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Line Mikkelsen, Berkeley, CA (USA)

69. Existential sentences

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Abstract

The term ‘existential sentence’ is used to refer to a specialized or non-canonical construction which expresses a proposition about the existence or the presence of someone or something. Because of their special structural and interpretive characteristics, existential sentences have offered a rich ground on which to test theories concerning the semantics of noun phrases and of predication, as well as theories concerning the role of non-canonical constructions in information packaging. This chapter begins by reviewing the basic structural, semantic and discourse functional properties of existential sentences. Since, across languages, existential sentences resemble copular, possessive and locative sentences, considerable debate has arisen about the extent to which their semantics are similar. The chapter therefore continues with an overview of the different analyses that have been proposed for the core existential proposition. The remainder of the chapter is devoted to two distinctive features of these sentences which have generated substantial discussion in the semantics and pragmatics literature: 1) the so-called definiteness restriction, which limits the ability of definite and quantificational nominals to appear as the ‘pivot’ of the construction; and, 2) the predicate restriction, which has been claimed to restrict the expressions that can appear as the ‘coda’ to so-called stage-level predicates.

1. What is an existential sentence?

The term ‘existential sentence’ is used to refer to a specialized or non-canonical construction which expresses a proposition about the existence or the presence of someone or something. Thus, the sentence in (1a) is considered existential because it is specialized (insofar as it has an expletive subject, whose distribution is highly restricted in English) and entails nothing other than the existence of one even prime number. In contrast, (1b) will not be considered existential for the purposes of this article because, even though it entails nothing other than the existence of one even prime number, there is nothing specialized about its syntax: it has the canonical subject-predicate structure used in English. Finally, (1c), though closely related to the construction in (1a), differs from it in syntactic details, in its use in discourse, and in the fact that, thanks to the verb, it entails something more than mere existence or presence. This latter type of sentence, an example of the ‘presentational-*there*’ construction (see e.g., Aissen 1975), will not concern us further here.

- (1) a. There is one even prime number.
 b. One even prime number exists.
 c. There stood in the corner an empty coat rack and umbrella stand.

Existential sentences vary somewhat in structure, semantics, and pragmatics from language to language, though they generally share certain characteristics as well. This article will include examples from a variety of languages, though the discussion of their semantics and pragmatics will be based primarily on English.

1.1. Structural properties

Syntactically, existential sentences typically manifest most or all of the following five characteristics (see Francez 2007 for a particularly clear discussion and examples). First, an expletive subject, like English *there* or French *il* in (2a–b), may be required; however, in languages without expletives no such subject appears, as illustrated by the Catalan and Maori examples in (2c–d). Note that *hi* in (2c) is a locative clitic equivalent to French *y* in (2b):

- (2) a. There are bugs eating the corn.
 b. Il y a eu une reunion.
 it loc has been a meeting
 ‘There has been a meeting.’
 c. Hi ha espai a l’ armari.
 there has space to the closet
 ‘There is space in the closet.’
 d. Āe he taniwha.
 yes a taniwha
 ‘Yes, there are taniwhas.’ (from Bauer 1993, cited in Chung & Ladusaw 1994: 42)

Second, though existential sentences do not always contain a verb (see e.g., (2d)), if there is one it is often homophonous with a verb meaning ‘to be’ (2a) or ‘to have’ (2b–c), or with some other verb related to possession (such as *geben* ‘give’ in German in (3a)) which is ‘bleached’ of its content; it may also be a special lexical item such as Hebrew *yeS* (3b).

- (3) a. Es gab ein Kind in dem Garten.
 it gave a child in the garden
 ‘There was a child in the garden.’
- b. yeS harbe tisot ad xacot.
 EX many flights until midnight
 ‘There are many flights until midnight.’ (Francez 2007: 60)

Curiously, the survey in Clark (1978) indicates that the verb in existential sentences is rarely, if ever, homophonous with a verb that literally means ‘exist’, although in English one does find sentences like (4):

- (4) There exists one even prime number.

However, Aissen (1975), building on Ross (1974), has argued that such sentences, which are also attested with a limited set of verbs including *remain*, *ensue*, and *follow*, do not share all of the properties of existential sentences with *be*, but rather manifest some characteristics of the latter and some of the so-called ‘presentational-*there*’ construction illustrated in (1c).

Third, in all existential sentences there is a ‘pivot’ nominal which describes the individual whose existence is under discussion (*bugs* in (2a), *une reunion* in (2b), etc.). The pivot is typically subject to certain semantic restrictions which will be discussed in section 3.

Fourth, in most languages, a ‘coda’ phrase may appear (such as *eating the corn* in (2a)), which is external to the pivot noun phrase. As with the pivot, only predicates meeting certain semantic conditions are licensed as codas, as will be discussed in sections 1.2 and 4.

Finally, in many, though by no means all, languages, a locative expression appears which may be obligatory and ‘bleached’ of content (e.g., *there*, *y*, *hi*), though the syntactic role this expression plays in the construction may vary from one language to another. For instance, in English it is the subject, while in French and Catalan it is not. The presence of such a locative expression has resulted in the frequent grouping of existential sentences together with locative constructions (see e.g., Lyons 1967; Kuno 1971; Kimball 1973; Clark 1978; Freeze 1992; Rigau 1997; Zeitoun et al. 1999 and several more recent references cited in Francez 2007), although others (e.g., Milsark 1974) have argued that the similarity between existential and locative sentences is superficial or spurious, at least in some languages.

