

Implicit Arguments: Comparing with Demonstratives, Indexicals, Pronouns, and Definite Descriptions

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Note: This handout can be downloaded (then links to references can be clicked) from my site.

Principal Readings

(Partee 1989) Binding implicit variables in quantified contexts
(Condoravdi and Gawron 1996) The context-dependency of implicit arguments
(Zeevat 1999) Demonstratives in discourse

Additional readings

(Lewis 1980) Index, context, and content
(Braun 2008) Indexicals (Stanford Encyclopedia of Philosophy)
(Mitchell 1986) *The Formal Semantics of Point of View*
(Dowty 1982) Quantification and the lexicon: a reply to Fodor and Fodor
(Lewis 1979) Scorekeeping in a language game

For next time:

(Elbourne 2005) *Situations and Individuals* – **read Chapters 1-4 and 7 for next time**
(Kratzer 2004, Kratzer 2009) (Just sections 1-6 of the latter): Why domain restriction should be done by a situation argument rather than by a property-variable.

1. Demonstratives, Indexicals, and Pronouns

Today I want to set up some background for discussion of the nature of hypothesized implicit arguments. In (Partee 1989) I assumed that if implicit variables were linguistically “real”, they were like pronouns, and then offered some arguments to show that they weren’t all like pronouns, and concluded that at least some of them shouldn’t be treated as real linguistic constituents, but more like parameters of evaluation. But as Condoravdi and Gawron (1996) pointed out, analyzing implicit variables as empty pronouns isn’t the only option; they argued that they are more like phonologically empty definite descriptions.

So let’s first begin by distinguishing among indexicals, demonstratives, and pronouns, and then extend the discussion to include definite descriptions.

1.1. Terminology.

Terminology in the area of demonstratives and indexicals is not uniform. When people make overt distinctions between demonstratives (= deictics) and indexicals, they usually agree on the clear cases; but one often finds one term or the other used to cover both. So then to be safe, people sometimes use modified expressions like “pure indexical” or “indexical in the narrow sense”, etc. Here is a quote from (Braun 2008):

Kaplan (1989) distinguishes between two different sorts of indexical, *pure indexicals* and *true demonstratives*. The true demonstratives include ‘he’, ‘she’, ‘his’, ‘her’, and ‘that’, while the pure indexicals include ‘I’, ‘today’, ‘tomorrow’, ‘actual’, ‘present’, and (perhaps) ‘here’ and ‘now’¹. (More on ‘here’ and ‘now’ below.) The two types of indexical differ in how their references and contents are determined. The reference and content of a true demonstrative in a context depends (roughly) on the speaker's accompanying *demonstrations* or intentions. For example, the reference and content of ‘that’ in a context is determined (in part) by the speaker's pointing gestures or by the speaker's intention to refer to a particular object. (See section 2 for more on the nature of reference-fixing for true demonstratives.) The reference and content of a pure indexical in a context does not depend on these sorts of speaker intentions and actions. For example, the reference of ‘I’ in a context is always the speaker, whether or not she points at herself, and the reference of ‘tomorrow’ in a context is always the day after the day of the context. We can reasonably say that the reference and content of a pure indexical is *automatic*, whereas the reference and content of a true demonstrative is not. (See Perry 1997, 2001.) [(Perry 1997) is accessible online – BHP]

From here on [Braun, not BHP!], we shall use the term ‘demonstrative’ to mean *true demonstrative*, in the above sense. ‘Indexical’ shall be used here as a generic term, so that it encompasses both (true) demonstratives and pure indexicals. (Braun 1999, beginning of section 2.3)

Among linguists it's the term *demonstrative* that's more frequently used to cover both demonstratives and indexicals, I believe (as we saw in Heim's dissertation). Today I'll try to use each term in its narrow sense.

The list of pure indexicals is relatively small; they are all anchored to what Bühler called the *origo*, the “I-here-now (and actual world)” center, usually associated with the speech act, but sometimes displaced (e.g. in quotation or performance).

The paradigm demonstratives in English are *this* and *that*; other languages may have two, three, or four typical demonstratives, often varying with respect to relative distance from the speaker and/or the hearer. *He* and *she* can also be used demonstratively; in fact quite a few elements appear to have both demonstrative and anaphoric uses (maybe most

¹ Some say *here*, *now* are not pure indexicals because of the indeterminacy of how large a region is meant. But apart from the vagueness problem they behave like pure indexicals, and I think it's better to consider them vague pure indexicals than to classify them with demonstratives.

demonstratives do? Pure indexicals tend NOT to have anaphoric uses.) *It* seems to be difficult or impossible to use as a demonstrative; *that* is used instead.

