1. Introduction

An awful lot of what we mean is dependent on reference: we refer to entities and then say something about them.

Reference: the act of using a linguistic expression meaning to pick some entity out for your interlocutors’ consideration

Following common usage, I’ll refer collectively to those NP types which are canonically used to refer as the definite NPs (Lyons 1999, Abbott 2010). Depending on the inventory of NPs in a given language, these will certainly include proper names; indexicals and demonstratives; and pronouns. In some languages, like English, the inventory also includes definite descriptions, or their closely related kin. For example, in Bulu (Bantu) (Barlew 2015), there is a non-demonstrative definite determiner te- which differs from English the in important respects, but forms NPs which are used to pick out entities that the speaker has reason to believe the addressee is paying attention to. And in languages without definite determiners, like Japanese or Serbo-Croatian, bare NPs—those without article or determiner—may sometimes be used to refer, as well. But here we will focus on the English definites, taking them to illustrate problems of more general interest.

It is not linguistic expressions themselves which refer, but speakers who refer in using them (Strawson 1950). Why is their interpretation a matter for pragmatics? A simple example:

(1) [To a companion seated in a café, looking out the window:] Look at that UPS guy over on the corner. The man obviously needs help with that big package.

What is the meaning of the underlined definite description? Does the NP the man itself refer to anyone? Certainly not out of context. If I just utter (2):

(2) [To a companion who’s reading the paper:] I don’t like the man.

my companion is likely to complain that he doesn’t know who I’m talking about. It is only in context that the man can be used to refer. And even then, not always:

(3) Every time a father feeds his baby in public, the man gets a lot of attention from the ladies around him.
(4) Every father who attended the concert with his son went out for a beer (for the man) and a root beer (for the boy) later.

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1 Much of this was drawn from Roberts (to appear 2015).
Though meaningful, *the man* in (2) arguably doesn’t refer to anyone in particular. Instead, the NP picks out the arbitrary father introduced in the antecedent of the conditional. And in (4), *the man* seems to be bound by *every father*, so again doesn’t refer to anyone in particular.

How does the referential use in (1) work? And is it unrelated to the uses in (3) and (4)?

2. Anaphora and Familiarity Presuppositions

Until quite recently, theories of the various members of the class of definite NPs were treated as pretty much unrelated to each other.

In logic and formal semantics, following Russell (1905), a definite description was treated as quantificational, introducing both an existential quantifier and a variable bound by that quantifier, along with a uniqueness condition:

(5) The man needs help.

\[ \exists x [ \text{man}(x) \land \forall y (\text{man}(y) \rightarrow y=x) \land \text{needs-help}(x)] \]

- **existence**: ‘there is a man’
- **uniqueness**: ‘every man is that individual’, i.e. ‘there is no other man’
- ‘there is a unique man and that man needs help’

There are a couple of obvious problems with such an account—first and foremost that there is certainly more than one man in the world. But we can still utter this in context to refer to someone particular, as in (1). But one virtue of the Russellian logical form is that it permits us to account for use of the expression with narrow scope relative to other operators:

(6) Every day a different UPS guy delivers our packages. Some days, the man is friendly.

For the second sentence, we might offer this logical form:

\[ \exists z (\text{days}(z) \land \exists x [\text{UPS-man-on-z}(x) \land \forall y (\text{UPS-man-on-z}(y) \rightarrow y=x) \land \text{friendly}(x))] \]

‘there are some days such that there is a unique UPS man on that day and he is friendly’

To capture the sense of (5), we added the additional implicit descriptive content *UPS-* and *on-z*, with \( z \) bound to the arbitrary day in question. This kind of contextually-suggested descriptive enrichment is called **domain restriction** and is what the Russelian approach has generally appealed to in cases of so-called *incomplete descriptions* like those in (5).

Domain restriction is independently motivated across different types of quantificational operators, including quantificational determiners, adverbs of quantification, tense operators and modals. These are all most often intended to be understood relative to some intended implicit restriction on their domain of quantification. In the context suggested for (7), the speaker most likely intends to use the vocative *everyone* to refer to (and thereby call to) the students in that classroom:
(7) [in a classroom:] Everyone get out your notebooks.