A crucial and very difficult question is how all of these elements in an existential sentence are related syntactically and semantically. On this point there has been considerable disagreement among linguists. Existential sentences are often truth conditionally equivalent to copular sentences ascribing a property or location (see article 68

(Mikkelsen) *Copular clauses* for more on such sentences). For example, (2a) is synonymous with (5), though it differs in the contexts in which it is used.

(5) Bugs are eating the corn.

For this reason, many analyses have related existential and copular sentences derivationally or have attributed to them the same basic predicational structure, in which the pivot nominal serves as the argument to the coda phrase, which in turn effectively serves as the main predicate for the sentence – this was the intuition behind the ‘*There*-insertion’ transformation in transformational grammars (e.g., Burt 1971; Milsark 1974; see e.g., Stowell 1978; Safir 1985; Pollard & Sag 1994 for related analyses for English).

However, other linguists have treated the similarity between existential and copular sentences as accidental. For example, Barwise & Cooper (1981), Chung (1987) (for Chamorro), and McNally (1992) argue that the pivot is the only complement to the existential predicate. On such analyses the coda either has to be treated as a pivot-internal modifier (as assumed by Barwise & Cooper), or else as some sort of adjunct. McNally (1992) specifically proposes that those codas which cannot be plausibly treated as pivot-internal modifiers should be analyzed as predicative adjuncts similar to the depictive adjunct in (6).

(6) They ate the vegetables steamed.

Finally, Williams (1984, 1994), Hazout (2004), and Francez (2007) all argue that the pivot nominal is in fact the main *predicate* of the existential sentence while the coda serves as a pivot-internal modifier or as an adjunct. What constitutes the subject of the existential predication is a matter of disagreement: Williams and Hazout argue that it is the expletive, though they do not provide an explicit semantics for this predication relation; Francez argues that the pivot denotes a property of an implicit contextual domain (something intuitively similar to a location), whose identity can be restricted by the coda phrase. The variety in the proposals for the basic syntax and argument structure of existential sentences makes it difficult to directly compare the semantic analyses that have been proposed in the literature for what Francez refers to as the ‘existential proposition.’ Nonetheless, a brief overview and comparison of these analyses is provided in section 2.

1.2. Semantic and discourse functional properties

Although it is unlikely that one single semantics and discourse function can be assigned to existential sentences cross-linguistically, certain semantic and discourse functional properties are consistently associated with these sentences across languages. Perhaps the most important of these is the intuition that existential sentences serve primarily to introduce a novel referent into the discourse – one fitting the description provided by the pivot nominal. This function is, in turn, almost certainly related to two other characteristics commonly attributed to existential sentences. The first of these is the so-called *definiteness restriction* on the pivot nominal (an early exhaustive description of which appears in Milsark 1974), to be discussed in section 3. Though the exact characterization of the facts is complex, as a first approximation the definiteness restriction amounts to

a restriction on the acceptability of definite, demonstrative, and necessarily quantificational noun phrases, including proper names and personal pronouns, in the pivot (see Chapter IX for more details on these various kinds of noun phrases):

- (7) a. ??There is each/every first-year student present.
 b. ??There are most first-year students in that class.
 c. ??There is the neighbor's dog barking.
 d. ??There is that carpet under the table.
 e. ??There are them / Anna and Bob waiting outside.

As will be discussed in section 4, Milsark related the definiteness restriction to another semantic restriction which is evident in existential sentences in English and other languages. Specifically, the coda has to be what Carlson (1977a) referred to as a stage-level predicate, as exemplified in (8); so-called individual-level predicates are not licensed, as shown in (9). Though the precise definition of what counts as an individual- or stage-level predicate is a difficult matter which cannot be dealt with here, stage-level predicates tend to describe accidental properties, while individual-level predicates tend to describe essential ones.

- (8) a. There were many people in line already.
 b. There were a few people waiting for hours.
 c. There was a live pig roasted.
 d. There were no taxis available.
- (9) a. ??There were many students anarchists.
 b. ??There were lots of donors generous.
 c. ??There were inmates psychotic.

It is also often claimed of existential sentences that they are *thetic* (term due to the philosophers Brentano and Marty; see Kuroda 1972; Sasse 1995 for modern discussions), purely rhematic, or topicless; or, alternatively, if they are assumed to have a topic-comment or theme-rheme structure, the topic or theme is hypothesized to be a location rather than the referent of the pivot (see e.g., Babby 1980 for Russian; see also Kim 1997, and Leonetti 2008 for Romance and a general survey): Since the only obligatory nominal in an existential sentence is the pivot, and the pivot introduces a novel referent (whether directly or indirectly), there is no other candidate expression except perhaps the coda that can provide the topic of the sentence or serve as the subject of a categorical (logical subject-predicate) or theme-rheme propositional structure. Note that the failure of the pivot to serve as a topic would also follow directly if the pivot were in fact the main predicate of the existential sentence. (See Chapter XV for more on notions such as *theme*, *rheme*, and *topic*.)

These semantic and pragmatic generalizations, though frequent, are not entirely unproblematic, however. For example, Abbott (1992, 1993, 1997) and Ward & Birner (1995) have argued that existential sentences serve not only to introduce novel discourse referents but also to reintroduce or focalize referents that have already been mentioned. Consider, for example, (10) (from the Challenger commission transcripts, cited in Ward & Birner 1995: 727):

- (10) I think there was one flight where
we had one problem. It wasn't ours,
but there was that one flight.

