Discourse Structure and the Structure of Context

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Meaning depends on context. It depends on context in all sorts of ways. This is a truism that comes almost for free.

It is much harder to say how meaning depends on context - to pinpoint the various contextual factors that affect the meanings of different expressions and to spell out in detail how those expressions are affected by them. For one thing such analyses require explicit characterisations of "context". In many discussions of the context-dependence of language such a characterisation has been lacking, and for that reason alone it is usually quite difficult to see how they might be turned into formally rigid theories.

Among the notions of context which can be defined with the necessary precision there are two which have played an important part in formally articulated accounts of meaning in natural language, of the kind that became possible through the work of Montague, and which is now often referred to as "formal semantics".

The first of these is the notion of utterance context. Salient factors of the utterance context of a given utterance u are speaker, time and addressee, and one simple formal definition of utterance context is simply as a tuple consisting of these three items - or of just the first two in cases where the utterance has no specific addressee or audience. (This is the definition which I will adopt here, but there are many alternatives which have been proposed, and used effectively, in the literature [ref.: Kaplan, Lewis, Cresswell]

The dependence of ''meaning'' on utterance context is hard to miss, since it is so obvious that what is meant by ''indexical'' expressions like *I*, *you* or *now* does depend on it.[1] Indeed, it is a dependence of which theorists have been aware for a very long time. I am not sure how far this awareness can be traced back. But it clearly goes back to times well before the beginning, rouhly forty years ago, of formal natural language semantics as we know and practise it today. For instance, explicit analyses of the role of utterance context can be found in [Russell, ??] and in [Reichenbach, El. of Symb Log.] Utterance context played a central role in the logical and semantical studies of the sixties and seventies that is sometimes referred to as the ''California School'', exemplified by the seminal work of Montague, Scott, Kaplan and Lewis Today this role of utterance context is perhaps best-known through the three-level theory of meaning of Kaplan's 'Demonstratives'. Kaplan's theory has also been characterised as ''two-dimensional'': one dimension of semantic dependence is dependence on utterance context, the other is the dependence on ''circumstances of evaluation. This two-dimensionality is also the hall-mark of the closely related account of assertion, presupposition and the communication of information that was proposed in the early seventies by Stalnaker. [ref. Assertion, Pragmatics,..]

The second context notion which admits of precise definitions is that of the *discourse context*, as it is used in theoreis of Dynamic Semantics. The concern common to all these theories is to account for the

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[1]Note that I am using ``meaning'' in a non-technical sense. It is common for accounts of the semantics of a word like *I* to claim that the word has a fixed meaning, but that its refrerence depends on utterance context, and that the referent of a given occurrence of *I* is obtained by 'applying' this fixed meaning to the context of that occurrence. (So, if utterance contexts are tuples made up of speaker, utterance time and, as the case may be, addressee, then the meaning of I will simply be the projection function which selects the first component of each such tuple.) The pretheoretical use of ''meaning'' to which I have helped myself here is not to be confounded with these more conscious uses. ''Semantic value'' would arguably have done better for my purpose, except that this really has the ring of a term of art.
I am making a similarly unreflected use of the term 'interpretation'. The main difference with 'meaning' is that 'interpretation' is used to refer to the process of determining the meaning of a bit of language, as well as to the results of such processes. These results will, according to one of the basic assumptions on which the approach of this paper rests, always be representations which capture the meanings that interpretation processes aim to identify.
Given the formal framework which the later parts of the paper presuppose these loose uses of terms that have been given well-defined, specific definitions in th literature are of no consequence.

cumulative nature of interpretation: Interpretation of a sentence S occurring somewhere within an ongoing discourse often depends on the content of the part of the discourse which precedes S. (Probably the most familair example of the influence of antecedent discourse on sentence interpretation iare cross-sententially anaphoric pronouns; for an example see the representation below.) One way to dscribe such cross-sentential interpretational dependencies is to assume that the part of the discourse preceding S - or, more accurately, the interpretation assigned to it - determines the discourse context K within which S is to be interpreted and to describe the interpetation of S as a process which takes K into account.

There are two important prima facie differences between utterance context and discourse context. First, discourse context is an essentially dynamic concept: When S is interpreted within the discourse context K, the result of its interpretation will be integrated into K. The updated context K', which reflects the contribution made by S as well as those made by the sentences preceding it, will then be the discourse cotnext for the next sentence. Utterance context, on the other hand, is not intrinsically dynamic (although we will see that it too can have certain dynamic aspects).

Secondly, utterance contexts are extra-linguistic: They are composed of entities which are connected with the making of the given utterance; but these entities are neither linguistic entities as such, nor are they necessarily connected to the content of the discourse. In short, utterance contexts are part of the world or situation in which the utterance takes place. Discourse contexts, on the other hand, are intimately related to linguistic content and linguistic form: Discourse context is determined by the antecedent discourse and must reflect what is communicated by this antecedent discourse. Moreover, one of the central and well corroborated claims of Dynamic Semantics is that discourse contexts should do more than capture the propositional content of what has been said; the form in which this content is expressed matters too.[2]

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[2] One striking example is the contrast between (1.a) and (1.b)

(1) a. Fred owns a car. It is in the repair shop.
b. Fred is a car owner. It is in the repair shop.

The dynamic theory which will serve as the formal background for the present paper, *Discourse Representation Theory* (or *DRT*, for short), goes further in emphasising the representational status of discourse contexts. The discourse context for sentence S_k from the discourse $<S_1, ..., S_n>$ is assumed to be identical with the semantic representation that results from interpreting $<S_1, ..., S_{k-1}>$. This assumption of the identity of discourse context and content representation has sometimes been referred to as the ''unity of context and content''[3].

Even from the little that has been said here so far it should be clear that a theory of natural language interpretation and meaning which incorporates those aspects of context-dependence that are now reasonably well understood mustz incorporate reference to both utterance context and discourse context. (Think of any sentence which contains both I and a third person pronoun referring to someone who has been mentioned one sentence before.) But how can notions of context as different as utterance context and discourse context be incoroprated into a single notion of context, which allows us to account for both kinds of context dependence in a cogent, unified way? Especially the second difference between utterance context and discourse context we noted, may well be seen as an obstacle.

However, the problem is not as forbidding as could have been thought. In fact, a partial solution of sorts has been around within DRT almost since its inception. Such a solution was urgently needed form the start because of DRT's emphatic concern with the semantics of tense and temporal adverbs, in which cross-sentential anaphora and indexicality usually act in tandem. To mention just one example, the simple past tense in simple sentences is indexical in that it locates the desribed event or state in the past of the utterance time. But in non-initial sentences event location also tends to have an anaphoric aspect insofar

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The first sentences of (1.a) and (1.b) both state that Fred owns at least one car. but the pronooun *it* in the second sentence is entirely felicitous in the case of (1.a). In (1.b) the use of it is highly marked, and for some speakers not really acceptable.

3 For introductions to DRT see (Kamp, 1981), (Gamut, ??), (Kamp & Reyle, 1993), (Blackburn & Bos, ??), (Van Genabith et al. 2004). Closely related to DRT qand dating from roughly the same time is Heim's File Change Semantics, (Heim. 1982). (While the two developments were independent, the first formulation of FCS antedates that of DRT by roughly a year.) The original formulations of DRT and FCS make the same predications, but FCS never took the representationsal stance which DRT adopted from the beginning.

as the preceding sentence provides further information about the time when the new state or event obtained or occurred. Sometimes this anaphoric aspect is reinforced or taken over by an adverbial in the new sentence.

The following example illustrates these facts and shows how DRT has been dealing with the temporal components of utterance context and discourse context within the setting of a single formalism.[4] Consider the following two-sentence "discourse" (2)

(2) i. Last week Fred bought a donkey.
ii. He sold it the next day.

Interpretation takes the form of:

(a) constructing a semantic representation of (2.i), and
(b) constructing a representation of (2.ii), using the representation of (2.i) as discourse context, and incorporating the new representation into the representation of (2.i)

The result is a representation of the "two sentence discourse" (2.i,ii).

DRT assumes that the construction of a semantic representation for a sentence S proceeds from a syntactic analysis of S, which is provided by a parser which has done its work when interpetation starts. (This is a notoriously unrealistic idealisation, which the theory shares with many of its competitors.) Here I show neither the syntactic trees for (2.i) and (2.ii) nor do I discuss the construction principles which convert these trees into semantic representations. The semantic representations of DRT are called "Discourse Representation Structures" or "DRSs".

(3) a. DRS for (2.i) (and discourse context for (2.ii)):

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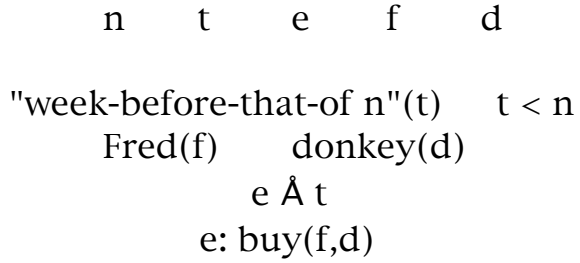
4 The example should also give readers unfamilar with DRT some sense of how the theory works in general and of what iots representations look like. I must stress, however, that I have not striven for unhampered accessibility of this paper to those who lack any kind of previous exposure to DRT. Much of the paper should be understandable even without such exposure, but probably not all.



Like any other DRS, (3.a) consists of two components, (i) its universe and (ii) its condition set. The universe is a set of *discourse referents*. These function as representations of entities. The condition set consists of *DRS conditions*, which attribute properties and relations to the entities represented by the discourse referents in the universe. Thus ''donkey(d)'' stats that the entity represented by d is a donkey, ''Fred(f)'' that the entity representeed by f is the bearer of the name Fred, as that name is used in (2). ''e: buy(f,d)'' states that th entity represented by e is an event of f buying d. The remaining discourse referents and conditions have to do with the temporal location of e. These elements are contributed by (i) the past tense of (2.i) and (ii) the adverbial *last week*. t represents the location time of e. (The condition '' e Å t'' expresses this.) The past tense of (2.i) contributes the information that is time lies before the utterance time, which is represented by n. This time is also, and more precisely, characterised by the adverb *last week*, viz as the time denoted by this phrase. The condition contributed by the adverb has here been abbreviated as "week-before-that-of n"(t), but the intention should be clear: the condition fixes the entity represented by t to be the week immediately preceding the one which contains the utterance time (represented by) n.

The semantics for DRSs interprets the discourse referents of the DRS universe as existentially quantified variables, while the conjunction of the conditions forms the matrix to which the existential quantifiers binding them are prefixed. (This implies that DRSs always represent existentially quantified conjunctions of atomic formulas. The DRS formalism acquires the full power of predicate logic through the inclusion of complex DRS conditions, representing negation, universal quantification etc., conditions which play no role in the present example.) Although all discourse referents from the DFRS universe act as existentially quantified variables, some of them may nonetheless

function as representations of particular individuals. Typically this effect is produced when one or more of the DRS conditions in which the discourse referent occurs as argument are ''uniquely identifying" in the sense of being satisfied by exactly one thing. This, for instance, is the role of the condition ''Fred(f)''.

There is one discourse refernt in (3.a), however, viz. n, which represents a unique time, although no uniquely identifying condition for n occurs within (3.a)'s condition set. n is an *indexical* discourse referent. What it represents is fixed by the conditions under whcih the represented sentence or discourse is uttered: n represents the utterance time of the represented utterance. How this principle is implemented matters little. We can think of n as existentially quantified like other discourse referents from the DRS universe, but constrained by the implicit condition that it represents the utterance time in question; or we can treat it as a special kind of ''indexical constant'', which denotes the utterance time. What matters is that it is always the utterance time which n de facto represents.

One implication of these stipulations concerning n is that a DRS which contains an occurrence of n is meaningful only as representation of an utterance, which determines an utterance time. It can also be regarded as the representation of a sentence or discourse type, but then only in the hypothetical sense of giving the truth conditions that any utterance of this type would determine, given that n is taken as representing the time of that utterance. (On this second gloss (3.a) is the logical form of the diagonal proposition expressed by the sentence (2.i) (Stalnaker, [Assertion]).)[5]

Construction of the DRS for the second sentence of (2) now proceeds against the background of the discourse context (3.a). This context provides through its discourse referents f and d antecedents for the pronouns *he* and *it*, and through its discourse referent e an antecedent for the interpretation of the adverbial *the next day* (whose natural interpretation in this context is the day after the donkey's purchase.[6]

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5 In the original version of DRT to which the present DRS construction belongs n is the only indexical discourse referent. Extensions of the theory in wshich DRSs are used as characterisations of the content of propositional attitudes make use of a second indexica discourse referent, i, to represent the self. See (Kamp, 2003) and (Van Genabith et al., 2004)

6 This interpretation of *the next day* is anaphoric in the sense that the word *next* can be treated as having an implicit argument t'' for the time or event after which the

The anaphoric connections between the sentences (2.ii) and (2.i) are captured in the DRS (3.b) by the conditions ''x = f'' ''y = d'' and '' ''the-day-after-that-of-e''(t')''.

(3) b. DRS for (2.ii)

n t' e' x y

"the-day-after-that-of-e"(t') t' < n
x = f y = d
e' Å t'
e': sell(x,y)

Noteworthy about this DRS is the interaction between the past tense of (2.ii) and its temporal adverbial the next day. As in the case of (2.i) tense and adverb cooperate in the location of the described event. In the case of (2.ii), however, the interpretation of one of these, the past tense, relies on information from the utterance context, whereas the interpretation of the adverb requires the discourse context. The capability of dealing with such interactions between utterance context and discourse context in the domain of temporal reference has been one of the standard feaures of DRT since the early eighties. The way it is done, by incorporating elements of the utterance context into the discourse context in the form of indexical discourse referents, will be our guide also in the more explicit integration of discourse context and utterance context proposed in the sections that follow.

Merging of (3.a) and (3.b) - i.e. merging (i) their universes and (ii) their condition sets - yields (3.c) as representation of the discourse (2).

(3) c. DRS for (2)

n t e f d t' e' x y

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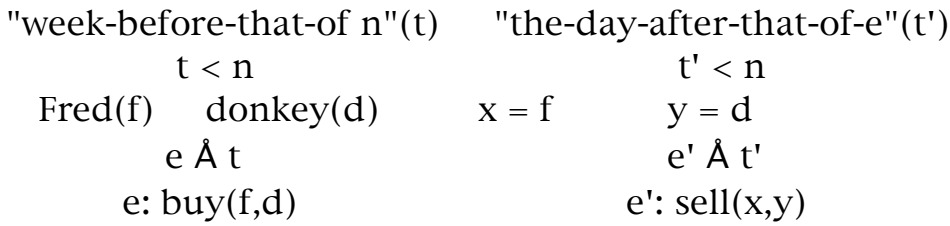
enotation of the NP containing *next* is located - in such a way that the NP can be paraphrased as ''the day after the day containing t'' ''. A formal treatment of the NP which follows this intuitive analysis is somewhat more involved than what is shown in the DRS below, but I hope that I have said enough to indicate what such a more detailed treatment would look like.



This example shows how one aspect of the utterance context has been incorporated within DRT. It is fairly straightforward to extend this mthods to the two other components which I treat as part of utterance contexts; details will be discussed in Section 3.2. Normally, however, context involves much more than a combination of discourse context context and utterance context. As a rule the common ground between discourse participants, on which they rely for the effectiveness of the words they choose, includes much else besides. For one thing, speakers almost invariably presuppose their interlocutors to share with them a vast array of knowledge and assumptions of all kinds: knowledge of many entities of various kinds - people, places, works of art, past events - and all sorts of assumptions about how ''things work'' - general rules and laws, some strict, some defeasible, that concern the physical behaviour of inorganic and organic matter, or the functioning of artefacts, or the general dispositions of human minds, or the fabric of morals, politics and society. And finally there is, in those cases where people are communicating face to face, the environment within which the communicaton takes place, which enables the speaker to refer to things by drawing the addressee's attention to them as he speaks.

All this is information which theories of Dynamic Semantics have tended to ignore. This practice is defensible as long as we focus exclusively on the explication of those phenomena for which the dynamic approach was originally developed: cases of ''pure anaphora"", where the target expression depends for its interpretation solely on the discourse context. It ceases to be defensible as soon as one attempts to go beyond this and to develop an account of the interpretation and reference conditions for expressions which do not function in such a ''purely anaphoric'' manner - for instance, when we try to extend the account to one covering the full range of types of

definite noun phrases (in other words: not just anaphoric pronouns, but also proper names, definite descriptions and demonstratives[7]).

One symptom of the inadequacy of DRT's restricted notion of context is the need it entails for making an excessive use of *accommodation*. According to a widely accepted assumption (and one to which I subscribe) definite NPs of all types trigger ''referential'' presuppositions - presuppositions that their denotations can be identified in ways that are independent of the propositional content of the utterance of which the NP is part. Implicit in this assumption is that such NPs are used felicitously if and only if the context contains the information that is necessary to identify its denotation in the way the associated presupposition requires.

The need for accommodation arises in particular for presuppositions that are generated by constituents of sentences which inaugurate a discourse. When a discourse-initial sentence gets interpreted, the discourse context, as defined in DRT, doesn't yet contain any information at all. A fortiori it won't contain the information that is needed to justify the presuppositions to which the sentence gives rise. So the theory predicts, as a matter of course, the need for accommdation to a non-empty context in whicxh the necessary information is present. Intuitively this makes a joke of accommodation as a repair strategy, to be resorted to only when standard interpretation strategies have failed.[8]

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7 I will limit attention to the definite NPs of English. Languages differ as to the types of definite NPs they admit and the rules for reference and interpretation which govern them. This is true even for closely related languages, such as e.g. English and German.

8 Recall in this connection the account of accommodation given by (Beaver, 1997): When an interpreter realises that what he took to be the context does not permit justification of one or more presuppositions, he may conclude that his assumption of what the context was must have been mistaken: Apparently the speaker had another context in mind, in which those presuppositions are justified. Accommodation is then the interpreter's adjustment of his own assumptions about the context so that they are in line with what he thus infers about the speaker's context and make it possible to justify the presuppositions after all.

It is a well-known observation that speakers often use sentences whose presupppositions they know are not satisfied in the context, counting on the recipient to accommodate these presuppositions and thereby acquire the informat5ion they embody "through the back door". (The most often cited example of this is the "journalistic" use of definite descriptions like "Adam Smith, the 35 year old formula 1 driver and father of two small children ...". Such cases of speaker-intended

There has been a tendency within Dynamic Semantics (at least I have to confess to its having been my own over many years) to dismiss this problem by admitting that "of course, in practice the context would contain a lot more than what the theory specifies explcitily as the difscourse context, and that all that additional information is available even before the discourse starts". Thus, many of the cases of accommodation which the theory seems to predict will not actually be needed, since the required contextual information is already in place. This is fine as far as it goes. But it doesn't go very far. What dynamic theories need is a more systematic way of talking about additional contextual information.

Part of such a more systematic treatment, I will argue, is that the theory maintain a clear distinction between different kinds of contextual information. In particular, the discourse context, which develops as the discourse unfolds, must be kept distinct from the initial context information, which is independent of what is communicated within the discourse itself. It won't do to assume what past hand-waivings at non-empty discourse-initial contexts may have suggested: that there is a non-empty context to start with and that this single context structure then gets amplified as the discourse unfolds. What we need, in other words, is an concept of *articulated* contexts, according to which a context consists of a number of distinct but interacting components.

The proposals of this paper should be seen as a first attempt to develop such an articulated context notion, and to explore its implications for meaning, refference and interpretation of a range of expressions. Section 2 specifies and motivates the notion of an articulated context I propose. In Section 3 the structure of articulated contexts is elaborated further in conjunction with an exploration of some of the implications for the interpetation of different types of defintie NPs - proper names in 3.1, indexicals in 3.2, demonstratives in 3.3 pronouns in 3.4 and definite descriptions in 3.5. Secxtion 4 is devoted to a m,ore detailed discussion of some examples, in which the interpretation rules formulated in Section 3 are used in the interpretation of a few sentences and "mini-texts". Section 5 draws some general conclusions - of a more philosophical nature, and hopefully of interest also to

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accommodation are common enough, but they are quite different from the kind of accommodation that DRT is forced to assume must go on inevitably at the beginning of almost any new discourse.

philosophers who may feel that linguistic detail need not always be a road to philosophical insight, but can also be a detraction from what they see as the essential questions.

2. Context Components and Contextual Environments.

It is an old observation that verbal communication would be practically impossible if speakers could not build upon the common ground which they share with their interlocutors. Speaker and audience must not only share a command of the language in which the speaker expresses himself, but also substantial quantities of extra-linguistic knowledge. (See e.g. (Strawson, 1964(?).) But the mere acknowledgement that this is so does not get us very far. What we need, minimally, is a useful classification of the different kinds of information that common grounds are composed of. We need such a classification as basis for the definition of articulated contexts. In fact, an articulated context will be formally defined as a tuple of components, each of which consists of information of one relevant category.

Two orthogonal classification criteria suggest themselves. The first concerns the form and content of information, the second its provenance. The importance of both criteria has been visible already in what was said about DRT in Section 1. As we recalled there, one of the principal claims of DRT and other dynamic theories is that discousre interpretation depends in special ways on the discourse context, i.e. on the information which derives from the antecedent discourse. Moreover, it is not only the origin of this information which matters, but also the form in which it is made available. (Cf. fn. ?? which illustrates the contraint on anaphoric singular personal pronouns that their antecedents be discourse referents that are already present in the universe of the (discourse) context DRS.). However, in this case it is the origin of the information - Is it derived from the preceding part of the discourse? - which decides whether or not it belongs to the discourse context. We will refer to the discourse context component of an articulated context as K_{Dis}.

In Section 1 we saw how a partial notion of utterance context can be incorporated into the notion of discourse context as DRS: Utterance time is represented within the context DRS in the form of a special discourse referent n and this discourse referent is ''anchored'' to the

actual time of the represented utterance. This treatment of the utterance time is the paradigm for our treatment of each of the components of the utterance coontext. The present proposal involves a quite restricted notion of utterance context, which includes apart from the utterance time only the utterer, represented by the special indexical discourse referent sp, and, in cas there is one, the addressee, represented by the discourse referent ad. Like n, these discourse referents are anchored, to the actual speaker and addressee of the given utterance, respectively.

In this way the notion of utterance context can be adapted to that of the discourse context in that both are treated as representations. This is defensible insofar as discourse participants can be supposed to have representations of the mentioned aspects of the utterance context as well as of the information which the discourse has so far made available. But of course, the anchors of the indexical discourse referents are crucial, and those involve more than representation as such. Anchors provide a link between representations and the real world. So our theory needs some way of talking about the real world and to incorporate some parts of it into the contexts we are in the process of defining.

To this end we assume that utterance interpretation takes place within the setting of a "contextual environment" which consists of (i) a representational context, a tuple of DRSs, two of which are the discourse context K_{Dis} and the utterance context K_{Utt}; and (ii) a model of the world in which the given utterance is made and which contains (among many other things) the entities (speaker, time, adressee) asociated with this utterance. Anchors provide links between discourse referents from the former and and entities belonging to the latter.[9]

For our immediate purposes an extensional model (for the DRT-language which encompasses the DRSs considered in this paper belong) would be sufficient. Nevertheless I will assume that the second components of our contextual settings are *intensional* models, which each contain an extensional model of the world of the relevant

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9 The theory of anchoring is one of the many aspects of DRT which I cannot explain in appropriate detail here. Suffice it to note that when a discourse referent x is anchored to an entity a, this makes x a representation of a, in the absolute sense of direct reference. (Direct reference is captured within DRT in tems of anchoring.) For details see (Kamp, 1990, 2003) and (Van Genabith et al., 2004).

utterance as one of their parts. One of the reasons for this is that it enables us to make formal sense of such intensional notions such as the proposition expressed by a given utterance or the property denoted by a predicate expression, etc (See Van Genabith et al.)

Neither K_{Dis} nor K_{Utt} contain the often large amounts of information that are available at the beginning of a discourse. This information derives on the one hand from the usually extensive parallel experiences of the discourse participants and on the other (in cases of face-to-face communciation) from their shared current access to elements of the environment in which the communication takes place.

Information of the first provenance can be usefully subdivided into two kinds according to content and form. This division corresponds roughly to the distinction between A-box and T-box in certain approaches to knowledge representation within Artificial Intelligence [references!)]. The T-box is assumed to contain generalisations and laws, while the A-box functions as repository of knowledge concerning particular objects, events or situations. I will refer to the corresponding components of the context as K_{Gen} and K_{Enc}, respectively. Here "Gen" stands for "general knowledge" and "Enc" for ''encyclopaedic knowledge".

The fifth context component I will distinguish is called K_{Env}. This component represents information derived from the immediate environment. The distinction between this component and K_{Utt} may seem surprising, especially to someone familiar with Kaplan's ''Demonstratives'', in which the term ''demonstrative" is applied both to indeixical words like I or now and to demonstrative and to demonstrative phrases in the more narrowly conceived sense current within linguistics, according to which the singular demonstratives of English are noun phrases beginning with *this* or *that* , either occurring just on their own or else followed by some common noun phrase N'. In spite of the semantic and pragmatic similarities between indexicals and demonstratives which Kaplan was right to stress, there are important differences as well. In part these differenes are related to the different ways in which the referents of indexicals and demonstratives are accessible and represented.

It is with these latter differences in view that I have decided to assign these representations to distinct context components. I hasten to add,

however, that as things stand I am not fully confident that as I have drawn the distinction it can be justified on those grounds; some adjustment may prove desirable at some later point, when the place of articulated contexts in semantic analysis has been explored more thoroughly.

We will return to all aspects of contextual environments we have introduced in this section - articulated contexts, intensional models and anchoring relations - as we discuss the interpretation rules for context-dependent expressions in Section 3. To conclude the present section here is a summary of where we are at this point:

1. A *contextual environment* is a triple consisting of

   (i) an articulated context,
   (ii) an intensional model, and
   (iii) certain anchoring relations relating context and model.

2. An *articulated context* is a quintuple $<K_{Dis}, K_{Gen}, K_{Enc}, K_{Utt}, K_{Env}>$, where

   (i) K_{Dis} is the discourse context,
   (ii) K_{Gen} the general knowledge context,
   (iii) K_{Enc} the encyclopaedic context,
   (iv) K_{Utt} the utterance context and
   (v) K_{Env} the environment context

N.B. Def. 2 should be seen as a kind of working hypothesis. I already recorded my uncertainty concerning the division between K_{Utt} and K_{Env}. But the uncertainty also affects other distinctions, such as that between K_{Gen}, K_{Enc}. Here too further experimentation may lead to certain adjustments. I do not think, however, that any of this is likely to invalidate the present approach as a whole.