Classic works on demonstratives and indexicals include (Bennett 1978, Bühler 1934, Davies 1982, Fillmore 1966, Fillmore 1997, Kaplan 1979, Kaplan 1989, Lewis 1979, Lewis 1980, Perry 1997).

1.2. Lewis, Kaplan

David Lewis, David Kaplan, and Robert Stalnaker all made major contributions to sorting out how to think about the context-dependence of various features of discourse, including indexicals and demonstratives.

Lewis in (Lewis 1980) and Kaplan in his papers on demonstratives (Kaplan 1979, Kaplan) emphasized the distinction between evaluating a sentence with respect to a small set of *indices* (typically including a world and a time, perhaps also a location), indices which may be manipulated recursively in compositional interpretation, vs. evaluating a sentence in a *context*, such as the speech act context or some imagined context.

Kaplan used the following example:

(1) I am here now.

Is this sentence a logical truth? Well, on the one hand, it is always true when spoken, given the rules that determine the values of the indexicals *I*, *here*, *now*. But it is not a necessary truth; (2) does not hold, because there are many possible worlds in which I am somewhere else right now. (I am assuming the normal modal semantics for *necessarily*: *Necessarily* ϕ is true in world w if ϕ is true in all possible worlds w' .)

(2) Necessarily I am here now.

One might call sentence (1) “pragmatically valid”. When uttered in any context, it expresses a (contingent) proposition that is true in that context.

Kaplan considered both indexicals and demonstratives to be *rigid designators* which *directly denote* their referents, insensitive to any temporal or modal or intensional operators under whose scope they might occur.

Kaplan proposed getting from a sentence to a truth value in two stages. First the sentence is evaluated with respect to its *context*; this fixes the values of all its indexicals and demonstratives and gives as result what Kaplan called its *content*, a function from indices (possible world and time) to truth value, i.e. a proposition. Kaplan used the word *character* for the meaning of the sentence in the richer sense, i.e. the function from contexts to contents. A sentence has a constant character, and has different contents in different contexts.

Lewis emphasized that it is a matter of choice whether to proceed one stage at a time as proposed by Kaplan, or whether to take the meaning of a sentence to be a function from context and indices to truth values. He showed how to transform an analysis of one sort

into an analysis of the other sort, and made many valuable observations about the distinction between contexts and indices.

Both emphasized that a *context* must be coherent: if a context includes a time of utterance, a place of utterance, and a speaker, that speaker must be at that place at that time. Indices have no such constraint; if one were to include an index for speaker as well as world and time, then the evaluation of a modal sentence might well involve considering possible worlds in which there is no speaker at the given time. We need that, of course, in order to show that sentence (3) is not a necessary truth:

(3) I am speaking now.

1.3. Zeevat

Zeevat (1999) presents an explicit formal theory of demonstratives and indexicals within a modified version of Kamp's Discourse Representation Theory, aiming to formally capture what he agrees with in Kaplan's theory but with some important changes. His account makes demonstratives and indexicals a special case of the treatment of definite NPs in terms of presupposition, in the spirit of the account of names in (Geurts 1997) and treatments of definite descriptions like (van der Sandt 1992). Kamp himself had introduced "external anchors" for DRTs to account for indexicals and demonstratives; Zeevat argues against that and instead develops the notion of *intensional anchors* as an alternative; he argues that for normal indexicals and demonstratives they allow a proper reconstruction of Kaplan's theory, whereas Kamp's did not. (We will not discuss the problems of intentional identity that motivate the intensional aspects of Zeevat's system.) I discuss it briefly here because it brings the treatment of demonstratives and indexicals closer to the treatment of definite NPs.

Zeevat himself had earlier introduced a compositional variant of Kamp's theory (Zeevat 1989). In this paper he reopens the question of compositionality in the light of some aspects of the DRS construction algorithm that involve "finding a suitable antecedent" in parts already processed.