So the enrichment of the descriptive content of the definite description, above is just an instance of a more general phenomenon of domain restriction. Interestingly, however, the best accounts (e.g. von Fintel 1994) argue that domain restriction itself is anaphoric, requiring salience of the relevant properties, though they don’t offer any insight into how that anaphora gets resolved. So domain restriction accounts still take the incomplete definites to be anaphoric in some sense.

In treatments of pronominal anaphora in compositional semantics focusing on the sentence (e.g. in Montague 1973), a pronoun is treated as a free variable, to either be “bound” by some operator elsewhere in the constituent uttered or given an arbitrary value by an assignment function.

(8) The man said he was hungry

$$\exists x [\text{man}(x) \& \forall y (\text{man}(y) \rightarrow y=x) \& \text{said}(x,[\text{hungry}(x)])]$$

existence: ‘there is a man’

uniqueness: ‘every man is that individual’, i.e. ‘there is no other man’

‘there is a unique man and that man said he was hungry’

(9) He was hungry

Hungry(x)

interpretation of x: an assignment function giving (arbitrary) values to variables

Demonstratives, instead, have been argued to be indexicals (Kaplan 1977), and thus assumed to be given their interpretations directly by the context of utterance: This is a function of what the speaker indicates at the time of utterance, canonically with a deictic gesture (e.g., pointing). So they have been viewed as related in this way to the first and second person pronouns I and you, and to indexical adverbials like here and now, all picked out directly by different features of the context of utterance: who was speaking, who was being addressed, the location and time of utterance, and for the demonstratives, who was being demonstrated by the speaker.

Proper names are generally treated as directly referential: simply picking out the person who bears the name by virtue of some naming convention established in the community which uses the name.

But in fact, despite their differences, there is one feature which all these different NPs share, and which is not captured by accounts which treat them in this heterogeneous fashion. All definite NPs carry a certain kind of presupposition, an anaphoric presupposition called (Heim 1983) a familiarity presupposition. The strictest type of familiarity presupposition is stereotypical anaphora, wherein the speaker intends that the intended referent be retrieved via coreference with a preceding NP. But there are other means of making the intended referent contextually salient, and hence helping to fix the NP’s meaning.
In third person pronouns, demonstratives and definite descriptions we find the following types of uses, reflecting the properties of generalized anaphoricity outlined by Partee (1984):  

**coreferential with an antecedent NP:**

(10) A man and a boy were coming down the street. The man looked worried.
(11) A man was walking down the street. He looked worried.
(12) I saw one quilt which was quite abstract, with lots of asymmetric diagonals. Another one was more traditional, worked in an old Amish pattern. This quilt was less busy than the other, but just as bold.

**with a non-linguistically salient referent:**

(13) [Context: looking together at a house:] The roof needs fixing.
(14) [Context: looking together at a house:] It needs a coat of paint.
(15) [Context: looking together at a house:] That roof needs fixing.

The non-linguistic salience of the intended referent illustrated for definite descriptions in (13) is much like that displayed in the canonical use of demonstratives, as in (15). Because the neuter singular pronoun *it*, unlike the 3rd person masculine and feminine or plural pronouns, has no demonstrative uses (Maclaran 1982), its use in (14) cannot be demonstrative.

All three of these NP types also have bound variable interpretations, where they have a quantificational or irrealis antecedent:

**quantificationally bound:**

(16) At the boy scout camp, every father and son that built a fire together decided that the boy would gather brush and wood while the man made a clearing and laid the fire.
(17) Every couple that built a fire together decided that she would gather brush and wood while he made a clearing and laid the fire.
(18) Every dog in my neighborhood, even the meanest, has an owner who thinks that that dog is a sweetie.

**donkey anaphora:**

(19) If a cat and a dog have a fight, the cat usually wins.
(20) If John sees a car he likes, he should buy it.
(21) If an upwardly mobile yuppie sees that a neighbor has a car, he usually worries that that car is cooler than his.

