denoting expressions (e.g. DPs containing nouns like *kind*) to appear in argument positions that correspond sortally to particulars, as in (16).

(16) a. I've never eaten that kind of meat.
b. That brand of cereal is available at our local supermarket.

DKP differs from both Van Geenhoven's version of semantic incorporation and Restrict in that, to my knowledge, it has not been proposed that DKP be an obligatory composition operation available for any given predicate. That is, modulo the definiteness effect (which Chierchia suggests is pragmatic), on the DKP analysis existential sentences are just like those in (16) or any others in which kind-denoting expressions occupy object- or stage-level argument positions.

The question that concerns us is: How can we distinguish the analyses in (11), (13) and (15) from that in (6)? First, we must look for evidence to decide whether the relevant argument should be analyzed as a property-qua-function or as its entity correlate. If the latter, we will have evidence for (11) or (13); if the former, we will have evidence for (6) or (15). Second, we must try to identify selectional restrictions on the argument of the relevant predicate which would support its being restricted to nonparticulars (cp. *extinct*). If it is so restricted, we will have support for (6); if it is not, any of the other three analyses might be viable. Combining these two diagnostics we can distinguish between (6), (15), and (11)/(13). In this paper I will not investigate arguments for/against (11) and (13) or other implementations such as Farkas and de Swart's (2003) or Dayal's (2003). I now turn to the first type of evidence we need.

3. Arguments against a functional-type complement for *there*-sentences

3.1. Categorial restrictions on the postverbal expression

A simple and yet convincing argument against assigning the postverbal expression in *there*-sentences a functional type comes from the fact that it must be a nominal. Other non-finite predicative expressions such as APs, PPs, and bare singular count nominals, which are all felicitous in typical predicative positions, are excluded from *there*-sentences. This contrast between there-existentials and true predicative contexts is shown in (17) and (18).

(17) a. *There was happy.
b. *There is professor of philosophy at Yale.
c. There was happiness.
(18) a. She was happy.
b. She is professor of philosophy at Yale.
c. That is happiness.

Chierchia (1984:48) suggests that adjectives such as *happy* denote properties-*qua*-functions, and that precisely the job of determiners and nominalizing affixes is to produce expressions that can serve as arguments for predication:

(19) T(*happiness*) = ∩**happy**

In contrast, the failure of non-nominal property-type expressions and bare singular nominals to appear in existentials is not straightforwardly predicted by any analysis which assigns the postverbal expression a functional type—such an analysis must resort to a syntactic constraint requiring the postverbal expression to be a DP. This is unattractively *ad hoc* given that in other contexts (such as copular constructions) acceptability depends on semantic type rather than on syntactic category.[8]

3.2. Quantification over the postverbal argument

A second argument that *there be* does not combine with a property-*qua*-function comes from sentences that involve quantificational DPs in the postverbal position of the kind first discussed to my knowledge in Lumsden 1988, and exemplified in (20):

(20) I divided up the dogs by the type of head that they had. There was the Terrier-type head (Type "B" Head), the Spaniel type head (Type "C" Head), and the Bulldog type head (Type "A" Head)….In the Small British Terriers group …**there is each type of head**.
(http://www.geocities.com/great_pyreneez_kennelz/wolftodog2.htm)

The semantics in (6) accounts directly for these examples: *each type of head* can quantify unproblematically over the existential predicate's argument if *type* ranges over

[8]See Farkas and de Swart 2003 and Dayal 2003 for additional relevant argumention involving bare singulars.

entity correlates of properties (represented by variables with a subscripted *P*):

(21) a. T(*type of head*): λx_P.**type**(x_P, **head**)
b. (**each** x_P: **type**(x_P, **head**))[**instantiate**(x_P)]

The DKP analysis also has no problem:

(22) a. (**each** x_P: **type**(x_P, **head**))[$\lambda x_O[x_O = x_O](x_P)$]
b. (**each** x_P: **type**(x_P, **head**))[$\exists x[\cup x_P(x)]$]

On a semantic incorporation or Restrict analysis we have two options. I will use Restrict to illustrate. The first is to have *type of head* denote a second-order property (see e.g. de Swart 2001) and to allow *each* to denote a relation between second-order properties. A derivation is shown in (23). I assume a tripartite logical form structure, following Heim 1982, as in (23a). Both the restriction and the nuclear scope of the operator **each** are translated as open formulae ((23b,c)). Existential closure on the nuclear scope (represented by the operator EC) binds all variables other than the one bound by **each**. The translation of *each* will combine by function application (which Chung and Ladusaw represent via the relation FA) with that of *type of head* and then that result will combine by the same rule with the rest of the sentence, as in (23d).