On Van der Sandt's 1992 theory, expressions which are *presupposition triggers* induce a presupposition whose content is determined by the expression. "For example, the verb *regret* triggers its complement as a presupposition, the noun *bachelor* applying to an object x triggers the presupposition that x is an adult male." (Zeevat p. 280) The DRS algorithm first enters the presupposition as a separate "presupposition DRS" at the site of the expression and then searches the *accessible*² part of the old DRS for an occurrence of the material in the presupposition DRS. "If it is found, the discourse markers occurring in the presupposition DRS are unified with the corresponding markers in the old DRS. This process binds discourse markers in the new material to the old markers." If no antecedent can be found, the presupposition is *accommodated*, i.e. added at some point (details about local vs. global accommodation are controversial) in the accessible DRS where it does

² See our earlier discussion (last week) of parallels between anaphora and presupposition with respect to syntactic and semantic constraints on accessibility of "antecedents".

not cause inconsistency. (If there is more than one choice, considerations of recency and topicality guide the choice.)

The algorithm just described can also be considered as an idealized model of the hearer/interpreter. The hearer can also be assumed to have some additional knowledge, such as the knowledge that an utterance event has taken place. This can be modeled by adding at the very top of the DRS a designated discourse referent e for the utterance event and a condition

(1) $utterance(e)$

(In a Heimian system, we could add a designated file card that represents the utterance itself. We might imagine these special file cards to be of a different color.)

If a sentence is uttered that contains the word I , that word generates the presupposition $utterance(e)$, $agent(e,x)$, where e is the special discourse referent introduced for the utterance. If the utterer of the sentence is already represented by a discourse referent y , then presupposition resolution yields the identity statement $x = y$; if she is not represented, accommodation adds the (presumably trivial) information that the utterance event has an agent.

An utterance of *I am sick* will lead to a DRS with two discourse referents, e and x , and the three conditions $utterance(e)$, $agent(e,x)$, $sick(x)$.

The story for indexicals *you*, *here*, *now* is similar: they trigger presuppositions using other thematic roles of the utterance event: $goal(e,x)$, $location(e,p)$, $time(e,t)$. These presuppositions do not need accommodation; the use of utterance DRSs “guarantees their resolvability.”

How do demonstratives like *this*, *that* work? Also by using the interpreter’s knowledge of the utterance situation. Zeevat assumes that they require that a pointing gesture by the speaker has been noticed by the interpreter. The presupposition DRS therefore will contain a condition that there is an event e_1 which is a pointing gesture: $point(e_1)$. An occurrence of *this* presupposes the combination in (4).

(4)

e x t e_1 y
$agent(e,x)$
$time(e,t)$
$point(e_1)$
$agent(e_1,x)$
$time(e_1,t)$
$goal(e_1,y)$

If the required pointing is missing, there are two possibilities. Zeevat argues that a pointing is normally required for demonstrative *this*, and if the interpreter knows that there has been no pointing, it is not accommodated and the utterance is anomalous. “But in special circumstances, e.g. listening to a conversation on a tape or through a keyhole,

we do accommodate the existence of a pointing that we cannot see.” This is a “repair move”, not normal accommodation. (“Repair” could be an interesting research topic.)

Zeevat also has an interesting discussion of the impossibility of local accommodation of a pointing gesture with embedded demonstratives.

(5) It could have been the case that this was precious.

If there is no pointing, and we know there is no pointing, this sentence is anomalous, even though we could imagine local accommodation under the scope of the modal operator: a precious object could have been at the scene of the utterance and the speaker could then have pointed at it while making the utterance. But we don’t do any such accommodation. Zeevat appeals to Blutner’s Theorem, which predicts that a presupposition trigger which has a simple non-presupposing expression alternative does not allow accommodation. Since *something* or a descriptive definite could be used in the given sentence, Blutner’s theorem applies.

Zeevat extends this approach to *names* and *anaphoric expressions*. For Zeevat, the interpretation of names is context-dependent, and the semantics of a name is exhausted by its triggering a presupposition to the effect that that name is the name of a certain individual, something which should exist in the background knowledge of the hearer. (Unlike the case of indexicals, the presupposition for a name could fail if the name is not known to the hearer; then normal accommodation can come into play, or the hearer can stop and ask a question.)

Anaphoric pronouns, like demonstratives, do not accommodate, and Zeevat argues that his unified treatment helps to explain that.

(6) It could have been the case that she was pretty.

If the *she* lacks an antecedent, we do not allow local accommodation under the modal; it never means that some woman could have been mentioned in the previous discourse and could have been pretty. Blutner’s theorem comes into play here just as before.

