

Lecture 6. Kamp-Heim I. Anaphora with Indefinite Antecedents; Donkey Anaphora.

0. The context of Heim's dissertation	1
1. Do indefinites refer?	2
1.1. Russell's view.....	2
1.2. Anaphoric pronouns as bound variables.....	3
1.3. Anaphoric pronouns as picking up speaker's reference.....	4
1.4. Anaphoric pronouns as disguised definite descriptions.....	6
1.5. Anaphoric pronouns and the ambiguity hypothesis.....	7
1.6 Summary.....	8
2. Problems with donkey sentences.....	8
2.1. Donkey anaphora as variable binding.....	8
2.2. Donkey sentences and pragmatic accounts of anaphora.....	8
2.3. Donkey anaphora and disguised definite descriptions.....	9
2.4. Donkey sentences and the ambiguity hypothesis.....	10
2.5. Summary.....	10
References	11

Readings: Full references and links for downloading are in References at the end.

(1) (Heim 1982) -- Heim's dissertation. Read Ch. 1 and start looking at Ch. 2 (for next week).

(2) (Karttunen 1976) – Karttunen's seminal work on "discourse referents".

(3) (Lewis 1979) – A classic by David Lewis introducing a "dynamic" approach to semantics.

Optional: (Evans 1977, Evans 1980, Fodor and Sag 1982)

Semantics CD 2008: Today everyone who is in class will receive a CD with a great many readings in anaphora, plus many more readings in semantics: the 2008 semantics CD is the 2007 semantics CD plus many more things. If you are not in class today, you may be able to copy the CD: I will provide a master copy for LaTeX at RGGU and one for OTiPL at MGU.

0. The context of Heim's dissertation

Today we will focus on the first chapter of Heim's dissertation (Heim 1982). To describe the context in which Heim was working, let me quote the beginning of the Preface to her dissertation:

In November 1978, a workshop was held at the University of Massachusetts whose title was "Indefinite Reference" and whose topic Barbara Partee described in a circular that started as follows:

One standard view among logicians is that indefinite noun phrases like 'a tall man' are not referring expressions, but quantifier phrases, like 'every man', 'no man', and 'most men'. Yet in many respects, indefinite noun phrases seem to function in ordinary language much like definite noun phrases or proper names, particularly with respect to the use of pronouns in discourse. This may be simply a matter of sorting out semantics from pragmatics, but there is not to our knowledge any currently available theory that simultaneously characterizes the logical or truth-functional properties of indefinite noun phrases and accounts for their 'discourse-reference' properties

Irene Heim was a Ph.D. student at the time, and although none of the participants in that stimulating interdisciplinary workshop had a solution for the problem, Heim immediately started working on it, and it became the topic of her dissertation. At around the same time, Hans Kamp

had independently started working on the same problem, and the theory introduced in his paper (Kamp 1984) has much in common with Heim's theory. Heim's theory is known as "File Change Semantics", Kamp's as "Discourse Representation Theory"; I will often refer to the two together as the Kamp-Heim approach.

We'll spend three weeks on this theoretical approach and the issues it is concerned with. This week we will discuss Heim's Chapter I, "Problems concerning indefinites and anaphora in logical semantics", which lays out the central issues and provides a critical introduction to the major approaches that had been taken to them prior to Heim's and Kamp's work. Next week we'll discuss Heim's Chapter II, "Indefinites as variables", and Kamp's paper, and how Heim's and Kamp's work has led to "dynamic semantics". The following week we'll discuss Heim's treatment of definite descriptions as anaphoric expressions in her Chapter III, "Definites in File Change Semantics", and parallels between presupposition phenomena and anaphora.

1. Do indefinites refer?

(Note: The headings in this handout are the headings in Heim's Chapter 1. Example numbers are Heim's. Parts of Ch. 1 that we won't discuss are indicated by headings with no content.)

1.1. Russell's view.

- (1) A dog came in
- (2) John is friends with a dog.