In this example a demonstrative noun phrase appears in the pivot position which is directly anaphoric to an expression that appears in the previous sentence. A more familiar example is provided by the so-called list use of existentials (see e.g., Rando & Napoli 1978), illustrated in (11), in which proper names are often found:

- (11) A: Who showed up?
B: Well, there was Alex.

Such examples raise the question of whether a uniform semantics and discourse function can be given for everything that looks formally like an existential sentence, or whether in reality there are several subtypes of existential sentence, perhaps with distinct semantics and pragmatics.

The claim that the pivot cannot be a topic is similarly questionable. As Leonetti (2008: Fn 21) points out, existential sentences in which the pivot is topicalized are attested; the English, Catalan and Spanish examples in (12a), (12b), and (12c), respectively, illustrate. In the Catalan example, the presence of the partitive clitic *n'* (glossed as 'some') is anaphoric to *pintura* and marks the sentence clearly as a clitic left-dislocation construction. In such constructions the left-dislocated expression has been argued to be topical (see e.g., Vallduví 1992):

- (12) a. They told us there was a solution, and indeed a solution, there was.
- b. *Pintura, n' hi ha dins l'armari.*
paint some there has in the closet
'Paint, there is in the closet.'
- c. *Ardillas, hay en el bosque.*
squirrels have in the woods
'Squirrels, there are in the woods.'

Understanding such counterexamples in the face of the strong intuitions concerning the discourse referent introduced by existential sentences and the information structure of these sentences entails first making a decision as to the basic semantics of existential sentences, a difficult issue to which we now turn.

2. The existential proposition

The space of possibilities for the basic semantics of existential sentences includes various options, five of which will be mentioned here. On the first option, proposed in Barwise & Cooper (1981), an existence predicate serves as the main predicate. The pivot is analyzed as a generalized quantifier and thus takes the existence predicate as its argument, as in

(13b) for the sentence in (13a) (though one might also consider treating the pivot as non-quantificational when possible and having the existence predicate take it as its argument, as in (13c), where the pivot is analyzed for the purposes of illustration as denoting the value of a choice function, along the lines of Reinhart () or Kratzer (1998); see also Chapter IX).

- (13) a. There is one good answer.
 b. **(one**($\lambda x[\mathbf{answer}(x) \wedge \mathbf{good}(x)]$))($\lambda x[\mathbf{exist}(x)]$)
 c. **exist**($f(\lambda x[\mathbf{answer}(x) \wedge \mathbf{good}(x) \wedge |x| \geq 1])$)

Either way, such an analysis runs into trouble in cases where the coda phrase cannot be plausibly treated as part of the pivot (see Keenan 1987 for arguments that such cases do in fact exist). However, Zucchi (1995) suggests a variant of this analysis on which the coda serves to contextually restrict the domain of quantification of the pivot, eliminating this criticism concerning the syntactic and semantic function of the coda.

The second option involves treating the coda, rather than an existence predicate, as the main predicate. Again, the pivot could in theory be treated either as a generalized quantifier (following e.g., Keenan 1987, see (14b)) or as non-quantificational (14c).

- (14) a. There was a room available.
 b. **(a**($\lambda x[\mathbf{room}(x)]$))
 ($\lambda x[\mathbf{available}(x)]$)
 c. **available**($f(\mathbf{room})$)

Such an analysis effectively equates existential sentences semantically with copular sentences. However, Keenan (1987) adds the proposal that what makes existential sentences special is the possibility of what he calls an existential reading, formulated as in (15), where '1' is the universal property, that is, a property all individuals have, roughly analogous to the property of existing:

- (15) $1 \in \text{Det}(\text{NP} \cap \text{XP})$ (Keenan 1987: 301, minor details modified)

Keenan observes that an existential sentence with a logical form like that in (14b) will have an existential reading just in case the determiner in the pivot has the property of being what he calls *existential*. Keenan's notion of an existential determiner will be discussed in section 3, as it plays a role in his account of the definiteness restriction.

Among the criticisms that have been leveled against analyses like that in (14), two stand out. First, there is evidence that the coda is not the main predicate. For example, Williams (1984) argues that if the coda were the main predicate, it should be able to extract like a main predicate. But as the contrast between (16a–b) shows, it does not.

- (16) a. How sick were the children?
 b. *How sick were there the children?

Such reduced acceptability under extraction is characteristic of adjuncts.

McNally (1992: Ch. 2) offers an additional argument against treating the coda as the main predicate, based on asymmetries between extraction from within complements vs. adjuncts. Huang (1982) showed that extraction of an adjunct from within a complement or main predicate is possible, whereas extraction of an adjunct from within an adjunct is not. (17), which shows the contrast in acceptability in the extraction of a manner adverbial from a main predicate vs. a depictive adjunct, illustrates this asymmetry.

- (17) a. How badly was she coughing _?
 b. *How badly did you leave the concert hall coughing _?

The impossibility of such extraction out of the coda indicates that it is an adjunct, and not the main predicate.

- (18) *How badly were there people coughing _ in the audience?