(23) a. [$_{IP}$ each [$_{DP}$ _type of head] [$_{IP}$ there was _]]
b.T(*_type of head*): λP.**type**(P, **head**)(P) = **type**(P, **head**)
c. T(*there was* _): Restrict(λx[**exist**(x)], P) = λx[**exist**(x) $\wedge$ $P(x)$]
EC(λx[**exist**(x) $\wedge$ $P(x)$]) = $\exists x$[**exist**(x) $\wedge$ $P(x)$]
d. T(*there was each type of head*) = T(*each* [_ *type of head*] [*there was* _]) =
FA(FA(**each**, [**type**(P, **head**)]), $\exists x$[**exist**(x) $\wedge$ $P(x)$])

This analysis doesn't run into any immediate empirical problems. However, it is subject to the same criticisms that motivated Chierchia (1984:77ff.) to adopt what he called the "three-layer hypothesis": the hypothesis that all expressions of natural language can be typed as entities (whether particulars, entity correlates of properties, or propositions), first order properties, or second order properties, the latter being strictly limited to quantificational determiners and certain adverbs. First, allowing common nouns to denote both first and second order properties results in an unattractive and empirically unmotivated proliferation of types for other categories. Second, it offers us little insight into various data Chierchia discusses, such as the fact that determiners, complementizers and nominalizing affixes exist at all, or the fact that there is little or no independent evidence for second order quantification (other than precisely the example under discussion) or anaphora to second order properties in natural language.

The second option for a semantic incorporation/Restrict analysis is to have *type of head* denote a property of entity correlates of properties and use type coercion or an alternative composition rule to permit the combination of the quantifier (or an associated bound variable) with the existential predicate. For example, we would have to develop an alternative rule, Restrict′, which would combine a predicate denoting a property of individuals with an expression denoting an entity correlate of a property, ultimately yielding the same result as Restrict.

(24) FA(FA(**each**, λx_P[**type**(x_P, **head**)]), Restrict′(λx[**exist**(x)], x_P))

However, note that this rule is effectively indistinguishable from DKP.

In sum, while the empirical arguments are not definitive, the possibility of quantification over the postverbal argument in *there*-existentials offers no reason to treat the postverbal nominal as a functional type; rather the opposite. Moreover, if we find that just those languages (with determiners) that permit bare singular nominals in their existential constructions are precisely those that exclude quantification similar to that in (20) in those same constructions, we have even more reason to consider the diagnostics in this section and the previous one to be reliable indicators as to the semantic type of the relevant nominal.

3.3. What about pronouns?

One potentially serious problem for the claim that the postverbal nominal denotes the entity correlate of a property comes from data such as (25) together with that in (26):

(25) *No perfect relationship is such that there is it.

(26) a. Every kind of machine has its defects.
b. Every kind of wine becomes more popular after Santi writes about it.
c. Every kind of animal engenders sympathy once it's extinct.
d. ??Every type of head is such that there is it.

Sentences such as (25) which led Heim 1987 to propose the constraint in (27):

(27) **There be x*, when *x* is an individual variable.

If the nominal denotes an entity correlate of a property, and in general entity correlates of properties can be referred to using the pronoun it, as (26a-c) would suggest, it is hard to explain why (25) and more crucially (26d) are unacceptable.

However, the pronominalization facts are not so simple. Not all pronouns are excluded from existential constructions. Deictic (or potentially deictic) pronouns are acceptable in the same contexts as definites and names are; only *it*, which is never deictic, is completely unacceptable:

(28) a. [Talking about who/what can help:] There's me/you/us/her/them/this/that.
b. ??There's it.