The underlined NPs in (19) – (21) are instances of the donkey pronouns discussed by Geach (1962), the problems they present for anaphora and semantics admirably explained in the first chapter of Heim (1982) (and see §3 below). Each takes as its antecedent (the discourse referents

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2 Whether such definite NPs are *always* anaphoric is more controversial. For our purposes, what matters is that they do have such uses. See Heim (1982), Lyons (1999), and Abbott (2010) for enlightening overviews of the relevant literature, Roberts (2002,2003,2005), Elbourne (2005,2008,2013), and Beaver & Coppock (to appear) for more recent contributions to this old debate.

3 These are so-called because of the original examples introduced by Geach (1962): If a farmer owns a donkey, he beats it, and Every farmer who owns a donkey beats it, the underlined pronouns called ‘donkey pronouns’.
for) an arbitrary instance of an entity introduced by an indefinite NP in the conditional antecedent.

The uses noted above are those used by Partee (1984) to characterize the class of anaphoric expressions. Note that, given (12)-(14), this sense of anaphora does not imply that the NPs in question must have a coreferential antecedent NP. Rather, Heim (1982) had argued that in order for an anaphoric presupposition to be satisfied, it sufficed that the interlocutors have common knowledge of the intended referent at the time of utterance, something she reflected in a common discourse referent corresponding to that entity.

I would add two additional types of use involving narrow scope under operators, uses also reflecting anaphoricity in this sense:

**Inverse linking:**

(22) The political gathering was attended by the mayor of every city in Indiana.
(23) S/he who must be obeyed in each family is usually the dog.
(24) That senator with the most seniority on each committee is to be consulted. [King 2001:10]

In (22) *every city in Indiana* is understood to take wide scope over *the mayor*; in (23) *each family* takes wide scope over the rest of the subject NP, and in (24), *each committee* does the same.

**bridging:** (Clark 1977)

(25) Every car had a statue on the dashboard.
(26) In every 1960s marriage it was understood that he should take out the garbage and she should wash the dishes.
(27) [Pointing to an empty car that’s taking up two parking spaces in a full lot:] That driver needs a courtesy lesson.

The definite description in (25) depends for its interpretation on a prior NP, the quantificational *every car*; but it is not coreferential with this antecedent. Rather, any given dashboard is understood to stand in some functional relation with one of the cars in the domain of *every*, the pragmatically retrieved function picking out, for any car, its dashboard. This is also the case with *he* in (26), which is understood to take as antecedent *every marriage* and to implicate that the man in question is the husband in a given (traditional heterosexual) marriage, just as *she* is associated with a function that returns the wife of that same marriage.

The demonstrative in (27) also has an “antecedent”, but instead of an NP, it is the demonstratum of the accompanying deictic gesture made by the speaker, a particular car. Moreover, *that driver* is not coreferential with its “antecedent”; rather it is the value of a function on that entity, the driver who parked the car (the function suggested by the demonstrative’s head *driver*). This is what Nunberg called *deferred ostension*, but it seems to closely parallel the bridging exemplified in (25) and (26). Such examples are found under quantification, as well, as in (28), where the demonstratives take as their bridging “antecedent” the quantified NP *every table*:

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(28) [Maitre d’ instructing waiters how to set up a dining room, pointing to one set of chairs among a group of identical sets in the storage room:] Every table should be set up so that this one [pointing to the unique chair with arms] is at the head, looking toward the dais, with these others [sweeping gesture at the remaining chairs in the set] are at the remaining places.

(28) means that for each table, the chair with arms in the set assigned to that table should be placed at the head of that table, while the remaining chairs in the set assigned to that table should be distributed to the remaining places.

The range of familiarity presuppositions exemplified above argues that in the general case, definite NPs so-used require only weak familiarity (Roberts 2002, 2003, 2005), that is, they require that the context of utterance entails the existence of the relevant entity (and, for proper names, of the relevant causal chain, as above). Thus, cases like (10) – (12) where there is an explicit coreferential antecedent—satisfying strong familiarity—are a special case.