Russell (1919): **NO**. Sentence (1) asserts that: $\text{Dog} \cap \text{Came-In} \neq \emptyset$ (expressed set-theoretically).

In traditional logical terms: $\exists x(\text{Dog}(x) \ \& \ \text{Came-in}(x))$

This is entirely analogous to a universally quantified sentence like (3):

- (3) Every dog came in

Set-theoretically: $\text{Dog} \subseteq \text{Came-in}$

Logical notation: $\forall x(\text{Dog}(x) \rightarrow \text{Came-in}(x))$

Arguments:

Argument 1. What is the referent?

- (4) John is friends with a dog, and Mary is friends with a dog.

If *a dog* **refers**, then this should assert that Mary is friends with the same dog that John is friends with. But it doesn't; Mary may be friends with the same or a different dog.

Not-so-hidden assumption: If an expression refers, each occurrence of it should have the same reference. But consider indexicals and demonstratives like *I*, *this*, and (referential uses of) *he*.

Argument 2. Negation.

- (5) It is not the case that a dog came in.

This sentence says that no dog came in. It doesn't say of some particular dog that it didn't come in. That is easier to account for on Russell's view than on the view that *a dog* refers.

Argument 3. Indefinites embedded under other quantifiers. Compare (7) and (8):

- (7) Every child owns a dog.
- (8) Every child owns Fido.

Russell's analysis gets this right; how could it be accounted for if indefinites refer?

Russell's view became the 'received' view. But the problem posed for it by anaphora has been known for a long time, going back at least to Strawson (1952).

- (9) A dog came in. It lay down under the table.

This would be simple to account for if *a dog* refers; then we could say that *it* has the same referent. How can one account for such anaphora on a Russellian view?

1.2. Anaphoric pronouns as bound variables.

But must the pronoun in (9) refer? Sometimes pronouns are understood as bound variables. Could there be a way of analyzing the pronoun in (9) as a bound variable?

- (9') $\exists x(\text{dog}(x) \ \& \ x \text{ came in} \ \& \ x \text{ lay down})$

Such a proposal was made by Geach (1962), who proposed assigning truth conditions to the whole discourse, not to its individual sentences.

Problems for this approach:

Problem 1.

- (10) (Strawson 1952) A: A man fell over the edge.
B: He didn't fall; he jumped.
- (11) (Heim) A: A dog came in.
B: What did it do next?

For (10) we need a theory which can allow that A's statement is false and B's true.

For (11) it is hard to imagine a coherent meaning for the "whole text" – what would its type be? We need to explain how A's utterance has a statement-meaning and B's a question-meaning.

Heim notes that Geach's analysis is not hereby refuted; perhaps it just needs supplementation.

Problem 2. A worse problem, discussed by Evans (1980, p.339).

- (12) John owns some sheep.
According to Russell: $(\exists \geq 2x)(\text{Sheep}(x) \ \& \ \text{Own}(j,x))$
- (13) John owns some sheep. Harry vaccinated them.
Geach-type analysis would be: $(\exists \geq 2x)(\text{Sheep}(x) \ \& \ \text{Own}(j,x) \ \& \ \text{Vaccinated}(h,x))$

But imagine a situation in which John owns 6 sheep and Harry vaccinated 3 of them. Geach's analysis predicts that (13) should then be true; but our intuition is that it's false.

Evans (1980, p.343) claims that a similar problem also arises even for the singular case.

- (14) There is a doctor in London. He is Welsh. (Or: ..., and he is Welsh.)
vs.
- (15) There is a doctor in London who is Welsh.

According to Geach's analysis, (14) is equivalent to (15). But according to Evans, that's wrong.

(The literature on *uniqueness* picks up on this argument; see Kadmon's dissertation (Kadmon 1987), Heim's later work (Heim 1990) and other work on "E-type" pronouns, etc.)