There are two closely connected ways in which contextual environments, and the articulated contexts that are part of them, show their theoretical usefulness. First, by relating the interpretation of different types of referring expressions to different context components it is possible to bring out some of the semantic and pragmatic differences between these expression types in ways that are

unavailable in versions of dynamic semantics in which the only kind of context is the discourse context. Second, the dynamics of context now takes on a new complexion. Context change is no longer a matter of the incrementation during discourse processing of a single context component. It involves not just the growth of certain context components, but the *transfer* of information from one context component to another. While this is more complicated, it does on reflection much greater justice to the way in which information is handled in the course of discourse interpretation.

3. Context components and the interpretation of particular expressions.

One of the principal empirical claims of the original formulation of DRT was that anaphoric singular pronouns require antecedents that are represented in the discourse context. This, one might say, is the essence of DRT's characterisation of "true anaphora": An expression is interpreted (truly) anaphorically iff it is interpreted as representing an entity which stands in some particular relation (one from a small repertoire[10]) to one that is represented in the discourse context.[11]

In earlier versions the empirical content of this claim could not be stated in a fully satisfactory way. Since the theory had no means of addressing the non-anaphoric uses of pronouns, it could only state that *if* a pronoun is used anaphorically it is subject to the mentioned constraints. Now a more comprehensive treatment is possible. We can replace the earlier claim by the following:

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10 The most prominent of these relations is identity. This is the relation relevant for the interpretation of anaphoric personal pronouns. Other anaphoric expressions require other relations, for instance, for *the/an other* the relation is difference, for anaphoric temporal expressions various relations play a role: temporal precedence, temporal succession, temporal inclusion, ...

11 It has been noted by several authors (e.g. Bos, 198?) that even English singulat pronouns allow on occasion interpretations other than those predicted by the DRT account (i.e. interpetations according to which they refer to something which has not yet been introduced explicitly into the discourse context. These cases require careful attention (to some extent have already received it), but ths is not the concern of the present paper.

(1) Singular third person personal pronouns of English[12] can be used in one of only two ways:

(i) as anaphoric in the sense just described, in which case the pronoun's must be represented in the discourse context, or

(ii) deictically, in which case its referent must be "capable of demonstration", and therefore belong to the utterance environment.

Precisely what is meant by (ii) still needs to be explained. We will discuss deictic uses of pronouns and demonstratives in sections 3.? and 3.?. At that point it will also be possible to throw light on the systematic connection that exists between the deictic and anaphoric uses of pronouns, demonstratives and definite descriptions.

First, however, we turn to another type of definite NP, which has been even more prominent in philosophical discussions throughout the history of analytic philsophy of logic and language: the proper name.

3.1 Proper Names.

We already noted that one problem with earlier versions of DRT is that many occurrences of definite NPs seem to require counterintuitive uses of accommodation. If we assume - and this is something to which I with many others, am committed - that every definite NP gives rise to a referential presupposition (to the effect that its referent must be identifiable by means independent of the statement in which the NP occurs), then such unwanted appeals to accommodation will arise in particular for proper names. For instance, it is perfectly natural to begin a discourse with a sentence with one or more proper names, but the reference presuppositions of these names cannot be justified in the (still empty) discourse context. However, the problem is much more general: For every first use of a name in a discourse, whether it be in the intial sentence or later on, the old theory predicts the need for accommodation, and in almost all cases this prediction seems to run counbter to our intuitions.

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12 as well as many other languages. But I will focus on English in this paper; other languages are ignored.

With our new notion of context this problem vanishes. It is normal that the context presupposed by a given utterance, text or conversation contains a substantial amount of general and encyclopaedic world knowledge. Moreover, this information is available from the start, unlike the discourse context which is empty at first and gets built up only gradually. In other words, we may assume that normaly the starting context K_0 has non-empty components $K_{0,Gen}$ and $K_{0,Enc}$. Exactly how the presupposed world knowledge is to be distributed between K_{Gen} and K_{Enc} is a non-trivial matter, about which we will say a little more in Section ??. But for now the following first approximation will do. I assume that both K_{Gen} and K_{Enc} are given in the form of DRSs. Informally speaking, the content of K_{Gen} consists entirely of generalisations. In current DRT terms this means that they are given either as conditionals or as duplex conditions, and this entails that no discourse referent occurs in the main universe of K_{Gen}. In contrast, K_{Enc} is assumed to be a kind of encyclopaedia which contains information about particular entities of various kinds: people, places, events, artefacts, works of art (such as certain books, plays or compositions) and so on. Each of these is represented by its own discourse referent. This discourse referent comes with a number of conditions in which it occurs as argument; and among these conditions there is often one which specifies the represented entity's name. [13,14]

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13 I do not think that it is coherent for an entity to be represented with no other conditions attached to it than the one specifying its name; there should be at least some "sortal" conditions, which specify what sort of entity is represented - i.e. whether it is a person, place, event, ... But this is a matter of detail which need not detain us.

14 One problem for the division of information between K_{Gen} and K_{Enc} are domains where we have "systems of naming". The best known instance of this are the natural, whole and rational numbers. Each of these number systems come with canonical naming regimes - methods for assigning canonical names to each of the entities belonging to the domain. Were we to represent the numbers of these systems with their names as part of K_{Enc}, and in the way just indicated, then K_{Enc} would become infinite, and moreover it would contain discourse referents whose accompanying name-assigning conditions would involve names of unbounded size (some longer than any person could pronounce even if he devoted his entire lifetime to it). The alternative is to incorporate this knowledge into K_{Gen}, in the form of a set of recursive definitions which generate discourse referents for each of the different numbers the system contains in tandem with the canonical names for those numbers. In such a recursive representation the discourse referents for the individual numbers would only be implicit; but they could be made explicit whenever the need arises. One situation in which such a need arises would be the occurrence of a number name in an utterance. One could also consider a mixed system, in which the more

In normal language use most discourse-first uses of proper names are unproblematic because the referent of the name already has a representation within K_{Enc}. More precisely: because K_{Enc} contains a discourse referent x_N, together with a condition to the effect that the proper name N is the name of the entity represented by x_N. (I will assume from now on that this condition has the form "Named(x_N,N)"[15]). Under these conditions the current use of N can be understood to refer to the entity represented by x_N. More explicitly, the reference presupposition which comes with the name's use is justified by the presence of x_N and "Named(x_N,N)" in K_{Enc}. In keeping with earlier DRT formulations, we assume that the current use gives rise to the introduction of a discourse referent representing the referent of N into the discourse context. But note that this introduction now takes on the character of a *transfer* of the representation of the referent *from* K_{Enc} *to* K_{Dis}: As in earlier formulations it is at this point that the referent makes its entry into K_{Dis}. But this now no longer means that up to this point it was nt represented iwhtin the context at all (and, thus, should have counted as unfamiliar). Discourse presence and familiarity are now two different notions. The first entails the second, but not conversely.

"familiar" numbers - including those up to, say, a hundred, together with some salient larger numbers (144, two hundred, five hundred, a thousand, two thousand, ten thousand, one hundred thousand, a million, ..?) would be represented separately and individually (and thus in K_{Enc}), while the general recursive specification would remain part of K_{Gen}.

It should be pointed out that such naming systems are by no means limited to pure mathematics. Within our culture the most prominent systems outside are mathematics are (i) that for naming points and intervals of time, and (ii) that for naming points and regions on the surface of the earth. But there are lots of other examples where something of a general naming systems (or the awareness that such a system exists) plays a part in our cognition - for instance KV numbers for Mozart's works, the naming of streets in many American cities, and so forth.

15 In earlier versions of DRT the result of processing a proper name N occurring in a sentence or discourse is the introduction of a discourse referent x together with the condition "N(x)". The import of this condition is that x stands for the entity that the speaker refers to through his use of N. This entails that N is a name of this entity; but in general the two statements are not equivalent, since N may serve as the name of other entities as well. So the old "N(x_N)" and the new "Name(x_N,N)" should not be equated. I return to this point presently

Exactly how we represent the transfer from K_{Enc} to K_{Dis} is not very important. For definiteness I will assume that the discourse referent x_N is put into the universe of K_{Dis}. (This means that x_N will now belong to two different DRS universes, but there is no real harm in that.) What matters is that the conditions of K_{Enc} which express properties of the entity represented by x_N are now also available as part of its representation in K_{Dis}. We will assume that the transfer of these conditions is implicit in the transfer of x_N itself.

Many of the names people use in ordinary discourse are ambiguous - the same name is used on different occasions to name not just one fixed individual, but two or even more. Such ambiguities can manifest themselves in the context on particular occasions of verbal exchange in several ways. The one I will briefly consider here is that where K_{Enc} contains more than one discourse referent that is accompanied by the condition that it represents something named N. To be more specific, let us assume that the universe of K_{Enc} contains the discourse referents x_N and y_N and that the conditions "Named(x_N,N)" and "Named(y_N,N)" are among the conditions of K_{Enc}. A discourse-first use of N can now be resolved either to x_N or to y_N. A choice must be made which disambiguates the given use of N. Non-arbitrary disambiguation will have to rest on further conditions that are asscociated with x_N and y_N, respectively, and which tell more about the entities that the two discourse referents represent. Details of the considerations that will lead to one choice rather than another can vary almost without end, but there is no need to go into these here.

A central concern of the philosophical discussion of proper names since Kripke's Naming and Necessity has been the question proper names are directly referential. I will assume, without wanting to argue the point, that they are, or at least that this is so for names of real entities (as opposed to fictional names). The direct referentiality of names is the effect of the two factors which Kripke identified: (i) Names are introduced within a speech community as labels for entities which thereupon count as their referents; in these labelling situations the labellers have independent access to the entities that are labelled; it is this which enables them to establish the labelling (or "naming") relation between the name and its bearer. (ii) Speakers use names with a commitment to refer to those entities as whose labels the names were originally introduced in the speech community to which they belong.

(It is this commitment which makes it possible for a name to refer to its bearer even when it is used someone who has no personal acquaintance with the bearer and may have very little information about it, or even information almost all of which is false.)

I already pointed out that within the DRT-framework I am using direct reference is captured in terms of anchoring: the discourse referent x which represents a directly referential expression β belonging to an utterance U within the DRS representing the content of U is anchored to the direct referent of β. (see (Kamp, 1990, 2003), (Genabith et al, 2004)).

As noted earlier, the inclusion of anchors carries with it that representations are considered in conjunction with models; and the models to be used in this connection are the intensional models of, e.g., (Van Genabith et al., 2004). It is convenien to think of such a model M as given in the form $\langle W,\{M_W|w \in W, w_O\rangle$, where W is M's set of possible worlds and for each $w \in W$, M_W gives the relevant[16] information about world w. w_O is the actual world of M, in which U (or D) takes place. So the universe of M_{WO} consists of the entities that from the perspective of the discourse participants are the real, or actual ones.

Within this setting in which DRSs are considered in tandem with models, the notion of an anchor can no be defined aong the lines adumbrated in Section 2:

An (*external) anchor in* M*for* a discourse referent x belonging to some DRS K can now be characterised simply as a pair $\langle x,d\rangle$, where d is an element of U_{M_W} for some $w \in W$. We will only consider anchors for real entities d, i.e. elements of $U_{M_{WO}}$.

In the cited papers on anchoring anchors are discussed only in connection with DRSs which represent propositional attitudes. It is natural and legitimate, however, to extend their use also to context DRSs, since in last analysis these are representations of assumptions

16 "Relevant" is to be understood as "relevant to the given DRS-language L in question. (See Kamp & Reyle, 1993). I will leave largely open in this essay what L is like. So no more precise characterisation of "relevant", and thus of M, is possible. Nor is one needed.

which are (presumed to be) shared by utterer and addressee. It should be clear from what I have said that this is the role for anchors in the present essay. Indeed, each of the components of articulated conctexts may contain anchored discourse referents (with the exception of KGen, which presumably has no discourse referents in its main universe at all). This I assume is true in particular of K_{Enc}. In fact, for discourse referents in K_{Enc} I take this to be the typical case; and that in particular for those discourse referents which "represent by name", i.e. those discourse referents x_N which are accompanied by a condition of the form "Named(x_N,N)".

This means that the directly referential character and function of the name N are part of the common ground that is presupposed by discourse-initial uses of N. Moreover, when N is used as part of an utterance U, the directly referential function of N is transferred from K_{Enc} both to the representation of the content of U and to the discourse context (into which the use of N introduces x_N).[17]

What about uses of proper names that are not discourse-initial? It has been noted that such uses have an anaphoric character. (See (Geurts,

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17 Note that it is possible for different names N_1 and N_2 to be anchored to the same entity d. This may happen in one of two ways. The first one, which holds no particular inerest, is that where a single discourse referent x comes with two naming conditions, "Named(x,N_1)" and "Named(x,N_2)", Suppose that x is anchored to the individual d. The intuitive meaning of this configuration is that the discourse participants have a representation of the individual d that is known under two different names, N_1 and N_2. In such a case either N_1 or N_2 could be used felicitously in a discourse reference to d. The more interesting case is that where K_{Enc} contains two distinct discourse referents x and y with the naming conditions "Named(x,N_1)" and "Named(y,N_2)" and the anchors <x,d> and <y,d>. In effect this means that N_1 and N_2 are two names for the same thing, but that the discourse participants may be unaware that they have the same bearer. It is important in this connection that external anchors should *not* be seen as part of the explicit knowledge of those who are in possession of the representations containing the anchored discousre referents. External anchors may be implied by the knowledge of the one in possession of the representation, in combination with the way in which this agent is linked up to the world (directly or as part of a larger society). But it is in their nature that the specific information they contribute is not capturable in purely representational terms in any case; and especially in the case of proper names the actually representable knowledge may, as we noticed above, fall very far short of this contribution, or may even be in conflict with it. Thus two discourse participants who share the information given by K_{Enc} may have representations for entities named as N_1 and N_2, be committed to these entites being in fact one and the same, but yet be unaware of this fact.

1999 (?)).) Within the present set-up this intuition can be explicated as follows. When a name N is used for the second (or third, ...) time in a discourse D, i.e. if it has been preceded by a discourse-initial use in D, then a discourse referent for the entity named by N is already part of K_{Dis}. So interpretation of this occurrence of N can make use of a member of $U_{K_{Dis}}$ as "anaphoric antecedent". If we take it as a hallmark of the anaphoric use of an expression that the discourse referent representing its referent is identified with (more generally: taken to stand in some particular relation to) some discourse referent from K_{Dis}, then, evidently, such non-initial uses of a name qualify as anaphoric.[18]

It should be noted that there is also a further difference between discourse-initial and non-discourse-initial uses of proper names. A discourse-initial use of N may require accommodation, viz. when K_{Enc} does not contain a discourse referent with the condition that it

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18 I add, perhaps unnecessarily, that the notion of a (non-)discourse-initial use is a term of art insofar as the repetition of the name N in a discourse D does not automatically qualify the later use or uses as non-discourse-initial in the sense intended here. When N is ambiguous, and in particular when it is ambiguous in K_{Enc} in the sense that K_{Enc} contains more than one discourse referent accompanied by the condition that the entity it represents is named 'N', then in principle a later use of N can also qualify as discourse-initial in the intended sense. For instance, supppose that K_{Enc} contains two discourse referents x and y, each accompanied by the condition that the entity it represents has the name N. Then it is in principle possible for the first use of N in D to be interpreted as referring to the entity represented by x while the second use is interpreted as referring to the entity represented by y. In that case both uses should be considered discourse-initial in D. In general, a use of a name can only be described as (non-)discourse-initial *relative to* a given interpretation.

Given this clarification of the terminology, it is possible to assert that the use of a name is non-discourse-initial iff its referent is represented in the current discourse context. Thus, in view of our explication of anaphoricity, the non-discourse-initial uses of names are just their anaphoric uses.
I said that it is possible in principle for a later use of a name to be discourse-initial in the technical sense intended. In actual fact, however, such uses are fairly rare. Using the same name N twice in a discousre - in the specific sense of twice using the NP which consists solely of the word N - while intending different referents for the two uses, impresses speakers as a violation of the rules of proper, cooperative language use. If the name N is to be used a second time in the same discourse, but now to refer to a different individual, there exists a strong preference for an NP which indicates the referential shift explicitly. E.g., when the discourse participants know two people called "Robin", and one of these has already referred to by means of the one word NP *Robin*, then it is much more natural to refer to the other Robin by something like *the other Rob*in (*the male Robin* or something of that sort) than by using the NP *Robin*. again.

represents an entity named N (or when it is clear for other reasons that the one or ones represented in K_{Enc} cannot be what the speaker intended). In contrast, non-initial uses of N, in the sense elucidated above, never require accommodation, since by definition a suitable representation of the referent (according to the recipient's interpretation) will always already belong to K_{Dis}.[19]

We conclude this section with a statement of the interpretation rules for proper names and a summary.

Interpretation rules for proper names:

(a) Discourse-initial uses of a proper name N. We distinguish three cases.

(i) There is one discourse referent x in K_{Enc} which is accompanied by the condition "Named(x,N)" and which is also compatible (given the further conditions involving x that K_{Enc} contains) with the other constraints imposed on the interpretation of the given occurrence of N. In this case x is chosen as the interpretation of the given use of N. We implement this by stipulating that the given act of interpretation introduces a discourse referent x_N for the given occurrence of N into the universe of the DRS K representing the content of the utterance of which the given occurrence of N is part, and that it adds to the condition set of K the equation "$x_N = x$" (See (Kamp & Reyle, 1993). Furthermore x is added to the universe of K_{Dis}.

(ii) There are two or more discourse referents $x_1, .., x_n$ in K_{Enc} which all satisfy the conditions stated in (a.i). In this case interpretation of N must choose between these. If no particular choice can be justified, the interpretation remains ambiguous. The effect is a set of k alternative interpretations (ideally a singleton), where $x_{i_1}, ...,x_{i_k}$ ($k \leq n$) are those discourse referents which cannot be eliminated as unintended interpretations for N.

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19 In this regard the anaphoric uses of names differ from anaphoric pronoun uses. A pronoun can be used in a situation where no suitable antecedent for it is present in K_{Dis}. In such a situation accommodation would be the only way of saving the interpretation. Recall in this connection footnote ??, which refers to discussions in the literature whether and to what extent accommodation of pronouns is possible at all.

The i_j-th interpretation (j = 1,..,k) involves adding the condition " $x_N = x_{i_j}$" to the DRS K of the given utterance, while x_{i_j} is included in the universe of K_{Dis}.

(iii) There is no x in K_{Enc} which satisfies the conditions of (a.i). In this case a referent for N must be accommodated. We distinguish two cases:

(iii.i) A new discourse referent x is introduced into K_{Enc} together with the condition "Named(x,N)". In all other respects we proceed as under (a.i).

(iii.ii) A discourse referent x from the universe of K_{Enc} is chosen for which "Named(x,N)" is not a condition in K_{Enc}. In this case only the condition "Named(x,N)" is accommodated. Again we proceed in all other respects as under (a.i).

(b) Non-discourse-initial uses of a proper name N. Given the way in which we have defined non-discourse-initial uses of names, K_{Dis} always contains a discourse referent x_N with the accompanying condition "Named(x,N)". We distinguish two cases.

(i) If there is just one such discourse referent x_N, then it will be taken to represent the referent of the given use of N. In this case we introduce a new discourse referent x'_N into the representation of the utterance containing N and add the condition "$x'_N = x_N$".

(ii) If K_{Dis} contains several discourse referents $x_{1,N}$, ..., $x_{n,N}$ which satisfy the above conditions, then again there is a need for disambiguation. In this case we proceed as under (a.ii).

(It should be noted that cases of type (b.ii) will in general about as infelicitous as the repeated uses of names which are discourse-initial in our technical sense. In the present case too one would preferably use some larger NP of which the name is a constituent.)

Summary of Subsection 3.1:

1. Correct use of a proper name N requires that the intended referent be represented as part of K_{Enc}. After the first use of N as name for a given referent the referent is represented in K_{Dis}, and subsequent uses of N may be interpreted as "anaphoric to that representation".

2. Discourse-initial uses of a proper name may be accommodated in case K_{Enc} does not contain a representation for the (intended) referent of N. Non-discourse-initial uses of names never require accommodation.

3. The directly referential nature of names can be captured via anchors to entities from a given model. Anchoring is possible not only for discourse referents in the representations of uttered sentences and discourses, but also for those which occur in components of the context, in particular K_{Dis} and K_{Enc}.

4. The ambiguity of a name N can manifest itself in several ways. In particular, it can be present in K_{Enc}, in which case the recipient must make a choice between the different discourse referents of K_{Enc} that represent entities named N. Using the name by itself to refer to different entities bearing it within one and the same discourse is possible but normally infelicitous. Preferred would be in such cases NPs which contain the name as one of their parts and which indicates the intended refeence shift explicitly.

3.2 Indexicals.

Indexicals are expressions whose referents are determined by the occasions on which they are used. But this is a very broad characterisation, which covers much more than what I want to reserve the term "indexical" for. As examples of indexicals I mentioned in Section 1 the words *I*, *you* and *now*. I also indicated there that I want to understand by an indexical just those expressions whose occurrences refer to one of a small set of salient "aspects" of the utterances which contain them. Which utterance aspects should be included within this set is an issue that is often raised, but remains, when all has been said at least in part a matter of stipulation. I will assume that the set contains just three aspects: the producer of the utterance, the utterance

time and (in those cases where there is one) the addressee or addressees.

Form and content of K_{Utt} reflect this stipulation. The universe of K_{Utt} will always consist of the following discourse referents: (i) sp, representing the utterer; (ii) n, representing the utterance time, and, in case there is an addressee, (iii) ad, representing the addressee or addressees.[20] With this choice of the particular symbols "sp", "n" and "ad" is connected the convention that they are used only as representations of the mentioned utterance aspects. Thus, using the symbol "sp" amounts to the same thing as using an arbitrary discourse referent symbol, say "x", together with a condition which states that x stands for the producer of the utterance in question.[21] Analogous conventions apply to the use of "n" and "ad".[22] I will refer to sp, n and ad as *the indecxical discourse referents*.

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20 In case there are several addressees, ad will represent a plural individual. In some such cases (though not in all) ad is represented as the mereological sum of a number of particular individuals b_1, ..., b_n, by way of the sum condition "ad = $b_1 \approx ... \approx b_n$". In such cases the component discourse referents b_1, ..., b_n will be assumed to belong to the universe of K_{Env}, (and not to that of K_{Utt} itself). For more on this see Subsection 3.3.

In numerous languages the difference between the case where the addressee is a single person and that where there are several is morphologically marked. (Many have distinct forms for singular "you" and plural "you"; the distinction may also show up in the form of number morphology on the verb, on adjectives, etc.)

Just as there are cases where an utterance has more than one addressee, there are also those where it has more than one utterer. A plurailty of utterers refers to itself with *we* rather than *I*; many other languages also such a distinction. However, utterances with a plurality of utterers will be ignored.
We note in passing that*we* does not always denote a plurality of utterers. It can also be used in cases where there is a single utterer, who wishes to refer to a set of individuals of which he himself and at least one other indiovidual are members. An example of this kind of use of *we* iwill be considered in Section 4.

21 I make no effort to specify any particular form for this condition. All we need to know is that, whatever this form would be, its truth conditional import would be the same as the contraints on possible embeddings imposed by hte use of the symbol "sp" that will be stated below..

22 These conventions are reminiscent of the one of (Kamp & Reyle, 1993, Ch. 4) pertaining to the use of lower case and upper case letters for "singular" and "plural" discourse referents. The use of a lower case letter iindicates that the discourse referent repesents an (atomic) individual and the use of an upper case letter that it represents a "non-atomic" individual, or, equivalently, a set of ≥ 2 elements.

The occurrence of indexical discourse referents is severely restricted. As we have just stipulated, they may occur in K_{Utt}. The only other representations in which they may occur are the representations of utterance content (in particular representations of the utterances of sentences and of multisentence discourse), and therefore in discourse components K_{Dis} of articulated contexts.

The semantics of representations containing indexical discourse referents must reflect their indexical status. There are two ways to state the conditions that secure this. The first takes the form of imposing certain constraints on possible embeddings[23]: Any verifying embedding for a DRS K containing one or more indexical discourse referents must map these onto the corresponding aspects of the utterance which K represents. (Note that this presupposes that we are dealing with a representation of an utterance, which involves not only a linguistic form - be it of a sentence, a multi-sentence discourse of discourse segment, or a sentence constituent -, but also the utterance aspects which indexical discourse referents represent. Thus he very occurrence of an indexical discourse referent in a DRS is a sign that we are dealing with an utterance representation and not just with a representation of an expressions type in abstracto.)

The second possibility is to assume that indexical discourse refereents always come with anchors to the coresponding utterance aspects. The constraints which anchors impose on possible embeddings will then produce the same effect as the special conditions formulated in the last paragraph. There isn't much to choose between these two ways of implementing the special reference conditions for indexicals, and I will go back and forth between them as convenient. By and large I will follow the existing DRT practice of expressing the conditions in the first way when indexicals occur in utterance representations[24], while speaking of anchors for the discourse referents of K_{Utt}.[25]

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23 At this point it is inevitable to bring certain features of the (model-theoretic) semantic of DRSs into play. Put succinctly, the truth condition of DRSs are stated in terms of so-called embeddings, functions which map the discourse referents from the univers of a DRS to elements of a model. An embedding verifies a DRS K in a model M at a world w iff the conditions of K are verified in M_W by the elements of M which are the values, under teh given embedding, of the discourse referents occurring in those conditions. For details see any of the DRT introductions mentioned in footnote 1.

24 For occurrences of n in utterance representations this analysis has been adopted within DRT since its early days. n is needed in such representations as soon as one endeavours to represent the sematic contributions of tense, since these

So far in this section we have only discussed indexical discourse referents. We said nothing about the indexical words *I, now, you* of English which, in a way yet to be made precise, correspond to them. To describe the semantics and pragmatics of these words, and state their relations to the indexical discourse referents sp, n and ad we need to take the pairs of corresponding words and discourse referents one at a time. We start with n.