1.4. Properties of Implicit Variables and properties of indexicals, demonstratives, pronouns

This is a topic that we want to keep in mind all the time: as we examine various proposals for treating various sorts of implicit arguments or other implicit material, we can usefully ask whether these unexpressed “items” seem to have the properties of indexicals, of demonstratives, of pronouns, and/or of definite NPs, and consider what that implies for how to treat them. That’s undoubtedly one of the Big Questions in this area, and it won’t be easy to answer. But let’s try to make a start. In Section 2 below, we’ll see how Gawron and Condoravdi argued that certain implicit arguments are more like definite NPs than like pronouns. And there are relevant arguments about such things in some of Elbourne’s work.

Implicit indexicality

As noted in Fillmore (1966, 1997) and Partee (1989) there are many words that have a kind of first-person-oriented indexicality as part of their meaning, either exclusively or as one option.

(7) Implicit indexicality examples:

- (i) *come* vs. *go*, *bring* vs. *take* (Fillmore (1966, 1997))
- (ii) *ago* (*2 years ago* = *2 years before now*)

(homework: find more)

Implicit demonstratives.

I suspect there may not be any. Demonstratives call attention to something that wasn't in the hearer's attention before, and I'm not sure that a null element can do that.

In this connection it's important to distinguish between demonstratives – which require a pointing or some other kind of attention-directing act – from anaphoric pronouns with a non-linguistic “antecedent”, something that has been raised to sufficient salience in the non-linguistic context.

Contrast between true demonstratives and anaphoric elements with non-linguistic “antecedent”:

Scenario: John comes into the office carrying a large wrapped package of a mysterious shape.

Variant one: Someone notices and immediately says “What's THAT?” (Demonstrative.)
[An accompanying eye-gaze can substitute for an overt pointing since the object is so salient.]

Variant two: People gather around with quizzical looks; John remains silent. Eventually someone says, “Well, what IS it?” (Non-demonstrative pronoun.)
[The object became not only perceptually salient but “activated” – on the file card metaphor, we can say that everyone had already added a file card for the mysterious object they all knew they were all interested in, so it could then be referred to with a pronoun or a non-demonstrative definite.]

If we follow Kaplan and Zeevat and say that a true demonstrative requires a pointing or some equivalent gesture, it seems hard to see how any null element could qualify. This may correlate with the fact (if it is a fact) that true demonstratives never (?) have reduced stress, whereas both anaphoric pronouns and indexicals can.

Implicit anaphoric elements.

Putting pronouns and anaphoric definite NPs together for the moment (and Elbourne and some others would advocate putting them together quite generally), a great many implicit arguments and other implicit elements would seem to be best classified this way. Most of the arguments in Partee (1989) were directed to showing similarities between implicit variables and pronouns, e.g. in binding possibilities.

(8) Implicit anaphoric examples:

- (i) Implicit object of *notice, win*. (Needs an antecedent in a suitable structural position; can be bound.)
- (ii) Implicit argument of *local, enemy, right, left* (can also be indexical)
- (iii) Implicit argument of *nearby, later, 2 miles away*, etc. (Some of these can also be indexical, some can't.)

Implicit elements that do not seem like any of the above.

- (9) Implicit examples that seem neither indexical nor anaphoric:
- (i) The “free R” in the genitive relation (Mary’s team)
 - (ii) Domain restrictions? (But see discussion of Kratzer 2004 next week)

2. Condoravdi and Gawron response to Partee: they’re not pronouns, they’re definite NPs.

2.1 Partee 1989

Partee (1989) observed that the distribution and interpretation of many “implicit arguments” had much in common with the distribution and interpretation of pronouns, showing the same sorts of C-command restrictions, weak crossover, etc. But Partee (1989) argued against analyzing the examples as containing “unpronounced/empty/zero pronouns”, because of some observed differences between implicit arguments and overt pronouns.

First the similarities to pronouns.

- (10) a. Only the **nearest** photographer got a good picture of Reagan.
b. #? Only the **nearest** photographer got a good picture of every senator.
c. Every senator directed a smile at the **nearest** photographer.
- (11) a. Only **his** top aide got a good picture of Reagan.
b. #? Only **his** top aide got a good picture of every senator.
c. Every senator directed a smile at **his** top aide.

These similarities provide one argument for positing empty pronoun-like elements in the structures containing such context-dependent elements as *nearest, local, later, enemy, notice*.