Problem 3. Theories of structural constraints on quantifier scope, scope islands.

- (9) A dog came in. It lay down under the table.
- (16) Every dog came in. #It lay down under the table.
- (17) No dog came in. #It lay down under the table.

"Real quantifiers" can't bind across sentence boundaries.

This is of course a theory-dependent objection. It will be re-examined in Heim's 2.1.2.

1.3. Anaphoric pronouns as picking up speaker's reference.

"A radically different approach to the relation between an indefinite antecedent and a pronoun anaphoric to it was originally suggested by Grice. The suggestion was taken up by Kripke (1977), on whose paper I will base my discussion." (Heim 1982, pp. 14-15). The central idea: Distinguish the literal semantic value of an expression from what a speaker is intending to convey with it. ("Semantic reference" vs. "speaker's reference".)

The dilemma that we seem to be faced with: The anaphoric pronoun in (9) seems to pick up the referent of its antecedent, and yet Russell gave good arguments for saying that indefinite NPs don't have a referent. Geach tried to exploit the fact that some pronouns don't "pick up a referent" but act as bound variables. Kripke argues that there is no dilemma, because two different senses of "reference" are being conflated.

Kripke's idea: Russell is right about the semantic value of indefinites. But there may still be a "speaker's reference": it may be clear to the hearer that the speaker has a particular individual in mind as the thing that satisfies the indefinite description (e.g. "is a dog and came in"), and about which he may be trying to convey some further information (e.g. that it lay down under the table.)

It would then not be unreasonable to suppose that pronouns should be able to pick up the *speaker's reference* of their antecedents; we know independently that pronouns can get their values from the context, i.e. that pragmatics as well as semantics is relevant to the interpretation of pronouns.

Kripke didn't claim that *all* instances of pronouns with indefinite antecedents can be analyzed this way. Heim notes that even some cases he may have wanted to include present problems for his view.

- (18) A dog has been rummaging in the garbage can.

If my evidence is indirect, I may utter (18) without there being a "speaker's referent" for *a dog*.

But (18) can still be followed by (19):

- (19) It has torn open all the plastic bags.

This *it* doesn't pick up speaker's reference, since there wasn't any. The speaker did not have any dog "in mind", and doesn't have any idea what dog satisfies (18).

David Lewis (1979) suggests a variant approach that might help: a pronoun may refer to

whatever object is maximally salient in the situation of its utterance. An object may become salient by linguistic or non-linguistic means. Linguistic means include but are not limited to the production of an antecedent that (semantically) refers to that object. An existential statement may raise an object's salience. So it could be argued that my utterance of (18) can raise the salience of the dog that "is responsible for the truth of what I say, and for my saying it", even if I am unable to pick out what dog that is. Thus Lewis's analysis avoids the commitment to "having a particular referent in mind".

And Lewis considers the following issue: what if my utterance of (18) is actually false? Then what could be said about the *it* in (19)? It seems that there must be a presupposition failure in (19), and the *it* won't pick out anything at all, and (19) won't express a proposition in the actual world (although it would have if the world in which my utterance took place were as I thought it was). (Heim also raises, but doesn't try to settle, concerns about cases in which more than one dog was responsible for the mess.)

Problem Heim raises for Grice-Kripke-Lewis account: minimal pairs like (Partee's) (21a-b):

- (21) a. I dropped ten marbles and found all of them, except for one. It is probably under the sofa.
b. ?? I dropped ten marbles and found only nine of them. It is probably under the sofa.

If salience can be raised indirectly, by virtue of there being an entity 'responsible for the truth' of an utterance, then why should there be any difference between 21a and 21b? It seems that we cannot after all look only at truth-conditions of sentences and context, but must consider how the sentences are worded.

First attempt at expressing the generalization illustrated by (21a-b): (p. 22)

A necessary condition for an utterance of a sentence S to promote an object x to maximal salience is that S contain either an NP that refers to x or a singular indefinite NP whose predicate is true of x.