As yet another argument against treating the coda as the main predicate, Francez (2007: Ch. 4) observes that quantificational expressions within the coda always take scope over the pivot, while quantificational predicates in main clauses need not take wide scope over their subjects; contrast (19a) and (19b):

- (19) a. Some drummer I know is in every rock band.
 b. There is some drummer I know in every rock band.

While the scope facts follow on Francez' analysis of the coda as a modifier, this argument is weakened by the fact that the pivot can be independently shown to take narrowest scope (see section 3, below).

A second criticism of analyses like that in (14) is that there are a number of types of existential sentences that do not have acceptable copular sentences as counterparts (see e.g., Kimball 1973 and the examples in (20)).

- (20) a. There was space in the room.
 b. ??Space was in the room.
 c. There was a fire in the school.
 d. ??A fire was in the school.

If the compositional semantics for the contrasting pairs in (20) is the same, it is difficult to explain why the existential sentences are acceptable while the copular sentences are not.

A third possible analysis for the existential proposition is that proposed in Milsark (1974, 1977), on which the existential predicate contributes an existential operator; the pivot denotes a property that serves as its restriction (with any determiner that might be present serving as a cardinality predicate); and the coda serves as the scope of the existential quantifier. Milsark's semantic 'E rule' is as follows (1974: 206):

- (21) *there AUX (have-en) be Q NP X* is interpreted: the class C denoted by NP has at least one member *c* such that *P(c)* is true, where *P* is a predicate and *P* is the reading of *X* and the set of such members *c* is of cardinality *Q*.

See Landman (2004) for a variant on this property-based analysis of the pivot.

The analysis in McNally (1992), closely related to Milsark's, constitutes a fourth possibility for the existential proposition. This analysis differs from Milsark's on three points. First, the pivot is analyzed not as a property looking to be bound by an existential operator, but rather as the *entity correlate of a property* (Chierchia 1984) – the reification of a property that allows it to serve as the argument to another predicate (just as the nominalization *goodness* of the adjective *good* allows us to say things like *Goodness is a virtue*). Second, and relatedly, the main predicate in the sentence is the property of being *instantiated*, which applies to the pivot's denotation. Though these two aspects of the analysis might appear to be simply notational variants of Milsark's analysis, see McNally (2009) for arguments that they make distinct empirical predictions. Finally, the coda, as mentioned above, is analyzed as a VP-internal adjunct modifier which stands in a control relation to the pivot and which serves to restrict the spatiotemporal index at which the main predicate holds by forcing it to be included in the time the adjunct predicate holds of its argument. The semantics for (14a) on this analysis is sketched in (22), where (i) constitutes the core existential proposition, and (ii) and (iii), the ultimate effect of the adjunct predicate (see McNally 1992: Chapter 4 for a slightly different formulation and further details).

- (22) (i) **instantiate**($\lambda x[\mathbf{room}(x)]$);
 (ii) the token individual y who supports the truth of (i) at a time t is in the extension of **available** at t' ; and
 (iii) $t \leq t'$.

Milsark's and McNally's analyses share the fact that they remove any quantificational force from the pivot. Though both argue that this leads to a natural account of the definiteness restriction (see below), the proposal to treat the pivot as a property can be criticized. For example, the semantics proposed in (21) and (22) initially runs into difficulties when the pivot contains a monotone decreasing determiner such as *no*, *few*, or *at most two*, or a non-monotone one like *exactly three* (see article 43 (Keenan) *Quantifiers*). Take (23) as an example:

- (23) There was exactly one cookie left.

If *exactly one* is treated as a cardinality predicate, (21) and (22) predict that (23) will be true not only when there is exactly one cookie left, but also when there is more than one left: (21) and (22) only require finding an individual cookie with a cardinality of exactly one, but fail to make the sentence false if more than one such individual can be found. To solve this problem, McNally (1998) suggests a decompositional analysis for *no* and *few* (equivalent to a sentential negation plus *a* and *many*, respectively), following a proposal in Ladusaw (1992) (see also Chapter XIII); she follows Krifka (1999) in arguing that *at most* and *exactly* should be factored out from the semantics of the pivot and treated as focus-sensitive operators whose semantics is incorporated at the clause level. Francez (2007) points out that such an analysis is inelegant, though he provides no conclusive empirical arguments against it. Francez also observes (as did McNally) that it is difficult on the analysis in (22) to treat the coda as a controlled adjunct predicate in a fully compositional fashion.

Francez's (2007) alternative constitutes a fifth proposal for the existential proposition. Francez argues that the pivot – and not an existence predicate or the coda – should be the main predicate of the existential proposition. However, he also maintains that the pivot should denote a generalized quantifier, that is, a property of sets. This leads him to conclude that the logical subject of the existential proposition must be a set, rather than an individual. Specifically, he proposes that this set is a *contextual domain* – a set of salient entities in the context. Hypothesizing that the subject of the existential proposition is a contextual domain is way of capturing the intuition that existential sentences are 'about the context.' This domain, as its name suggests, is not directly denoted by any specific constituent in the existential sentence; however, the coda can contribute to restricting its identity. Francez's definition of contextual domains appears in (24). It defines this domain as a set of individuals who stand in a contextually specified relation R to another individual α .

(24) For every element α of type τ , let d_α be the contextual domain of α , where $d_\alpha =_{\text{def}}$
 $\lambda y_\tau [R_{\langle \tau, \langle \tau, D \rangle \rangle}(\alpha, y)]$

Francez's analysis of a sentence like (25a) is thus as in (25b). The pivot contributes the negative existential quantifier, the rest of the sentence contributes nothing else, and thus the quantifier is applied to the contextually-supplied domain d_α .