Even those NP-types that most theorists agree to be referential, proper nouns, display several types of context-dependence, and hence cannot be successfully used to refer without adequate contextual clues to their intended referent. For example, Mary doesn’t uniquely pick out any individual. It’s only in context that its use conveys singular reference, permitting the addressee to pick out the intended referent. In this sense, we might say that Mary is an incomplete name, and thus its use to refer is essentially context-dependent.

But besides incomplete (or possibly ambiguous) names, there is another reason to think that the felicitous use of a proper name presupposes familiarity on the part of the addressee. This familiarity doesn’t require some kind of personal acquaintance with the individual which a name picks out. Rather, in order for a proper name to be felicitously used, the name must be properly introduced to the addressee. For example, the use of Ernest in (29) is a bit odd:

(29) There is a gentleman in Hertfordshire. Ernest is engaged to two women.

Either (a) Ernest is an individual already known to the addressee (at least ‘by name’), in which case the second sentence seems like a non sequitur when uttered after the first, or else (b) the speaker intends by use of the name to refer to the aforementioned gentleman in Hertfordshire. However in the second case, if the gentleman were familiar to the addressee then the speaker wouldn’t have used the first sentence; but if he wasn’t familiar prior to this, the speaker hasn’t really properly introduced the name, so that the addressee is being required to accommodate the answer to Who’s Ernest? and what’s he got to do with Hertfordshire?

There are a number of ways that a name can be properly introduced. Here are just a few:

Cumming’s (2008) “naming construction”:

(30) There is a gentleman in Hertfordshire by the name of ‘Ernest’. Ernest is engaged to two women.
Appositives, also a construction for naming:
(31) There is a gentleman in Hertfordshire, Ernest. Ernest is engaged to two women.
(32) I’d like you to meet my friend Ernest. Ernest is engaged to two women.

Deictic introduction ritual:
(33) A speaking to two companions: Charles (nodding and gesturing to Charles), this is Ernest (nodding and gesturing to Ernest). Ernest (nodding and gesturing to Ernest), Charles (nodding and gesturing to Charles).

But the original way that a name is introduced into the language is via a dubbing event, what Matushansky (2008) calls the introduction of a naming convention:

Dubbing:
(34) A: Who’s that?  
B: I dunno. Let’s call him ‘Ernest’. I think Ernest is awfully cute, don’t you?

Compare (34) with I hereby dub thee Sir Ernest, or a naming by parents. In these cases, there is a socially granted authority vested in the dubber. But nicknames and nonce cases like (34) do frequently occur, and the resulting association can persist just as well in the informal cases as in the more formal ones.

A dubbing might be regarded as the origin of the type of causal chain that Kripke (1972) argued underlies the direct referentiality of proper names: The dubbing conventionally associates the name with its intended referent. The other types of proper introduction could then be regarded as the establishment of new links, extending the chain to the new acquaintance so that s/he is familiar with it and may use the name correctly. Thereafter, it is felicitous to use the proper name with that newly introduced acquaintance to (directly) refer to the intended bearer of the name. So even proper names bear a familiarity presupposition, albeit of a special type.

3. Accounting for familiarity presuppositions

From data related to Partee’s paradigm, Heim (1982) proposed that we take pronouns and definite descriptions as presupposition triggers. We’ll extend Heim’s thesis (as she implicitly intended) to the more general:

Heim’s Hypothesis: Anaphora is a conventionally triggered presupposition.

As we saw in the previous lecture, anaphora is a kind of functional, conventional presupposition, a “hard” trigger in the sense that its failure usually leads to infelicity. Taking it to be conventional, as in the Character of he discussed there, helps to explain the non-accommodability of most anaphoric presuppositions. Recall from that discussion:

Projection pattern universal: The patterns of projection and filtering captured by rules like Karttunen’s (1983) and are attested across languages.
Then if the definite NPs all carry anaphoric presuppositions, we predict the following pragmatic universal:

**Anaphora universal**: Anaphora resolution across languages is constrained by the same patterns of dynamic context-update as we find in presupposition satisfaction.