If something like this is true we want to know why. On a Lewis-style approach, it seems to be an added stipulation.

Note that on Geach's approach, the difference between (21a) and (21b) is accounted for. There is an expression that can contribute an existential quantifier ("one [marble]") to bind the bound variable "it" in (21a), and no expression that would provide a suitable binder in (21b). Also, on the views of some authors (like Strawson, and unlike Lewis and Kripke) who believe that indefinites sometimes do refer, and a pronoun can then pick up that reference, there is also a suitable difference between (21a) and (21b).

Compare the sorts of "anaphoric island" examples discussed in Postal (1969):

- (22a) John owns a bicycle. He rides it daily.
(22b) John is a bicycle-owner. ?He rides it daily.
(23b) John is married. ?She is nice.

Here too the Grice-Kripke-Lewis account would seem to have difficulty; the salience-raising potential of certain sentences does not depend only on their truth conditions, but on the specific form of expressions within them.

1.4. Anaphoric pronouns as disguised definite descriptions.

This approach, best represented by Evans (1977, 1980), also maintains Russell's claim that indefinites do not refer, but says that there is a third kind of interpretation for pronouns in addition to interpretations as bound variables and as "pragmatic" pronouns (referring by virtue of their referent's salience). He calls these **E-type pronouns**¹.

(9) A dog came in. It lay down under the table.

E-type pronouns always have quantified (rather than referential) antecedents, but are not bound by them. Their meaning is the meaning of a systematically constructed definite description.

(9') A dog came in. The dog that came in lay down under the table.

(24) Just one man drank champagne. He was ill.

(24') Just one man drank champagne. The man who drank champagne was ill.

(25) Few congressmen admire Kennedy. They are very junior.

(25') Few congressmen admire Kennedy. The congressmen who admire Kennedy are very junior.

How to evaluate Evans's proposal? We need to know how to interpret definite descriptions.

Evans's assumption about a sentence containing a singular definite description "the F": such a sentence implies that there is exactly one F and is true if that unique F satisfies whatever the sentence predicates of "the F". For plural definite descriptions, he assumes the implicature that there are at least two Fs and that the sentence is true if *all* Fs satisfy the relevant predicate. So, for instance, the second sentence of (9) is predicted to imply that exactly one dog came in, and is predicted to be true just in case the unique dog that came in lay down under the table.

The uniqueness claim for definites (and for such pronouns) is controversial. First of all, Evans notes that the relevant domain may be contextually limited.

(27) A wine glass broke last night. It had been very expensive.

Presumed delimitation: just one wine glass broke last night in the given household.

But Evans clearly makes predictions that are the opposite of Geach's, namely that the following pairs are "by no means paraphrases":

(27) A wine glass broke last night. It had been very expensive.

(27a) A wine glass which had been very expensive broke last night.

(14) There is a doctor in London and he is Welsh.

(14a) There is a doctor who is Welsh in London.

Heim doubts the uniqueness implication predicted by Evans for (27), considering a scenario in which she dropped a tray with three wine glasses, breaking all of them, but two were cheap and didn't matter to her. When asked about her bad mood the next day, she might say (27). But as she notes, perhaps Evans could claim that this is a case of contextual delimitation of the domain.

¹ No one has been able to remember or reconstruct why Evans called these pronouns "E-type pronouns", but one thing everyone agrees on is that he did not name them after himself. There is a very funny invented etymology by Larry Horn on Linguist List, here: <http://www.linguistlist.org/issues/5/5-280.html>.

Heim finds a clearer contrast in (14) vs. (14a), and agrees with Evans's intuitions about them. But she is skeptical about his explanation for the source of the contrast. And she notes that there is certainly no uniqueness implication in a variant of (14) like (29).

(29) There was once a doctor in London. He was Welsh ...