Any account of the distribution of pronouns based simply on definiteness or on at least the simplest interpretation of the constraint in (27) will have trouble explaining the contrast in (28). This contrast suggests that the problem in (25), (26d) and (28b) is the necessary anaphoricity of the pronoun. Given that *there*-existentials must be independently associated with some kind of pragmatic condition related to the novelty of the postverbal nominal (see McNally 1992, 1998 and references cited therein on the independent roles of semantic and pragmatic factors in accounting for the definiteness effect), we might account for the restriction on *it* via the constraint in (29), where the notions DISCOURSE-NEW and HEARER-OLD are taken from Prince 1992. The former refers to a referent which has not been previously mentioned in the discourse; the latter

refers to a referent which is part of the common ground, whether because of previous mention or simply because of shared knowledge.

(29) The postverbal nominal in a *there*-sentence must be able to introduce a discourse-new (if possibly hearer-old) referent.

(29) is a slightly weaker version of the constraint on postverbal nominals proposed in Birner and Ward 1995, but is compatible with the data they discuss in their paper.

4. Arguments for an "instantiate" semantics over an "exist" semantics

Now let us return to the choice between an "instantiate" semantics such as (6) and an "exist" semantics which permits entity-correlate-of-a-property arguments via Derived Kind Predication. Recall that one way to distinguish the two would be to identify (in the case of an "instantiate" semantics) or fail to identify (in the case of an "exist" semantics) selectional restrictions on the argument of the relevant predicate which would support its being restricted to nonparticulars. I know of two such potential restrictions for English *there*-sentences. The first involves subject contact clauses (i.e. *that*-less relatives); the second becomes evident when we consider relativization out of the postverbal position in *there*-sentences.

4.1. Subject contact clauses

Subject contact clauses are found in certain dialects of English, perhaps most productively in Appalachian English and Hiberno-English. My discussion is based on that in Doherty 1993 and all data mentioned here is taken from his work. In all dialects that permit subject contact clauses, they are licensed only in a restricted set of contexts. In the least permissive dialects, they appear only in the postverbal DPs in *there*- and *have*-existentials (30a,b), in *it*- and pseduo-clefts (30c,d), and in copular sentences with impersonal subjects such as (30e):

(30) a. There's **a man here can't speak English**.
b. I have **an idea might work**.
c. It was **Bill did it**.
d. **The only one can do it** is John.
e. Here's **the one'll get it for you**.

While there has been debate as to whether the contact clause forms a constituent with the noun it modifies (see e.g. Erdmann 1980), Doherty (1993a:92ff.) provides convincing arguments that they are indeed relative clauses that form a constituent with this noun.

In more permissive dialects, such as Appalachian and Hiberno-English, subject contact clauses have a rather wider distribution, being licensed in certain modal contexts ((31a)); as complements to intensional verbs such as *seek*, where they have a strong or exclusive preference for *de dicto* readings ((31b)); in a slightly wider variety of copular sentences (e.g. (31c)); and in the restriction of universally quantified DPs ((31d,e)):

(31) a. I'd like to meet **the man would play-act on Larry**.

b. I'm looking for **someone speaks Irish well**.
c. John is **the only one can do it**.
d. **Any man can't fight for his friends** had better be dead.
e. **Everyone lives in the mountains** has an accent all to theirself.

In contrast, they are excluded from extensional contexts other than those mentioned above ((32a,b)) and from other copular sentences which Doherty does not precisely define but which appear to be more predicational in nature than those in which contact clauses are acceptable (e.g. (32c)):

(32) a. ***A man speaks Irish** walked into the bar.
b. *I gave a ticket to **a man comes every day**.
c. *John is **a doctor treats his patients well**.

It is difficult to find a positive generalization that will account for all the facts; however, what is clear is that if we posit an "exist" semantics for *there*-existentials, it will be impossible to distinguish a context like that in (30a) from e.g. those in (32a,b), since *there*-sentences are typically considered extensional.[9] In contrast, on the "instantiate" semantics, we have at least the hope of assimilating the postverbal position to that in copular sentences under the following generalization, adapted from Doherty:

(33) Subject contact clauses are licensed only in nominals that do not introduce persistent discourse referents into the discourse model.