(25) a. There was no coffee.
 b. $\lambda P_{\langle e, D \rangle} [\mathbf{no}(\lambda x [\mathbf{coffee}(x)], P)](d_\alpha)$

What might d_α be? It must be a set of individuals, in order to serve as the scope of *no coffee*. And by (24) it will have to be a set that stands in contextually-determined relation R to some type of object. Francez (2007: 74–75) suggests for this particular example that α is the spatio-temporal parameters of utterance, and R is the relation of being located within those parameters. Thus, (25b) ends up being equivalent to (26), which can be paraphrased as saying that no coffee has the property of being in the set of things located within the spatiotemporal parameters of the utterance (represented in (26) as st_u).

(26) $\mathbf{no}(\lambda x [\mathbf{coffee}(x)], \lambda y [\mathbf{loc}(st_u, y)])$

When there is an explicit coda, the analysis treats the coda as a modifier which as a rule serves to restrict the relation R .

(25b) has the virtue of treating the pivot as the main predicate in a technical sense, an analysis for which there is increasing syntactic support. However, it is not at all usual for the subject of a predication to be a set and, moreover, to effectively serve as the nuclear scope of a quantifier. It is therefore not clear to what extent this analysis really preserves the spirit of the claim that the pivot is the main predicate. On the other hand, unlike Keenan's analysis it manages to treat the coda as a modifier, and it avoids the criticisms that have been made of property-based analysis of the pivot.

As can be seen, each of these analyses has pros and cons. Given the comparatively little content of existential sentences, it might even be the case that different languages choose different options for expressing the existential proposition (see McNally 2009 for examples and discussion of this possibility).

3. Analyses of the definiteness restriction

The definiteness restriction, illustrated in (7), is the characteristic of existential sentences that has received greatest attention in the semantics and pragmatics literature. In addition to the restrictions on necessarily quantificational noun phrases and certain definite and demonstrative noun phrases (including personal pronouns and proper names), Milsark claimed that there are restrictions on the indefinite noun phrases that are licensed as well, which limit the acceptability of partitives (including covert partitives, identifiable by stress on the determiner) and generically interpreted indefinites, though Hoeksema (1989) observes that the restriction on partitives holds for English only when there is no coda phrase.

- (27) a. ??There are five of the prime numbers less than 10. (cf. Five of the prime numbers are less than 10.)
 b. ??There were SOME teachers on strike, but not others.
 c. ??There are dinosaurs extinct. (cf. Dinosaurs are extinct.)

Milsark (1977) referred to the noun phrases/determiners excluded from the pivot position as *strong*, and to those licensed in the position as *weak*. An important aspect in the development of subsequent analyses of the definiteness restriction has been the attempt to arrive at a more precise and empirically adequate characterization of the weak/strong distinction.

A number of different syntactic, semantic and pragmatic analyses of the definiteness restriction have been proposed. Since space precludes reviewing all of these here, only the most representative of these analyses will be reviewed. Strictly syntactic analyses of the restriction will not be discussed, as the facts clearly indicate that even these analyses must ultimately rely on semantic or pragmatic notions. For example, Milsark himself, Woisetschlaeger (1983), Holmback (1984), and others have observed that morphologically definite noun phrases such as those in (28) are perfectly acceptable in existential sentences when they are ostensibly semantically indefinite.

- (28) a. There was the most amazing painting in their collection!
 b. There was the mother of a student waiting outside.

Thus, no analysis that appeals exclusively to the form of the pivot will account for the definiteness restriction.

To an important extent the divergence in the analyses of the restriction reflect divergence in the starting assumptions concerning the data. These divergences will be introduced as the different analyses are reviewed.

Although Milsark (1974, 1977) did not provide a fully formalized, compositional semantic account of the definiteness restriction, the essence of his proposal was clear. If we posit that the existential predicate contributes an existential operator, we would expect the pivot to license only those expressions whose denotations could combine with such an operator. In other words, the pivot has to denote a property. Pivots containing necessarily quantificational determiners such as *each* and *every* should be excluded because they are already quantificational. The operator contributed by such determiners will bind any variable within the logical form for the pivot. In contrast, Milsark suggested,

weak indefinite noun phrases are systematically licensed as pivots because indefinite determiners can be analyzed as cardinality predicates, making the noun phrase amenable to a property-type analysis. Heim (1987: 23) characterizes the restriction in similar, if negatively defined terms:

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

(29) would exclude, for example, the bound variables left behind by quantifier raising. Heim also argues that the generalization in (29) can account for another fact that has been related to the definiteness restriction, namely that when the pivot is relativized, only a so-called amount relative reading appears to be available.

Amount relative clauses can be distinguished from ordinary relative clauses both syntactically and semantically. The semantic difference is that the amount relative describes a quantity rather than a specific individual. This is evident in examples like (30), an adaptation of one of Heim's amount relative examples:

(30) It would take days to drink the champagne they spilled that evening.