This predicts that we will not find a language in which the fundamentals of anaphora and constraints on anaphora resolution are different than what we find in English. We *surely do* find in some languages particular anaphoric trigger which places language-particular constraints on the kind of antecedent that would resolve its anaphoric presupposition (e.g. see Barlew 2014 on Bulu; Matthewson 2008 on St’át’imcets), but once an anaphoric presupposition is triggered, the pattern of anaphoric accessibility and its effects on felicity will not differ significantly from what we find in other languages, like English and Guarani.

Recall that Karttunen’s rule schemata for presupposition projection could really be understood as capturing some features of how context changes in the course of interpretation. This is how we can explain the anaphora universal: What’s universal is the way that context gets updated in the course of interpretation and the fact that anaphoric NPs require “antecedents”, not in the sense of coreferential NPs in prior context, but of contextual entailment of existence (weak familiarity).

This helps bring into focus the importance of the following questions for any adequate theory of pragmatics:

**What is a context of utterance?**

The development of a theory of context has a complex history in formal semantics. See Roberts (2015 to appear) for a brief overview. When we aim to develop scientific semantic theories, we would do well to keep in mind David Lewis’ excellent advice in “General Semantics” (1972):

> In order to say what a meaning *is*, we may first ask what a meaning *does*, and then find something that does that.

We can paraphrase this advice for pragmatics as follows:

> In order to say what a context of utterance *is*, figure out what it *does*, and then find something that does that.

We need a theory of context that tracks the information interlocutors share in discourse and does so in a way that is updated in the course of interpretation.

The theories of Kamp (1981) and Heim (1982) developed the foundations of such a theory. See Geurts & Beaver (2014) for an excellent introduction to the basics of Kamp’s DRT in its current form. The more recent theories of dynamic interpretation due to Groenendijk & Stokhof (1993), Muskens (1996), Martin (2013), and Anderbois et al. (2015), among others, all propose modifications and extentions of that earlier work by Heim and Kamp.
Exercises: Go through the following using the DRS construction procedures illustrated in Geurts & Beaver (2014):

(a) Consider their DRS for negative Pedro doesn't have a donkey in (5), p.10. How would this DRS be extended to treat (35):

(35) Pedro has a donkey. He is mean. His donkey doesn’t like him

How does this DRS illustrate that claim that negation is a hole to presupposition?

(b) Now consider (36), and construct a DRS for it based on their conditional in (7), p.11.

(36) Pedro is mean. If he owns a donkey, he beats it.

How does this illustrate the hole status of the if-clause, and its function as a filter for the presuppositions of the main clause?

(c) Can (36) be felicitously followed up with (37)?

(37) #In his fury last night, he injured it.

Why?/Why not? Show by constructing the extended DRS.

(d) What kind of DRS should we construct for (38)?:

(38) Pedro is mean. He owns a donkey and he beats it. In his fury last night, he injured it.

How does this differ from that for (36)+(37)?

All the variables in the universes of DRSes are called discourse referents (or in Kamp’s early work reference markers). Karttunen (1976) pointed out that we keep track of information in discourse about a number of individuals other than those we take to be actual entities in the world: for example, hypothetical individuals, or instantiations of quantificational statements. And we may keep track of information about someone we believe to be real, not knowing whether this individual is the same as some other with whom we are familiar, perhaps later merging information about the two. To distinguish these bundles of information from actual entities in the world, Karttunen called them discourse referents. Heim and Kamp gave technical expression to this notion by modeling discourse referents (Kamp’s reference markers) as constraints on the assignment functions interlocutors can use to interpret variables at a given point in discourse. We assign an "address" to each bundle of information we take to be about a single (actual or hypothetical) individual, the address being a particular variable, say x. Then we require that any assignment function we use to interpret utterances at that point in the discourse be such that whatever it assigns as the value of x be an individual which satisfies all the information we have about that (actual or hypothetical) individual discourse referent. Hence, instead of assignment functions being arbitrarily chosen, they are used to encode the information about familiar discourse referents, permitting a continuity of reference.
Across discourse, these discourse referents, in the technical form of the set of permissible assignment functions, are managed dynamically to reflect the way that information changes: If we add more information about a particular discourse referent, the permissible assignment functions will be further constrained. If the discourse referent is merely an instantiation of a generalization or, say, hypothetical, triggered by information under the scope of a modal or other operator, then once the hypothetical mode has been closed off, outside the scope of that operator, the discourse referent is no longer available for reference, and accordingly, the relevant constraints on assignment functions no longer hold. This is the key to interpretation of donkey pronouns in these frameworks, as in (20) above or (7) in Geurts & Beaver (2014). The discourse referent whose introduction into the information is triggered by utterance of a donkey will be available only under the scope of the conditional. Hence it can bind the "donkey pronoun" \textit{it} in the predicate, but normally is not available for reference after that. For example, we cannot felicitously continue (36) with (37).