This generalization extends to *there*-existentials because on the "instantiate" analysis it is not the nominal that introduces the discourse referent; rather, as argued in McNally 1992, the referent is introduced indirectly via inference based on the lexical entailments of the existential predicate.

To account for these facts on the DKP analysis, two assumptions are necessary. First, we must assume that subject contact clauses are acceptable as modifiers of kind-terms. This seems unproblematic. However, the second assumption is untenable, namely that kind terms and DKP are systematically excluded from extensional contexts such as those in (32a,b). This assumption is obviously falsified by examples such as the following:

(34) a. The kind of man you mentioned just walked into the bar.
b. I gave a ticket to the kind of man you are looking for.

Analogous assumptions must be made to account for the facts on a semantic incorporation/Restrict analysis, the equivalent to the second assumption above being that semantic incorporation/Restrict is not a combinatorial option in extensional contexts such as (32a,b). However, no language for which such operations have been proposed limits them in this way. Therefore, it would be quite odd for English to allow semantic incorporation or Restrict just for sentences such as those in (30) or (31) but not for extensional contexts as a whole.

In sum, an "instantiate" semantics for *there*-sentences offers better propsects for explaining the distribution of subject contact clauses than does an "exist" semantics.

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9 The only characterzition of existentials as intensional that I know of is that in Farkas 1981, on which the postverbal nominal is given a very similar analysis to the one I argue for below.

4.2. Relativization out of *there*-sentences

I now turn to the relativization facts. In order to show how these facts argue for an "instantiate" semantics for *there*-sentences, it is first necessary to review what has previously been said about such relative clauses.

Relative clauses whose gap corresponds to the postverbal nominal in a *there*-existential, such as those in (35), have been claimed to have only amount readings and not ordinary restrictive relative readings (see e.g. Carlson 1977b, Heim 1987, Grosu and Landman 1998).

(35) a. Bruce has scooped almost every trophy there is.
b. ...you...think you've tried just about every remedy there is...
c. ...it will be overburdened with all the problems there are in the community...

Intuitively, an amount reading is one on which an amount rather than a given object or set of objects is described. For instance, the amount reading of (36a) is true if Marv can fit 10 marbles in his pocket simultaneously and he puts 10 out of the 20 in his possession in his pocket at one time. The amount reading of (36b) is the only plausible one – it requires that we be able to drink the same amount of champagne as was spilled, not necessarily the same liquid.

(36) a. Marv put everything he could in his pocket. (Carlson 1977:528)
b. It will take us the rest of our lives to drink the champagne that they spilled that evening. (Heim 1987:38)

Looking again at the examples in (35), it is not obvious that they have a reading that makes reference exclusively to amounts. In fact, an important difference between amount relatives and relatives out of existentials is that the latter always impose an identity of individuals requirement that is not imposed by amount relatives (McNally 1992, Grosu and Landman 1998). For example, (37) cannot be true if there were five books on the shelf, and I read five books (in the relevant context) some or all of which were distinct from the five on the shelf:

(37) I read the books there were on the shelf.

However, the claim that relatives out of *there*-existentials have an amount reading despite this identity of individuals condition has been made on the basis of two observations. First, both amount relatives and relatives out of *there*-existentials appear to be restricted to a definite/universal determiner on the head noun (though we will see a few counterexamples below).

(38) a. ??Marv put something that he could in his pocket.
b. ??Bruce has scooped two trophies there are.

Second, at least in some dialects of English both amount relatives and relatives out of *there*-existentials allow only a *that* or null relative pronoun and do not easily license *which* or *who.*

(39) a. ??Marv put everything which he could in his pocket.

b. ??Bruce has scooped every trophy which there is.
c. ??We've talked to everyone who there is.

Given the facts in (37-39), one must draw one of two conclusions: either that relative clauses out of *there*-sentences need not be amount relatives, or that they must be a special type of amount relative. Grosu and Landman (1998) opt for the latter conclusion; in McNally 1992 I did the same. Let us now see why this is not viable and that instead we should conclude that the relative clause need not have an amount reading.