The relative clause in (30) refers to the quantity of champagne that was spilled, not to the exact same liquid that was spilled. Turning to syntax, amount relatives are different from ordinary relatives in that they require a definite or universal determiner on the head noun they modify, and can only be introduced by *that* or a null relative pronoun in some dialects of English (see Carlson 1977b). Note that the amount reading of (30) disappears if the determiner is not universal or the relative pronoun is changed to *which*:

- (31) a. It would take days to drink some champagne they spilled that evening.
 b. It would take days to drink the champagne which spilled that evening.

Heim observes that relativization of the pivot syntactically resembles amount relativization, as the examples in (32b–c) show:

- (32) a. You've eaten every cookie there is in the house.
 b. *You've eaten some/two/many cookies there are in the house.
 c. *You've eaten every cookie which there is in the house.

She argues that the contrast between examples like (32a) and (32b–c) follows if in ordinary relativization of the pivot an individual variable is left behind in the position of the gap; she suggests that in amount relativization, the variable left behind does not correspond to the gap but rather to a subpart of the gap. Thus, the logical forms for the noun phrases containing the amount and restrictive relatives in (32a) and (32c) could be informally represented as in (33a) and (33b), respectively. Heim suggests that the universal quantifier in the amount relative is interpreted as a maximality operator over degrees *d*:

- (33) a. Max *d*: there were *d*-many cookies in the house
 b. every *x*: cookie *x* \wedge there was *x* in the house.

Despite the initial appeal of this proposal, there is one important respect in which relativization of the pivot differs from amount relativization: the former imposes an identity of individuals requirement. That is, in order for (34) to be true, it is not enough that I read a quantity of books identical to the quantity on the table in question; I must have read the exact same books that were on the table.

(34) I read all the books there were on the table.

Grosu & Landman (1998) propose a semantics for amount relatives which attempts to account for this fact. However, McNally (2008) argues that there are problems with Grosu & Landman's analysis and that, despite the superficial similarities between amount relatives and relativization of the pivot, we cannot conclude that the latter is necessarily amount relativization. Nonetheless, McNally fails to provide an alternative analysis for all of the facts, and relativization of the pivot remains an understudied and poorly understood phenomenon.

Returning to the definiteness restriction, what exactly Milsark's (or Heim's) basic account of the restriction predicts for proper names, pronouns, definites, and strong (e.g., partitive) indefinites depends on the assumptions one makes about the semantics of these latter expressions. Partee's (1987) theory of noun phrase type shifting leads one to expect that all of these expressions should be able to shift to well-defined and felicitous property-type denotations, for example those in (35):

- (35) a. $[[Anna]] = \lambda x[x = \mathbf{a}]$
 b. $[[the\ dog]] = \lambda x[x = \iota y[\mathbf{dog}(y)]]$
 c. $[[them_i]] = \lambda x[x = y_i]$

But if such denotations are available, we might expect these sorts of noun phrases to be acceptable in existential sentences.

In fact, as noted in section 1.2, there is good evidence that true definite noun phrases are indeed acceptable (see, in addition to the references cited elsewhere in this article, Ziv 1982 and Lumsden 1988). But let us maintain for a moment the view that they are not, or at least that such noun phrases are attested only with an alternative kind of interpretation, such as the presentational interpretation illustrated in (1c), or the list interpretation illustrated in (11). Such a view is assumed in both Barwise & Cooper's (1981) and Keenan's (1987, 2003) accounts of the restriction.

Both Barwise & Cooper and Keenan assume that noun phrases as a rule denote generalized quantifiers. They take as their first task a proper semantic characterization of those quantifiers that appear in (English) existential sentences vs. those that do not – in other words, a more precise account of the weak/strong distinction. Barwise & Cooper (1981: 264) begin by defining strong and weak determiners as in (36).

- (36) A determiner D is *positive strong* or (*negative strong*, resp.) if for every model $M = \langle E, [[\]]\rangle$ and every $A \subseteq E$, if the quantifier $[[D]](A)$ is defined, then $A \in D(A)$ (or $A \notin D(A)$, resp.). If D is not (positive or negative) strong then D is *weak*.

A quantifier is strong if it is headed by a strong determiner. However, other factors may make a quantifier strong. Even though proper names lack a determiner altogether

in English, they always behave like quantifiers constructed out of strong determiners; similarly, partitive noun phrases, even though they may contain weak determiners, also behave as if strong. In both cases, this behaviour can be shown to follow from the existence presupposition associated with the noun phrase.

Barwise & Cooper's explanation of the definiteness restriction is pragmatic: Under the assumption that the existential proposition is of the form in (13b), existential sentences with strong nominals as pivots will be tautologous or contradictory, but never contingent, and thus will be systematically uninformative. However, this account of the restriction falls apart if the coda is external to the pivot, as Keenan (1987) and others have argued: Even if it is not new information that the denotation of the pivot exists, the ascription of the coda property to the pivot's denotation could well be informative.

Keenan's characterization of both the class of noun phrases licensed in existential sentences and his account of the definiteness restriction are slightly different. Rather than claiming that definite and universal noun phrases are unacceptable as pivots, he simply assumes that they lack the existential reading in (15), above. Keenan (1987: 291) defines the class of determiners that yield noun phrases with the existential reading as *existential* (see (37a)); Keenan (2003) proves that the existential determiners are equivalent to those defined as *intersective* as in (37b). The intersective determiners, in turn, are just those that are *conservative* on both their first and second arguments (see Barwise & Cooper 1981 on the notion of conservativity; note that Keenan 2003 also generalizes these definitions to $n > 1$ -place determiners and Boolean combinations of determiners).