Partee (1989) offered two, admittedly inconclusive, kinds of arguments against treating all implicit arguments as a species of empty pronouns, the first concerning the antecedents and the second concerning the decompositional analysis of the dependent elements.

The first argument is that overt pronouns in their discourse anaphoric and bound variable uses normally require overt antecedents. I gave examples with quantified contexts but no

overt “antecedent” where a bare dependent element like *nearby* without an overt pronominal argument can be used, but a corresponding form *with* an overt pronoun cannot (*near it, near there*).

- (22) (d) Every beginning general who loses his first battle switches to a *different* strategy in his second. (# a strategy *different from that/it*)
(e) Why do so many people marry people with the *opposite* sleep pattern? (# sleep pattern *opposite from that/it*)
(f) I wish that just once when I had just worked out a good solution for one client, my next client would come in with a *similar* problem. (# *similar to it/that*)
- (13) (a) Every man who stole a car abandoned it *2 hours later*.
(a') # Every man who stole a car abandoned it *2 hours later than that*.
(c) Every man who stole a car abandoned it *nearby* / #*near there*

The second argument is that not all the lexical elements that admit context-dependent and bound-variable readings take complements or admit of a plausible (to me) decomposition into a context-independent predicate plus pronominal arguments.

Consider *left* and *right*. As used in the examples below, they are context-dependent with two arguments or parameters: to the left or right (i) *of what* and (ii) *from whose point of view*. The first is naturally expressed as an argument, but the second can only be made explicit via a wordy paraphrase which looks more like an adjunct than an argument. The ungrammatical (20b) represents an attempt to make the second “argument” overt as a source or experiencer.

- (20) (a) John had a black spot on the middle of his forehead. *To the left of it* (from John’s point of view/ from an observer’s point of view) was a green “A”.
(b) ... *? *to the left of it from/for him*
(c) Every man had ... [same data]

Similar examples involved *foreign, foreigner, stranger*: *foreign* and *stranger* can take overt pronominal arguments, but *foreigner* cannot; all three can be used context-dependently with no overt argument.

Examples with *arrive* suggest differences between *here, there*, and an implicit contextual point of view. The anchor for *arrive* is the *I* in the sense that it is my point of view that establishes the frame of reference. My varying location in the bound-variable cases seems like a quantified-over shiftable “here”; but the actual word *here* doesn’t itself allow any bound-variable reading. (*There* can, but its anchor or antecedent must be 3rd-person-like, not 1st-person.)

- (24) (a) In all my travels, whenever I have called for a doctor, one has *arrived* within an hour.
(b) ... **arrived there*
(c) ... **arrived here*

The behavior of *arrive* with its implicit goal parameter seems to have properties that overlap those of first-person and third-person locative anaphoric items but it is different from both.

My own alternative proposal was too inarticulate to be worth repeating here; among more recent proposals, what Lasersohn does with the “judge” parameter (which we’ll study soon) could be seen as the sort of thing I was aiming at.

2.2 Condoravdi and Gawron 1996

Condoravdi and Gawron’s starting point is the work of Mitchell (1986) and Partee (1989), which showed that implicit arguments of predicates like *win*, *local*, *enemy* can have “deictic” [not really; these are either indexical or anaphoric with non-linguistic ‘antecedent’], discourse anaphoric, and bound variable readings. Their aim is to give a unified account of the readings of these implicit arguments and to characterize the type of context-dependency involved.

We claim that context-dependent predicates are associated with familiarity presuppositions with respect to their implicit arguments and that these presuppositions account for the particular kind of context-dependency and for the readings of implicit arguments. In section 2 we distinguish implicit argument predicates that are crucially context-dependent from those that are not and describe their range of readings. In section 3 we provide an analysis of the anaphoric readings of implicit arguments. In section 4 we integrate the anaphoric and indexical readings of implicit arguments.

Section 2.1 is mainly devoted to making it clear that existentially quantified ‘null arguments’ of verbs like *eat* are not to be grouped together with true implicit arguments. The true cases of context-dependent predicates are ones which require some anchoring context for felicity, and which put structural restrictions on what elements in a discourse can supply a value for an implicit argument. We discussed those things a bit on the first day. Section 2.2 discusses the variety of readings implicit arguments can get: “deictic”, discourse anaphoric, or bound variable. Certain elements have further restrictions: *ago* can only pick out its temporal reference relative to the utterance situation (it’s strictly indexical), whereas *before* excludes that possibility and can only be anchored to the linguistic context.