3.2.1 n, *now* and other n-dependent expressions

n, I said, represents the utterance time. But what *is* the utterance time? Is it a time point? A temporal interval? And which point, or which interval? And what, when one comes to think of it, precisely *is* the utterance that a given utterance time is supposed to be the time "of"? We cannot discuss all relevant questions here. Instead I will begin with a stipulation: The time of a given utterance is the duration of the actual utterance event. This formula leaves much unanswered. As regards spoken utterances. Does the utterance event consist just of the production of the utterance or is the time it takes the addressee(s) to interpret the utterance to be included as well? And what is involved in

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normally serve to relate the states or events described in the represented sentence or discourse to the utterance time. See e.g (Kamp & Reyle, 1993) or for a more recent formulation (Van Genabith et al., 2004).

For those who are familiar with the DRT-based proposals for the representation of attitude reports of (Kamp, 1990, 2003), (Van Genabith et al, 2004) it should be added that what is beoing said here about indexical discourse referents only applies to non-embedded occurrences of them. As the cited publiations make clear, different semantic rules apply to occurrences within sub-DRSs that represent attributed thoughts.

25 Because of these model-theoretic stipulations DRSs containing indexical discourse referents express (in relation to any intensonal model M) propositions which are singular with respect to each of the indexicals they contain. Suppose for instance that the DRS K of an utterance U contains sp and that d is the individual from M_{W_O} who is the utterer of U. Then the proposition expressed by K relative to M is the set of those worlds $w \varepsilon W_M$ such that there is an embedding which verifies K in M_W. Since each of these verifying embeddings maps sp onto d, d acts as the "referent of" sp in all possible worlds of M, so that sp plays the role of a "rigid" designator in M.

the "production" of an utterance, just the producing of the acoustic waves or the also the mental activity that is needed to make the utterance?, and if mental preparation is to count too, how much of it? (Sometimes we think carefully and for an appreciable amount of time before speaking. in such cases it would seem counterintuitive to se the thinking as being an integral part of the utterance whch results from it.) When verbal communication does not take the form of speaking face to face, questions of this sort multiply and become even more difficult to answer. (What is the time spanned by an utterance that is part of a conversation between someone on earth and a space traveller, which is at a distance from our globe of several light minutes, or more? What are we to say about communications per letter, telegram, e-mail, T-box?)

These questions too we must leave aside. We will focus just on oral face-to face exchanges with one speaker and one addressee, in which the time it takes a signal to travel from speaker to interlocutor is negligeable. And I propose, once more without argument, that we take as the duration of an utterance, and thus as its "utterance time", the period which begins with the start of its physical production and ends when its final part has been registered by the recipient. (So we exclude, somewhat arbitrarily, those preparatory processes which precede the onset of the acoustic signal, as well as the interpretational processes which may within the mind of the addressee after the last bit of sound waves has entered his ears. So, in view of the assumption that the travelling of sound from speaker to hearer requires a negligeable amount of time, the utterance time, characterised in these terms is just the period needed to produce the utterance as a sequence of sound waves).

It might be thought that by these stipulations we have resolved all important questions about utterance time by fiat. Not so. There is oe crucial parameter which hasn't been decided: What is the utterance which determines, according to the stipulations we have made, the utterance time that is relevant to the interpretation of those sentence constituents for whose interpretation utterance time is important? The word *now* is one, but only one among these. (The tenses, for instance, are others), But it is on *now* we focus.

Let us assume that occurrences of *now* refer to the utterance times associated with these occurrences. (I will return to this assumption

below; and question its general adequacy, but seems unexceptional at least for many normal cases, and it will help to focus on the issues that concern us it theis point.) What does this assumption come to in connection to any particular occurrence of *now*? That depends on what is to count as the relevant "utterance". In principle there are quite a few possibilities. The relevant utterance could be the production of just the word *now* itself. But it could also be the production of the sentence of which the given occurrence of *now* is a part, or the production of the sentence constituent in which *now* is an adjunct, or of the entire conversation or text within which the given token of now occurs; or of some multi-sentence segment of this converation or text. Perhaps other cadidates couild be considered as well.

How are we to decide between these various options? There is no once-and-for-all answer to this; what is to be considered the utterance whose duration determines utterance time is something that varies with the kind of speech act in which the given *now*-token figures, and with the type or genre of the discourse containing it. The two discourse fragments in (2) give a flavour of some of the factors which play a role

(2) (a) It was really an amazing event. I have wondered for some time whether to tell you about it
But in any case I don't have time now.

(b) I want to you to run as fast as you can.
You start RIGHT ... NOW!

(2.a) represents what appears to be a kind of default case. Here the relevant utterance is the entire discourse consisting of all that (2.a) gives, and more if this is to be considered an excerpt from some longer conversational exchange. This assumption, that the utterance time is that of the discourse as a whole, underlies our understanding of a large range of communicative uses to which language is put. Given our assumption about the denotation of *now*, this entails that uses of *now* in discourses of this kind always refer to the duration of the entire discourse. However, this is but one of a number of important consequences, and I will turn to some others presently. I wil refer to this option as the *global* (choice of) utterance time.

(2.b) shows that other possibilities exist too. In relation to this example one is led to asume that the utterance relevant for the reference of *now*

is just the utterance of the word *now* itself, and not that of the entire sentence, let alone of the entire discourse. Cases of this latter kind are interesting from the general theoretical pursued here, in which special attention is payed to the ways in which context may change as a discourse proceeds. Where utterance times are times of utterances of parts of a discourse, and not of the discourse as a whole, each new utterance time will give rise to a change in the utterance context, from one in which n rerpesented the old utterance time to a context in which it represents the new one.

One discourse genre for which this feature of changing utterance times has been noted (and extensively discussed) in the literature is "reportive speech", a mode of use of the present tense in which the speaker reports a succession of events which are intended to be understood as happening at the very times at which the sentences are uttered which report them. (The classical example is live reporting of athletic events such as football matches.) What we see in such discourse is a continuing, sentence-by-sentence shift of utterance time, and thus a continuing change of utterance context from earlier to later utterance times. But reportive speech is not the only discourse genre (or the only type of speech act) where the utterance time is non-global. Uses of indexical expressions which involve non-global utterance times can also be incidental, embedded within a larger discourse, in which other occurrences of such indexicals require evaluation in terms of the global utterance time. For instance, suppose that in the course of a dispute over, say, an election which is taking place today, you suddenly say, looking at the screen of the television behind me, the sound of which has been turned down: "Look, the president is just making a statement". Then I will interpret you as informing me, through the utterance of this particular sentence, that a certain event is taking place at the time of your uttering this one sentence, but not necessarily for the duration of our conversation as a whole. In this case utterance time is needed for the interpretation of the present tense of the sentence, and it is in this connection that what seems to be needed is a non-global utterance time. (I will be more explicit about the role of utterance time in the interpretation of tense in the next few paragraphs.) It is in part this switch to a "local" utterance time for the interpretation of this utterance that it strikes us as a kind of interruption of the argumentative discourse in which you and I are engaged and in the course of which you make it.

The possibility of selecting one from a number of different utterances when interpeting an expression whose interpretation depends on utterance time gives rise to two different questions: (i) According to what principles do interpreters determine which one of the possible utterances is intended? and (ii) What is the impact of such choices on the resulting interpretations (in particular, on their truth conditions). About the first question I have little to say, and what little I can say i will keep for the end of this subsection. The second question leads us back to a matter which I touched on only briefly so far, viz the way in which utterance time determines the denotation of *now*. (I stipulated that the denotation of *now* is simply identical with the utterance time and promised that I would return to this later.) However, to get a better sense, of how the choice of utterance time may affect resulting interpretations it will be helpful to also look at some other expressions whose semantics depends on utterance time. Prominent among these are the tenses, and it will be useful to have a brief look at them..

Before we do let us make a quick inventory of where we stand. In the theory we are developing what counts as the utterance at any point in the course of sentence or discourse interpretation determines the utterance time and thus the time represented by the discourse referent n of the current K_{Utt}. This means, I stipulated, that for this K_{Utt} n is anchored to the given utterance time. Interpretation of any expression which depends on utterance time can now be construed as relating its interpretation to the given K_{Utt}. This means that the interpretation rules for such expressions, which embody their semantics, should be stated in terms of K_{Utt} and more specifically in terms of its n.

With this we turn briefly to tense. There is a simple division of the tenses of English and many other languages into past, present and future. The classification is semantically motivated: a tense qualifies as past, present of future insofar as it serves to locate the state or event described by a sentence in which the tense occurs as "before", "at" or "after" the utterance time. Such a divison cannot be more than a small part of the story that one would nowadays expect from anyone who presents a systematic analysis of the semantics of tense, but for what I want to say right now it is all we need. Let us assume, then, that there is such a three-fold division of the tense forms of English and let us not worry about some of the problems that such a classifications raises (e.g. whether the present perfect should be analysed as a present tense, as its name would suggest, or a past tense). The point to be made here

concerns the "before", "at" and "after" used above, with their scare quotes which suggest that there is more that needs to be said. Of these three items the one that is most in need of comment is "at". According to what I have said so far, present tense sentences locate their states or events "at" the utterance time n. But what exactly does that come to? My claim: it always means that n is temporally included in the state or event described by the sentence. This claim comes in conjunction with two others, viz that past tense sentences locate their states or events (entirely) before n and for future tense sentences the described state or event lies in its entirety after n. The three claims are summarised in (3)

(3) Let ev be the eventuality (= state or event) described by a sentence S. Then

(i) If the tense of S is past, then ev < n (ev wholly precedes n)
(ii) If the tense of S is present, then ev n (ev includes n)
(ii) If the tense of S is future, then ev < n (n wholy precedes ev)

It is imjportant to note that this provides with three possibilities which are mutually exclusive, but which in general are *not* jointly exhaustive. For as soon as n is not a point but an interval - and we have assumed that in general it is the latter - there are possible ev's which are unfit to be located by any of the three tense types. (For instance, an ev which begins somewhere in the middle of n but ends at some point lying in n's future.) And it is clear that the bigger the interval n, the farther this tripartite division is removed from an exhaustive division.

The intuitive justification of (3) is something like this. The three kinds of tenses each represent a different perspective from which the eventuality that is described by a sentence bearing one of the tenses in question is presented. The perspectives associated with the past anad future tenses are both external. Past tenses are used to present the eventuality as gone by and thereby an inalienable part of history; a future tense persents its information as likely or bound to happen. But since the shape of the future depends on innumerable factors, among which our own desicions and those of others play an important part, there is a large and essentially continuous spectrum reaching from the barely possible to the inevitable; and this is the reason that it is so difficult to draw a clear line between future tenses and modal operators. In contrast to past and future tenses the present tense represents an internal perspective: The described eventuality is

presented as something that is going on at the time of the presenting. Eventualities presented form this perspective must be either states or ongoing processes, and their duration must straddle the entire interval of time that counts as the "presentation time". If we identify the presentation time connected with a given verbal presentation with what we have so far referred to as utterance time, i.e. with the time represented by the n of the current K_{Utt}, then we are back at (3.ii).[26]

The question how much hangs on the determination of utterance time can also be raised in connection with the word *now*. Here too we would expect an impact on truth conditions. For instance, suppose that *now* occurs in a state describing sentence S, and that, as I assumed above, the described state is understood to include the location time t_{loc}. Assume moreover that *now*, like all temporal locating adverbs, serves to identify t_{loc}; and finally that, as proposed above, *now* denotes the time represented by n. Then the contribution made by *now* to the truth conditions of S would seem to depend on how the utterance time (which n represents) is determined; the larger the utterace time, the stronger the constraint which *now* contributes.

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26 Circumstantial evidence that this is the right way of looking at the distinction between past, present and future tenses, (and in particular at the function of the present tense) comes from English and the comparatively few other languages which have obligatory marking of progressive aspect. In many contexts English present tense sentences with non-stative verbs require the present progressive. E.g. when I tell you about my current occupations I may say to you "I am writing an article about the present tense", whereas "I write an article about the present tense." would be marginally grammatical at best. Among the cases where the need the present progressive is felt are in particular those which earlier I described as involving the default strategy for deteemining utterance time, viz. those where the uterance is that of the entire discourse.

Not all uses of the present tense, it should be added, involve the internal perspective sketched in the last paragraph. I already drew atetention to those cases where the utterance time is not that of the discourse as a whole but of some local utterance - consisting, say, just of the sentence in question but nothing more. Some of these, we noted, have been described in th literature as uses of the "reportive present". Let us once more focus on uses of this kind. The presentation perspective of such utterances, one might want to say, is neither purely internal nor purely external. The external features of this perspective come out most clearly with sentences which report events - sentences in the simple present tense whose verbs are "event verbs". The utterance presents the interpreter with the event it reports as a fait accompli. By the time he has received the entire message he knows that the event, which is supposed to be temporarily included within the duration of the sentential utterance, of which he has just perceived the end, is a part of the past. And yet he is processing the message which informs him of this event at this very moment, so the information does carry for him the immediacy and actuality of the now. Seen from this angle the presentation perspective retains some of the internal features which we als find with other uses of the present tense. This aspect is more strongly present when the utterance in question rports a state or ongoing event. (As usually described reportive speech admits of stative and progreesive statements as well as simple present tense event sentences.)

On reflection, however, the contribution of *now* to truth conditions comes to little. This is so in particular for sentences in which *now* occurs in the company of present tense. For, as we saw above, the very same constraint, viz that the described state must temporally include n, follow already from the assumptions we made about the function of present tenses. One may include now in such a sentence for emphasis, e.g. to contrast the utterance time with some other time or times which have been mentioned or are implied; but it doesn't make any clear contribution to the truth conditions. In this respect, the old arguments about the truth-conditional redundancy of *now* still stand.[27]

But is it true that, as I proffered earlier, *now* does always refer to the utterance time? I said I would return to this question, and when I do so now, it is to answer it in the negative. First note that there are a number of expressions which like now depend for their reference on the utterance time, but whose references are not identical with it. Here are three (the list is not exhaustive): *today, these days, nowadays*. The point at issue is illustrated in perhaps the most straightforward way by *today*. A token of *today* refers to the day on which it is uttered, i.e. to the (unique) day which includes the utterance time. This of course presupposes that the utterance time is included in a single day, but that is a condition which is normally satisfied - as a rule conversations do not take the whole day. Normally utterance times are much shorter than a whole day, even when the utterance is identified as that of the entire discourse. In all those cases the denotation of *today* is determined by n, but it isn't identical to the time n represents.

Something similar applies to *these days* and *nowadays*. They denote periods of time which cover of a (presumably large) number of days and which must include the utterance time. n imposes a constraint on what the denotation could be, but, for the same reason that was just given in connection with *today*, we may assume that in practice it never coincides with that denotation.

In the light of this it is natural whether this possibility - referring to eriod which includes n but is not identical with it - does no exist in the

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27 See (Prior, 1968), (Kamp,1971). Note that the above considerations presuppose that in sentences of the indicated sort (presence of now, state-describing, present tense) now and the prsent tense are interpreted in rlation to the same utterance time. I do not know of any cases where this assumption is not satisfied, and cannot think how cases requiring such an analysis could come about.

case of *now* too. And indeed there appear to be the cases where this is so. An example is (4)

(4) In the nineties people would still ishow off with their mobilphones. But now/nowadays it is so common to have one that noone takes any special pride in it.

Here the contrast between the first and the second sentence makes it natural to understand *now/nowadays* in the second sentence as denoting a period that is of the same magnitude as the *nineties* in the first. So, since the nineties denotes a decade, *now/nowadays* is understood as referring to a period comprising several years as well, e.g. the first decade of the new century. For *nowadays* we already noted that it can be used to refer to periods longer than the utterance time. But *now*, it seems, can be used just as well in (4), and without appreciable change in meaning.[28]

Summary of 3.2.1.

1. There are various uncertainties connected with the notion of the utterance time which is represented by the discourse referent n of the current K_{Utt}. Among these there is in particular the uncertainty what is to count as the utterance U such that the utterance time is the duration of U. A default assumption about U is that it covers the entire discourse. When this assumption holds throughout a given discourse, all exprssions in it whose interpretation involves n are interpreted with respect to a single utterance time, which remains the anchor for n

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28 Besides those uses of *now* in which it refers to the utterance time or to some period including it, there are also uses where now refers to some time in the past, which does not include the utterace time at all. The existence of these cases has been a concern witin formal semantics since the early seventies. The same is true for other expressions which often refer to times which stand in some particular relation to the utterance time, including the three discussed in the last three paragraphs. The conditions under which reference to times that stand in these rlations to other times than the utterance time, vary from one such expression to the next, and this appears to be true also for other languages than English. (See Kamp & Rohrer, 1983, 1986), (Kamp & Schiehlen, 2002).) More empirical work is needed in order to establish a clearer picture of the different possible constraints under which indexical expressions can refer to periods which are not related to the utterance time. Uses of indexicals in which their reference is not determined in relation to the utterance time fall outside the scope of this paper and I will ignore them in particular when formulating later on in this section rules of interpretation for indexicals. Because the principles ignore such uses, they are strictly speaking incomplete.

throughout. In such a situation K_{Utt} is, at least as far as n is concerned, immutable. The situation is different, when utterance times are determined by utterances which cover only a small part of the discourse (e.. the utterance of an indexical expression on its own, or of the sentence in which the expression occurs). In that case K_{Utt} changes beteen utterances belonging to the same discourse and thus shows a kind of dynamics.[29]

2. In English and also in many other languages there is a range of indexical temporal expressions, whose interpretation depends on the

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29 Cases in which the utterance time is taken to be that of the entire discourse present a certain difficulty, especially when we assume that they involve anchoring of n to this discourse time. It is quite common for the discourse participants to take the utterahnce time as that of the entire discourse without having any clear idea, durin the early part of their conversation for how long it will og on; and, indeed, this may be genuinely undetermined when the conversation begins. In this case the period to which n is anchored is not yet fixed and it might be wondered how anchoring would be possible in such cases.
As a matter of fact I do take this to be a serious problem. As soon as the discourse begins, its time is accessible to the participants - *as* the time of the discourse that has just started - and the fact that the full extent of his time is still indeterminate desn't prevent it from serving as an anchor. (More ought to be said about exactly what this implies for the notion of anchoring we have been using, but this would lead too far afield.)
I believe, however, that the indeterminacy of the time of the entire discourse has an important implication. Because in so many cases the full extent of the global utterance time cannot be determined until the discourse has actually come to a conclusion, it is part of interpretations which make use of this default strategy to take the utterance time to be inherently indeterminate, with the attendant constraint that the result of interpretation should not depend on what the utterance time will turn out to be in the end. Extrapolating from this we arrive at the constraint that intrpretation should be independent of which subinterval of the duration of the entire discourse is assumed as utterance time. it is easily seen that this constraint restricts what can be said to precisely the three possibilites listed in (3): either ev lis in the future of the entire discourse, in which the appropriate tense is a future tense, or ev has ended before the discourse started, in which a past tense is appropriate; or ev spans the entire duration of the entire discourse, in which present tense is appropriate, with the additional proviso that ev is the kind of eventuality that is interpreted as including t_{loc}, rather than being included in it. (It is easy to verify that when and only when we presupppose that the eventuality described by a sentence S satisfies one of these three possibilities that it becomes immaterial which subinterval of the discourse duration is chosen in interpreting S.) A discourss whose sentences satisfy this presuppopsition is semantically robust in that the truth conditions which interpetation assigns to them are indpendent of what - within the duration of the discourse as a whole - is taken as the relevant utterance time. This is an alternative way of explaining why the tripartite division of (3) should hold.

utterance time. Among these are the tenses of the verb and adverbs such as *now*, *today* and *nowadays*. There are cases - viz. some of the occurrences of *now* - where the utterance time serves itself as the denotation of the token of an indexical expression. But it is more common for the utterance time to enter into the exprssion's interpretation in some other way.

3.2.2 sp, ad, *I* and *you*.

Most of the problems which we have encountered in connection with n and the expressions whose interpretation depends on it of *now* and n do not arise in connection with sp and ad and the expressions depending on them. In general, it seems quit clear what should be understood by the producer of an utterance. Even cases where one person speaks on behalf of someone else - messengers, heralds, diplomates, legal representatives and spokespersons of all sorts -, where conceptual complications could have been expected, the situation is quite clear. Even if there is an important sense the words spoken by someone acting in such a capacity may be understood as coming from the one he represents, there is also a clear sense in which it is representative who counts as the producer, and not the one he represents: When the representative uses the word "I" he refers to himself, not to the one who has sent him on his errand. It is this sense, which relates to the interpretations of (unquoted) uses of I, which is relevant here, and in that sense it is the one who speaks irrespective of whether he acts as ambassador.[30]

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30 A further source of complications is the possibility for an utterance to have a plurality of speakers. In some cases, such as when a letter is signed by a group of authors, the matter is clear. An alternative is that where one person signs, but does so in the name of the others. With spoken utterances the typical cases correspond to this second type, with one form a group of individuals doing the actual talking, but on behalf of the others as well as himself. Utterances with a plurality of producers are distinguished from those with a single producer in that self-reference is always made with the help of the plural pronoun *we*, rather than the singular *I*. But of course this test will be present in some but not in all cases. Moreover, only occurrences of *I* mark an utterance unequivocally as having a single "producer". The pronoun *we can* be used to refer to a collective of producers, but *we* also occurs in utterances with a single producer, to refer to some set of which the producer is one of the members, and where the others do not count as among the producers of the given utterance. And even in cases where it is clear that there is a collective of producers, it is often not clear who belongs to it (and sometimes this is even intentionally left vague). In what follows utterances with more than one producer will be ignored.

Not quite as straightforward is the notion of the addressee (or addressees) of an utterance. Here we are confronted with a question which plays no comparable in connection with speaker identity: Is it just the intention of the producer which defines the addressee(s) of his utterance, or is it rather features of the utterance which are public and accessible to those who have to decide whether they are he or an addressee? The following ancient joke (inasmuch as it is one) helps to focus on the issue. A severely cross-eyed and not very popular corporal wants to find who among his men is repsonsible for the prank of which he feels he has just been made the but. He has asked the three men who he suspects most to step forard and right now they are lined up in front of him. meanng to address the one to the right, he utters the words: "Tell me who did this? The one in the middle sreacts to this with the words: "I don't know, sir." He barks back. "I didn't ask you anything." Whereupon the one to the left says: "I didn't say anything."

Who, in either of his two speech acts, did the corporal address? Was it the person he meant to address or the one at whom, objectively speaking, should have been regarded as in his line of sight? Were the soldiers who reacted to his utterances simply *wrong* in thinking they were the addressees or is there a real question here: the one who the corporal wanted to address or the one who, under normal conditions one would recognise as the addressee? I do not quite know how conflicts of this kind, between what the speaker intends and what would naturally inferred from the ouward features of the speech act he perform, shoudl be resolved. Normally intentions and outward signs are in harmony, and it is in such normal, prototypical cases that our concepts are rooted. What we are to say in relation to situations where this harmony is broken is often genuinely underdetermined, and can be resolved only by stipulation.

In the case of the corporal and his men I myself strongly incline to see the corporal's intentions as decisive. He does address the man on the right the first time and the man in the middle the second time, even if it looks different to an external observer (who doesn't know or ignores his ophtalmic idiosyncrasies). Perhaps there are cases where my intuitions would point in the opposite direction. But for our present purposes it is not crucial that we get to the bottom of this, and I will cut the knot by assuming that in all those cases where the producer has a

clear conception of who he means to address, it is that or those individuals who count as the addressee or addessees of his utterance.

This formulation, however, raises a further query: What is it for the producer to have a "clear conception" of whom he wants to address. In many situations - that of our cross-eyed corporal among them - the matter is straightforward: The producer has an anchored representation of the person he wants to address and it is this representation which figures in the utterance intention which results in the speech act he performs. But there are other cases too. One complication arises in many cases where there are several addressees. Many of these are no more porblematic than the ones with a single addressee of which we just spoke. These are cases where, typically the number of addressees is small and where the producer has anchored representations for each of them.[31] But there are also cases where the set is large. For instance, a public spaker intends to address the crowd in front of him, but she has anchored representations for at best a few of the people composing it. If she means to address the crowd as a whole, one could still argue that she has an anchored representation of the crowd, as a "plural individual". But the matter becomes more complicated when the speaker wants to address those within the crowd who belong to her party - among the people she is facing some are party members and some are not, and her words are intended specifically for those who are.
Here the set of addressees determined, in the speaker's mind, partly by description, viz. as consisting of those people in the crowd before her which satisfy the description "is a member of my party".

It seems reasonable to include such cases, where description plays an essential part in defining the addressee(s), also as involving a well-defined intention-based (set of) addressee(s). But it is well to be aware of the diversity of cases which fall under this decision. These concern not only spoken utterances, but also, and in fact much more so, written ones. Often descriptive identifications of the addressee(s) are open-ended: Not only may it be unknown to the author at the time when he produces his "written utterance" which particular individuals fit them. It may well be that people come to fit them through the (unforseeable) circumstances in which, at some later time. the utterance comes to their attention. One example is that of somebody who puts a sticker on his

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31 I am rferring here implicitly to the proposals for the respesentation of propositional attitudes in (Kamp, 1990, 2003) and (Van Genabith et al., 2004).

rear bumper which says, in script of carefully chosen size: "WHEN YOU CAN READ THIS, YOU ARE TOO CLOSE." [32] But the variety of such cases is endless - traffic signs, warnings to trespassers, messages in bottles thrown into the sea by desperate shipwreck survivors on uninhabited isles (this presumably a dying category), varoius kinds of leaflets, flyers and advertisements of all sorts. A new and intriguing - as well as trying - variant are the personally addressed communications with which most of us are bombarded per e- and regular mail, and which are evidently h work of software that makes use of electronically accessible address lists, usually acquired by paralegal means. Even if it looks like I am being personally addressed in such a letter or message, is their any tenable sense in which anyone can be ascribed the intention of addressing *me*?

Where and how the line is to be drawn between well- and ill-defined addressee-intentions is left for others to decide. I will just assume that the line has been drawn somewhere, and that in all those cases where, according to this demarcation, there is an intentionally defined addressee (or set of addressees) it is this individual or set which acts as anchor for ad in the current K_{Utt}.

This is all I will say about anchors for the discourse referents sp and ad.