In the scoreboard for a language game we considered in lecture 2, the set of discourse referents with which the interlocutors are jointly familiar is DR, a crucial part of the contextual information used for reference.

Although DRSes are representational, I have argued elsewhere (Roberts 2002, Roberts 2004) that what matters isn’t the representation of a discourse referent in the universe of such a structure, but the associated existential entailment. This is crucial in permitting us to extend the notion of anaphora to cover cases where there is no explicit NP antecedent in prior discourse:

(39) [Context: A goat walks into the classroom.] Whew! It stinks!

(40) Every Hoosier has \textbf{a basketball hoop}.
George is from Terre Haute.
He mounted \textit{his} on the garage.

(41) Every student turned in \textbf{his paper} Friday.
I graded \textit{them} over the weekend.

And arguably this is what licenses anaphora in examples like (42):

(42) Frank is a beekeeper. He keeps \textit{them} in the orchard.

That is, in order to be a beekeeper, one must have bees. Knowing this, and given the salience of the beekeeping, the existence of the bees themselves is sufficiently salient (for many of us) to license the use of \textit{them} to refer to the bees. Note that the salience is quite important.

Cf. the difference in this famous pair due to Partee (p.c. to Heim 1982), uttered out of the blue:

(43) I dropped ten marbles and found all of them, except for one. \underline{It} is probably under the sofa.

(44) I dropped ten marbles and found only nine of them. \#\underline{It} is probably under the sofa.
(43) and (44) illustrate the importance of salience for the felicitous use of pronouns (as opposed to definite descriptions). The first sentences in this pair are truth-conditionally equivalent, all entailing the existence of a missing marble. This is sufficient to license the definite description in (45), though the existence is merely entailed (I called this weak familiarity in my work on definites):

(45) I dropped ten marbles and found only nine of them. The missing marble is probably under the sofa.

But weak familiarity doesn't guarantee salience, and this is why the pronoun is infelicitous in (44). When the missing marble is explicitly mentioned, and hence salient, in the first sentence of (43), use of the pronoun is felicitous. Or if there is some other way in which the missing entity is made maximally salient (I'll tell you a real-life story about this), then (44) becomes acceptable. My articles on definites and pronouns (Roberts 2003,2002,2004 constitute an extended argument for this general view of nominal anaphora.

But this brings us back to the generalization suggested by the Partee paradigm we considered at the outset. If this provides evidence that pronouns are anaphoric, and for anaphora as presupposition satisfaction in a dynamic context, what does that tell us about definite descriptions, demonstratives and names?

In one leading thread in the contemporary literature, definite descriptions are taken to be anaphoric (Roberts 2003, Elbourne 2005), though there are some who deny that that is general (Abbott 2010, Beaver & Coppock to appear). Even if the definites are all anaphoric, that does not mean that they have no quantificational force, but rather than they must also be definite in the sense described above, so that the existentially bound variable is equated with some familiar discourse referent.

Roberts (2004) and Elbourne (2008) take demonstratives to be another species of anaphoric trigger, partly based on Partee paradigm illustrated for demonstratives in (10)-(21). But Roberts (2015b) argues that though demonstratives are anaphoric in this sense, they are also indexical, an argument we’ll consider in the next lecture.

As for proper names, this is an open question. But see Geurts (1997), Cummins (2008), Roberts (2009, 2015) for additional discussion.

4. Summary

…coming up

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