Section 2.3 summarizes Partee’s claims (seconded by Nunberg (1992)) that any dependent element – whether a pronoun or the implicit argument of a relational predicate – has associated with it three specifications, which together account for its distribution and interpretation:

- (12) a. what kinds of context it can anchor to
- b. requirements on the context for the element to be felicitous
- c. meaning

Condition (12a) is needed to distinguish among those items that can act only as pure indexicals, those that can play all three roles, etc. Condoravdi and Gawron identify the challenge for a unified analysis of context-dependency as how to characterize the three kinds of contexts in a uniform way without losing the distinction between them.

They note that Kamp and Heim unified the deictic (or indexical) use of pronouns with all their other uses by assuming that the top-level discourse context subsumes the external context of the utterance. Information about individuals salient in the external context is accommodated in the top-level DRS or file, along with descriptive information about the “guise” under which they are salient. C&G note that this departs substantially from previous work which accepted Kaplan’s arguments that deictic uses of pronouns are both context-sensitive and directly referential. (This may not be directly central to our concerns but it’s an interesting issue, and one also discussed by Zeevat. There’s more about it in both papers.) Partee differed from Kamp and Heim in keeping the external context separate; it’s the outermost context, always accessible, and every other context is nested within it.

Section 2.4: Indexicality and Implicit arguments.

In this section they note that pure indexicals like *I*, *here*, *now* must anchor to the external context and are directly referential. “They cannot be given an account parallel to that of deictic pronouns in Kamp (1981) and Heim (1982) for the reasons that motivated direct reference theories in the first place (Kaplan 1979, Kaplan 1989, Perry 1977 *inter alia*). The descriptive conditions associated with their meaning (e.g. being the speaker, for *I*) are responsible for picking out the right individual in a given context of utterance but do not enter the *content* of what is said. As a consequence, (13a) is not synonymous with (13b); the proposition expressed by (13b) relative to any context of utterance is necessarily true, while that expressed by (13a) is not.

- (13) a. I am the speaker (of this utterance).
b. The speaker (of this utterance) is the speaker (of this utterance).

Nunberg (1992, 1993) uses the term “indicativeness” to characterize the property of certain linguistic elements such as pure indexicals that the conditions determining their reference do not enter their content. C&G then ask whether implicit arguments can ever be indicative? Nunberg had said no, arguing that control by the context of utterance and indicativeness do not go hand in hand. C&G will argue that implicit arguments do have indexical readings and in that case are indicative.

In Section 3, they argue that implicit arguments pattern with definite descriptions on their anaphoric reading and in Section 4 they argue that they behave like true indexicals on their ‘deictic’ reading.

Section 3. Implicit Arguments and Implicit Descriptions.

Partee (1989) had already noted that implicit arguments, unlike pronouns, do not always require an explicit antecedent on their anaphoric uses. C&G use this property to argue

that implicit arguments are more like definite descriptions, which allow “bridging” and inference to construct an appropriate “antecedent”.

“Contexts for predicates with implicit arguments are those that entail, or can be extended (via accommodation) so as to entail, the existence of an entity that satisfies the selectional restriction imposed by the predicate for that argument. In that respect implicit arguments pattern with definite descriptions rather than pronouns in allowing for associative anaphoric readings. . . . implicit arguments are like pronouns in their capacity to anchor to any kind of context; however, they are unlike pronouns and more like definite descriptions in not demanding an overt antecedent.”

The sentences in (14) illustrate this. Even without an overt antecedent denoting a bet, (14a) and (14b) share a reading on which every man won the wager he made on the outcome of the Superbowl. The pronoun in (14c) lacks this reading.

- (14) a. Every man who bet on the Superbowl won.
b. Every man who bet on the Superbowl won the bet.
c. Every man who bet on the Superbowl won it.

Implicit arguments also have a wider range of readings than elements that are strictly dependent on reference parameters such as time. Temporal expressions with implicit arguments need not be anaphoric on the reference time of any accessible context. (This was not noted by Partee.) For instance (semi-quoting C&G), (15a) has a reading equivalent to (15b), although there is no reason to assume that the context of the restriction of the quantifier contains a reference time corresponding to the time of the escape. Similarly, (15c) has a reading equivalent to that of (15d) without anything in the previous discourse introducing a reference time corresponding to the baking of the cake.