Her conclusion to the discussion of Evans's proposal is to separate it into two claims:

- (a) certain anaphoric pronouns mean the same thing as certain definite descriptions;
- (b) definite descriptions are to be analyzed in a certain way, which involves predicting uniqueness-implications for singular definite descriptions.

She has cast doubt on (b), but does not question (a). The problem with (a) is that there is no available theory of the semantics of definite descriptions that helps, and she considers the task of developing one to face essentially the same difficulties as the task of accounting for anaphoric pronouns with indefinite antecedents. Paraphrasing anaphoric pronouns away as disguised definite descriptions doesn't solve the problem without a better theory of the meaning of definite descriptions. (There has been much continuing work on "disguised definite description" approaches, including work by Heim herself, although that's not the approach she takes in her dissertation. We will probably come back to this topic some more.)

1.5. Anaphoric pronouns and the ambiguity hypothesis.

Maybe indefinites are ambiguous, and we just have to give up looking for a uniform account.

Chastain (1975): Sentences containing indefinites are ambiguous. Sometimes 'A mosquito is in here' and its stylistic variant 'There is a mosquito in here' must be taken as asserting merely that the place is not wholly mosquito-less, but sometimes they involve an intended reference to one particular mosquito. (p. 212)

But how are the two readings of 'There is a mosquito in here' supposed to differ? This account seems similar to Kripke's but without distinguishing semantic reference from speaker's reference. Heim notes some points of similarity with linguistic theories that posited "+/- specific" indefinites, most of which were proposed without systematic attention to the possibility of using scope distinctions to account for the relevant behavior.

One account which argues that there must be a referential/nonreferential (or specific/nonspecific) ambiguity in indefinites *in addition to* a scope ambiguity is Fodor and Sag (1982), using an argument based on scope islands. From (35) we conclude that "the rumor that ..." is a scope island, since "each" cannot get wide scope; yet in (36), it seems that "a student of mine" can indeed have 'wide scope'. And since 'a student of mine' can have wide scope but cannot have intermediate scope, it seems better to posit a "referential" (i.e. scope-irrelevant, "as if maximal scope") reading in addition to a quantificational reading for indefinites, than to try to invent mechanisms for giving them idiosyncratic scope-escaping properties.

(35) John overheard the rumor that each of my students had been called before the dean.

(36) John overheard the rumor that a student of mine had been called before the dean.

Note: This issue has been followed up on extensively in recent years, in work of Reinhart, Abusch, Kratzer, and others. Debates about the proper interpretation(s) of indefinites are as crucial to the study of anaphora as debates about the interpretation of the pronouns themselves, and of definites. These issues will keep coming back as we study anaphora.

1.6 Summary.

Heim notes that none of the authors considered were discussing “generic indefinites”, and agrees to continue that exclusion.

Section 1.6. gives a good succinct summary of 1.1 - 1.5.. Heim notes that there is no obvious “best” analysis emerging so far – all the analyses considered have problems, and it is not clear which problems will be most serious in the long run. And she notes that the problems to be discussed in section 2, concerning donkey sentences, will present all four kinds of approaches with difficulties that outweigh most of the weaknesses noted so far.

2. Problems with donkey sentences.

- (1) If someone/anyone is in Athens, he is not in Rhodes. (Chrysippos)
- (2) If a man owns a donkey, he beats it. (Medieval, revived by Geach 1962)
- (3) Every man who owns a donkey beats it. (Likewise.)

What are the truth conditions? Most common assumption:

- (1') $\forall x(x \text{ is in Athens} \rightarrow \neg x \text{ is in Rhodes})$
(2' = 3') $\forall x \forall y((x \text{ is a man} \ \& \ y \text{ is a donkey} \ \& \ x \text{ owns } y) \rightarrow x \text{ beats } y)$

Take this as a working assumption; but it has been challenged and will be examined.

First she argues that indefinites in donkey sentences are not to be analyzed as generics. (E.g. because “someone” is never generic but can occur in donkey sentences; similarly for indefinites under “there is”, which can also occur in donkey sentences.)