Grosu and Landman propose an extension of Carlson's and Heim's analyses which is designed to account for the identity of individuals condition while continuing to treat the relative clause as a species of amount relative.[10] Specifically, they, like Heim, have the clause denote in principle a unique maximal degree, but they enrich the notion of degree so that it is not simply a numerical value but rather a triple $<|x|, P, x>$ that includes, in addition to the typical numerical value associated with a degree ($|x|$), a sortal description P (to specify what the degree is a degree of) and also a plural individual to which the degree corresponds. Although typical amount relatives when combined with the head noun denote a singleton set containing one of these degree triples, via the intervention of a special "SUBSTANCE" operator such relatives, a singleton set containing the plural individual from the triple can come to serve as the denotation of the head noun plus relative clause and yield the identity of individuals reading. Because the relative clause, whether interpreted with identity of individuals or not, will always serve identify a unique individual, Grosu and Landman predict the unacceptability of indefinite determiners as in (38). However, as I will discuss below, the analysis says nothing specific about the facts in (39).

But despite what the facts in (38) and (39) might suggest, there is a serious problem for the claim that only amount relatives are possible out of postverbal position in *there*-existentials, even taking into account identity of individuals as under Grosu and Landman's analysis. The problem is that the denotation of the relative clause need not determine a unique maximal individual, even though in the majority of cases it appears to do so. This can be seen in at least two facts. First, though very rare, violations are in fact attested of the condition that the determiner marking the head noun be definite or universal. Some examples found via Google appear in (40):

(40) a. For instance, they can observe that there's a difference between reasons *there are* to believe P—where these include reasons not now available to you—and reasons *you have* to believe P. For example, one reason there is to believe you'll soon be sick is the fact that you just drank poison. (J. Pryor, Is There Non-Inferential Justification?, ms. Princeton U., italics original)
b. Let's start with posting a summary of the things you don't believe in, the reasons you don't believe in them, and possible reasons there are to believe in them….

On all analyses of amount relatives, maximality is a key aspect of their semantics, but the facts in (40) are totally incompatible with the relative clause identifying a maximal (and therefore unique) individual.

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10 Space limitations preclude a complete presentation of Grosu and Landman's analysis. I refer the reader to their paper and to McNally 2006 for additional details and commentary.

The second fact that suggests that relative clauses out of existential sentences are not amount relatives involves modifiers such as *only* and *different* on the head noun. Both *only* and *different* systematically block the amount reading of a cooccurring relative clause, as shown in (41); nonetheless, these modifiers systematically occur with relative clauses out of *there*-sentences, as shown in (42).

(41) a. It will take us the rest of our lives to drink the only champagne they spilled that evening.
b. We will never be able to recruit the different soldiers that the Chinese paraded last May Day.

(42) a. The only kinds of reasons there are are reasons for action….
b. Notice what different kinds of problems there are and can be in human life

Grosu and Landman's semantics for amount relatives out of *there*-sentences is exactly identical to that for other amount relatives except for the application of the SUBSTANCE operator, which simply returns the plural individual that forms part of the degree triple instead of the entire triple. This is not the sort of difference to which *only* or *different* are going to be sensitive; what these modifiers share semantically is a felicity condition guaranteeing the nonuniqueness of the extension of the nominal they modify. Thanks to maximality, amount relatives will never satisfy this nonuniqueness condition, leading to the blocking of the amount reading in (41). If *there*-sentences allowed only an amount reading, we would expect the sentences in (42) to be unacceptable. The fact that they are acceptable clearly indicates that this amount reading is not obligatory.

If we reject the idea that relatives out of *there*-sentences must be amount relatives, we must develop an alternative explanation for the restriction in (38) (to the extent that it is a fact) and (39). (38) indicates that, at least in general, there is a very strong tendency for the head noun plus relative clause out of a *there*-sentence to denote a singleton set. But this is entirely expected if the gap corresponds to the entity correlate of a property. The head noun will have to denote a property of entity correlates of properties, and these, like proper-names type shifted to properties, will generally have a unique extension. The exception will be when the head noun is something like *kind* or *type*, which denote (possibly) nonsingleton sets of entity correlates of properties. *Reason*, while not lexically restricted to this sort of denotation, demonstrably lends itself to denoting a such a set. Unsurprisingly, it is precisely with such nouns that we find modifiers such as *only* or *different* and the exceptions to the restriction on the use of indefinite/nonuniversal determiners.