- (37) a. A function f from properties to sets of properties is existential iff for all properties $p, q, p \in f(q)$ iff $1 \in f(q \wedge p)$.
 b. [A function denoted by a determiner] D from P_E into $GQ_{E,X}$ is intersective iff for all subsets A, A', B, B' of E , if $A \cap B = A' \cap B'$ then $DAB = DA'B'$.

Intuitively, an existential determiner is one whose semantics can be calculated without making a comparison between sets, as is necessary with, for example, proportional determiners such as *most*. To know whether e.g. each student in a given class read *Hard Times* it is necessary to compare the set of students in the class who read *Hard Times* with the set who did not, or with the set of students as a whole. In contrast, in order to determine the truth of a proposition involving an intersective determiner such as *two*, as in *Two students read Hard Times*, we need only identify the set of students who read *Hard Times* and determine its cardinality. This makes the contribution of an intersective determiner more like that of a property than like that of a true quantificational operator.

However, the facts are not so simple. As Lumsden (1988) observes, necessarily quantificational noun phrases are perfectly acceptable in existential sentences when they quantify over kinds, as in (38a), or similar higher-order objects, as in (38b), where what is asserted is the existence of an instance of every one of a set of types of reasons:

- (38) a. There was each of the three kinds of chocolate available.
 b. There was every reason to believe that it would rain.

Although Wilkinson (1991) suggests accounting for examples like (38a) by reanalyzing noun phrases of the form *D kind of N* as equivalent to *an N of D kind*, McNally (1992)

points out various ways in which these two types of noun phrases are not equivalent, thus casting doubt on the viability of such a reanalysis.

Still, the acceptability of the noun phrases in (38) and the intuition that they are somehow ‘covertly indefinite’ raises the possibility that the definiteness restriction is not semantic but rather pragmatic in nature. Pragmatic analyses of the restriction fall into two general groups. One group (e.g., Prince 1992; Ward & Birner 1995; Abbott 1992, 1993; Zucchi 1995) attribute the restriction to a condition on the discourse status of the referent associated with the pivot. For example, Prince (1992) argues that the referent of the pivot has to be ‘hearer-new,’ i.e., not part of the common ground at the time of utterance. Ward & Birner (1995) argue that the notion of hearer-newness can be extended to account even for cases of definite noun phrases in pivot position; specifically, such noun phrases are licensed just in case there it is possible to construe the referent of the noun phrase as hearer-new in the context (e.g., because it has been forgotten about by the hearer). However, Abbott (1997) contends that it is difficult to maintain that the referent of the pivot is hearer-new particularly in cases where the pivot is anaphoric, such as in (10), above, and suggests that ‘it may not be the case that any single discourse-based principle can account for the distribution of NPs in this construction.’ (1997: 107).

The second general group of pragmatic approaches to the definiteness restriction builds in one way or another on the non-topical nature of the pivot position, often taking into account that the existential construction in most languages exists in a paradigm with one or more other constructions that are conventionally associated with a different information structure (see Hannay 1985; Borschev & Partee 2002; Mikkelsen 2002; Beaver et al. 2005; Francez 2007; Hu & Pan 2007; Partee & Borschev 2007). The intuition behind these proposals is that indefinite noun phrases often make poor subjects, particularly when there is a strong association between subject and topic in a language, while definite noun phrases make good ones. Existential sentences in many languages serve to get out of subject position a noun phrase which would otherwise have to be expressed as a subject (compare e.g., (20a–b), above). Part of the argument for this view comes from the observation, developed in detail in Beaver et al. (2005), that the cross-linguistic variation in the definiteness restriction is gradient rather than absolute. Beaver et al. present a quantitative study which, rather than dividing noun phrases into two groups (weak vs. strong), orders them on a scale according to how many subject properties they manifest. They argue that this same scale can be used to predict the variation in the definiteness restriction across languages. Existential sentences in different languages may be sensitive to different points on the scale, but it should always be the case that if a language allows a given noun phrase candidate for canonical subject in the pivot position, it should also allow all *worse* candidates for canonical subject to appear as pivots as well. Similarly, if a given noun phrase type is blocked from pivot position, all *better* candidates for canonical subject on the scale should be blocked as well.

Finally, in contrast to the above-mentioned proposals, which offer a unified account for the definiteness restriction, McNally (1992) argues that the restriction is part semantic and part pragmatic in nature. Her analysis is grounded in the claim in (22) that the existential predicate selects for the entity correlate of a property. On this analysis, any noun phrase that can plausibly be treated as an entity correlate of a property *or* as a quantifier over entity correlates of properties is expected to have a well-formed interpretation in the pivot position. If the notion of ‘weak’ is taken to describe the semantic restriction on the type of the pivot and if the semantics in (22) is recast in set-theoretic terms (as in

McNally 1998), the proposal also leads naturally to the definition of ‘weak’ as ‘property denoting’ (see Ladusaw 1994 for a development of this idea).