2.1. Donkey anaphora as variable binding.

The logical formula in (1') gives commonly posited truth-conditions for (1); some authors have tried to take it as a serious clue to the actual semantic structure of the sentence, and have proposed that the indefinite in donkey sentences ends up interpreted as a wide-scope universal. For such approaches, the major problem is to explain when and how that happens.

First approximation to a generalization:

An indefinite that occurs inside an if-clause or relative clause gets interpreted as a universal quantifier whose scope extends beyond this clause.

But besides being unrevealing, this isn't even correct. “A donkey” in the following has no such wide scope reading. (And no one has tried to propose the generalization in such a form.)

- (12) A friend of mine who owns a donkey beats it.

Two attempts to actually account for a “switch” in the interpretation of the relevant indefinites. Both are serious attempts, but both fail; we won't discuss them.

[2.1.1. Egli's proposal. 2.1.2. Evaluation of Egli's proposal. 2.1.3. Smaby's proposal.]

2.2. Donkey sentences and pragmatic accounts of anaphora.

Approaches which assimilate the (or some) uses of pronouns to their ‘pragmatic’ uses, in which

they refer to some sufficiently salient referent, do not help at all with donkey sentences, since the pronouns in donkey sentences do not refer at all. This means that if we adopt a Gricean account of anaphora in (1) we will need a completely different account of the anaphora in (2).

- (1) John owns a donkey. He beats it.
- (2) If John owns a donkey, he beats it.

2.3. Donkey anaphora and disguised definite descriptions.

Evans cites some donkey-sentences in illustrating the E-type use of pronouns.

- (1) If a man enters this room, he will trip the switch.

Evans generally seems to believe that E-type pronouns can give a correct account of donkey anaphora, though Heim notes a footnote in which he expresses a caution:

... the interpretation of *a*-expressions is unclear, and we may be forced to recognize that they are sometimes used as equivalent to *any* ...

- (3) If any man loves Mozart, he admires Bach.

It seems that Evans considers (1) an instance of E-type pronominalization, but (3) (and a variant of (3) with *a* in place of *any*) to be an instance of bound-variable pronominalization. But Heim prefers to discuss a clearer version of Evans's proposal, one on which donkey-anaphora is to be analyzed uniformly as E-type anaphora (with notes to similar proposals made in work by Cooper (1979) and Parsons (1978).)

The E-type pronoun analysis of donkey sentences makes the claim that the following pairs of sentences are equivalent.

- (1) If a man enters the room, he will trip the switch.
- (1a) If a man enters the room, the man who enters the room will trip the switch.
- (4) If someone is in Athens he is not in Rhodes.
- (4a) If someone is in Athens the one who is in Athens is not in Rhodes.
- (5) Every man who owns a donkey beats it.
- (5a) Every man who owns a donkey beats the donkey he owns.

Heim does not dispute the equivalences. The stronger claim, to be debated, is that these pairs are properly analyzed in terms of the standard (Russellian) semantics for definite descriptions.

[Some discussion of specifics of Cooper's and Parsons' analyses and the differences between them; we may have occasion to return to this. Both papers are on the Semantics CD 2008.]

On Parsons' analysis, the translation of (5) is (5b):

- (5b) $\forall w((\text{man}(w) \ \& \ \exists u (\text{donkey}(u) \ \& \ \text{own}(w,u))) \rightarrow \exists u (\forall v((\text{donkey}(v) \ \& \ \text{own}(w,v)) \leftrightarrow u=v) \ \& \ \text{beat}(w,u)))$

2.3.1. Pro and contra the uniqueness implication.

Both Cooper and Parsons are well aware that the truth conditions they predict for donkey sentences are in conflict with the judgment that the truth conditions of (5) are as in (5f):

(5f) $\forall x \forall y((x \text{ is a man} \ \& \ y \text{ is a donkey} \ \& \ x \text{ owns } y) \rightarrow x \text{ beats } y)$

The truth conditions agree in two types of cases, namely

- (i) (both true) when every man owns no donkey or every man owns exactly one donkey and beats that one; and
- (ii) (both false) when at least one man owns at least one donkey that he doesn't beat.