As regards sp and ad the dynamics of K_{Utt} is quite straightforward, and it is much simpler than the dynamics of n. In monologue the anchor for sp remains constant, but this is of course not so in conversation, where it changes with every "turn taking", i.e. when the floor is taken by a different speaker (in dialogue: by the other participant). With ad the matter is slightly more involved. By our decision to focus on the producer's intentions the anchor for ad is determined by whom the speaker (i.e. the anchor of sp) has in mind. What this implies for the anchor of ad in the course of a monologue depends on how precisely monologue is defined. On a strict (but I think natural) definition of monologue, according to which it not only involves a single speaker but also a fixed addressee or set of addressees in the speker's mind the anchor for ad will be just as constant thoughout a monologue as that for sp. But when we include among monologues also discourses in

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[32] There is further complication with this and many similar cases, viz that such stickers are for sale; those who put them onto their cars, aren't the "authors" in the same straightforward sense in which someone who pens a letter is the author of the words he sets down on the page. This is na aspect of the problem of the authorshp of written speech acts which I can do no more than mention in passing.

which a single speaker may shift from one audience to another while he is at it, this will of course no longer be so in general. None of this is very interesting and I propose that for the rest of this paper we keep in the back of our minds just two discourse types. (i) monologues in the strict sense just defined, where the utterance may be either spoken or written; and (ii) dialogues, i.e. conversations in which there are just two participants who take turns.

It may be felt that the problems arising inconnection with sp and ad, while not entirely trivial, are simpler than those arising in connection with n. There is however one issue, not considered so far, which affects the analysis of all aspects of K_{Utt}, but which leads to substantially greater complications in connection with producer and addressee than with utterance time. To discuss this matter in the detail it deserves would take up more space than I want to devote to it here. Moreover, what I have to say about it would require me to rpesent a fair amount of partly technical background concerning the representation of complex attitudinal states and common knowledge.[33] But while I refrain from a proper discussion of this issue, I want to at least sketch what the problem is, because it seems to me to touch on some of the most fundamental questions about reference, meaning and comunication.

3.2.2.1 An interlude about *de se*, *de re* and common ground.

I have followed - and so far without wasting any words on my doing so - a widespread practice within semantics and pragmatics to assume that the context of an utterance is a store of information shared by those who are involved in an event of verbal communication - that the context has the status of the *common ground* between them. The notion of common ground has given rise to a discussion that has been going on for many decades and that has been conducted mostly from the perspective of epistemic logic: What does the claim that a proposition p is common knowledge (or "part of the common ground") between two persons a and b entail by way of beliefs that a and b must entertain with regard to p? These discussions are important (and meaningful) irrespective of the details of the underlying theory of propositional attitudes that they presuppose; and they are largely insensitive to the question whether this underlying theory includes a

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33 Once more the reader is referred to the publications cited in fn. ??.

representational component, which attributes to propositional attitudes "structural" properties, which have to do with how the possessor of an atitude represents its content to himself, and which will in general not be fully reflected in those intensional characterisations of propositional content according to which a proposition is a set of possible worlds.

However, when representational aspects of propositional attitudes are taken into account as well (as this is done for instance in DRT-based proposals such as those of (Asher, 1986, 1987), (Kamp, 1990, 2003) and Van Genabith et al., 2004)), then there is a further cluster of problems to which the concept of common ground gives rise: For it is now possible that a and b share the same propositional content (given as a set of possible worlds), yet have different representations of this content. A special, but pervasive case of this arises in connection with the representation that discourse participants have of themselves and of their discussion partners. As argued in (Kamp, 1990, 2003), any normal human agent has a representation of himself "as self". This "self-representation" enters in his plans (as the argument to the action predicates of which they are composed, his feelings of hurt, humiliation, pride or happiness, and in many others - all those thoughts that in the theory of (Lewis,197?) are attributions *de se*. (In fact, I refer to such attitudes as de se as well, even if the assumptions I make about their form Lewis might have found misguided.) Self-representations of this kind are directly linked (that is: linked without any descriptive mediation) to the represented self. In this respect they are fundamentally different from the mental representations that an agent can entertain of anything external. These latter representations too can be linked in a directly referential manner to what they represent, viz. in that the representing discourse referent is anchored to the represented entity, but these links involve some form of descriptive mediation. An entity representation that is directly referential via anchoring is called *de re*.

One consequence of this perspective is that in all normal communication situations a discourse participant will have (a) a direct, "de se" representation of himself and (b) a different kind (though normally directly referential) representation of his interlocutor. Thus the producer a and addressee b of a given utterance U will have different kinds of representations of the individuals a and b: a will have a *de se* representation of a and a *de re* representation of b; for b the situation is reversed.

One implication of this is that the contexts which this paper presents as common grounds between speaker and hearer cannot do full justice to the form in which each of a and b has the information they are being said to share. This inadequacy is especially evident in connection with the context component K_{Utt}. We have been treating the representations of both speaker and hearer as *de re* representations. This is neither faithful to the representation of the speaker nor to that of the hearer; for each will have a representation of himself that is not *de re* but *de se*.

Note that in this regard there is an important difference between sp and ad on the one side and n on the other. The representations that each of a and b can be assumed to have of the present will be of the same type, a representation which functions in much the same way as de se representations of the self. In the mentioned DRT literature it is assumed that this involves a discourse referent - the symbol used is also n - which is directly connected with the thought (or propositional attitude) of which it is a constituent and represents the time at which the represented thought is being entertained. Here there is no discrepancy in form and function between two representations of the same individual (such as a's representation and b's representation of a).

It should be added, however, that there is a further issue which arises in all cases where two persons can be said to share representations of entity This problem is arguably the greatest philisophical challenge for to an account of comon knowledge. It arises in every case where agents can be said to share reference to a thing. And here it arises just as much for shared representations of the present, where the the representations that are being shared are of the same sort, as it does for shared reference to a speaker or addressee where the representations are typically not of the same kind. Once more, for discussions of this problem I must refer to the cited publications. Here it will be henceforth ignored. I will also ignore the distinction between *de se* and *de re* in what follows. It is a distinction that impinges on the proposals of this paper only in connection with sp and ad. Because no provisions are made for the distinction here the interpretation rules for the words which involve sp and ad, primarily I and you, aren't quite what in may own view they ought to be. Still, they are close enough to serve within the general setting of the proposals I am developing here.

3.2.3 K_{Utt} and K_{Dis}.

There is one matter connected with K_{Utt} which still needs to be addressed. This is the relation between K_{Utt} and K_{Dis}. Here too we must distinguish between n on the one and sp and ad on the other hand. It is implicit in earlier versions of DRT that as soon as one of the participants of a discourse mentions himself or his addressee - using *I* in the first and *you* in the second case - a discourse referent x representing the person mentioned will be introduced into the universe of K_{Dis} (unless K_{Dis} contains a representation of this person already). If the mentioned person is the speaker (referred to as *I*), then x will share its anchor with the discourse referent sp of the current K_{Utt}, and if it is the addressee, then x will share its anchor with the current K_{Utt}'s ad. This "alignment" between K_{Utt} and K_{Dis} will remain as it is so long as there is no tunr taking. If and when that happens in a dialogue, then, as we have seen, the anchors for sp and ad in K_{Utt} are switched. But turn taking does not affect K_{Dis}; in particular, the anchor for x remains what it was, so at this point the alignment between K_{Dis} and the current K_{Utt} has changed.

In relation to n the matter is more complicated. First trhre is the difference that n is required in the analysis of quasi any sentence, because almost every sentencw has a finite tense, and even the interpretation of those which don't will involve utterance time as a rule. So if we assume that any interpetation which invokes n also has the effect of introducing a representation of the utterance time into K_{Dis}, K_{Dis} will, in the large majority of cases, contain such a representation as soon as the first sentence of the discourse has been processed. Let us assume that this first utterance representation in K_{Dis} takes the form of the discourse referent t_o. I will assume, consistently with similar assumptions I have made earlier in this paper, that t_o is anchored to the utterance time that is involved in the interpretation which is responsible for its introduction.

In case this utterance time is that of the entire discourse D[34] and all further n-related interpretational acts that occur in the course of

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[34] There is a slight terminological ingruence in our use of the term "utterance time" in those cases where it is the time of the "utterance" of the entire discourse and

interpreting D refer to this same "global" utterance time, this is all there is to it: all later invokings of n refer to the same time and so do not require the introduction of additional utterance time representations into K_{Dis}. The matter is more complex in cases where successive interpretations in the course of processing D invoke "local" utterance times, e.g. the times of the utterances of the respective sentences containing the indexical elements which require these n-involving interpretations. In such cases each n-related interpretation involving a new utterance time will introduce a new temporal discourse referent t_i into K_{Dis}, anchored to the utterance time that is invoked by this particular interpretation. In the end, when the entire discourse has been processed and represented, K_{Dis} will contain discourse referents t_o,..., t_n for all these different utterance times, each anchored to the utterance time which occasioned its introduction. At each stage of the interpretation of D the discourse referent n of the current K_{Utt} will have the same anchor as the most recently introduced utterance-time-repesenting discourse referent t_i. Here too the alignment between K_{Utt} and K_{Dis} changes as discourse interpretation proceeds.

3.2.4 Interpretation rules.

We sum up the findings of this section by stating the interpretation principles for the indexical words I, you and now in the same way in which we did this for proper names at the end of Section 3.1.

Before we can state the interpretation rules themselves, we must be even more precise about the relationship between K_{Utt} and K_{Dis} than we have been up to now. The alignment between K_{Utt} and K_{Dis} of which we have spoken in the last section involves relations of coreference between these discourse referents on the one hand and discourse referents in the universe of K_{Dis} on the other. We have so far assumed that n, sp and ad are part of K_{Utt} from the very start, but what about corresponding discourse referents in K_{Dis}? The answer to this

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where this discourse is a conversation: It is a little odd to talk about the entire covnersation, an alternation beteen the contributions of different speakers, as a single "utterance". But this is what our terminology commits us to. This oddity has no consequences for the substance of what I have been proposing. Even so it seemed right to point out that it exists.

question which is in line with earlier assumptions is that such discourse referents are introduced into if and when expressions are interpeted whose interpretation involves one of the discourse referents of K_{Utt}. With regard to sp and ad these expressions are the pronouns I and you (as well as a nmuber of others which we will not consider here). Suppose for instance that speaker a utters a sentence containing an occurrence of *I*. Since it is a who is speaking, sp of the current K_{Utt} is anchored to a. Interpetation of the given token of *I* will now lead to the introduction of a new discourse referent x into K_{Dis} which will also be anchored to a and thus coreferential with sp of the current K_{Utt}. Likewise for occurrences of *you*. For n the issue isa little more complicated; we will turn to that presently.

The coreferentiality of x and sp of which we spoke just now is the result of their being anchored to the same individual a. It is important for us to realise, however, that this is information that is directly available to the discourse participants. (It is important for one thing because a discourse referent in K_{Dis} which is anchored to the speaker cannot serve as antecedent for a third person pronoun. For instance, when speaker a uses the pronoun *he*, the recipient b knows that a discourse referent x which represents a is excluded as anaphoric antecedent for *he*. (For more on this see Section 3.4.) This is information which interpreters use and must be able to use, and so it must be available at the level of representation.[35]

The simplest way in which we can implement this availability within the formal framework under development is in the form of an alignment relation between x and sp. More generally we assume that such referential alignments between discourse refernts in K_{Dis} and the discourse referents of K_{Utt} are bundled in what we will call the *indexical correspondence* (*of* the given articulated context[36]). The indexical correspondence takes the form of a set of ordered pairs the second

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35 The prohibition against using third person pronouns to refer to speaker or addressee is part of a larger prohibition against using third person NPs of any kind in such situations. (The prohibition is not absolute but it is very strong, not only for pronouns but also for other third person NPs.)

36 Fomally this is an addditional context component for which I did not make room in the schematic proposal of p. 7. One simple way to repair this is to make the indexical correspondence to a component of K_{Dis}. So the first component of our 5-membered articulated contexts wil now be a pair of the form $<K_{Dis}$,InCo> rather than simply K_{Dis}.

members of which are discourse referents from K_{Utt}. (At this instant, where we are still concerned just with speaker and addressee, we only consider correspondences whose second member is either sp or ad, keeping pairs where the second member is n for the next paragraph.) In texts and monologues, where there is no change of speaker or addressee throughout, the indexical correspondence is stable. It can only grow, viz when a discourse referent for speaker or addressee is inroduced into K_{Dis}. Like the indexical correspondence starts out empty, and as soon as either the speaker or addressee is mentioned, a discourse referent x representing this person is introduced into K_{Dis} and the indexical correspondence is enlarged with the pair <x,sp> or <x,ad> (as the case may be). This is not so for dialogues. Here the indexical correspondence will change with each turn, with a pair <x,sp> replaced by the pair <x,ad>, and vice versa.

With regard to the utterance time a similar distinction that needs to be made between discourses where the indexical correspondence is stable and those where it is not. As asumed above in connection with speaker and addressee, let us assume that as soon discourse interpretation involves processing of a tense, indexical temporal adverb or other expression whose interpretation involves utterance time, a discourse referent t_o is introduced into K_{Dis} to represent this (first) utterance time; and, noreover, that at the same time the pair $<t_o,n>$ is added to the indexical correspondence. (In the light of what we observed earlier,this will almost invariably happen at the very beginning of discourse processing, since (almost?) any sentence will contain a finite tense or else require the utterance time for some other reason.) If this first utterance time is construed as the utterance time of the discourse D as a whole, and this continues to be so in all subsequent invokings of the utterance time, then $<t_o,n>$ will remain part of the indexical correspondence throughout, and that is all there is to it. The matter is different when some or all of the utterance times involved in the interpretation of temporally indexical expressions are times of uterances of parts of D. For instance, consider once more the case of reported speech, where each tense is interpreted in relation to the time of the utterance of the sentence in which it occurs. Here there will be a change in the indexical correspondence with each shift of utterance time (and thus with each new sentence): each time a new utterance time representation gets introduced into K_{Dis}, and as the new discourse

referent t_{i+1} gets introduced, the old pair $<t_i,n>$ of the indexical correspondence gets replaced by $<t_{i+1},n>$.

So much about the indexical correspondence.[37] We are now ready to state the interpretation principles for *I*, *you* and *now*, though this is now little more than a dull exercise: We assume that both the K_{Utt} for the utterance that is being processed and the indexical correspondence that reflects the relation between this K_{Utt} and K_{Dis} have already been established.

Interpretation rules

1. Interpretation rule for *I*.

(i) Suppose that for some discourse refernt x in K_{Dis} the indexical correspondence contains the pair <x,sp>. Then x is used as representative of the given occurrence of I in the representation of the sentence containing this occurrence.[38]

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37 In footnote 31 (??) we noted that he prohibition against using third person pronouns to refer to speaker or addressee is part of a larger prohibition against using third person NPs of any kind. This suggests that the domain of the indexical correspondence should not be restricted to the universe of K_{Dis}, but allowed to include discourse referents from other context components than K_{Dis}, which are relevant to the interpretation of other types of NPs. (See 3.1 as well as 3.3 and 3.5 below.) For instance, it is quite common that speaker a and addressee b share a representation of one of them, say a. (Usually they will share representations for both of them) The sharing may be based on earlier encounters between them, or it may be that b knew a by hearsay even before they ever met. It is usual in such cases, moreover, that the shared knowledge includes the person's name - a's name is known not only to himself but also to b. According to the assumptions made in 3.1 this means that there will be a discourse referent z in K_{Enc} together with the condition "Name(z,N)", where N is the shared name of a. Since it is highly "marked" for someone to refer to himself or to his addressee by using his name, the normal interpretation of a use of N by either a or b will be normally interpeted as referring to some individual distinct from a. The most natural way of capturing the interpreter's tendency to take such an utterance of N as not referring to a and his ability to avoid this is to assume that the indexical correspondence includes the pair <z,sp> or <z,ad> (depending on whether n is used by a or by b). The interpeter will look for another discourse referent u which appears in K_{Enc} accompanied by the condition "Name(u,N)", or else accommodate.

38 It is not all that easy to see whether the indexical correspondence might end up containing more than one such pair. However, even if it were possible for this to

(ii) The indexical correspondence contains no pair <x,sp>. Then a new discourse referent x is introduced into K_{Dis} and this x is used as representative of the given occurrence of *I* in the representation of the sentence containing this occurrence.

2. Interpretation rule for *you*.

As in case 1, but with"sp" replaced everywhere by "ad".

3. Interpretation rule for *now*.

As in case 1, but with"sp" replaced everywhere by "n".

3.3 Demonstratives and K_{Env}.

The demonstrative expressions we will consider are (i) phrases of the forms *this* N' and *that* N', where N' is a simple or complex common noun phrase, consisting of a head noun N with or without adjoined adjectival phrases, prepositional phrases and/or relative clauses, (ii) the one word NPs *this* and *that*; and (iii) the words *here* and *there*.

As with proper names, interpretation of these expressions can be distinguished into two main cases, those where the referent is already represented withn K_{Dis}, and cases where it is not. We begin by looking at hte cases where it isn't.

This case subdivides into two subcases in its turn. the first is that where the referent is represented in K_{Env}. In the second case the referent isn't even represented there. The first of these is reminiscent of what has been said about the interpretation of proper names in 3.1. The normal use of a proper name presupposes, we said, that the name's bearer has a representation in K_{Enc}, and the interpretation then consists in identifying the referent of the given use of the name with that representation. Similarly, the interpretation of a demonstrative expression may involve selecting the relevant representation from K_{Env}

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happen, and the indexical correspondence would contain, say, two pairs <x_1,sp> and x_2,sp>, it would be immaterial which of x_1 and x_2 would be chosen for the interpretation of *I*, since both represent the same individual (viz the anchor for sp).

and identifying the demonstrative's referent as the one thus represented.

But demonstratives can also be used felicitously when their referent is not represented in any component of the context. In such cases the utterance of the demonstrative is a way of *drawing attention* to its referent. Often this is an entity in the environment in which the utterance takes place, but which the interpreter had not yet taken notice of. In such a situation the referent cannot have a representation in the given K_{Env}; for after all, K_{Env} represents information that is shared between speaker and addressee; so it would be available in particular to the latter.

In order to be able to describe more closely what goes on in cases in this kind, we must appeal to the model M which together wth the articulated context provides the setting presupposed in the account developed here. In Section 3.2 we made the assumption that the utterances which make up the discourse D under analysis are entities belonging to the actual world part of M, M_{W_O}, and that the same is true of the utterance aspects that are represented in K_{Utt}. In the same spirit we now assume that M_{W_O} also contains all the entities which are accessible in the environment in which D takes place. We refer to this part of M_{W_O} as ENV_D. In general only some of the entities in ENV_D will have been explicitly noticed by the either speaker or addressee; and in general the set of those of which it is common knowledge between the two that they have been noticed by both will be even more restricted. Thus the set of entities represented in K_{Env} will normally be a proper subset of ENV_D. In order that we can state this more accurately, let us assume that the discourse referents in the universe of K_{Env} are always anchored and that their anchors are elements of ENV_D. The proper inclusion just mentioned will then be between the set of these anchors and the set of all entities in ENV_D.

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Interpretation of a demonstrative whose referent is not represented in the context can now be described as follows. The successful use of a demonstrative requires that the interpreter arrives at a correct identification of the intended referent. This can either take the form of identification with a discourse referent in K_{Env} - that is the case we

have discussed already - or of the interpreter's attention being drawn to that entity in ENV_D to which the speaker intends to refer. In this second case a new discourse referent x is introduced into K_{Env} together with conditions which include the descriptive content of the demonstrative expression used, but possibly ohter information as well . More about that below.

Once again, in either kind of interpretation a representation of the referent is also added to K_{Dis}. When the interpretation takes the second form, then same discourse referent that is introduced into K_{Env} is also added to K_{Dis}. In the first case, where the demonstrative is interpreted by identification with a discourse referent in K_{Env}, this discourse referent is added to K_{Dis} if this hasn't been done before.

Situations where the discourse referent from K_{Env} which the interpreter takes to represent the demonstrative's referent also belongs to K_{Dis} deserve further comment. In section 3.1 I argued that normal non-discourse-initial occurrences of names can be regarded as anaphoric because their interpretation involves identification with a discourse referent that is a member of the universe of K_{Enc}. By the same token demonstratives that are interpreted in the manner just described may be considered anaphoric as well. There is however an important difference between names and demonstratives. When a name is used "anaphorically" the discourse referent which is taken to represent its bearer belongs to K_{Dis} as well as to some other context component. Demonstratives, however, also allow for anaphoric interpretations in which the antecedent discourse referent belongs only to K_{Dis}. We distinguish these two tpyes of "anaphoricity" by referring to the second type as *essential* and to the first as *inessential anaphoricity*.

We have seen, then, that demonstrative phrases allow for at least four different kinds of interpretation: two non-anaphoric ones - the one where the referent is already represented within K_{Env} and the one in which it is not - as well as inessentially and essentially anaphoric interpretations. In fact, the range of interpretational possibilities for demonstratives is even wider than that. But to discuss the additional possibilities it will be helpful to focus on the particular forms that demonstrative phrases can take. We begin with phrases of the forms *this* N' and *that* N'.

3.3.1 *this* N' and *that* N'

Before we come to the interpretation options for demonstratives which have not yet been mentioned, we will first look more closely at the ones that have been. We focus on demonstratives of the form *that* N'. (For what follows there isn't a great deal of difference between *that* N' and *this* N'; but there is some, and the discussion of the issues which are of interest at this point is simplified somewhat by restricting attention to one of them.)

We start with the case where the interpretation of the demonstrative has the effect of introducing a new discourse referent into K_{Env} (as well as, of course, into K_{Dis}). These are the uses of demonstratives which, in Kaplan's terms, involve some form of *demonstration* - some "gesture" which accompanies the use of the demonstrative phrase and serves to help the recipient in zeroing in on the referent the speaker intends. One of the puzzles connected with demonstrations - at least, it seems to me as Kaplan saw at the time when he wrote *Demonstratives* - is how they contribute to the meaning of what is said. This is a question to which I have little to say. But I am not sure how important it is. In any case, it seems to me that whatever contribution demonstrations make, it is not as constituents of the propositional content of what is said. Nor should demonstrations, I believe, be seen as constituents of what Kaplan calls character; though the upshot of this discussion, and, indeed, ultimately of this paper as a whole, may well be that the notion of character is quite limited in its scope: while it has been of inestimable value in advancing our understanding of the role that devices of direct reference play in the detemination of sentence meaning and content, and while it continues to be of use in discussions which focus exclusively on indexicals, it does not afford room to many factors that need to be taken into consideration when we turn to other referential devices.

My own preference is to take a more "pragmatic" view of the function of demonstrations. At least in the cases we are now considering - in which the intended referent belongs to ENV_D but is not represented within K_{Env} - the point of a demonstration is solely to guide the interpreter towards the referent the speaker intends. If the demonstration serves this purpose, then the result is, we already saw, a representation of what the speaker said in which the discourse referent

representing the demonstrative's referent is anchored to the same entity as the corresponding discourse referent in the representation which the speaker wanted to communicate. And so, if the interpreter's representation matches the speaker's intentions also in all other respects, it will determine the same truth conditions as the speaker's own representation.[39] All that counts, in other words, is the demonstration's effectiveness in helping the interpreter select that entity in the environment which the speaker means him to select.

I am inclined to see this selection process as separable from the actual construction of the interpreter's representation of the content of the speaker's utterance. On this view demonstrations do not enter into the actual computation of meaning from linguistic form, and the principles which govern their role in referent selection should not be seen as meaning rules (provided they do not play a role in meaning computation somewhere else).

Of course this view can be contested. And there seems to be at least one good reason for contesting it. An important factor in determining the referent of demonstratives of the form *that* N' is the descriptive content of N': The referent is presented as san entity which satisfies this description, and the search should thus be for an entity which does. Typical demonstrations, such as pointing in a certain direction, restrict the search space; and ideally demonstration and descriptive content should be matched in such a way that within this restricted search space there is exactly one entity that satisfies the descriptive content. This observation suggests that it ought to be possible to articulate the "semantics" of pointings and other types of demonstrations, which relates the restrictions which demonstrations impose on antecedently given search spaces systematically to their intrinsic physical properties (e.g. the body part - finger, arm, head,... - with which one points, the duration and stability of the pointing gesture, and so on). Such a semantics of demonstrations could then be combined with the semantics of descriptive expressions (of category N') to yield a semantics of demonstratives-cum-demonstrations, which articulates the reference of such utterance complexes in terms of (i) the form of N', (ii) the relevant properties of the demonstration; and (iii) the structure of the given environment (involving the entities it

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[39] This claim needs a lot of underpinning, which I am suppressing in this presentation. The worried reader is referred to some of the more recent DRT-literature, in particular to (Van Genabith et al., 2004).

contains, their properties and their spatial distribution, both in relation to the position of the speaker and to that of the inerpreter.

I do not know how much hope there is for such a project. I also do not know how interesting it would be. But in any case the contribution it could make to a general theory of the interpretation and meaning of utterances involving demonstratives with accompanying demonstrations is limited. For the requirement that the content of N' and the physical properties of the demonstration should jointly determine a unique element from the environment, while sufficient, is not always neccessary. Often, constraints that derive from the position which the demonstrative occupies within the uttered sentence (e.g. selectional restrictions connected with the argument position it occupies), will assist referent selection as well; in such case the joint costraints imposed by N' and the demonstration need not yield a unique satisfier, so long as the among the remaining candidates there is only one which satisfies the additional contraints.

Moreover, there are also cases where the information provided by descriptive content and demonstration is incorrect - i.e. the intended referent does not obey these constraints - but where the interpreter succeeds nevetheless in selecting this referent. The celebrated instances of this phenomenon are the "referential uses" of definite descriptions first brought up by Donnellan (Donnellan, 1968, ..?). The examples that he and many others after him have discussed concern definite descriptions; but it is plain that the same thing is also true for the complex demonstrative phrases we are currently discussing. (To take just one of them, the one where you tell me at a party "The man in the opposite corner with a martini in his hand is a famous philosopher.", but where the man in question is actually holding a glass of water: You might just as well have said: "That man in the corner with a martini in his hand.", with or without pointing in his direction. Successful referent selection would have been just as likely in the one case as in the other.)

The existence of cases where it is not the content of N' but the demonstration that is at fault, e.g. because the speaker points in the wrong direction (the referent he intends is not located within the spatial sector that his pointing indicates) is more difficult to prove, precisely because there is no well-defined theory of how pointing demarcates space on which the argument could rely. Yet it is hard to

believe that there are no such cases, especially when the descriptive content gives enough information for the selection (possibly in combination with other contextual factors), a misdirected pointing may be taken for what it is, and ignored accordingly.