The unacceptability of the relative pronouns *who* and *which* illustrated in (39) is characteristic of a sortal restriction, and indeed this is what Heim 1987 suggests: she posits that the exclusion of *who* and *which* is due to the fact that the relative clause denotes a degree. Since I reject the idea that the relative clause must denote a degree (though nothing should prevent that from being an option in whatever cases are conducive to amount readings), there must be some other sortal restriction involved. I argued in McNally 1992 that this restriction follows directly if the gap in postverbal position corresponds to a property or its entity correlate under the assumption that relative *who*, *which* are sortally restricted to particulars. Such a restriction is supported, for example, by the oddness of such relative pronouns when the gap in the relative clause is corresponds to a predicate nominal:

(43) a. ??They didn't recognize the kind of vase which it was.
b. They didn't recognize the kind of vase (that) it was.
c. ??His parents were unhappy with the man who he had become.
d. His parents were unhappy with the man (that) he had become.

Thus, the "instantiate" semantics for *there*-sentences provides for an analysis of relatives out of postverbal position where an amount relative analysis fails. Let us now consider how an "exist" semantics coupled with DKP or semantic incorporation/Restrict would handle these facts.

What is most crucial to any analysis that builds on an "exist" semantics is to account for the (near) obligatoriness of the facts: that definite determiners are almost always found, that indefinite determiners sound odd except when the postverbal nominal plausibly denotes a nonsingleton set of properties of properties, and that the relative pronoun is required to be *that* or null. If we adopt the DKP analysis, for example, we would have to posit that DKP is obligatory with *there*-existentials; otherwise, we would expect relative clauses out of existentials to behave like relative clauses out of any other ordinary argument position. But DKP as a rule does not appear to be subject to lexical selection: predicates over particulars quite systematically allow the possibility of saturating their argument positions with kind-denoting expressions, but I know of no proposal on which this is the *only* possibility. Indeed, to propose that a predicate must combine with its argument via DKP is empirically indistinguishable from proposing that it lexically selects for an entity correlate of a property. In contrast, cases of obligatory semantic incorporation and Restrict have been argued for by Van Geenhoven 1998 and Chung and Ladusaw 2004, respectively; thus, a Restrict analysis could account for facts like these which ultimately involve sortal restrictions associated with a particular argument position.

Summarizing the data in the previous two sections, I conclude that while, in general, no single fact argues conclusively for one analysis of the *there*-existential predicate over another, taken together the facts support the claim that the predicate denotes a property of entity correlates of properties.

5. The typology of semantic variation in existence statements

The results of the previous sections can be distilled into the following table, which indicates how we can distinguish empirically between two very similar semantics for existence statements on which the predicate obligatorily combines with an argument that does not correspond to a particular.

Predicate semantics	**Categorial restriction to DP**	**Quantification over relevant argument**	**Restriction to "amount-like" relatives or other selectional restrictions**
"exist"+ obligatory SI/Restrict	DP excluded	No	Yes
"instantiate"	Yes	Possible	Yes

In addition, we can add two further possibilities: an "exist" semantics which optionally allows the predicate to combine with a kind-denoting argument via DKP, and one which

optionally allows the predicate to combine with a property-*qua*-function argument via semantic incorporation or Restrict. Some languages might allow both of these options. When one or both of these options exists, there should be no restriction to "amount-like" relatives or other sorts of selectional restrictions, nor should there be any restriction on quantification over the postverbal argument – quantification over any sort of individual that can serve as the argument to the existence predicate should be licensed. In a language where semantic incorporation or Restrict is an option, we would expect to find the possibility of bare singulars in the relevant argument position; if this option isn't available, we would expect to find no bare singulars.

We do not have to look far to find cross-linguistic and within-language evidence which suggests that all of these possibilities are attested.