In other situations, the truth values diverge:

- (iii) (5f) is true, but (5b) is false, if every man beats all of his donkeys, but at least one man owns at least two.

Parsons and Cooper argue that in cases like (iii), we really don't judge the donkey sentence true, and that our judgments are relevantly close to the truth conditions in (5b). First, about (iii):

- (8) Every man who has a daughter thinks she is the most beautiful girl in the world.
- (9) Every man who has a son wills him all his money.

But what do these sentences prove? Inconclusive on closer examination. Be careful about implicatures and implicit domain narrowing.

Stronger examples that show shortcomings of uniqueness implications: [famous Heimian example, known as "**the sage plant example**"]:

- (12) Everybody who bought a sage plant here bought eight others along with it.

For Parsons, (12) should be a contradiction; for Cooper, it is predicted to make sense just in case we can presume that "it" picks out one particular sage plant per buyer in some contextually determined way. But that does not seem true.

2.3.2. Conditionals.

Evans:

- (1) If a man enters this room, he will trip the switch.
- (2) If a man enters this room, the man who enters this room will trip the switch.

Evans would assign the following uniqueness implication:

- (1b) If a man enters this room, then exactly one man enters this room.

What exactly this means depends on analysis of *if-then*. Assume material conditional; oversimple,, but benignly so. Clearly too strong a claim.

- (4) If someone is in Athens he is not in Rhodes.

Heim then shows that the same problem arises with more sophisticated treatment of *if-then*.

2.4. Donkey sentences and the ambiguity hypothesis.

Heim shows very briefly that positing ambiguity in indefinites does not help at all.

2.5. Summary.

Among the theories of cross-sentential anaphora looked at in section 1, only two were capable of providing more or less automatically an analysis of donkey anaphora.

One is Geach's proposal that all pronouns are bound variables; it leads to Egli's and Smaby's approaches, providing mechanisms by which an intrinsically existential quantifier receives a universal interpretation. Those approaches require complex rules of complex types, much stipulation with little explanation. Some empirical problems as well.

The other is the Evans - Cooper - Parsons E-type pronoun approach: pronouns as disguised definite descriptions. The indefinites are uniformly interpreted as expressing existential quantification and obeying normal scope-island constraints. No special rules for the interpretation of the indefinites; the work all goes into the interpretation of the pronouns: a third kind, neither bound variable nor referential, with the characteristics of a Russellian definite description. Problem: the uniqueness implications are too strong, especially clearly so in the case of conditional sentences.

Common denominator: Proponents of either approach agree that **the following three assumptions cannot all be true** (differing about which to modify):

- (a) Indefinites are existential quantifiers (except for generic ones), and never change force.
- (b) Indefinites obey the same scope-island restrictions as other quantifying NPs (and there is no exportation.)
- (c) Pronouns are either bound variables, or else refer.

[3. Donkey anaphora in game-theoretical semantics.]