These considerations make me doubt that in the theory of linguistic meaning a semantics of demonstrations could play more than a peripheral role. Nevertheless, what remains important for our considerations here is that demonstrations are used to make sure that the interpreter will be led to the intended referent. They are an impotant means for providing the interpreter with the clues he needs. But they are only one device among several. I leave the enterprise of spelling out the details of how this particular device makes its contrbutions to whoever feels inclined and able to do so.

So far in this section I have confined attention to the cases where the intended refernt is not yet represented within K_{Env}. However, the other non-anaphoric case, where K_{Env} does contain a representation of the referent but this repesentation does not belong to K_{Env}, is, from the point of the present discussion, very similar. The difference between the two cases is that in the one considered up to now the speaker assumes that his addressee may not yet be aware of the entity he refers to; so it is essential to enable the addressee to establish contact with this element in his environment. In the other case it is common knowledge between speaker and addressee that the addressee has registered the referent n less than the speaker. This may make it easier to get the addressee to focus on this entity as the referent of the demonstrative the speaker uses. For one thing, if the interpreter can be trusted to look for a referent first among the entities for which he has a representation already (i.e. those of which he is aware, all the information he will need is to make a unique selection among those. Under such circumstances a simpler, less expressive N' might do than would have been the case otherwise; or perhaps it is possible to make do without ann accompanying demonstration. Relying on such assumptions, however, is in general quite delicate and risky, and so speakers do not, if I am right, distinguish in their use of demonstraive expressions and demonstrations much between the caes where they assue that the addressee'has already noticed the referent and those where they assume he has not.

By itself this is not particularly interesting. But the matter is of some importance in connection with the interpretational options for demonstratives which have not yet been mentioned. To what extent it is right to speak of additional options here depends partly on another question: What exactly should be consider part of the "environment"? i have not been very articulate about this, and suggested merely that in face to face communication the speaker and his adressee are normally in a sitution where they both have access to certain objects, for instance through sight. This leaves many questions of detail unanswered. for instance, how well must an entity be accessible in order to count as part of the environment? Must it be immediately accessible, in the sense that it can be perceived without any preparatory movement, such as turning one's head, looking around a corner, removing a curtain or opening a drawer, or are some forms of preparatory movement admitted? And what of entities which have only just left the scene, such as the bird which a moment ago was still sitting in front of the window (and in plain view), but which has just flown away and is no longer visible - whether or not the discourse participants remain motionless in their seats, turn their heads or even get up and step outside?

Since I have isolated K_{Env} as a separate component of he context, I owe an answer to any of these questions. But this is a debt which I won't discharge in this paper. This is one of the reasons why the preent proposal is only a sketch, which will need filling out eventually. The problem to which these questions point can be rephrased as that of drawing boundaries between the different context components, or, put in yet another way, providing clearer and more explicit critieria for what information goes into which. The boundary that is directly relevant for the present discussion is that between K_{Env} and K_{Enc}. Take for instance the bird that has just flown off. I raised the question whether it should be assumed that it still has a representation within K_{Env}. We can supplement that question with a second one: Does the bird have a representation within K_{Enc}; and in particular, should we assume that in virtue of its flying away its representation has been shifted from K_{Env} to K_{Enc}?

I have rephrased the problem in this way because I want to make it an axiom connected with the notion of context we are developing that all information which intuition tells us does belong to the common ground

is represented in at least one of the context's components. The question that then needs to be answered is what goes where.

It seems to me that there is some leaway in how to deal with this question. For instance, I myself have no clear intuitions about the case of the bird. I can well imagine that there are pertinent considerations for resolving this particular case one way or for resolving it another, and this will prove true also for other cases that are prima facie controversial. But the matter will have to be left for further exploration and reflection.

One thing that does seem clear to me, however, is that there are cases which clearly do involve a transfer from K_{Env} to K_{Enc}. Suppose you and I are talking to each other in the place where we both work. A week ago, when I visited you at home and we were sitting in your living room, a bird flew against the window and broke its neck. We were both quite upset - especially since you had taken various precautions to prevent this from happening - and so the bird is still present in our awareness today and each of us rightly assumes that this is so for other no less than for himself. So the bird and its unhappy end are still part of our common ground Of course this was also true a the time when the accident happened; moreover, according to what that has been said in this paper about K_{Env}, the bird was part of that earlier common ground via a representation belonging to its K_{Env} component. But now, a week later and in a different place, it seems, again in the light of what has been said about K_{Env}, exceedingly implausible that its representation still belongs to that context component. It seems much more natural to say that the bird has become an item of our shared encyclopaedic knowledge. At any rate, that is where I postulate that knowledge which continues to be shared, but which no longer qualifies as knowledge about the environment of the conversation ends up.[40]

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40 In the light of this stipulation the term "encyclopaedic knowledge" (of which the "Enc" of K_{Enc} was said to be an abbreviation may seem to be somewhat of a misnomer.: Isn't it a bit odd to refer to the nowledge about the unfortunate bird which may be privy t just you and me, as "encyclopaedic"? Here I can do no better than admit that I could n ot think of a better name. But the intention behind the concept of K_{Enc} should be clear nonetrheless: Each one of us carries with him a huge "library" of representations of entities with which he has become acquainted in one way or another. some of these are public figures, cities etc, which would deserve a place in any typical encyclopaedia. But there also lots of items - presumably the vast majority - that can lay no such claim to fame. They include our freinds and relatives (not all of whom, it may be assumed, deserve encyclopaedic immortality), the

Somewhere along the line, be it for change of place or passage of time, the bird's representation mut have migrated from K_{Env} to K_{Enc}.[41]

The reason for dwelling on this case is that it shows not only that a reasonable construal of the distinction between K_{Env} and K_{Enc} must allow for shifts from the first to the second, but also a second point: Demonstrative phrases - and this is true in particular of the demonstrative NPs *that* N'considered in this section - can be used to refer not only to entities represented in K_{Env} or K_{Dis}, but also to entities represented (exclusively) in K_{Enc}. For instance, it is perfectly natural for you to initiate our conversation at work with the words: "You remember that bird that flew against the window of my living room the other day." The direct object of the sentence you have used is a demontstrative of the form that N'. And its use is legitimate because the intended referent is represented in the K_{Enc} of our common ground (as it exists even before a word has passed between us.

Nor is it necessary for the referent of a demonstrative to have been represented as part of the common ground of speaker and recipient at any previous time. I could strike up a conversation with you by something like "They just discharged that man who some years ago claimed he had proved the inconsistency of arithmetic and then shot a colleague who had taken the trouble to go through the proof and told him he thought there was a mistake." Suppose that this is a person

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furniture in my house, tools and apppliances such as my lap top and my toothbrush, and so forth and so on. Given any group of two or more people the items that count as part of their common ground will in general form but a small subset of the entity library of each individual member. But neverthless, so long as the group and cohesive, it too will typically contain many items that no encyclopaedia would feel called on to mention. "encyclopaedic" in the sense intended here should not be equated with "of wide or general interest".

41 The reader may have baulked at my use of the verb "migrate" (and similar formulations earlier on). for nothing that I have so far said excludes the possibility that the representation of the bird was part of K_{Enc} from the very beginning (so that at the outset, when it crashed against the window, it as a constituent of both K_{Env} and K_{Enc}). In fact, although I have been arguing from the premise that this is not so, I have no very strong arguments for excluding this possibility. This is another loose end of hte proposal in its present form. Those who incline in the oppopsite direction from mine, would have to describe the csae differently, saying that at some point the bird's represenation disappears from K_{Env} and survives solely as part of K_{Enc}. However, the essence of the issue remains irrespective; moreover, for the second point, discussed in the next few paragraphs, the difference beween these two descriptions of the case is irrelevant.

neither of us ever knew personally. Suppose also that his case captured the headlines for so long, and it made such an impact on the professional community, that it is reasinable for me to assume that my knolwedge of it continues to be shared by you. Finally, suppose that I am right in this assumption. Then my use of the demonstrative phrase with which I refer to the man will be a legitimate one; and if you catch on to who it is I am talking about, connecting my demonstrative with the representation of him which you have retained from the time when his case hit the news, then my use will also have been sucessful.

Between them the various uses of *that* N'-demonstratives we have looked at show that they can exploit nearly any part of the context. They can draw their referents from K_{Env}, K_{Enc} and K_{Dis}, and it should be remembered in this connection that of the remaining two components, K_{Utt} and K_{Gen}, K_{Gen}, as repository of various law-like generalisations, doesn't make available any discourse referents and of the three discourse referents of K_{Utt} sp and ad can be realised only by the special indexical expressions *I* and *you*, whereas n is realised by indexical temporal adverbs and the tenses.

Of special interest is the fact (also noted before) that demonstratives can "pick up" discourse referents that belong to K_{Dis} while not belonging to any other component of the context. In the terminology we introduced esarlier, demonstratives allow for *purely anaphoric* uses. It is worth pointing out that with this option carries comes the possibility of using demonstratives in linguistic contexts where the contribution they make to the truth conditions of the sentences containing them is not that of referring expressions but rather that of a bound variable. An example - for a demonstrative of the form considered in this section, is (4)

(4) Whenever a Texan steals the cattle of some other Texan, then that other Texan will be very cross.

The explanation of this last possibility has been perceived as one of the original selling points of DRT, and I still believe that it is right: cases where an anaphoric expression appears to function as a bound variable are cases where its anaphoric antecedent is a discourse referent that belongs to the universe of a "local", logically embedded discourse context, which is "accessible" from the position of the anaphoric expression. Usually such embedded contexts are made available by

parts of the very sentence in which the anaphoric expression occurs (as we see in (4)). Since the discourse referents belonging to the universes of embedded contexts have bound variable interpretations, we get the same effect for the expressions that are interpreted as an anaphoric to them. (Without some knowledge of DRT this paragraph is not really understandable. But the matter is fully described in the DRT-literature. The details can be found e.g. in (Kamp & Reyle, 1993, Ch.2.).)

Demonstrative NPs share their versatility with two other types of noun phrases, viz. pronouns and definite descriptions. Nevertheless, each of these three types functions according to its own rules, and one of the important issues for the semantics and pragmatics of English NPs is how they divide the broad territory of contextual resources between them. In view of the wide range of different possible uses of demonstratives we postpone a presentation of their different

We will consider pronouns in section 3.4 and have a first look at definite descriptions in 3.5. It is only at that point that we will be in a position to say something about this issue. In the remainder of the present section we consider three other types of demonstratives I have announced we would take a look at, (i) complex demonstratives of the form this N'; (ii) the simple demonstratives *this* and *that*, and (iii) the spatial adverbs *here* and *there*.

3.3.2 *this* N', *this* and *that*.

There is not much to say about *this* N' as opposed to *that* N'. There is a general tendency for *this* to be used to refer to things near to the speaker and *that* to refer to things farther away. But in contemporary English this isn't more than a tendency. Even when I say *this man* when pointing at a man at some distance and follow up immediately by saying *that man* while pointing standing right next to us, what I do isn't a violation of the rules of grammar. Rather, my use of *this* and *that* suggests that I consider the man referred to as *this man* as "nearer" in some sense than the one referred to as *that man*. Often this sense is a topographical one, but it seems that in principle any kind of salience or relevance ordering can provide a basis for the *this-that* opposition. For the interpreter of a demonstrative NP containing either *this* or *that* the

choice of determiner will serve as an indication that the speaker sees teh referent as high or low on some literal or metaphorical nearness scale. And this in turn makes it possible for the speaker to impose a kind of "salience complexion" on the referent through his choice of *this* or *that*.

It has often been suggested that salience in discourse correlates strongly with recency. For instance, it has been proposed that anaphoric pronouns select among the possible antecedents that are compatible with their constraints (e.g. male person for English *he*) the most salient one and that in practice this usually comes to the same thing as the one most recently mentioned. A reflection of this intuition is the slight preference that appears to exist for using *this* N' rather than *that* N' when referring to a newly introduced satisfier of N'. But even this is not an binding rule.[42]

About the English one word NPs *this* and *that* little needs to be said beyond that which transfers straightforwardly from the discussion of complex demonstratives. There are a couple of idiosyncrasies, though,

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[42] Another feature of the demonstrative phrases *this* N' and *that* N' is a presupposition to the effect that there are other satisfiers of N' besides the demonstrative's referent. This effect is especially prominent when *this* or t*hat* receives focal stress. In view of the general theory of the smeantics and pragmatics of focus, according to which the focus domain of an expression with focal stress contains at least one other entity besides the referent of the focussed expression itself. (Worth observing, though, is that stressed use of *this* and *that* is possible at all, with the just described semantic effect, whereas stressed use of the definite article the is possible only in correction-like cases where "*THE* N' " means something like "the unique N', not one N' out of several". The explanation of this difference is, I take it, that singular *the* implies uniqueness. This prevents stressed *the* from signifying that the referent (of the definite description of which it is the determiner) contrasts with some other satisfier of the descriptive content of the description, as that would contadict the uniqueness presupposition. It is enough that the demonstratives *this* N' and *that* N' do not carry such an implication to account for the effect that with them stress can be given the contrastive interpretation we have noted.

With unstressed demonstratives the presupposition appears to be quite weak, When the demonstrative is used deictically, it does not seem to be there at all and with anaphoric uses it is hard to tell, since the presuppositon need not entail that there are other satisfiers within the discourse context, but only that there are others "at large". In general such a presupposition is extremely weak, especially since the descriptive content of anaphorically used demonstratives tends to be quite unspecific.

I leave the question whether and in what sense demonstratives carry a non-uniqueness presupposition for further investigation.

which should be mentiond. First, the NPs always refer to something inanimate- this is true both of their deictic and their anaphoric uses. In addition, the anaphoric uses of the simple NPs *this* and *that* have the curious further constraint that their referents should be abstract entities, such as facts or propositions. Thus compare the two sentence discourses (8.a,b). Clearly *this one* in (8.b) refers to the new cook, whereas this in (8.a) can only be understood as referring to the fact that she had hired another cook.

(8) a. Then she hired another cook.
This I couldn't understand at all.

b. Then she hired another cook.
This one I couldn't understand at all.

The closest one can get in English a plain *this* or *that* when referring deictically to an animate individual or to any kind of individual anaphorically are the NPs *this one* and *that one*, where one functios as a "general pronoun", i.e. as an expression that is anaphoric to a simple or complex noun. These observations are evidently neither very deep nor very general. But they illustrate a general point that is of some importance. Exactly how the various definite NPs of a language work and how they divide the various referential possibilities that our present notion of articulated context enables us to distinguish belongs to the idiosyncrasies of individual languages. Even languages where there is as much similarity between the overall structure and function of NPs as there is between, say, English and German, may differ considerably in the details of how form maps onto function, or range of functions.

3.3.3 *here* and *there*.

The demonstratives this (N') and that (N') have an indexical aspect insofar as this conveys proximity to the speaker while that carries the opposite, "distal" connotation. But as we have seen, these effects are very weak; and of course, the spatial connotation is often entirely absent in the anaphoric uses of these demonstratives. With *here* and *there* the indexical component is stronger. This should not be surprising as the basic semantic function of these words is to refer to parts of space in the first place. In fact, it has been suggested that *here*

is an indexical with equal rights as *now*: Just as *now* is used to refer to the utterance time, *here* is used to the utterance location.

There is surely something to this claim: *here can* be used to refer to the location where the utterance takes place of which it is a part. But it certainly isn't always used this way. And it should be emphasised how freely the word can be used to refer to places other than the place of utterance. In this respect *here* appears to be even more flexible than *now*. *now*, we noted in passing in Section 1, can be used to refer to times that differ from the utterance time, but this always involves some kind of perspectival shift. A first difference between *here* and *now* has to do with the fact that places can be literally pointed at, whereas this is not possible for times. I can use *here* while pointing at a place that is not only distinct from my own location (and thus from the location of my utterance), but may in fact be quite far away. (For instance, I can point at a point on a map and say "Here is where I was born.", although this is a place in a distant country from the one in which the conversation takes place.)

Of course, the possibility of pointing at places in a literal way doesn't *entail* that *here* can be used in this deictic manner. But it is also clear that the use does presupposes this possibility, and for times that presupposition fails. So this is need not be a linguistic difference between *here* and *now*. However,*here* also allows, like *now,* for anaphoric uses, and here we find differences that cannot be explained in extralinguistic terms. In (9.a,b) we see anaphoric uses of both *here* and *now*.

(9) a. Since we couldn't find any rooms, we moved on to the next town.
But **here** there weren't any inns or boarding houses at all.

b. ? Since we couldn't find any rooms, we moved on to the next town.
But **now** we couldn't find any inns or boarding houses at all.

(9.a), with *here* referring to the town the protagonists have moved to, seems to me perfectly natural; and there appears to be some difference with (9.b), where the use of *now* as referring to the time when they

have reached the new town, strikes me as slightly marked. Still the difference is minor at best.

It is not straightforward to obtain quantificational readings for either *now* or *here*. One type of construction which allows for quantificational construals of *here* are "modal subordination" cases such as that of (10.a). Interestingly, however, the "bound variable use of here in (10.a) does not seem to be matched by the possibility of such an interpetation of now in the closely similar (10.b): At least for me (10.b) is quite bad.

(10) a. As a rule, when we could not find rooms in the town where we had planned to spend the night, we just moved on to the next one.
But often we wouldn't be able to find rooms here either.

b. ?? As a rule, when we could not find rooms in the town where we had planned to spend the night, we just moved on to the next one
But often we wouldn't be able to find rooms now either.

A similar difference can be observed for sentences in which the quantification is expressed sentence-internally, as in (11), a "bound variable" reading appers to be no better for *here* than it is for *now*:

(11) a. ? Usually when we moved on to the next town in order to find accommodation, there were no free rooms here either.

b. ?* Usually when we moved on to the next town in order to find accommodation, we couldn't find any free rooms now either.

As far as these examples are concerned, here seems to be more like demonstratives of the form *this/that* N' than like now. Like the *this/that* demonstratives the word *here* seems to allow for genuinely anaphoric uses, where the discourse referent serving as antecedent is not only an exclusive element of K_{Dis}, but where it can even be a member of a sub-ordinate universe. A more comprehensive investigation of the data is necessary, however, before the range of interpretational possibilities for *here* can be firmly assessed.

There is a second point connected with the semantics of *here* . This pointwas mentioned already in Section 3.2, but discussion was postponed. But this is as good a time for it as any. At issue are form and content of K_{Utt}. I stipulated in 3.2 that the universe of K_{Utt} consists of maxiammly three elements, sp, n and, when defined, ad. The question is, why stop at just these three elements and not include also, for instance, a representation for the place of the utterance? Why should K_{Utt} have a representation for the utterance time (n), but none for its location?

I do not have what I think of myself as a conclusive answer to this question. Moreover, this paper is not the optimal place for explaining my reason for this particular choice (such as they are), since it has to do with the distinction between *de re* and *de se* which is not reflected in the formal set-up which I have adopted here. To put the matter succinctly: utterance time, speaker and addressee have been chosen as the only entities to be represented within sp, ad and n have been chosen as the only members of K_{Utt} because I believe that they are the only entities which play an unequivocally *de se* role in the understaning of either in that of the speaker or in that of the addressee or in that of both: The speaker has a *de se* repesentation of himself, i.e. of the individual represented by sp, the addressee has such a representation of the individual represented by ad, and both have a de se-like, non-external representation of the utterance time (the psychological "now", as it is sometimes described). I am inclined to think that there are other entities besides of which we can have direct, non-external representations, viz. our own feelings and thoughts and perhaps also certain actions which we ourselves perform; these are directly accessible to us insofar as we experience ourselves as performing them - we do not need to observe ourselves as doing these things form the outside to know that we are performing them. The utterances we make are among these, so long as we do not describe them in success-related terms.[43] These entities, however, are not needed as referents for indexical expressions. On the other hand, entities that are relevant as referents of indexical expressions, but

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43 As a rule we need to observe the external world in order to determine whether an action with a certain goal was indeed successful. this in turn may determine whether I can describe my actions in success-related terms. For instance, I may be trying to inform someone about my arrival (e.g. by sending her an e-mail. I know - directly - what it is I am trying to do. But I do not know whether I have informed the person without finding out whether my message reached her.

different from the three I admitted to K_{Utt} do not, as far as I can see qualify as represented de se. I believe this is so in particular for what I have been referring to as the "utterance location". Among the representations of places you may have at any one time there is in particular that of the place you are currently occupying. (I am abstracting away at this point from the difficult question how far this place extends in various directions.) But I do not think that our representations of this place are non-external in the same as the de se representation I have of myself and my representation of the psychological present. Rather my representation of the "psychological here" is just as I have described it, viz. as the place I am now occupying. In other words, my representation of this place is, I assume, essentially like my representation of my mother or my bicycle - representations which relate the represented entity in some unique descriptive manner to myself - more precisely: to my *de se* representation of myself - backed up by the *de re* representations which I have of them as external individuals with which I am acquainted.

If the utterance location is not represented as part of K_{Utt}, then, clearly, it should be seen as represented within K_{Env}. It follows from what has been suggested here that the discourse referent representing the utterance location should be accompanied by a condtion to the effect that what it represents is the location of the utterance, or perhaps that of the speaker. However, this isn't saying very much so long as we aren't more specific about what actual constraint this condition imposes. I already indicated that what should be understood by "the utterance location" is vague. We are running up against much the same problem here as we noted in Section 3.2 with regard to n and *now*. However, it seems even more difficult to say anything of substance with regard to the ways in which we resolve or reduce the vagueness of the utterance location" in context than in connection with the utterance time. For one thing there is the uncertainty, already noted, whether the utterance location should be identified with the location of the speaker, or whether it should be thought of as a place which includes both speaker and addressee(s). The question whether the addressees should be included too seems to depend in part on far they are from the speaker: If the distance is very large, then including the addressees makes more of a difference, but at the same time their inclusion seems less compelling. This is so especially where communication is not face to face, and even more so when the speaker does not quite know where his addressees are.

These are imponderabilia just pertaining to the utterance location itself. In addition there is the question how the utterance location relates to the denotation of here. In connection with n and *now* I argued that the two - the time represented by n and the denotation of now - do not always coincide but that we can assume as a general principle only that the former is included in the latter. I would argue that the relation between the utterance location and the denotation of *here* is similarly underspecified. And in addition there are the uses of *here* where it does not refer to a location including the utterance location (in any of the possible interpretations of that notion), and which as we have seen are even more freely available than corresponding uses of *now.*

Here contrasts with *there* in much the same way that *this* contrasts with *that*. But the contrast seems to be stronger. For one thing, there simply cannot be used to refer to the location of the speaker (or uterance) itself. Moreover, it is odd to say "there" while pointing to a place close to me and in the same breath "here" while pointing to a place far away. (Though even such uses of *here* and *there* may be justified in special contexts.) A similar constraint obtains when *here* and *there* are used to refer to parts of a discourse or text. For instance, suppose that in a paper I refer back to an earlier section. I might then continue with some such words as "There - referrring to the earlier section - I argued for proposal I. Here - referring to the current passage - I want to reconsider the matter once more." Interchanging *here* and *there* is out of the question in this case. Also, referring to a recent section with there, while referring to one before that with here is marked, if once again it is perhaps not altogether impossible.

3.4 Pronouns.

I will make this a brief section - not because there isn't much to say about pronouns, nor because there isn't much that can be said about them within the present framework, but because so much has been said about pronouns already, within other frameworks and also within DRT. Within DRT, pronouns have been a focus of attention from the beginning, since they are crucially involved in the processes of discourse anaphora which were the central concern of the DRT enterprise when it started. Although the early DRT treatments of

pronouns leave much to be desired from an empricial perspective, there has been a good deal of more recent work which has improved substantially on the original DRT treatments, taking into account also other approaches, such as E-type treatments (Heim, 1990) and insights from approaches within AI ((e.g. Centering Theory, Gross et al. 1996).

There is neither room for nor sense in rehearsing all this literature here, let alone for trying to improve on it. At least this is so for the anaphoric uses of pronouns, which were the only uses with which classical DRT and other forms of Dynamic were equipped to say something of interest about. For as far as these uses are concerned there is not significant difference between earlier versions of DRT and the one presented here. Anaphoric pronouns are - this is now a matter of definition! - pronouns which get their interpetattion via the discourse context K_{Dis}, and this is precisely the one component of the context which has remained as it was.

The matter is different for the deictic uses of pronouns. These uses are much like the deicitc uses of demonstratives: A given pronoun utterance succeeds in referring by virtue of establishing conteact with an entity from the environment ENV_D, either by drawing attention to a new entity, which had not yet been represented within K_{Env}, or by picking up one that is already represented there. Again, in the first case a new representation is introduced into both K_{Env} and K_{Dis}. In the second case, where the referent is already represented within K_{Env}, only addition to may be required. However - this is a point that might already have been made in connection with *this*- and *that*-demonstratives in section 3.3 - there may be cases where the referent is already represented not only in K_{Env} but also in K_{Dis}. In a case of this kind the pronoun would qualify formally as used anaphorically. But nevertheless some of these do not feel like anaphoric uses at all. They are cases where the last mention of the referent lies too far back for the pronoun to have access to its representation withn K_{Dis}. It may then be possible to use the pronoun to refer to the referent nonetheless, by exploiting its deictic possiblities once again. And of course there will also be cases where there is a kind of overdetermination - where the speaker points at the referent in his environment while using hte pronoun, but where its representration within K_{Dis} would have been salient enough to permit a purely anaphoric interpretation.

3.4 Definite Descriptions.

Some of the things I said in the last section about pronouns applies equally to definite descriptions. They too have been the subject of an extensive literature - far too much of it to permit an even halfway asequate review here - and here too the treatment I favour myself has been presented elsewhere. ([Importance of Presupposition],Van Gen et al.) Nevertheless, in a review of the different types of English NPs they could not be omitted. In fact, omitting them would be quite unthinkable precisely because of the prominent part they have played in the theory of reference ever since it came to be grounded in formal logic. So there is nothing for it than to repeat, in most of what I will be saying in this section what I have said elsewhere, often on more than one occasion.