When coupled with Partee’s theory of type shifting, McNally’s proposal directly accounts for the contrast between examples like (38) and similar examples, such as (7a), which quantify over ordinary token individuals. The latter are excluded because they neither quantify over entity correlates of properties nor are able to type shift felicitously to denote entity correlates of properties (see McNally 1998 for details on which kinds of noun phrases do not have a felicitous property-type denotation and why they do not). However, since definites, demonstratives, partitive indefinites, proper names, and pronouns can all felicitously shift to a property type under Partee’s theory and then can shift to the entity correlate of that type, they are predicted to have well-formed interpretations in existential sentences, which, as noted above, they do. To account for the oddness of existential sentences with these kinds of noun phrases (when they are in fact odd), McNally adopts Prince-style pragmatic account. However, a mixed semantic-pragmatic account of the restriction would also be possible using a Beaver et al.-style analysis of the conditions on definites instead of one based on hearer-newness.

Though a non-unified analysis of the definiteness restriction might seem less attractive than a unified one, McNally argues that it predicts that the patterns of variation found in the restriction cross-linguistically will reflect the split between those noun phrases which are excluded in English for semantic reasons and those which are excluded for pragmatic reasons. This prediction is confirmed, for example, in Catalan, which systematically allows definites, demonstratives, names and pronouns in existential sentences, but allows only necessarily quantificational noun phrases that quantify over kinds or similar higher order objects.

The mixed semantic-pragmatic analysis also predicts an asymmetry in the scopal behavior of the pivot. The great majority of noun phrases in pivot position systematically have only narrowest scope with respect to other operators in an existential sentence (though see Francez 2007 for possible counterexamples). This is seen in e.g., (39a), which is unacceptable because *some* must take wide scope with respect to negation but cannot. The narrowest scope requirement follows if the pivot denotes a (scopeless) entity correlate of a property. However, there is no reason on this analysis to expect that pivots denoting quantifiers like those in (38) should have to take narrowest scope, and indeed they needn’t (see (39b)).

- (39) a. ??There wasn’t some student at the meeting.
 b. There wasn’t one particular variety of wine that we expected on the list.

Empirical studies such as Ward & Birner’s and Beaver et al.’s make clear that the facts concerning the definiteness restriction are much more complex than what was suggested by earlier studies of the phenomenon, and that additional cross-linguistic research is needed to determine how best to parameterize a theory of the restriction so that it can account for the attested variation while capturing what existential sentences have in common across languages. It seems likely that some kind of gradient or non-unified analysis will be inevitable; what remains to be determined is whether an analysis that is purely pragmatic or one that mixes semantic and pragmatic conditions will prove more insightful.

4. Analyses of the predicate restriction

The second restriction on existential sentences discussed in Milsark (1974) limits the types of predicates that appear in the coda: As illustrated in (9), above, those allowed in the coda correspond to Carlson's (1977a) class of stage-level predicates, while those excluded correspond to his class of individual-level predicates.

The predicate restriction has generated much less discussion in the semantics and pragmatics literature than the definiteness restriction, in part because there is less controversy over the facts. Perhaps the only point of contention has been whether noun phrases are systematically excluded (which would be consistent with the behaviour of nominal predicates under Carlson's classification) or whether temporary state-descriptive nominals are licensed, as Nathan (1978) and Hannay (1985) suggest, using examples such as (40) in support.

(40) ??There was a woman the president.

However, examples such as (40) are not generally considered acceptable in the literature and there seems to be little or no evidence in favor of the claim that noun phrases are licensed as codas.

The analysis of the predicate restriction is deeply bound up with the syntactic analysis of existential sentences and with the nature of the existential proposition. Milsark (1974, 1977) observed a correlation between those predicates which are excluded from the coda and those which disallow weak noun phrases as subjects of copular sentences. This sort of correlation is exactly what is expected if existential sentences express the same propositional structure as copular sentences. In contrast, if the coda is not considered an independent constituent but rather simply a post-nominal modifier, as in Jenkins (1975), Barwise & Cooper (1981) or Williams (1984), a non-stipulative explanation coda restriction should follow from independently necessary restrictions on post-nominal modifiers. Finally, those analyses on which the coda is a modifier must derive the restriction from independently motivated restrictions on the kind of modification the coda provides. For example, McNally (1992) proposes that the coda serves to restrict the spatio-temporal parameters within which the referent of the pivot is instantiated; on this view, individual-level predicates are ruled out because they lack the ability to provide the necessary sort of spatio-temporal restriction. Francez (2007) makes a similar claim concerning modification of the contextual domain.

It is obvious that a decision concerning the best analysis of the predicate restriction can only be made by taking into account the syntax and argument structure of existential sentences. It must take into the analysis of the definiteness restriction as well. For example, a Milsark-style analysis of the predicate restriction predicts that when definite noun phrases are (exceptionally) licensed as pivots, we should find violations of the predicate restriction as well. However, this does not happen, as (41), an adaptation of (10), shows.

(41) I think there was one flight that was a problem. *It wasn't ours, but there was that one flight the problem.

This fact thus serves as another sort of argument, beyond the syntactic, semantic and typological arguments that have been advanced with increasing frequency, against the

view that existential sentences and copular sentences have the same propositional structure.

5. Conclusion

Thanks to their special structural and interpretive characteristics, existential sentences have offered and continue to offer a rich ground on which to test theories concerning the semantics of noun phrases and of predication, as well as theories concerning the role of non-canonical constructions in information packaging. Their close relation to locative sentences raises interesting psychological and philosophical questions about the relationship between the notion of presence and that of existence. Finally, the striking similarities and differences in existential sentences across languages present interesting challenges for efforts to develop theories of ‘cross-linguistic’ semantics.

6. References

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Louise McNally, Barcelona (Spain)