- (15) a. Every fugitive was caught within a month.
b. Every fugitive was caught within a month of the time he escaped authority control.
c. The cake tasted better after two days.
d. The cake tasted better two days after the time it was baked.

(The relevant inference must presumably be very easily accessible and/or salient.) C&G support the argument that there is no reference time corresponding to the time of the escape or to the baking of the quantifier anywhere (even implicitly) in those examples by contrasting those examples with ones containing adverbs like *afterwards*, *beforehand*, *thereafter*, which require a reference time to anchor to. So, as they note, the analysis in terms of contextual indices such as reference times that Partee 1989 proposed for the entire class of context-dependent predicates with anaphoric readings “seems to fit at best a restricted subclass of them.”

A nice observation that they make: An implicit argument can also be dependent on a context which is itself implicit, i.e. does not correspond to any overt linguistic material.

- (16) a. He might leave today. He should return within a day.
b. He might leave today. He should return tomorrow.
c. He might leave today. He should return within a day of the day he leaves.

Sentence (16a) has a reading like (16b) and a reading like (16c). That means the implicit argument of *within a day* can be construed so as to get the overt *today* as its antecedent and also can be construed so as to be equivalent with a definite description taking narrow scope with respect to the modal *might*. (As they note, this is a case of modal subordination (Roberts 1989).)

Their proposal.

“In our analysis of implicit arguments, we will reconstruct the requirement that an implicit argument places on a context (Partee’s (11b) above) as well as the specifications of what kinds of contexts are acceptable anchors (Partee’s (11a) above) as felicity conditions. Following recent work in dynamic semantics (Dekker 1993, Groenendijk and Stokhof 1991, Heim 1982), we construe contexts as information states and take the meaning of a sentence to be specified in terms of how it updates a given information state. ... Following Heim (1982, 1983) and Beaver (1993), we take felicity conditions to be requirements on an information state in order for the meaning function to be defined on that information state.

...

We base our analysis of implicit arguments on Heim’s (1982) analysis of definite NPs, according to which their interpretation depends on the felicity conditions they impose on input information states. Definite descriptions require familiarity of their corresponding variable and their descriptive content. (17) exemplifies the analysis of standard definite descriptions.

- (17) $S \llbracket \text{the man}_x \text{ plays duets} \rrbracket =$
 $\{ \langle w, f \rangle \in S \mid f(x) \in (\text{play-duets}) \}$ iff $x \in V_S$ and $\forall \langle w, f \rangle \in S: f(x) \in w(\text{man})$.
Else undefined

We analyze the implicit arguments of relational predicates on a par with definite descriptions. Implicit arguments are associated with familiarity conditions for their corresponding variable and their descriptive content. The descriptive conditions associated with an implicit argument are, minimally, the sortal properties required by the predicate the implicit argument is an argument of.”

On their account, the implicit argument of *local* doesn’t need an explicit antecedent; its familiarity condition can be satisfied by accommodating a location associated with some element in the preceding text (e.g. *sports fan* in our earlier example) or in the utterance context, analogous to the accommodation that licenses the familiarity condition on *the engine* in (18).

- (18) The Porsche lurched to a stop. The engine was smoking.

Note: Condoravdi and Gawron have some remarks and suggestions about constraining accommodation (p. 15), but they don't try to give a full account – “these would lead us far afield into tangled issues ...”.

On their account, an overt variable corresponding to the implicit argument is part of the meaning of the given predicate (intransitive *win*, *local*, *enemy*, etc.); they do not require accommodation on any representational level (file cards, DRSs, etc) since they specify the presuppositions and the anchoring conditions of the implicit argument in terms of definedness conditions on an information state (p. 17). The indexing-to-contexts approach suggested by Partee (1989), on the other hand, was committed to the need for representational accommodation (unfortunately).

They are similarly not committed to the presence of a phonologically null argument at the syntactic level. (They are not committed to its absence either: if in some cases there are independent syntactic arguments for a null argument, that would be ok too.)