From a historical point of view the analysis of definite descriptions holds a particular interest in conjunction with the analysis of definite descriptions. For much of this history descriptions were treated as expressions which refer properly by virtue of unique satisfaction of their descriptive content. The major controversy during this time concerned the question whether this requirement of unique satisfaction was a presupposition (the view reluctantly held by Frege) or a normal ingredent of propositonal content, as in Russell's Theory of Descriptions. But different as these two positions may appear in substance as well as in their logical and methodological implications, on the point that unique satsifaction is essential to the way in which definite descriptions work they are in complete agreement. In this respect they form, it was widely held, a striking contrast with pronouns (in particular, the third person singular pronouns of which we spoke in Section 3.4). The perception could not have been expressed more forcefully than in Quine's famous dictum that "pronouns are the variables of ordinary language". As Quine saw it, a pronoun can be "bound" by non-referential as well as by referential "antecedents", and when the antecedent is not referential, but quantificational, then the effect of binding is that the pronoun acts as a token of the variable bound by the quantifier which occupies an argument position of some predicate.

On such a view, definite descriptions and pronouns are devices of reference that function in ways that are about as different from each other as can be. To someone looking at the ways in which pronouns and definte descriptions are typically used in ordinary writing and speech this should be surprising, for in lots of situations pronouns and descsrptions appear to be doing very much the same thing. Which writer, of however humble a text, doesn't know how hard it often is to choose between a pronoun and a description. Quite often either could be used in principle; in such situations one might opt for the description for the sake of greater explicitness, or to avoid a potential ambiguity, or one might choose the pronoun because it seems to produce smoother and less pretentious prose. But as far as the primary content is concerned that one wants to express one will be as good as the other.

This second perspecive is much in the spirit of the dynamic approaches to meaning for which the foundations were laid in the late sevventies and eary eighties. In these theories, which emphasise the anaphoric uses of NPs and more particularly their cross-sentential anaphoric uses, the function of a great many of the definite descriptions one finds in texts appear only slightly different from the standard use of pronouns in texts. Both types of expressions serve to pick up anaphoric antecedents, in for both the antecedent can be non-referential as well as referential. As a consequence, definite descriptions can play the role of bound variables no less than pronouns. (Replace e.g. *that other Texan* in (?) by *the second Texan* or *the victim*.) The diffference between definite descriptions and pronouns in such contexts, one is inclined to say, is no more than that the normally more explicit descriptive conent of definite descriptions makes it easier to select the intended antecedent from among the possible candidates. (the descriptive content of pronouns being next to null, altho9ugh there is some: the pronoun *he* can only refer to something that counts as animate and male, and similarly for *she* and *it*.) From this perspective the advantage of definite descriptions over pronouns would be comparable to that of a deictically used demonstratives accompanied by an explicit and accurate pointing over one where the pointing is sloppy and vague.

However, this is no more than informal speculation, and we have learned over the years how often it seems possible to accounbt for the

same semantic or pragmatic effect in more than one way. This is true for the function of pronouns and descriptions no less than for a great man others. So, it could well be that the traditional view isn't as wrong as all that, notwithstanding the similarity that there appears to be between pronouns and descriptions in certain contexts.

This is roughly the line I want to take. I will adopt a view of the role of descriptions which might be called "ne-classical" in that it is based on the principüle of unique satisfaction which has been so prominent throughout. That is what makes the account "classical". What makes it "*neo*-classical is that the descriptive content that must be instantiated uniquely consists not just of the descriptive part of the definite description itself, but is reinforced by an additional predicate C which has to be determined on the basis of the context. In this regard the definite determiner *the* is assumed to be like strong quantifying determiners such as every or most, of which it is now a comon asumption too that they are typically subject to contextual restrictions.

This parallel between descriptions and quantifiers might suggest a Russellian analysis. However, I follow the by now well-established linguistic tradition according to which definite descriptions, like all other definite NPs, are presuppositional. But there is nevertheless an important difference between the presuppositions of definite descriptions (acording to the present proposal) and those of other definite NPs. The presuppositions of other definite NPs - those which were surveyed in the preceding sections - are *referential* in the following sense: The referent of the NP must be available in one of the components of the context (or, in the case of deictic demonstratives at least potentially available by being perceptually accessible).[44] But the presuppositions of definite descriptions are propositional. Inasmuch as definite descriptions can be used "anaphorically" - and we just noted in

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44 In [Van Gen. et al.] a distinction is made between *anaphoric* presuppositions and *propositional* presuppositions. The former contain an "anaphoric" discourse referent, for which an antecedent must be found in the context, the latter do not. The referential presupositions spoken of here are much like the anaphoric presuppositions of [], an that they also contain a distinguished discourse referent which must be connected with some element of the context. (I ma omitting the formal details here.) I am using the term "referential" here to refer to such presuppositions, because I am using the term "anaphoric" exclusively for those cases where this element must belong to K_{Dis}. (In fact, the accommodation problem with the earlier versions of DRT can be said to arise precisely because all definites were treated as coming not just with a referential but with an anaphori presupposition.

connection with the dynamic approach that often this seems to be the case - this is because it is the resolution of the predicate C which can take on an anaphoric character.

Since it is the quantificational structure of the existence-and-uniqueness presupposition of a definite description which gives rise to the predicate C and the presuppositional resolution requirement connected with it, the presuposition on C stands in the same relation to the existnece-and-uniqueness presupposition as that presupposition stands to the content of the sentence in which the definite description occurs. Withjin the representational setting of this paper this "presupposition-assertion" connection, as it is sometimes called, is represented as a connection between the representation of the presupposition and that of the "assertion" (more generally, since not only assertions carry presuppostions, but other kinds of speech acts as well, the representation of the "non-presupositional part"). Since a given non-presuppositional part often gives rise to several presuppositions, the relation is in geenral one between representations (of the non-presuppositional part) and sets of representations (of presuppositions). Since the presuppositions of a given representation are logically prior to it - only when the presuppositions have been justified or resolved can the latter representation be regarded as having a properly defined content - we place the set of presuppositions to the left of the represesentation whose presuppositions they are. We take the left-right order as indicative that the set on the left and the representation on the right stand in the presupposition relation. Schematically we get the following basic arrangement:

(12) $\langle\{K^1Pr, .., K^nPr\}, K_{non\text{-}Pr}\rangle$

However, this only covers the simplest case. As I already implied, even the simplest definite descriptions already require a more complicated structure, since the presupposition on C is "presupposed by the existence-and-uniqueness presupposition. For instance, the preliminary[45] representation of (13.a) is that given in (13.b)

(13) a. The president prays.

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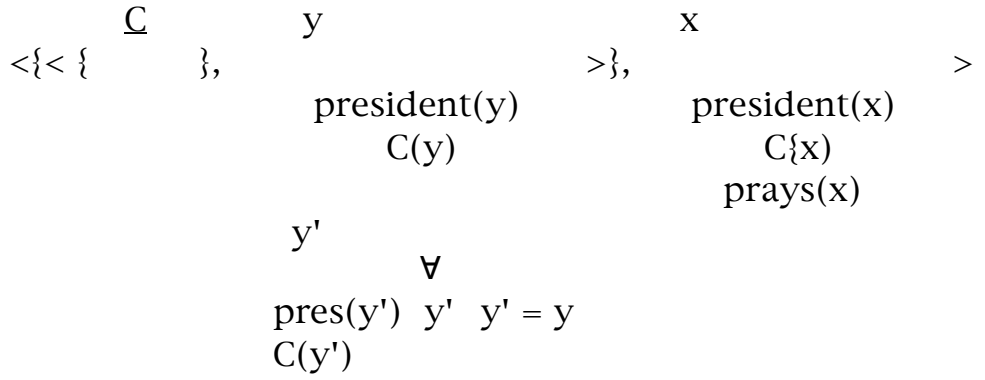
45 Preliminary representations are sentence representations in which the presuppositions are explicitly represented. Resolution and justification of the presuppositions turn prelimionary representations into definiteve representations, which take the form of DRSs.

b.



Here the structure within the outer curly brackets is the existence-and-uniqueness presupposition triggered by the president. The existence and uniqueness conditions, for a condition in which the descriptive contnt "president(y)" is reinforced with the contextual constraint "C(y)", is in its turn prceded by the referntial presupposition on C. (The occurrence of C in the universe of this presupposition is underlined to indicate that presuppossition justification must provide a "value" for C, i. e. identify a prediate in the context with which C cn be identified. (It is in such cases, where the presupposition is referential, that I often speak of presupposition "resolution" rather than presupposition justification.)

The existence-and-uniqueness presupposition has the status of a proposition. Justifying the presupposition amounts to showing that this proposition is entailed by the context (once the anaphoric C has been resolved). In case the presupposition is justified, it is the unique satisfier of the reinforced descriptive content which is the referent of the description. So the discourse referent x which stands for this referent in the non-presuppositional part of the representation (the DRS on the right in (13.b)) must specify this referent as satisfying both the condition "president(x)" from the descriptive part of the descrpition itself and the condition "C(x)" from the contextual reinforcement.

I said that the existence-and-uniqueness presupposition should be justified "in the context". In the earlier versions of this proposal I cited above this formulation sufficed since the context was assumed to have just one component. But with regard to the articulated contexts we are

using here, the same question arises that we have had to ask for all other types of definite NPs too: In which component of the context should the presupposition be justified? (Or in other words: Which component of the context should entail it?)

In this regard definite descriptions are remarkably unselective. Any component of our articulated contexts may be involved in the justification of their presuppositions and thereby in the determination of what they refer to. In order to by more precise on this point it is useful to distinguish between the existence and the uniqueness part of the presuppositions to which they give rise. So we will speak from now on about two presuppositions associated with definite descriptions: (i) the "existence" presupposition, to the effect that there is something which satisfies the (reinforced) descriptive content, and (ii) the uniqueness presupposition, to the effect that this satisfier is the only one. It is in the nature of the kind of information needed to justify these respective presuppositions on the one hand and the structure of the different context components on the other which components are useful for jsutifying which presuppositions. Establishing uniqueness often depends on strict or defeasible generalisations and these are to be found primarily in K_{Gen}. So justification of uniqueness will often involve K_{Gen}. Contextual justification of uniqueness, on the other hand, will often involve the other context components, since it is in these that we find the representations of particular individuals whose existence is common knowledge.

It must be emphasised, though, that justifications of existence can depend on general knowledge no less than justification of uniqueness. In fact, this seems to be an assumption implicit in many of the early discussions of definite descriptions, where examples like *the centre of the earth*, *the midpoint between two points A and B*, *the least common multiple* etc. play a prominent part. For descriptions like these our conviction that they refer properly - i. e. that both uniqueness *and* existence presupposition are jusdtified - is based entirely on general knowledge (in this case about the relevant part of mathematics.

Definite descriptions of this type may seem to be very different from those which are used to refer to some entity that has already been introduced into the discourse or belongs to the common ground from the start. These latter uses often compete with pronouns and demonstratives for the same "anaphoric" referents. It is they which

seem to support the view that the common denominator of all uses of descriptions is not so much unique satisfaction of a descriptive content, but *familarity of the referent*. (In fact, familiarity is seen as the common feature of all definite NPs. [cf. (Heim, 1982, 199? [Handbook of Semantics article]). Indeed, familiarity-based accounts fit naturally within a dynamic approach to meaning and withen the Dynamic semantics community the familarity theory of definites is widely accepted. In the light of this the present proposal, which returns to the classical idea of unique satisfaction, may well seem surprising.

what distinguishes all uses of definite familarity for descriptions and

which the particular individuals knownof our articulated contextsn the other hand important primarily for the justification of uniqueness, while justification is supported by the other components. The obvious reason is that it is these other components which have non-empty universes, and it is the individuals represented in them because it is thesexistence can be supported by any of the other components (with the exclusion - again for fully transparent reasons - of K_{Utt}). The reason why K_{Gen} is of primary importance in connection with uniqueness is that uniqueness information

We repesent the connection between one or more presuppositions and the

It is a view that seems especially incongruous when

f one looks more closely at the way in which pronouns and descriptions are often used in ordinary discourse, this can appears quite surprising

common to these two positions is that at least in simple sentences the proper and truthful use of definite descriptions entails that their descriptive content has one and only one satisfier.

Similar considerations apply to the just mentioned interpretations of demonstratives: Inasmuch as the demonstrative's referent is identified as one that is represented by a discourse referent in K_{Dis}, the demonstrative qualifies as anaphoric. These two "anaphoric" uses - of names and of demonstrative phrases - resemble each other also in that they differ only slightly from the non-anaphoric uses of these expressions, where there is no discourse referent in which represents their referent: In the anaphoric case the given interpretation can be obtained by exploiting the very same contextual information that is available also in the non-anaphoric case (K_{Enc} in the case of a proper name, K_{Env} in the case of a proper name).

However, the anaphoric possibilities of demonstrative phrases seem to reach further. As we will discuss at greater length below, demonstratives also allow for interpretations in which their representation is identified with a discourse referent from K_{Dis} even though this discourse referent does not occur in K_{Env}. Such demonstratives need not, and normally do not, refer to an entity from the environment ENV_D. In fact, when it is used anaphorically, a demonstrative phrase need not refer to some particular entity at all. Like anaphoric pronouns anaphoric demonstratives can play the role of "bound variables", as in (4)

(4) Whenever a Texan steals the cattle of some other Texan, then that other Texan will be very cross.

We thus can distinguish the following four possibilities for the interpretation of demonstratives:

(i) the demonstrative refers to an entity in ENV_D whch has not been part of the context until then and brings a representation into the context - more precisely: into both K_{Env} and K_{Dis}.

(ii) the referent of the demonstrative is represented within K_{Env} but not within K_{Dis}. In this case the representing discourse referent from K_{Env} is added to K_{Dis}.

(iii) the referent of the demonstrative is represented by a discourse referent which belongs both to K_{Env} and to K_{Dis}.

("quasi-anaphoric" use)

(iv) the demonstrative is interpreted by identifying its interpretation with a discourse referent which occurs within K_{Dis}, but not in K_{Env}.

The cases where the demonstrative gets a non-referential interpretation arises quite naturally as instances of (iv) in which the discourse referent that is used as anaphoric antecedent belongs to the universe of a "non-global", embedded context, as explained in all earlier presentations of DRT (and in most other versions of Dynamic Semantics). It should be noted that such discourse referents cannot belong at the same time to the universe of K_{Env}, as this would render the context structure as a whole incoherent: A discourse referent cannot be at the same time anchored and be quantificationally bound.[46]

In this case the problem can be stated in the form of a question: "What exactly are we to understand by "the utterance time"? There are two aspects of this question I want to mention here. They are closely connected, but should be kept apart. The first is: How long does the uterance time last? And the second: When does the utterance time change? The second of these is easier to address, so we begin with that one. The answer to this question might seem simple: Each new utterance determines its own utterance time, viz. the time at which it (i.e. that particular utterance) takes place. But on closer thought this isn't much help. How many utterances do I produce when I utter a sentence, e.g. - but the example is wholly arbitrary - when I utter the words " I am out of breath now."? Is there just one utterance, of the

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46 In the light of general principles governing the coherence of DRT-basec representations, this prohibition seems not only natural but inescapable. However, it does not follow explicitly from conditions that have been stated explicitly in earlier versions of DRT. This is because articulated contexts, which allow for the possibility that a discourse referent may occur simultaneously in more than one of a context's components, A formal definition of articulated contexts should be formulated in such a way as to entail the prohibition, but I have decided to stay clear in this paper from the degree of formalisation that such a definition would require.

sentence as a whole, or are there - instead or in addition - the utterances of the individual words of which the sentence is composed? And are we to distinguish - instead or in addition - utterances of the individual phonemes which constitute the words? For a sentence with indexicals - and here the choice of our sentences ceases to be completely arbitrary - this matter is important. For what is the utterance time for the word *now* as it occurs in our uttered sentence. The problem comes to look even more dramatic when we think of the sentence as uttered in the course of a longer discourse (maybe at the very end of it). Is it the individual sentences of this discourse that we should count as so many utterances, or is it rather the discourse as a whole?

Evidently these considerations do not help us very much. "Utterance" is to some extent a technical term, which wants to be interpreted differently depending on what issues are under discussion. Here, where the issue is the utterance *time*, our task is to interpret the term "utterance" so that it jibes with what can be said about the interpretation of "temporal indexicals" (i. e. expressions which refer to temporal points or intervals that stand in certain particular relations to their "utterance times"). It is clear that what counts as the relevant "utterance" for the determination of the utterance time is not simply a matter of grammar - it isn't just whether the unit produced is a phoneme, morpheme, syllable, word, clause, sentence or paragraph. What also counts is something that might be referred to as "genre". In certain types of discourse each successive sentence is meant and understood as determining its own utterance time. This option has been discussed especially in

This is thepossibility has been highlighted especially in discussions of the semantics of the present tense (in English and other languages)

I will call these the *primary* indexicals. For a while we will stick with these.

That such types exist has been pointed out repeatedly in

(A familiar example are the

speculations about the identity criteria for utterances do not get us much farther. What we choose to consider a particular utterance will depend on the context in which, or the purpose for which th

Of course, this doesn't tell us very much unless we can tell what is an individual utterance. That is a controversial issue in itself. Suppose for instance that a speaker addresses someone else with a sequence of sentences. How many uterances does that involve? Are we dealing here with one large, complex utterance or with as many distinct utterances as there were sentences? Let us assume that it the right answer is the latter. (This answer woul seem to be roughly in keeping with the assumptions that are usually made within speech act theory, where but it isn't just for that reason that

1. I'll take it that consists of a set of pairs

consisting of information concerning the actual topic of communication. The division I will propose here is certainly not meant to be the last word on this matter. It is motivated almost solely by the ways in which different definite NPs (and other expressions which act as "definite" designators) presuppose their referents.

From this last perspective the first distinction between kinds of contextual information that hits the eye is that between "deictic" and "non-deictic" information. This distinction corresponds to two different uses that are made of the term "context"within formal semantics which have lived side by side for at least 25 years without I believe ever having being related to each other in more than anecdotal ways. I refer to, on the one hand, the notion of utterance context as it was used and developed by the philosophers and logicians of the "California School" of the sixties and seventies (in particular Richard Montague, Dana Scott, David Kaplan and David Lewis) and the notion of discourse context that is central to Dynamic Semantics).

It is surprising that this problem hasn't commanded more attention, given that there are so many expressions (pronouns, definite

descriptions, demonstratives) that can be used either to refer deictically (i. e. to elements of the utterance context) or anaphorically (i. e. to elements of the discourse context). As regards indexical expressions, such as *now, I* and *you*, which refer - always or predominantly, to DRT has de facto made use of an integrated notion of context. This started with the use of 'n' to represent the utterance time - see e.g. (Kamp-Reyle 1993, Ch 5). There is also an indexical treatment of *I* and *you*, first sketched in (Kamp 1990) and now available in more detailed and formally elaborated form in (Kamp 2003), as well as in the forthcoming (Van Genabith, Kamp & Reyle 2004). This treatment of indexicality can be extended to other indexicals than the three I mentioned. For instance, indexical uses of *here* could be accounted for with the help of a functor "AT" which enotes the place of an object at a time. "AT(i,n)" thus denotes the place where the speaker is at the time of utterance. (This analysis surely needs refinement - for instance, how large is the place denoted by "AT(x,t)", i.e. how close must something be to y at t to count as "here"? But this is the kind of complication that arises for any proposal, and its solution seems independent of how the purely indexical dimension of the problem is dealt with.) for a second example, one can treat the pronoun*we* as referring to a set of at least two elements which must include the speaker(s); and so on for other indexicals. But what has been missing so far is any systematic treatment for the "third person demonstratives" mentioned above.

What we need minimally in order to complement the DRT treatment of indexical expressions with a treatment of demonstratives is the notion of a set of entities that are present within the environment in which the utterance takes place and which have already been noted by the hearer or which he can readily identify (e.g. by sight) when the use of a suitable expression draws his attention to them. But here we run immediately into a demarcation problem. Is there, form the perspective of different mechanisms of reference, any meaningful distinction between an object that you and I can both see from where we are and one that is no longer visible but that was there just a moment ago, e.g. a person who just left the room or the glas that just slipped from my fingers to disintegrate into a thousand smithereens? There seems to be a continuous spectrum reaching from (i) what is accessible to direct perception here and now via (ii) what was perceived so recently that it is almost as present to the mind as that which is currently before the senses and (iii) what is still in memory but more remote in experience to (iv) what one has never observed oneself but

ows about on the authority of others. And note well: the items farther along this spectrum aren't necessarily those whose existence or propertes are considered less certain. Many of us are inclined to trust authority at least as much as our own senses. (This is one of the worrisome aspects of man as a social animal.)[47]

With this difficulty in view I have decided to cut the context pie in a different way. Before I can say how, first a preliniary distinction, between discourse that is about general information - whether it be the laws of mathematics or nature, the injunctions of morality, the principles of politics, the attributes of God and so on - and discourse that is about some particular situation - either the immediate environment of the discourse participants, or something that happened to them,or to one of them, on some earlier occasion, or some event or events that neither of them were directly involved in, or even some purely imaginary situation or course of events, those which are the subject of story telling and fiction. For the time being we focus on discourse of the second kind, and more particularly on those kinds whose subject matter is a part of reality rather than a fictional situation or course of events. (I will return to the question of fiction separately later on.)

What decides wether an utterance, or sequence of utterances, is directed at one episode rather than another? This is a matter which I will not address in any detail; but it is one which deserves a moment of pause nevertheless. In Situation Semantics this question was rightly highlighted: Utterances, the Situation Semanticists noted, and the propositions they express, mean what they mean (and have the truth conditons they have) in virtue of what situation they are about. which situation an utterance or proposition is about is a demonstrative aspect,

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47 The continuity of this spectrum is closely related to a problem for the theory of (internal and external) anchors which is part of the extension of DRT to the treatment of propositional attitudes and attitudinal states proposed in (Kamp 200) and (Van Genabith et al. 2004). Direct reference and the *de re* thoughts and attitude reports to which it gives rise are treated in this theory as involving special links between the thinker (or subject of the attitude attribution) and one or more entities that the thought or attributed attitude is about and that make its content into a "singular proposition", into which these entities enter unmeiated by a certain mode of representation or description. Anchoring theory is forced to distinguish between a number of different types of anchors, corresponding to the cases (i) - (iv) mentioned in this paragraph and others. But here too it is difficult to motivate any one classification of anchors into types; moeover, it is unclear exactly what consequences any such classification has for an analysis of reference.

which, they rightly observed, many earlier treatments of the demonstative dimension of language ignored. The exception to this general neglect they note is Austin, and to do justice to this they introduced the term "Austinian proposition" to refer to their notion situation-focussed propositions, which have the particular situation that they make a claim about as it were built into them.

When we consider this as a problem of discourse rather than of utterances of individual sentences, this problem appear more tractable. A speaker who wants to focus the attention of her interlocutor on a particular situation or episode will often do this by mentioning one of the items from this situation or episode by name or by means of a uniquely identifying description. She thereby makes that situation or episode not only into the topic of the utterance in which this name or description occurs, but also into the topic of the following utterances, tyoically until clear notice is given that the topic has changed. Still, there is uch that needs to be said what the range of options for such "topic fixing" are.

I will leave this problem for others or may take it up myself on some later occasion. For my present purpose I will merely assume that the effect of topic fixing is that relevant information about the topic becomes a separate component of the context. In general the information which speaker has about this topic and the assumptions she makes about it won't coincide with those of the addressee. In fact, most forms of verbal exchange are based on the presuposition that the coincidence is not complete. (Exceptions are few and far between. One of them is joint reminiscing about a common experience, where nothing that is said is really new to the recipient, but only serves the experient of a joint reliving of the past; another is the asking and answering of questions during an exam - assuming that the examiner does indeed know the answers to the questions he asks.) Nevertheless there will in general be a fair amount of overlap between the information that speaker and recipient share about the topic; moreover, some of this knowledge about the topic is shared will be itself the subject of shared knowledge: a knows or assumes that a given bit of her knowledge about the topic is also part of what b knows about the topic and conversely.[48]

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[48] Many would no oubt argue that this is an oversimplified analysis of "shared knowledge" or "common knowledge". But for our needs here this will do.

I will assume that it is the shared knowledge and assumptions about the topic that make up the relevant context component. As regards the form of this context component I adopt a "DRT-conservative" position, according to which it is an ordinary DRS, consisting of a set of discourse referents and a set of conditions involving these discourse referents. (In particular, I will ignore internal and external anchors.) I will refer to this context component as CON_{TS} ("TS" for "topic situation").

However, we shall have to distinguish at some point of our considerations between the "objective" component CON_{TS} of a given discourse (i.e as consisting of that information concerning the topic situation that is *de facto* shared - i.e. for which both (or, more generally, all) discourse participants know or assume that the other (or all others) have this information as well - and what is assumed to be this CON_{TS} component, either by the speaker or by one or more of the addressees. For each individual discourse participant b we will refer to what b takes this component of the discourse to be like as ""CON_{TS}(b)". One source for the need of genuine accommodation are discrepancies between CON_{TS}(s) and CON_{TS}(h), where s is the speaker and h the addressee.

Should CON_{TS} be true of the actual topic situation? I take it that this is a presumption of those engaged in the given discourse. Contextual informtion is presupposed. If it should prove to be false, then the question of truth and falsity of what is said (be it that this information is asserted or plays some other role in the discourse) becomes void. But of course, the communicative function of any utterance belonging to the discourse is not affected by this. Utterances will in general succeed in transferring the information that the speaker wats to get across so long as e nough contextual information is actually shared (i.e. if CON_{TS} covers the requirements that the utterances impose on this component of the context. It is just that, if maskes false claims about the topic situation, then the representation which an utterance produces in the hearer is affected by the same failure of presupposition as the representation of the speaker's that she used her utterance to get across.[49]

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49 This is one difference between discourse whose topic is a real situation and dicourse in fiction. In fiction the context component CON_{TS} is *constitutive* of the situation that is being described: it is "true" of the described situation by "fiat". Here the possibility of this kind of presupposition failure simply does not arise. (it can

Sometimes the topic situation is the situation immediately surrounding the discousrse participants. In such cases there exists the possibility to refer to entities belonging to the situation by "demonstrative" means: The referring expression used succeeds in referring to its intended referent via an accompanying "demonstration" - some act or event which narrows down the "search space" (i. e. the space within which the referent is to be located) in such a way that the referent becomes uniquely identifiable. (The identification may or may not rely on information that is made available by the form of the utterance, either through the decriptive content of the "demonstratively" referring expression itself or because of selection restrictions associated with its occurrence within the uttered sentence.) In Kaplan's work (see in particular his "Demonstratives" in Almog et al, [Thoughts on Kaplan] 1988 (?))) expressions used for this kind of reference, which relies on some form of "demonstration", and indexicals, exemplified by words like "I" or "now", are treated as forming together the class of "demonstratives". From Kaplan's point of view this is a natural class, since for both types of expression reference varies as a function of what he treats the utterance context, whereas the reference is fixed by context (i.e. cannot vary further with the world - or "circumstance of evaluation" - in which the expressed proposition is evaluated for truth or falsety.