First, a consideration of the sorts of facts discussed above serves to confirm the analysis of the Chamorro existential predicates *guäha* 'exist' and *taya'* 'not exist', for which Chung and Ladusaw defend an obligatory Restrict analysis (interestingly enough, largely on grounds other than those discussed here). These predicates differ from most other verbs in Chamorro in allowing bare singular nominals as arguments (Chung 1987, Chung and Ladusaw 2004:87):

(44) a. *Mattu taotao gi petta. (Chung 1987:193)
Infl(s)-arrive person Loc door
('A man appeared in the doorway.')

b. *Ha-sodda' si Juan yommuk na patgun gi me'nan iya siha
Infl(3s)-find Unm Juan fat L child Loc front-L their-place
('Juan found a fat child in front of his (lit. their) house.') (Chung 1987:193)

c. Guäha taotao mattu gi petta
Infl(s)-exist person Infl(s)-arrive Loc door.
'There was a man (who) appeared in the doorway.'

d. Taya' lahi t-um-aitai i lepblu
Agr.not.exist boy Infl(wh)-read the book
'There was no boy (who) read the book.'

Moreover, these predicates do not permit quantification over properties or kinds (Chung and Ladusaw 2004:98 and chapter 3, fn. 5).

(45) *Taya' todu klasi-n hugeti-ña si Joe. (Chung and Ladusaw 2004:98)
Agr.not.exist all sort-L toy-Agr Unm Joe
(Lit. 'There aren't all sorts of toys of Joe's.')

Finally, according to Chung 1987:199-200, these predicates manifest in questions the same sortal restriction found with relativization (and to a lesser extent, with questions) out of *there*-existentials:

(46) a. Hafa guäha gi hälum kahun áis?
what? Infl(s)-exist inside box ice
'What is there inside the icebox?'

b. Kuantu na buteya guäha gi hälum kahun áis?

how-many? L bottle Infl(s)-exist inside box ice
'How many bottles are there in the icebox'

c. Hayi guäha gi kusina?
who? Infl(s)-exist Loc kitchen
('Who is there in the kitchen?')

This is exactly the array of facts expected if *guäha* and *taya'* denote properties of particulars but only combine with their arguments via Restrict or semantic incorporation.

West Greenlandic appears to be similar. Van Geenhoven observes that adjectives, numerals and verbs can incorporate (though she also has mentioned in personal communication that the adjective/noun distinction is not very easy to draw in the language).

(47) Angut marlu-raar-p-u-q. (Van Geenhoven 1998:15, ex. from Sadock)
man.abs two-catch-ind-[-tr]-3sg
'The man caught two.'

Similarly, Van Geenhoven (1998:45) notes that she had trouble getting her informants to accept the following example.[11] Van Geenhoven attributes the problem to pragmatics, but it is hard to see what pragmatic problem there could be with this sentence:

(48) Juuna tama-nik atuagar-si-v-u-q.
J.abs all-inst.pl book-get-ind-[-tr]-3sg
'Junna got all kinds of books.'

The patterns of data represented in the table coupled with facts such as those in (49) lead to a different analysis for Maori, a language for whose existential construction Chung and Ladusaw 2004 also propose a Restrict analysis. Chung and Ladusaw argue that nominals marked by the determiner *he* in Maori are special in requiring composition via Restrict; the Maori existential construction is peculiar in generally requiring *he*-indefinites and excluding indefinites marked with the determiner *tētahi*, which they claim combines with predicates via ordinary function application.

(49) a. Kāhore he taniwha.
T.not a taniwha
'There are no taniwhas.'

b. *Kāhore ētahi taniwha. (Chung and Ladusaw 2004:44)
T.not a.pl taniwha.
('There are no taniwhas.')

Müller-Reichau 2005 argues for an alternative view of the facts. Starting from Chierchia's position that the function of determiners is to convert expressions of type (<*s*,)<*e*,*t*>> into expressions of type *e*, Müller-Reichau argues for analyzing *he*-

11 Van Geenhoven attributes this example to personal communication from M. Bittner. It is unclear from Van Geenhoven's text whether Bittner's informants accepted the example or not.

nominals as obligatorily denoting entity correlates of properties.[12] This denotation will generally force them to undergo DKP, an analysis which is very similar to one on which they obligatorily undergo Restrict. He further proposes that the Maori existential predicate selects specifically for entity correlates of properties, i.e. that it has an "instantiate" semantics, as I have argued for *there*-sentences. This latter analysis is further supported by the fact that the otherwise excluded determiner *tētahi* is attested precisely with a kind nominal, as shown in (50):