“It also does not commit us to there being a one-to-one syntactic or semantic correspondence between an expression with an implicit argument and one with an overt argument. There are clearly syntactic differences between the two: syntactically present arguments require case marking and they might require certain prepositions in addition (*a local bar* vs. *a bar local to the neighborhood*); predicates with implicit arguments may have a different syntactic distribution than predicates whose arguments are syntactically expressed. For instance, predicates that are nominal modifiers may appear pronominally if they have no syntactic complements and postnominally if they do (*a local bar*, *a bar local to the neighborhood*). ... Selectional restrictions of a predicate with an overt argument and the corresponding one with an implicit argument may also be different. [Earlier in the paper, they noted that transitive *win* can have as its object either a contest or a prize; the implicit argument of intransitive *win* can only be a contest.]

They refine and elevate to a principle a hypothesis of Partee (1989): “If an overt argument is purely anaphoric, then it must have an overt antecedent.” And they agree with Partee that no such requirement exists for implicit arguments.

“How to formulate a theory that can capture this notion of antecedenthood remains an open problem and we will not address it here.”

Section 4: Indexicality and Implicit Arguments

The account in Section 3 handled anaphoric implicit arguments by treating them like Heimian definite NPs, requiring a familiar variable and presupposed (familiar) content, and allowing accommodation in the way that definites do (and pronouns mostly don't). How to treat the indexicals, and how to unify the analysis? If indexicals are directly referential (Kaplan), are we forced to claim ambiguity for any expression that can have both an indexical and a non-indexical reading?

Consider *nearby*, which can have both indexical (‘near here’) and anaphoric (‘near x’) readings. On its indexical reading, its implicit argument behaves like indexical *here* and not like an implicit definite description.

- (19) a. There could have been a river near here.
b. There could have been a river near the location of this utterance.
c. There could have been a river nearby. (like 19a, not 19b)

In the last part of the paper (but I'm running out of time, and this handout is pretty long already), they give an account of contexts, including a requirement that the input information state and the utterance context be consistent, and a requirement that the input context will therefore always include some discourse referent corresponding to **ego_C**, **here_C**, **now_C**. Skipping technical details, these distinguished discourse referents will then always (?) be accessible as possible anchors for indexical or anaphoric implicit arguments. For pure indexicals, they (and functions defined from them) will be the only permitted anchors. For indexical-anaphoric implicit arguments, they will be an available default anchor (if sensible).

“On our account, the indexical interpretation of an implicit argument functions as a kind of default. The utterance context is always present and the information it provides always available via the information state. ... It is perhaps no accident, then, that the vocabulary of implicit arguments is replete with words connected with space and time, when these are two of the principal features of the utterance context.” (p.22)

“More generally, the kinds of contexts a dependent element can anchor to (as described in Section 2) depends on the specificity of its felicity conditions and need not be stated independently. The elements that are descriptively characterized as anchoring to the context of utterance are those whose felicity conditions require that they be assigned to some contextual role (speaker, etc.). The elements that are descriptively characterized as anchoring to any context whatever are those whose felicity conditions simply require that they be assigned to some familiar (in the technical sense) entity.”

There's a footnote addressed to the issue of those that can anchor to any context EXCEPT the utterance context; that's harder. They suspect these are not a homogeneous class; reflexive pronouns, for instance, may have specifically *syntactic* binding requirements, whereas an element like *before* (vs. *ago*) will have to have an extra felicity condition excluding anchoring to the utterance context.

They even have an account of the Partee “we” example, where *we* can include a discourse anaphoric element and/or a bound variable element in addition to the indexical “I” element. See page 28! I think it's a very nice paper, and that it solves essentially all the problems raised in Partee (1989), and in ways compatible with Heim, Zeevat, Kaplan, etc.

Homework #2, for October 19.

1. Review the issues raised relevant to implicit arguments, implicit restrictors, and other implicit material in the introductory lecture and on October 7 and 14. Think about your own native language (or any language you know other than English) and

write 3 or 4 pages or so, with examples, discussing (a) cases where the data and the issues seem closely parallel to what we have seen for English, and (b) cases where you find possibly interesting differences between what we've discussed for English and what you find in your language.

2. See Section 1.4. of the October 7 handout, classifying various implicit variables as having properties of indexicals, anaphoric elements (like pronouns or like definite NPs, including bound variable readings), or neither; try to add to the lists, in English or in your language, and discuss the nature of the evidence for the classifications, adding more tests and/or questioning existing ones.

3. Summarize the similarities and the differences (syntactic and semantic) in the distribution of anaphoric definite NPs and anaphoric pronouns. Give your own evaluation of Condoravdi and Gawron's main claims about analyzing implicit arguments as implicit definite NPs rather than implicit pronouns.

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