However, it is a natural class only if we are prepared to see the effects of demonstration as being part of the utterance context just as the indexical aspects of the utterance context - who the speaker is, who the addressee, what the time of the utterance is, etc. From our present perspective it seems less compelling to see these as two manifestations of the same underlying referential mechanism, let alone as the only two. For one thing, direct reference is not only possible to entities that are either indeixical aspects of the utterance context or the possible targets of a genuine pointing. (I certainly do not believe that and I doubt that there is anyone who would.) It is hardly credible that it would no longer be possible to refer to a person directly only because she just left the room. And if it is possible to directly to a person who only just left, how long must it be since a person left before direct reference becomes impossible?

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arise only on a "higher" plan. viz. when the situation as described does not come across as "authentic" i.e. as a convincing rendering of wshat a situation of the sort described *could* be like.

Another consideration is connected with our use of names. There may be more to the theory of names than is found in Kripke's "Naming and Necessity" and other work on names from the same period (Chastain). But the principle that a name refers because of the way in which it has become established within the speech community, must, I believe, be part of any viable account of how names work. And according to this principle even members of that community can use a name to refer directly to its bearer, even though they have never been in direct contact with its bearer. It is enough if they use the name with a commitment to refer to whatever its bearer is in virtue of the name's history within the community. And it is not just names that can be used in this directly referential manner. Definite description too, it has been noted (e.g. Klein [Referential Descriptions] (1979 (?)), are often used with directly referential intention and usually they will also be thus interpreted.

In none of these cases does demonstration - in any physically concrete sense of a demonstrative act, such as a pointing with one's index, or a nodding or staring in a particular direction - play a part. But even when refernce is made to an object within the immediate environment, we often can and will do so by singling it out in a purely descriptive manner, i. .e. through the use of a definite description which is uniquely instantiated within the given topic situation. (This may require that this situation has already been selected as the topic of the given discourse, but as noted this may have been done at the very beginning of the discourse, and well before the NP in question occurs.)

So there seems no good reason to draw a line between demonstration-based references to entities in perceptually accessible environment and cases of direct reference which do not involve demonstration.

Does this set all the cases of direct reference discussed in the preceding paragraphs aside from reference by means of a "true indexical" such as *I* or *now*? Yes and no. True indexicals differ from all the expressions of which we spoke in the last couple of pages - proper names, pronouns, demonstratives beginning with *this, that, these* or *those*, and definite descriptions - in that no special conditions are required for reference to succeed: no requirement of a proper history, as with names, no need for a successful demonstration to support the selective potential of the NP itself, no descriptive adequacy (either by itself or in combination

with a supporting demonstration). The interpretation rules for words like *I* and *now* (if we abstract from the possibility of using the latter to refer to times in the past) are not only extraordinarily simple; they are also infallible. As long as these words occur in an utterance, they cannot but fail to refer to the corresponding, utterance-related entities of speaker and speech time. This sets the cases of pure indexical reference apart from all those mentioned above.

But this conclusion is easily misleading. In practice there is often more to the interpretation of an indexical than this simple story suggests. Suppose a teacher has lost his chequebook during an excursion in a youth hostel and has put out a reward for the one of pupils who finds it. At one point he hears someone cry "I've found it!" In one sense it is clear no matter what who the referent of this occurrence of *I* is: It is the person who produced this utterance. But that isn't of much use in itself. The teacher would like to know which of his pupils has found the chequebook. Perhaps he does know, because he has recognised the voice. Or perhaps he can find out because he can tell what direction the voice comes from, and identify its source either by looking in that direction or by going there to see who it was. In each of these cases the sound that is created in making the utterance acts as a kind of demonstration that makes it possible to fix the referent of the given NP (the pronoun *I*). The way in which this "demonstration" allows that is note quite the same as that in which pointing´s fix the referents of demonstratives, but it is not clear that the differences should be seen as outweighing the similarities.

It might appear from this that drawing a line between cases of indexical reference and all the other cases discussed above doesn't seem quite justified either. Should we conclude then, that the contextual information that is needed for referent identification in all these cases should be treated as belonging to one and the same context component? I do not think so. We already noted that the basic meaning rules for the pure indexicals differ from the interpetation rules for other referential expressions not only through their simplicity but also through their independence: Their application does not carry any of the presuppositions that are connected with those other rules. This fact is significant. The reason why the rules for *I* etc. are in practice informative in spite of this independence has to do with the special status of the referents of these expressions. These referents are given as part of the utterance situation as such, irrespective of what

counts as discourse topic. Whether the topic is the current situation of the discourse participants - their properties or their doings - or some past or future episode involving them or others, the speaker, the addressee(s), the time of speech, the places where they are at the time of speech are given as aspects of the utterance as such. And indeed, the speech time is almost always important (e.g. through the interpretation of tense) for the localisation of the events and states of which the discourse speaks, irrespective of whether these are located at, before or after it; and even in discourses about distant times and/or other protagonists speaker and addressee are often relevant as individuals who hold certain opinions about the topic situation.[50]

In other words, at least when people communicate face to face the utterance context, consisting of a few utterance-related items, such as speech time, speaker, addressee, and perhaps some others, plays an important contextual part in general, and not only when one or more of

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50 In face to face communication speaker and hearer always play a role in the representation of the new elements of common knowledge that are the result of each new utterance. (New kowledge of the form "x has just uttered the sentence S." and often further information that is also connected with the utterance.) Although this does not have anything to do directly with the indexical words I and you - it is something tha will happen irrespective of whether the uttered sentence s contains these words or not - it shows that the identity of the discourse participants, both to themselves and to their partners, plays an active part verbal communication of this kind.

When communication is not face to face, the processes which create new common knowledge are usually absent, for one thing because the producer of a written utterance will usually be unaware of its reception and often eve of the identity of the receiver. (Though there are exceptions to this. For instance, ssomething like the mechanisms that are repsonsible for new common knowledge in face to face communication can be triggered by written exchanges between regular and reliable correspondents.)

The cases of language use where the indexical features of the utterance context tend to be pushed into the background most resolutely ae those where authors write without having particular recipients in mind - thus when a writer writes for the "general public", rather than addressing a partocular person in a letter. It is a familiar observation from the theory of literature that in most narrative prose the speech time has lost its function as orientation point in the interpetation of the past tense (cf. Hamburger on the simple past as "Erzähltempus"). Similarly, it is a common feature of such prose that neither speaker nor addressee play any part. Note however that even this is not always the case. Often a writer will "take a step back" in order to make some comment on his narrateive in which he refers to himself (as "I") and sometimes also directly addresses the reader.

these entities belong to the topic situation. For this reason I will treat utterance context, in the sense described, as a separate component CON_{UT} of the context. I assume that CON_{UT} consists of (i) speaker; (ii) utterance time, and (iii) (when relevant) addressee(s). All other utterance-related entities, such as the place where the utterance takes place or the day when it takes place, will be treated as determined by one or more of these three.

We already noted that sometimes the topic situation contains all or some of the elements of CON_{UT}. Since these elements are given in any case (viz. as part of CON_{UT}), one would assume that they are also represented in CON_{TS}. Indeed, this will often be true. But even when it is true, the way in which an element of CON_{UT} is represented in CON_{TS} may be different from the way in which it is represented in CON_{UT}. Take our example of the schoolchildren who are all looking for the teacher's chequebook. The speaker of our example, i.e. the pupil who calls "I've found it!" and the relevant recipient, viz. the teacher, share a CON_{TS} which contains representations for the teacher and each of the pupils (together with the information that the teacher's chequebook is missing and that the pupil who finds it will get a reward). In particular, it will contain a representation of the pupil who has just called. But this representation is not the same as that which represents this pupil in CON_{UT}, viz. simply as the producer of the given utterance. So the teacher, who wants to interpret the utterance as a statement about the topic situation, and thus as one which extends CON_{UT}, must identify the caller with the right one of the pupils represented in CON_{ST} - or, more accurately, with his own representation of the topic situation, which may contain more information than CON_{ST}. The teacher's problem, in other words, is to connect the referent of the caller's *I* with the right discourse referent in CON_{ST}.

Cross-identification of discourse referents belonging to different context components is one important aspect of our use of articulated contexts in interpretation. A second and even more important one, as we will see, is the transfer from one context component to another.

in question. (Her calling "I've found it!")

hat In such cases there will be an overlap between

For notwithstanding what I have just said about intepreting *I*, the basic meanng rules for the interpretation.

My reason is the following.

The indexical, utterance-related information which enters into the simple interpretation rules for *I* or *now* does seem to be special and I will treat it as such, i.e. as belonging to a separate component of the context.

If one pursues this thought further, it Moreover, the

Summing up what has been said so far: One of the context components of the articulated context notion that we are developing is CONTS. This component is relevant only when the discourse has a topic situation or episode, which it is intended to be about.

In the ideal case there is agreement between speaker and addressee about what this information is or at least about

in which the discourse tawhat is the case in the situation in which we thewill assume that any discourse that pertains to a particula

To draw a dividing line somewhere within this spectrum

In more recent treatments for more than a decade, i.e. ever since its representations involve a representation of the utterance time representationthese two notions to a comparison and to integrate them into a single dynamic notion of context is all the more surprising since

The DRT treatment of indexicality is easily extended to other indexicals than the three - *now, I, you* - that were mentioned so far.

(We bypass the question whether and to what extent "knowing the vocabulary" already involves extra-linguistic knowledge - i.e. which parts of this knowledge are "lexical" and which are encyclopaedic.) That this "common ground" of shared knowledge grows as a given communication progresses is no less obvious, though it was not until the advent of the various forms of Dynamic Semantics that the first details of this incrementation process became somewhat better understood.

The sum truth of all this is that the actual form of a linguistic expressions that is uttered there are many other factors, connected with hte conditions unother than the which influence what meaning an expression conveys in any particular situation in which it is used.

the relevant notion of involve these different claims

What we find in the language literature is thus not just one claim that meaning is context-dependent, but a whole range of such claims, each involving its own kind of context. For none of these claims can there be much doubt that context-dependence of the kind it asserts actually exists - this is so even where the intended notion of context is left largely implicit - and we may safely conclude that context-dependence takes many different forms. There are many different factors other than the actual form of an expression which influence what meaning an expression conveys in any particular situation in which it is used.

Call a discourse referent x belonging to some representation K acts as a *direct representation* of the entity it represents iff it is anchored to this entity. An expression

In the context of the present account the directly referential character of names arises at two levels - in connection with the given use of the name N and in connection with the representation of the bearer of N (or the representations of bearers of N). We consider the second connection first.

Furthermore I assume that the discourse referents of K_{Utt} are anchored to the appropriate aspects of the utterance. This will guarantee that the interpretation rules for indexical expressions will assign them the correct referents. Since anchors take the form of pairs consisting of a discourse referent and an entity from the model M, the anchoring requirement on the discourse referents in K_{Utt} entails that the utterance aspects represented in K_{Utt} must be elements of M (more precisely: from the actual world component M_{W_O}).

The anchoring requirement for the discourse referents of K_{Utt} also has certain consequences for its dynamics. Although the discourse referents of K_{Utt} are always the same (viz. sp, n and ad), their anchors vary with the utterance. How they vary is a somewhat subtle matter, and one that depends also on the utterance aspect in question. Let us take the three discourse referents of K_{Utt} one at a time.

"Look, there is a blackbird with a worm in its beak sitting on the window sill.". Then I will take this as a statement that is purported to be true for the time of the utterance, but not for that of the discourse as a whole. [51]

[51] Admittedly, the main reason for interpreting the utterance as an interruption is no doubt the topic shift it involves - from politics to the presence of some particular bird. But even so the consideration that birds never stay on window sills for very long seems to play a role in the rewill be registered as an interruption of the conversation in which we have been engaged and which may be directly resumed without recourse to any special rhetorical device. The point is, however, that the interruption will be recognised

It should be emphasised that demonstratives may "pick up" discourse referents from each of the three context components K_{Env}, K_{Enc} and K_{Dis} even if thatan provide antecedents for demonstratives in the strong sense that this is possible even if the discourse referent which the demonstrative is used to "pick up" only belongs to that component. This is true in particular, we noted in the preceding section 3.3, for K_{Dis}.

That notions of context vary is clear even though many authors are not very explicit about what notion of context they have in mind.

Almost any of these claims strikes us as plausible. We have become attuned to the thought that meaning

While claims of context dependence statemens

is a truism that noone would want to dispute. In fact, countless statements can be found in the literature which say something to this effect. But what is context? On this point many of these statements not very explicit. And yet, it is clear that there is but little agreement. More often than not different authors have different notions of context in mind; and in some cases the gap between them seems to be a very wide one.

Even though so many of these claims refer to different kinds of context, by and large all of them strike us as plausible enough, including those where it is hard to make the precise context notion that is meant. That is not surprising, for we have become attuned to the thought that meaning does not solely depend on linguistic form, but on a vast range of other factors as well, reaching from the closely form-related (such as those which determine the interpretation of anaphoric pronouns) to aspects of social and cultural anthropology.

The source of the problem is easy to spot. The discourse contexts of DRT are DRSs, structures consisting of a set of discourse referents, which represent particular entities, together with a set of conditions which impose constraints on the entities the discourse referents represent. The discourse referents get introduced as discourse processing proceeds, in particular through the interpretation of noun phrases[52]. There can be no doubt that these discourse referents are part of the contextual information that is available once the part of the discourse that gives rise to their introducation has been interpreted.

52 There are other sources of new discourse referents too (e.g. the processing of finte tense), but for the present discussion it is the introduction by NPs which matters most directly.

There is a second distinction, which has been prominent in discussions about the philosophical implications of Dynamic Semantics (and more particularly DRT). It is also the one which provides a (perhaps tenuous) justification for including this contribution within this tribute to David Kaplan. This is the distinction between the notion of *discourse context* used within dynamic semantic theories and the notion of *utterance context* as it figures in work from the sixties and seventies on the semantics and pragmatics of reference and of which Kaplan's work (especially his "Demonstratives") should, I believe, be considered the most prominent representative. The utterance context in which a given utterance is made is a part of reality which fixes the reference of certain expressions occurring within the utterance; on the one hand "indexicals" like the pronouns *I* and *you,* on the other demonstratives such as *this* or *that man over there* when these are used deictically, i.e. as terms referring to objects in the "environment", with which the interpreter can establish language-independent contact, e.g. by direct visual perception.

Against the background of DRT the comparison between its discourse contexts and Kaplan's utterance contexts is complicated by the fact that DRT's discourse contexts are representational structures, whereas utterance contexts are part of the reality within which the utterance takes place, and in the cases that interest us - those where the utterance contains indexical or demonstrative expressions - it is also part of the reality that the utterance talks about. (For other versions of Dynamic Semantics, in which the discourse context is defined as some kind of model-theoretic object - such as a set of assignment functions into the domain of some particular model - this difficulty doesn't arise, or at least not in the same way.) So it looks as if in trying to compare discourse context and utterance context one is trying to compare apples and oranges.

I will resolve this difficulty by splitting the utterance context into two components, (i) a "representational" component which, like all[53] other

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53 The DRT-based ccount of meaning and interpretation outlined in this paper thus requires the simultaneous consideration of an articulated context and an (intensional) model. It should be pointed out, however, that this is aspect of the present account isn't really new. In a certain way it has been part of DRT almost from the start - it is as old as DRT's decision to analyse tenses as involving the indexical discourse referent n, as standing for the utterance time. A DRS K whose univers contains n is to be understood as the representation of an utterance made at some utterance time t, and taking the DRS as representation of an utterance made at t means that any legitimate verifying embedding f of the universe of K into the universe of a model M must map n onto t. This pressupposes that t is among the times of M.

components of the articulated context notion I will propose in this paper, *represents* information in a form in which it can be assumed to be available to the discourse participants, and (ii) a second component which provides the real world correlates of the discourse referents of this representational component. Only the first component will serve as a component of the articulated contexts which we are trying to define. The second component is to be thought of as a part of the real world in which the discourse takes place. It provides the "real referents" to which the discourse referents in the representational utterance context represent. Formally, we assume that this second component is part of an intensional model (in the sense of the intensional model-theoretic semanticsfor DRT, see (Genabith et al. 2004)). More precisely, the model is assumed to include, as one among its different possible worlds, the "actual world" in which the utterance in question takes place, and to contain, as part of the universe of this world, utterance-relevant entities such the utterance itself, its speaker, the utterance time, the addressee(s), as well as, usually, a variety of other entities.

The implication of this is that discourse interpretation is now to be described as a process that involves both a context and a model. But as a matter of fact this is a situation that is not new. It has been part of DRT ever since the tenses and other temporal expressions have been analysed with the help of the special discourse referent n, representing the utterance time. A discourse representation K which contains n within its universe must be understood as the representation of a sentence or discourse that is uttered at some given time t; and when thus understood, its truth conditions require that n is taken as representing t.[54]

There is a further question here which relates directly to Kaplan's work on demonstratives. This is whether we should distinguish between the utterance context, which provides for the referents of words like *I, you* and *now*, and an "environmental" component, which contains the perceptually accessible objects within the surroundings of the discourse participants, which can be made into the deictic referents of demonstratives. I will keep these two context components separate even though I do not think that very much hangs on this. What is

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54 Technichally this means that the only admissible embeding functions from the representation K into the model M are those which map n on t. (A presupposition is thus that t is among the times of the model.)

important are the different ways in which indexical expressions and demonstratives (in the stricter sense of the term in which they are distinct from indexicals) behave in discourse. The matter will be discussed in detail below.

The distinctions mentioned leave us with five different context components: besides the discourse context K_{Dis}, there are four additional context components, K_{Gen}, containing general world knowledge, K_{Enc}, containing "encyclopaedic" knowledge concerning persons, places, events, epochs, K_{Utt}, containing information that stands in a direct relation to the utterance, and K_{Env}, containing information concerning the immediate environment in which the verbal communication takes place. Thus our contexts are now 5-tuples of the form:

Given our characterisation (1) of structured contexts, this means that the interpretation of third person personal pronouns must relate to one of two possible context components: either

(i) (anaphoric case) the pronoun must find its antecedent within K_{Dis}; or else
(ii) (decitic case) its referent is either alraeady represented in K_{Env} or if this is not the case interpretation leads to the introduction of a new representation of the pronoun's referent within K_{Env}, on the basis of its language-independent identification.

The original DRT account of anaphoric pronouns I adopt here without further ado.[55] About their deictic use more will be said below in Section ??. Before that, however, we will consider the interpretation principles for some other types of NPs. We begin with proper names.

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55 It has been noted by several authors (e.g. Bos, 198?) that even English singular pronouns allow on occasion interpretations other than those predicted by the DRT account (i.e. interpetations according to which they refer to something which has not yet been introduced explicitly into the discourse context. These cases require careful attention (to some extent have already received it), but ths is not the concern of the present paper.

intensonal model MWe may assume that there are many other worlds w in W_M in which these aspects of the gievn utterance exist as well (even if the utterance itself does not). In each of these worlds it is possible to evaluate K with respect to truth or falsehood (K is true in w iff there is a verifying embedding, satisfying the additional requirement just stated, of K into M_W. The set of those worlds in which K is true may be identified as the *proposition expressed* by the represented utterance *with resprect to* M. It should be clear that this proposition is *singular with respect to* the indexical discourse referents of K insofar as for all w belonging to it the embeddings which verify K in M_W map each such discourse referent to the same entity.

The indexical behaviour of sp, n and ad is captured by the conditions which determine what constraints anchorsimposed on possible embedding functions for the DRSs in which hey occur. Suppose that the DRS K represents the content of an utterance U -of a sentence, a piece of discourse consisting of several sentencs or just a sentence constituent - and that K contains one or more indexical discourse referents. Then

sp to the utterer of U, n to the utterance time and ad to the addressee(s) of U. representation of a particular utterance of the sentence S or discourse D in question, and not a representation of the sentence or discourse *type*, i.e. not of S or D qua linguistic expression *in abstracto*. Moreover, the indexical discourse referents of such a representation K are then to be understood as referring to the aspects of the utterance which K represents.[56]

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56 In the technical terms of DRT this means that as possible verifying embeddings f of K only those qualifiy which map the indexical discourse referents of K to the corresponding aspects of the represented utterance. For instance, f(sp) must be the producer of this utterance. This requirement evidently presupposes that the model into which f embeds K must contain these aspects of the given utterance. Within the setting of the present discussion this requirement will be satisfied if we assume that the utterance itself and its relevant aspects belongs to the real world component M_{W_O} of the intensional model M presupposed by our analysis (See 3.1).
For n this analysis has been adopted within DRT since its early days, m ost particularly in the analysis of the tenses of the verb. For explicit formulations see (Kamp & Reyle, 1993) and especially (Van Genabith et al., 2004).
We may assume that there are many other worlds w in W_M in which these aspects of the gievn utterance exist as well (even if the utterance itself does not). In each of these worlds it is possible to evaluate K with respect to truth or falsehood (K is true in w iff there is a verifying embedding, satisfying the additional requirement just stated, of K into M_W. The set of those worlds in which K is true may be identified as the *proposition expressed* by the represented utterance *with resprect to* M. It should be clear that this proposition is *singular with respect to* the indexical discourse referents

We extend these assumptions about occurrences of the indexical discourse referents to K_{Utt}. That is, we assume that the discourse referents of K_{Utt} represent the relevant aspects of the utterance by which K_{Utt} is determined (in other words: the utterance that K_{Utt} is the utterance context of) through being anchored to these aspects. (The preconditions for these anchors are satisfied if we assume, as in the last footnote, that among the entities belonging to the universe of M_{W_O} are the utterance and its relevant aspects.)

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of K insofar as for all w belonging to it the embeddings which verify K in M_W map each such discourse referent to the same entity.

Justifications of (3) within a more formal theory of temporal interpretation is possible as well, but in my own experience they always depend on assumptions which need to be argued for in their turn, so that a plausivle case can be made only when the hteory is presented as a whole, which is out of the question in a paper with the more general aims of the present essay, in which temporal indexicality is just one of large range of referential phenomena. So I must leave i with this informal explication of the intuitions which (3) is meant to express

Circumstantial evidence that this is the right way of looking at the distinction between past, present and future tenses, (and in particular at the function of the present tense) comes from English and the comparatively few other languages which have obligatory marking of progressive aspect. In many contexts English present tense sentences with non-stative verbs require the present progressive. E.g. when I tell you about my current occupations I may say to you "I am writing an article about the present tense", whereas "I write an article about the present tense." would be marginally grammatical at best. Among the cases where the need the present progressive is felt are in particular those which earlier I described as involving the default strategy for deteemining utterance time, viz. those where the uterance is that of the entire discourse.

To see the connection between this fact and constraint (3.ii) requires a number of assumptions which need further justification. To provide that would carry us too far. So I will confine myself to sketching the gist of the argument, pointing to some of the existing literature where these assumptions are explained in greater detail and defended. The first assumption is that the progressive form serves to turn event descriptions into descriptions of states. (Thus the progressive of the quoted sentence above turns the event description "write an article" into the description of a state which holds while the activity of writing the article is in progress; according to the second assumption the temporal location of states and events takes the form of imposing contraints on where along the time line the "location time" t_{loc} of the described event or state can be located; the third assumption is that an event is always temporally included within t_{loc} whereas a state includes t_{loc}. The fourth assumption is the one expressed in (3.ii): Present tense requires, for reasons of its own, that the described eventuality include n. Or, to elaborate this in terms of location time: present tense requires (a) that t_{loc} include n and (b) that t_{loc} be included in ev.

[n and tenses]

While this doesn't prove anything about the reference of *now*, it shows beyond doubt that there are expressions whose tokens refer to periods of time which include n without being identical with it. This makes it natural to ask whether this possibility does not also exist for *now* too. And indeed it does seem that at least in some instances that is what

[(3) and *now*

Suppose, then, that *now* occurs in the course of a conversation or text. removed from speaking from a sate The first of these Well", one might reply naively, "that is the time of the utterance". But which utterance? Suppose for the sake of argument that we interpret the word *now* as referring to the time represented by n. (We will see below that this is not quite right in general, but for the present discussion the assumption will do.) Consider the following utterances

(2) (a) It was really an amazing event. I have wondered for some time whether to tell you about it
   i. But in any case I don't have time now.
   ii. But in the end I decided it is better to tell you after all. So I am going to tell you now.

(b) I want to you to run as fast as you can.
You start RIGHT ... NOW!

Here we have three occurrencs of *now*, each part of a larger utterance. What in each of these cases is the utterance which gives us the intuitively right reference for now? Put more pedantically: Which is the utterance such that the given occurrence of now refers to the time of *that* utterance?

Before we can address this question we need to say something first about what it means for a given utterance U and time interval I to say that I is the (utterance) time of U. For definiteness Consider the

utterance of sentence (2.a.i) ("But in any case I don't have time to tell you now.") What is the utterance time of this utterance? Is it the time it took the producer to pronounce it, (or, as the case may be, to write it down)? Or does the utterance time also include the time it takes the addressee to take the utterance in, and to make sense of it? Or are utterance and utterance time related in yet some other way? It is not obvious what the right answer is. But the issues of the discussion below are largely independent of the answer we adopt. So let us, for this purpose, adopt what appears to be the intrinsically least problematic one, according to which the utterance time is just the time it takes to produce the utterance.

Having settled on this definition of "utterance time", we return to the question what utterances give us the intuitively right utterance times as referents for the occurrences of *now* in (2). The relevance of this question should be clear: In each case there are many different utterances that would seem to qualify as candidates: the utterance of just the word *now*, the utterance of the sentence containing it; the entire multi-sentence discourse produced by the given speaker - these are the three most prominent possibilities, but if we insist we can discern others as well. Clearly the three possibilities we have mentioned yield different utterance times, with the first one properly included in the second and the second properly included in the third.