(50) Ka kai a au I te mātene mehemea anake kaore tētahi atu momo mīti
T eat Pers I DO the mutton if only T.not a away kind meat
'I only eat mutton if there is no other kind of meat available.' (ibid., 156)

Chung and Ladusaw do not offer a quantificational analysis of *tētahi*, so we cannot be sure that (50) illustrates quantification over kinds. However, we can easily account for the facts by positing that semantic effect of *he* is to convert properties of particulars into kinds, while *tētahi* does not. Suppose, as do Chung and Ladusaw, that *tētahi* nominals denote the value of a choice function which selects an element from the nominal's extension. Only if that extension includes nonparticulars, as in (50), should a *tētahi* nominal be acceptable in an existential sentence. The acceptability of (50) is less easily explained on the Restrict analysis, for the reasons discussed in section 3.2.

The English verb *exist*, though a prosaic example, is arguably a predicate that lexically selects for particulars and allows optionally for kind-type arguments via DKP but not for semantic incorporation or Restrict. We have already seen (in (7b)) that *exist* allows for quantification over particulars. It allows for quantification over nonparticulars as well ((51a)), imposes no selections restrictions like those related to relative clause formation out of *there*-existentials ((52b,c)), and does not permit a bare singular argument ((52d)):

(51) a. That kind of telephone in fact exists.
b. I want to meet the magician who really exists.
c. You must bridge the gap which exists between the two groups.
d. *Solution exists.

Finally, the Catalan existential predicate *haver-hi* appears to have an "exist" semantics and allows optional combination with a bare singular via Restrict in addition to combination with a kind term via DKP. Although definite DPs are systematically licensed in Catalan existentials, quantificational DPs are quite restricted. Still, one finds cases such as (52a) whose analysis is not entirely clear but which do not intuitively involve quantification over kinds, which is illustrated in (52b).

(52) a. Hi ha cada element que dóna classes com a professor que no vegis.
Loc have each element that gives classes as professor that no see.2sg
Roughly: 'You wouldn't believe the individuals you find teaching classes.'

b. Hi ha tota mena d'informació sobre les illes….
Loc have all kind of-information about the islands

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[12] Müller-Reichau suggests that additional support for his analysis comes from the fact that *he*-nominals are used in generic sentences as well, as would be expected on a (neo)Carlsonian analysis of such sentences.

'There's all kinds of information about the islands….'

Moreover, (53) shows that ordinary restrictive relatives can be constructed out of *haver-hi* clauses:

(53) vaig pujar a…la urbanització que hi ha a la muntanya….
go.1sg go-up.inf to the development that Loc have to the mountain….
'I went up to the development that (there) is on the mountain.'

Finally, in (54) we see examples of how bare singulars can appear in Catalan existentials.

(54) a. Hi ha garatge.
Loc have garage
'There is (a) garage.'

b. Demà hi ha examen.
Tomorrow Loc have exam
'Tomorrow there is (an) exam.'

Though subject to certain restrictions, the nature of which are unclear, the use of bare singulars is not limited to strictly idiomatic expressions but rather is at least partially productive.[13]

6. Conclusions

I have argued that even within the family of property-based analyses of existence statements, there is room for semantic variation, and I have pointed to various candidates realizations of these semantic options. For *there*-sentences in particular, I have argued that the analysis proposed in McNally 1992 is superior to a semantic incorporation analysis of the sort suggested in McNally and Van Geenhoven 1998 and in other works.

Revindicating a role for entity correlates of properties outside the realm of typical generic sentences raises various theoretical issues. The most difficult – and one which will have to be addressed on a future occasion – is how best to distinguish a proper subclass of kind terms. However, the insights I hope to have gained into the semantics of existence statements have depended heavily on Chierchia's three-layer hypothesis and his vision of the role of determiners in converting properties into viable semantic arguments. Further work will also be necessary to determine to what extent these assumptions are independently justifiable.

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13 I am grateful to Maria Teresa Espinal for discussion of the Catalan data, though this is not to imply that she necessarily agrees with the analysis suggested here.

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