References

- Chastain, Charles. 1975. Reference and context. In *Minnesota Studies in the Philosophy of Science, vol. VII -- Language, Mind, and Knowledge*, ed. K. Gunderson, 194-269. Minneapolis: University of Minnesota Press.
- Cooper, Robin. 1979. The Interpretation of Pronouns. *Syntax and Semantics* 10:61-92.
- Evans, Gareth. 1977. Pronouns, quantifiers and relative clauses. *Canadian Journal of Philosophy* 7:467-536.
- Evans, Gareth. 1980. Pronouns. *Linguistic Inquiry* 11:337-362.
- Fodor, Janet D., and Ivan A. Sag. 1982. Referential and quantificational indefinites. *Linguistics and Philosophy* 5:355-398.
- Geach, Peter. 1962. *Reference and Generality*. Ithaca: Cornell University Press.
- Heim, Irene. 1982. The Semantics of Definite and Indefinite Noun Phrases, University of Massachusetts: Ph.D. dissertation; published 1989, New York: Garland.
<http://newstar.rinet.ru/~goga/biblio/heim> (djvu) or
<http://semanticsarchive.net/Archive/Tk0ZmYyY/> (very large PDF file)
- Heim, Irene. 1990. E-type pronouns and donkey anaphora. *Linguistics and Philosophy* 13:137-179.
- Kadmon, Nirit. 1987. On Unique and Non-Unique Reference and Asymmetric Quantification, Dept. of Linguistics, University of Massachusetts at Amherst: Ph.D. dissertation.
- Kamp, Hans. 1984. A theory of truth and semantic representation. In *Truth, Interpretation and Information: Selected Papers from the Third Amsterdam Colloquium*, eds. J. Groenendijk et al., 1-42. Dordrecht: Foris. Reprinted in Paul Portner and Barbara H. Partee, eds., *Formal Semantics: The Essential Readings*, Oxford: Blackwell (189-22). [Reprinted in Paul Portner and Barbara H. Partee, eds., *Formal Semantics: The Essential Readings*, Oxford: Blackwell (189-22)].

- Karttunen, Lauri. 1976. Discourse referents. In *Syntax and Semantics 7: Notes from the Linguistic Underground*, ed. J. McCawley, 363-385. New York: Academic Press. [In *Semantics: Critical Concepts in Linguistics*. Javeier Gutiérrez-Rexach (ed.), Vol. III, pages 20-39. Routledge, 2003. Also in *Syntax and Semantics 7: Notes from the Linguistic Underground*, 363-85, J. D. McCawley (ed.), Academic Press, New York 1976. Translations: Textreferenten. In *Semantik und Generative Grammatik*, pages 175-197, F. Kiefer (ed.), Athenaenum, Frankfurt 1972; Referenti testuali. In *La linguistica testuale*, pages 121-147, M.-E. Conte (ed.), Feltrinelli, Milan 1977.].
<http://www2.parc.com/istl/members/karttune/publications/archive/discref.pdf>
- Kripke, Saul. 1977. Speaker's reference and semantic reference. In *Contemporary Perspectives in the Philosophy of Language*, eds. P.A. French et al., 255-276. Minneapolis: University of Minnesota Press. [Reprinted in A. P. Martinich (ed.) (1985). Reprinted in Davis 1991, 77-96. Reprinted in Ludlow 1997, 383-414].
- Lewis, David. 1979. Scorekeeping in a language game. In *Semantics from Different Points of View*, eds. Rainer Bäuerle et al. Berlin: Springer Verlag. [Also in: *Journal of Philosophical Logic* 8, 339-359. Reprinted in David Lewis, *Philosophical Papers: Volume I*, Oxford: Oxford University Press, 233-249. Reprinted in Portner and Partee, eds., 2002, 162-177]. <http://newstar.rinet.ru/~goga/biblio/essential-readings/06-Lewis-Scorekeeping.in.a.Language.Game.djvu>
- Parsons, Terry. 1978. Pronouns as Paraphrases. Ms. University of Massachusetts at Amherst. <http://www.humnet.ucla.edu/humnet/phil/faculty/tparsons/Pronouns%20as%20Paraphrases/Pronouns%20as%20Paraphrases.pdf>
- Postal, Paul. 1969. Anaphoric Islands. In *CLS 5: Papers from the Fifth Meeting of the Chicago Linguistic Society*, 205-239. Chicago: Chicago Linguistic Society.
- Russell, Bertrand. 1919. *Introduction to Mathematical Philosophy*. London: Allen and Unwin.
- Strawson, P.F. 1952. *Introduction to Logical Theory*. London: Methuen.