Which of these is the intitively right one? That seems to vary from case to case. In (2.a.i) it seems natural to take the utterance time to be that of the entire discourse, and not just of the sentence in which now occurs, let alone just the time that it takes to pronounce the adverb *now* contained in it. So in this case the relevant utterance would seem to be tha of the entire discourse. In (2.b) the relevant utterance time would appear to be the time it takes the speaker to say "NOW". So here it is rather the utterance of just the one word. (2.a.ii) illustrates a further complication. Arguably the relevant utterance is here either that of the word now by itself or that of the sentence conainting now. However, the time referred to by *now* appears to be in this case neither the time of the shorter nor that of the longer uterance, but rather to be a stretch which extends beyond either of these, and arguably starts the moment they end.

Note that the problem discussed in these last paragraphs arises not just in connection with sentences containing now, but generally for virtually

any sentence that contains finite tense - and thus for almost all sentences we encounter in ordinary discourse and texts. This is because n is involved in the interpretation of any finite tense occurring in a main clause - in first approximation: the present tense say that the clause predication holds o ver a period of time including n, the past tense that this period lies entirely before n and the future tense that it lies entirely after n. Thus the question is of the first importnce.

How does one tell in general which of the different utterances involved in the production of a bit of language is the one which determines the utterance time? This is a tricky question. Much of the discussion it has provoked has occurred within the theory of tense, and especially in connection with the semantics of the present tense. In particular, it has been noted that there are types of discourse and texts (also referred to as"genres") where it is understood that it is with reference to the time of each successive sentence utterance that the tense of that sentence is to be evaluated. The most celebrated instance are stretches of "reportive speech", the multi-sentence discourses that on-the-spot radio reporters engage in when recounting what is evolving in front of their eyes. In particular the present tense sentences produced in discourse of this kind (and they form the large majority) must be understood as making statements about the very times at which each given sentence is produced.

However, this is certainly not the only way in which we make use of the tenses. In fact, the genres which lend themselves to such an interpretation have often been presented as special (or "marked"). In what form this point of view is the more normal kind of discourse, the "utterance" which determines the utterance time as it is relevant to the interpetation of the tenses and adverbs like *now* is that of the discourse as a whole. (And mind, this is true in particular of most cases where hte discourse" is a conversation, to which different participants contribute in turn.) In all these cases the utterance time is the time which spans the discourse in its entirety. For the choice of tense this understanding of n has important consequences. In fact, it has consequences not only for the tense the speaker should choose for the sentence he uses to express the proposition he means to convey, but also for what can be conveyed at all. The next paragraph explains this.

The options for the choice of tense in main clauses can be divided into three categories: (i) one of the last tenses; (ii) a future tense; and (iii) a

present tense. (i) is appropriate when the period over which the predication expressed by the clause is mean to hold is wholly situated before n; (ii) is appropriate when this period is wholly situated past n; and (iii) is appropriate when the period includes n. The reason why this is not just a constraint on how things should be expressed but also on what can be said at all is that predications whose periods overlap n without including it fall outside the scope of these possibilities. The use of the present tense is restricted to the description of predications which hold *througout* the discourse.[57]

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57 The options listed in this paragraph are manifest with rare clarity in the case of English, because of its unusually strict and comprehensive rules for marking the distinction between progressive and non-progressive aspect. For non-stative predications English requires the use of progressive tense forms iff progressive apect is intended. One of the effects of this requirement is that in normal discourse (i. e. in"non-reportive speech") non-stative predications cannot be felicitously used ith the simple present, but only with the progressive present. Thus it is odd - one would be inclined to use the word "ungrammatical" - to say "Fred writes a letter.", while "Fred is writing a letter." is as grammatical as can be. Apparently it is only possible to state, in this kind of discourse type, that the activity of writing a letter is in progress throughout n, but not that the completed letter writing event is occurring then.
It should be stressed that what has been said up to this point does not account for why the first of these sentences appears ungrammatical to us. The explanation of this fact which I personally favour goes as follows. It rests on three assumptions. (1) A clause in which a non-stative predication is expressed with the verb in a non-progressive tense must be understood as describing a complete event, and as locating this event within the relevant location time. (2) When the tense is the present, then the loction time is n. (3) It isn't quite right to say simply, as I have done in the main bodyof the text, that in the types of discourse under consideration the uterace time is the time of the discourse as a whole. Rather there is, for these types of discourse, the presumption that any time included within the duration of the discourse (and thus in partocular every time which the utterance time of a part utterance) qualifies in principle as "the utterance time". Irrespective of which of all these possibleterance times we choose, interpretation of the discourse with respect to it should yield the same results. In other words the represenations of the successive sentences tzhat make up the discourse and the truth conditions they determine should be invariant with regard to the choice of these times. On the one hand this entails the role we allotted to the discourse time in our statement of the three options mentioned in the text (with the corresponding choice of tense). For instance, a predication period will be wholly in the future of the discourse time iff it is wholly in the future of each of the possible utterance times included in it. On the other - and this is the relevant issue at this point - the modified account excludes the use of non-stative predications in the simple present. For this would, in virtue of assumption (1), mean that an event e was described as temporally included in the location time and thus, in view of assumption (2), included in n. Thus, in the light of the present account of what can count as an utterance time e would have to be included in each of the potential utterance timjes included in the discourse time. On the plausible assumptions that there will always

Genre, or type of discourse, is thus one factor which regulates how the utterance time is determined. But isn't that, it might be objected, pushing the problem into a different place? For how does one recognise what type of discourse or genre a speaker engages in? To this I have little to offer in reply. But in any case it sees clear that the content of individual sentences plays an important part in clueing us into what the speaker's intentions must be - i.e. what utterance tim he has in mind. There are many kinds of predications with which we associate some kind of prototypical duration. And when this duration is of the order of that of a typical sentence utterance and clearly shorter than that of longer discourse or conversation, then we will take an utterance of a sentence which expresses such a predication as involving the intention that the utterance time be just the duration of producing that sentence and not the total duration of some longer verbal exchange in the course of which this sentence utterance occurs. For instance, suppose that in the course of a dispute over, say, some political matter, e.g. an election which is taking place today, you suddenly say, looking at the screen of the television behind me: "Look, the incumbant president is just making a statement". Then I will interpret you as stating a predication that that is meant to hold during the time of your utterance of this one sentence, but not necessarily for the duration of our conersation as a whole. it is aprtly for this reason that the utterance comes across as a kind of interruption to the dispute in which we are engaged.

These considerations about the determination of the utterance time also have certain implications for the dynamics of K_{Utt}. Here we only consider this question in relation to n. (sp and ad will be discussed in the next section.) First, the strictly representational part of remains, as far as n is the concerned, costant in any case. It consists of n, together with the condition implicit in the conventional use of the symbol "n" that n represents the utterance time. The only thing that may change in the course of a given discourse is n's anchor. Whether it does depends on how the utterance time is determined. In what we described as the "unmarked" case, in which the utterance time is the duration of the discourse as a whole, the anchor too rmains constant thorughout hte discourse. But in those cases where utterance times are the times of utterances that are proper parts of the discourse as a

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be potential utterance times n_1 and n_2 which are temporally disjoint from each other, this condition cannot be met: e cannot be included in both.

whole, these times shift as the discourse poceeds and so does the anchor for n.

So far we have spoken about the discourse referent n, while next to nothing has been said about the temporal indexicals of English. In particular nothing has been said about the interpretation of the word *now*. It might be thought that the trnasition form n to now is straightforward.[58] The interpretation rule for now, it might be thought, is simply that the discourse referent it introduces is identified with n. I do not think, however, that this can be right in general. To state my reservation it will be useful to first look at some other adverbials whose refernce is, like that of now, connected with the utterance time. They are: *today, these days, nowadays*. First *today*. Its interpretation rule is intuitively clear: an occurrence of *today* refers to the day including the time of the utterance of which it is part. (This presupposes that the utterance time does not straddle the boundary between two days, but that is a condition that in practice is satisfied easily enough.) For *nowadays* and *these days* the interpretation rules are less easy to capture. There is an inherent vagueness in these expressions, which it is often possible to constrain on the strength of contextual considerations, but which can rarely if ever be resolved entirely. However, even if it is difficult to determine the reference of these adverbs exhaustively, one thing is clear: each refers invariably to a period encompassing several days, and the day(s) of the uterance time must be among those. (In the case of *these days* this follows directly from its transparent compositional semantics, I suspect that a similar story can be told about *nowadays* as well, though I am unsure of the details.)

Common among *today, these days* and *nowadays* is that each of them is - like *now* - indexical in that its reference conditions depend essetially on n; moreover, for each of the three the referent is not given by identity with n but via some other relation, which in each case entails inclusion. In this light, it behooves us to ask a similar question about *now*: Is its relation to n really and invariably identity, or should a different relation be assumed in this case too? It is my imprssion that

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58 Assuming that we ignore, as I said we would, the uses of *now* where it refers to some past reference time.

the latter is the case - that th[59]ere are uses of *now*, where its reference is not the utterance time n, but some interval which includes n. cases where this seems plausible to me are those where now is used contrastively, and where the expression with which it is made to constrast denotes an extended period (of days, months, years, ..). consider for instance (3)

(3) At least in previous years there was always time for proper research. But now even that is becoming a scarce commodity.

In sentences like this there is a tendency ot interpret now as referring to a period of comparable "granularity" as the contrasting adverb. In the case of (3) this means that we think of *now* as standing for one or more years.

As a matter of fact, the word *today* also seems to allow for such a looser interpretation, where it stands not for the day of the utterance but for some longer period in which the utterance is included. (e.g. replace *now* by *today* in (3).) This suggests that *today* is in a certain sense "ambiguous", between a strict, literal interpretation according to which it denores the day of n, and a loose interpretation on which it can stand for any larger period also including n. I leave it for others to decide whether this it is right to speak of ambiguity in this case. But whatever the answer to that question, I take it that *now* is "ambiguous in essentially the same ay, between a strict sense in which it is taken to be identical with n, and a loose sense in which it can denote intervals of which n is a proper part.

I have dwelt on this aspect of the interpretation of *now* is since I believe that it ought to be kept distinct from the question what should be taken as the utterance time itself (or, in our technical terminology: what is to be taken as the referent of n). That we are really deaaling with two distinct issues here may not be all that obvious for the following reason: When we engage in a discourse of the "unmarked" sort, we often do not know how long it will go on for. In such cases we are committed to the utterance time spanning the entire discourse, but since we do not know when the dscourse will end, we do not know the end of the utterance time either, even though it is involved in the truth conditions of mst of

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59 As a matter of fact, the word today also allows for such a looser interpretation, where it stands not for the day of the tterance but for some longer period in which the utterance is included.

the statements we make. This may easily lead to the impression that the utterance time may be open-ended too. So, couldn't it be the case that those instances where now appears to refer to a longer period of time than n are really cases where it is the utterance time itself that is longer, rather than that the referent of n properly includes it? I do not think so. My main reason is that in many of the cases where now sems to refer to a period of time which properly includes the utterance time, its referent seems to extend beyond the period occupied by the discourse not only in the direction of the future but also in the direction of the past. And for spill-over in this second direction the open-endedness of discourse provides no motivation.[60]

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60 In a number of recent studies of the tenses and their interactions with temporal adverbs one encounters the noton of an "extended now". (Appeals to this notion have been especially common in connection with the analsis of the English present perfect, which presents a number of peculiarities which have long been known but for which a fully satisfactory, and generallyaccepted solution still does not seem to exist. In many cases translating the analysis proposed into the framework we are using here is not straightforward, so it is often not immeiately clear whether these proposals involve an extended now in the sense of an extended utterance time, which properly includes the time of the relevant sentence of discourse, or in the sense of a referent for some natural language constituent, word or mrpheme, which stands to the utterance tim e in the relation of proper inclusion. I am inclined to think that the right wy to make use of this concept is in the second sense, i.e. as involving an extension of the meaning of certain expressions.

First there is the question how we recoise who the addressee or addressees of a given utterance are. It is a notorious fact this is often unclear, and the source of confusion. However, it ften thisThe speaker may have a clear idea in mind as to who he means to address, but this may nevertheless be beyond recovery by his audience. Those who hold it to be a requirement on the primary aspects of an utterance that they can be identified on the strength of publicly available criteria, would be forced to the conclusion that in such a situation there is no addressee, or that the utterance is deficient in that it fails to identify the addressee even though it ought to so so. I will not pursue the pros and cons of this position, but blithely stipulate that when the speaker has one or several pesons uequivoclly in mind as he addressee or addressees of his utterance, then that person *is* the addressee (or those persons *are* the addressees).

But can we be sure that who the intended addressee or addressees are is always clear in the speaker's own mind? It needs little argument that we cannot. I am not so much thinking here of cases where someone leaves note for, or writes a letter to "who it may concern". These are cases where the addressee is not known to the writer in person, but is nevertheless identifiable to him in some other way (possible even in terms of the content of what is being written). More worrisome, it seems to me, are cases where there are several addressees, and where it is beyond the speaker's powers to survey the totality of those he is (or may be) addressing. Today, with its sheer unlimited means of communication transmission, this situation has become very common anad much exacerbated: Public speakers have may have no idea of all the different places to which their words are relayed; and yet, inasmuch as they are aware that their words are being relayed, they may feel in some sense committed to counting among their adressees many of the recipients that are reached in this indirect way. On the other hand, not everyone at the receiving end of the relayed message need to consider himself an addressee, no more than this is necessarily the case for everyone who happens to be in the same place and hear his words directly from his own mouth. In such cases there is, I think, a real and often unresolvable underspecification in the meaning of the word "you".

Having mentioned these complications I propose to pass over them and to concentrate on the cases where the speaker takes himself to be addressing a single individual. I take it that in such cases the speaker is

always committed to having a particular individual in mind, in the sense that with his representation of the adressee he associates conditions of which he assumes that they are uniquely satisfied. Cases in which this presupposition is no fulfilled we will simply set aside.

By limiting ourselves in this way we have removed all obstacles to a simple characteristion to the reference rules for sp and ad and the interpretation rules for *I* and *you*:

(i) Under the assumed conditions the identity of the speaker of an utterance is an objective fact. It is to the speaker of an utterance as determined in this way that the discourse referent sp of the corresponding K_{Utt} is anchored.

(ii) Under these conditions the addressee of the utterance is determined by the intentions of the speaker. ad is anchored to this addressee.

(iii) The word *I* occurring in an utterance U must be interpreted via identification with sp of the utterance context K_{Utt} corresponding to U.

(iv) The word *you* occurring in an utterance U must be interpreted via identification with ad of the utterance context K_{Utt} corresponding to U.

indexicality than in and which has nour discussion of producer- and addressee-related aspects of utterances has been much simpler and shorter than the preceding discussion of their temporal aspect. This comparative brevity is in part the effect of my decision to finess the more complicated issues which arise when there is a plurality of addressees and - we didn't even mention these so far, but of course these occur as well - when an utterance is produced by a plurality of speakers. But it is due also to another simpification, which is built in to the "architectural" presuppositions of the approach taken in this entire paper.

domain - is an aspect of the immediate contact between the participants in a normal face-to-face conversation that they see their respective indexical representations of the present as targeted to the same moment of objective time, and thus as representations of the same thing. It should be added that although there is no fundamental difference in this case between the representat ions entertained by a and by b, giving a satisfactory account of the sense in which these representations are "shared" by a and b (and are experienced as shared by them) is no easier than it is in conncetion with their representations of themselves. But, as said, that is a concern which falls outside the scope of this paper.

The complications I have touched upon in this last paragraph are just the tip of an iceberg of questions which prop up in various places when the distinction between representations *de re* and representations *de se* is taken seriously. I believe that ignoring this distinction permits presenting the issues that are my primary concern in this paper more succinctly and transparently than would otherwise have been possible. it has certainly simplified the discussion of the producer and addressee-related aspects of K_{Utt}. In this case, however, the simplification is, to my own taste, almost too much.

How this information is encoded at

and not just in the abstract way of convergent anchors.
And the algnemtnWhat about the question whether and when they also belong to K_{Dis} does not seem to be very important. However, in order to state our interpretation rules we must be fully explicit. I propose that we assume that discourse referents for these participants will be added to K_{Dis} if and when either of them is mentioned. Normally this will be by means of the pronouns *I* and *you*, though this need not be so in all cases. It is important, however, that as soon as this happens, it is clear which discourse referent from K_{Dis} represents the speaker and/or which the addressee. This information is important because - among other things - third person pronouns cannot be used to refer to either one of these elements (except in very special circumstances and even then such a use is highly marked). In other words, representing the speaker or the addressee precludes a discourse referent in K_{Dis} from serving as antecedent for such a pronoun.

A simple way to encode this information is to assume a correlation beween discourse referents in K_{Dis} and the discourse referents sp and ad of K_{Utt}. We refer to this correlation as the

Meaning depends on context. The literature contains countless statements to that effect. Not all these statements claim the same thing, for there is much variation in the notions of "context" they presuppose. Even so, by and large all of them ring true. Meaning - in particular sentence meaning - can depend on a wide variety of factors besides grammatical form; and different statements of context dependence focus on different aspects of this very general and complex phenomenon.

That different authors have different notions of context in mind is evident even though many of them are not very explicit about how context should be defined. When no more is intended than to point out that meaning is dependent on certain contextectual factors, lack of explicitness need not be much of a problem. It does become a problem when the aim is to go beyond that and develop a detailed account of *how* context shapes meaning,

Exemplary among theories of context dependence which make a point of defining context explicitly are those which were developed in California in the late sixties and early seventies to account for the effect on meaning of the utterance context - efforts which culminated in Kaplan's "three-level theory". This theory three different "levels" of meaning, *extension, intension* and *character*. The character of an expression is a function which maps utterance contexts onto its possible intensions, and in its turn each intension determines an extension for each possible world or "circumstance of evaluation". (In particular, the intensions of sentences can be regarded as propositions, which for each possible world return a truth value.) One precondition for making such a theory work is to provide an explicit definition of utterance context. While some aspects of the notion of utterance context have remained problematic to this day, especially in connection with the interpretation of demonstrative phrases of the form this/that N, other aspects of it have been largely unproblematic. For instance, that and how the context of an utterance determines such interpetation-relevant entities as the speaker/producer of the utterance, the utterance time or the addressee or addressees have always clear enough to enable well-defined predictions. This is one of

the reasons why the theory could serve as a model of precision and clarity for several decades.

Another approach to the context dependence of meaning which has made a point of defining context explicitly is Dynamic Semantics. This is true in particular of one of its earliest versions, Discourse Representation Theory (DRT), the theory which will be the point of departure and general framework for the proposals presented in this paper.[61] However, the notion of context used in DRT (and this is true of Dynamic Semantics generally) is not utterance context as it is used in the context theories of Kaplan and his California colleagues. Rather, it is a notion of *discourse* context. Discourse contexts not only influence the interpretation of what is said next, but are themselves the result of the preceding part of the discourse. This entails that discourse context is dynamic in that it develops as a discourse progresses, changing from one utterance to the next. It is also a much more "linguistic" notion than the utterance contexts of Kaplan's theory, insofar as it is grounded in the form and content of utterances, and not in the external conditions under which they are made.

Within DRT the language-related character of discourse contexts is particularly prominent. One of its central tenets is that the discourse context determined by a given discourse segment should be identified with the semantic representation of this segment. More formally: The context for the interpretation of sentence S_n of a discourse D is identical with the semantic representation (Discourse Representation Structure or DRS) of the part of D that precedes S_n (i. e. the discourse segment S_1,.., S_{n+1}). The theory describes in detail how DRSs are constructed from syntactic representations of the sentences of a discourse, and thereby provides *ipso facto* an explicit characterisation of the set of possible discourse contexts. It was from its insisting on the identity of discourse contexts and semantic representations that DRT derives its principal explanatory power.

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61 Unfortunately it is not possible in this paper t present all relevant detais of DRT. Though much of what is being said here may be accessible without antecedent knowledge of the theory, I am nevertheless presuppopsing some familiarity with its fundamentals. There are currently a number of introductios to DRT. Shorter ones can be found in (Gamut,) and (Blackburn & Bosch, 200?) Part II. (Perhaps the paper (Kamp, 1981) in which DRT was first introduced, should also be mentiond here.) A slow-paced, but detailed introduction is (Kamp & Reyle, 1993), though only Chapter 1 and part of Chapter 2 are needed for a beter understanding of the present paper. A more up-to-date overview of DRT is (Van Genabith et al., 2004).

Intuitively there seems t be a wide gap between such a notion of discousre context and the utterance contexts used in the work of Kaplan and others. One concern of DRT almost from the start has been to integrate the two notions. But although de facto some kind of integration has existed for some time, the issue has to my knowledge never been discussed in the general and which it deserves. This discussion goals of this paper.[62]

While DRT's notion of context is one of the comparatively few for which there exist precise formal characterisations, it suffers from a serious draw-back: It is, especially when compared with many other formal and informal context notions quite limited in its scope. The only information that discourse contexts contain stems from what has been conveyed in the discourse itself. But obviously this is only a small part of the totality on which addressees must rely in order to make sense of what they hear or read. For one thing these limitations show in the restricted range of context-dependent phenomena for which the theory is able to account - even in principle. We need not see this as a fundamental objection - no well-defined theory can be expected to provide explanations for everything. But this is not all. The limits to the notion of discourse context used within DRT pose a problem even for the account it provides for many of those explanations which are among its own avowed aims.
Many of the accommodations that are needed on the version of DRT under discussion[63] cannot be plausibly described as accommodations in this sense. Intuitively there is no difference in these cases between the context as it appears to the interpreter and the one assumed by the speaker, and that the information needed to justify the presupposition is available to the interpreter just as it is available to the speaker.

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62 Other forms of Dynamic Semantics, in particular those developed by Groenedijk and Stokhof and others who have followed them differ emphatically from DRT in this respect, and in fact were motivated by the concern to develop "non-representational" notions of discourse context, which stand in a more abstract relation to the discourses inducing them. At first blush it may seem as if these notions are more easily compatible with the notion of utterance context of Kaplan and others. But on closer inspection the problems of coming to a unfied, overarching notion of context are not significantly simpler than those that have to be overcome by a unified account of utterance contexts and DRT's discourse context.

63 I am thinking more specifically of the DRT version presented in (Kamp & Reyle, 1993). However, with regard to the point at issuse here all extant versions of DRT with which I am familiar are similarly inadequate. Henceforth in this paper I will refer to these versions indiscriminately as "classical DRT".

The source of the problem is evident. The discourse contexts of DRT only contain information that has been contributed explicitly by earlier parts of the very same discourse. But normally the contextual information that is available to an interpreter includes far more, and it is reasonable for a speaker to assume this to be so. For instance, interpreters will in general have knowledge about many more entities than the comparatively few which the discourse introduces explicitly. And they will share with those who address them a vast repository of "world knowledge", knowledge about the ways our world functions, with its natural laws, social conventions and legal and moral codes and prscriptions. To the extent that such information is available to the recipient of an utterance, and presumed to be available to him by the speaker, it is part of the context in which the utterance functions as communicative act, and it will be part of the context from the very start. By comparison the information carried by the discourse contexts of DRT will be puny, even after a good part of the discourse has been produced and interpreted.

In DRT-based discussions of examples (usually short discourses or texts, consisting of a few sentences) the fact that context contains far more information than is contributed by the discourse itself has often been informally acknowledged. "Of course", it is admitted, "in real life contextual information includes much more than what is provided by the discourse, and in particular verbal communication never starts within the vacuum of an empty context". Once this is conceded, many accommodations which the theory might seem to predict on the strength of its explicit postulates, can be argued not to be really needed after all.

This is an obvious way out of the predicament. But it is also the easy way out. It does nothing more than protect the theory from certain unwanted conclusions, instead of signalling the start of a substantive extension, which makes it possible to deal with problems that are beyond the reach of the theory as it was. To my knowledge there has been, in the more than the nearly two and a half decades since the first formulation version of DRT was stated, little that has been done to try and go beyond this mere acknowledgement that there is more to context than discourse context in DRT's specific sense. This paper is a first (and much belated) attempt on my part to take some steps towards such an extension.

Not that I will go very far. I will limit myself to doing two things:

(i) I will formulate contexts as consisting of several components, of which the discourse context, as defined in familiar versions of DRT, is only one.

(ii) I will discuss some aspects of the dynamics of such complex, articulated contexts. In particular - and it is here, I think, that the principal interest of the present study is to be found - I will argue that this dynamics involves not just the introduction of new representations into the context, but also the *transfer* of representations from one context component to another. To give just one example, the first use in a given conversation or text of a proper name will in the normal course of events have the effect of transferring the representation of its referent *to* the discourse context component *from* some other component of the context. In such cases there is no need for the name to be accommodated, since it was part of the context already, albeit not of the discourse context.

is implicit in one of DRT's original and most important messages. Certain aspects of interpretation - the interpretation of anaphoric pronouns saliently among them - depend on discourse context, and what goes into the discourse context is clearly a matter of provenance, viz. whether the information is provided (more or less directly) by the discourse itself. Indeed, as announced. One component of our articulated contexts will be the discourse context as defined in earlier versions of DRT. The information that goes into this component is selected exclusively on the basis of its origin.

In Section 1 mentioned the problem of finding a common framework for discourse context and utterance context. The problem is this. The discourse contexts of DRT are representations (of already processed discourse segments), whereas utterance contexts are emphatically not that - they are not representations of informations, but real entities, such as persons, places or times which serve as the referents of certain demonstrative expressions. Utterance contexts and discourse contexts thus appear to belong to fundamentally different categories, as different as a man and his name. To resolve this apparent incompatibility we will adopt a framework in which both categories - both the man himself and his name, so to speak - are available. That is, we assume that utterance interpretation takes place within the setting of a "contextual environment", consisting of (i) a representational context, essentially of the same making as the discourse contexts (= DRSs) of DRT; and (ii) an intensional model, which contains as one of its parts the actual world in which the utterances are made. Between these two components there can (and typically will) be links in the form of so-called *anchors* which connect discourse referents occurring in the former component to entities in the latter.[64]

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64 The theory of anchoring is one of the many aspects of DRT which I cannot explain in appropriate detail here. Suffice it to note that when a discourse referent x is anchored to an entity a, this makes x a representation of a, in the absolute sense of direct reference. (Direct reference is captured within DRT in tems of anchoring.) For details see (Kamp, 1990, 2003) and (Van Genabith et al., 2004).