

Definite Associative Anaphora

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Abstract. The paper deals with the phenomenon known as *associative anaphora*, a certain first-mention use of definites where the referent is implicitly associated with previously introduced discourse referents. Embedded into the theory of definiteness developed in Löhnner (1985), an account of associative anaphora is offered which precisely specifies the nature of the possible underlying associations. It is shown that in any case of associative anaphora, the head noun is interpreted as a particular kind of functional concept, which I call *FC2*. FC2s are functional concepts that in a given situation assign a necessarily unique correlate to a possessor argument. In the case of associative anaphora, the possessor argument is typically left implicit. In analyzing a text passage from a novel by Kureishi, it is argued that FC2s play a crucial role in the construction of a discourse representation, in which every discourse referent is anchored by a chain of functional links. It is then shown that the network technically presents a *frame* in the sense of cognitive psychology. Frames, in turn, are immediately related to FC2s, in that attributes in a frame actually are FC2s. This offers a simple explanation of how the anchoring of discourse referents in course of the construction of the discourse model can draw on general or situational knowledge represented in frames.

0. Introduction

The central subject of the paper is what is commonly called associative anaphora. Standard cases of this phenomenon are examples such as the underlined expressions in the following text passage from Kureishi's novel *The Buddha of Suburbia*:

- (1) a. *So it was a big cheering surprise when I opened the front door of Eva's house one day to find Uncle Ted standing there in his green overalls, a bag of tools hanging from his fist, smiling all over his chopped face. He strode into the hall and started peering expertly at the walls and ceiling.*
(Kureishi 1990: 110f.)

Associative anaphora involves a hidden link or anchor which has to be introduced earlier. The expressions are interpreted as though the link or anchor were explicit and anaphoric. In the case of the examples here, the anchor would in both cases be Eva's house mentioned before, i.e. *the hall* is interpreted as *the hall of Eva's house*, and *the walls* and *ceiling* analogously.

Usually, the term *associative anaphora* is used for definite NPs. It should, however, be noted that the same kind of implicit anaphoric linking is also to be observed with indefinite or quantifying NPs, as in the following example:

- (2) *Eva, also lying on her back, had one naughty, slowly enlarging eye open.*

The eye here, is clearly interpreted as one of Eva's eyes. Such cases are not discussed in this paper. For that reason, I am talking in this paper of *definite* associative anaphoras, henceforth abbreviated "DAA".

The passage in (1a) also contains expressions which can be seen as explicit versions of associative anaphora, i.e. definite expressions of the same kind with overt anaphoric links:

- (1) b. *So it was a big cheering surprise when I opened the front door of Eva's house one day to find Uncle Ted standing there in his green overalls, a bag of tools hanging from his fist, smiling all over his chopped face.*

What they have in common with DAAs is that they are definites capable of first-mention use: their (discourse) referent need not be introduced before. This is due to the fact that definiteness in these cases is based on context-independent general knowledge (house's have front doors, people

have fists and faces). The kind of expressions underlined in (1b) will also be included in our analysis.

If one includes DAAs with explicit anchors, one should also drop the condition that the anchor be anaphoric. There is no essential difference between *Eva's house* (in 1b) and *her house* in an appropriate context which allows for, or requires, the replacement of the proper noun by a pronoun. In both cases the referent of the whole NP is “associated” with, or anchored to, a previously established discourse referent. Thus, what this paper is about is, more generally, what one could call *associative definites* anchored in the discourse. Accordingly, when I talk of DAAs in this paper, the term is to be taken in this general sense.

A restriction I will keep to is the condition that the underlying association is based on general knowledge. It should, however, be pointed out that, in a complex text, context-specific associations can be established and added to the knowledge which is globally used for the interpretation of the text. Passage (1b) contains such a case: the definite NP *his green overalls*. The phrase requires a previous mention of the fact that “he”, i.e. Uncle Ted, has green overalls. But once this fact is established, the green overalls are “associated” to their owner in the same way as, e.g., his face. Thus, the basic mechanism which enables the use of such definites is essentially the same as in the case of DAAs. DAAs form a natural class with such expressions, because context-specific and general FC2s are the extremes of a continuum of generality where any borderline would be arbitrary.

As for DAAs with implicit arguments, I will restrict the discussion (with one exception) mainly to *direct* associative anaphora, i.e. to cases where there is a direct antecedent whose discourse referent can be construed as the implicit anchor. The anaphoric link may, however, be indirect, without a direct antecedent but nevertheless clearly grounded in the discourse. Examples of this type are given in the following passage:

- (3) *Eva knew what she wanted: she wanted the whole house transformed, every inch of it, and she wanted energetic, industrious people around her. We got down to it immediately. With relief, I abandoned any pretence at being clever and became a mystic assistant labourer. I did the carrying and loading and smashing, Eva did the thinking, and Ted ensured her instructions were carried out.*
(Kureishi 1990: 111)

The analysis I'm going to elaborate is embedded in, and dependent on, the general approach to definiteness proposed in Löbner (1985). I will hence first sketch the essentials of this approach. In section 1, a distinction between sortal, relational and functional concepts and uses of nouns is introduced, since functional concepts play a crucial role in my analysis. Section 2 presents a brief account of my analysis of the definite article and definiteness in general. In section 3, I take a closer look at the crucial properties of FC2s, a certain type of functional concepts, which, I claim, underlie all DAAs. A short discussion of earlier approaches to associative anaphora together with my own proposal is followed by a detailed analysis of DAAs in a text passage from Kureishi's “The Buddha of Suburbia” (section 4). In section 5, I will propose a general format for the network of discourse referents which implies strong constraints on the cognitive process of text interpretation. As it turns out, the resulting network formally constitutes a frame, in the technical sense developed in cognitive psychology, of an attribute-value structure. This allows a straightforward explanation for the interplay of knowledge and the construction of a discourse model. Section 6 addresses further implications and perspectives of the proposal.

1. Sortal, relational, and functional

1.1 Types of nouns and noun uses

Central to the discussion below is a basic distinction of possible noun interpretations. Prototypically, nouns are taken as encoding a concept which determines crucial properties exhibited by the potential referents of the noun. Let me call such nouns *sortal* nouns. (Even in cognitive psychology, the notion of *category* is apparently identified with the prototype sortal category.) For example, the noun *adjective* is understood as denoting words with certain linguistic properties. There are, however, other types of nouns (and categories, for that matter). These nouns characterize their possible referents primarily by defining a certain relation of the referent to other objects. Keeping to the realm of linguistic terms, *complement (of)*, *subject (of)*, *meaning (of)*, *attribute (of)*, *pronunciation (of)* would represent this class of nouns. *Relational* nouns are syntactically non-prototypical in that they require the specification of an additional argument for interpretability. In what follows we need a term for the argument to which a relational or functional noun relates its referents. Let us call it “possessor”, since the linguistic way of specifying it is mostly by means of possessive constructions:

- (4) a. *December’s children*
 b. *the lord of the flies*
 c. *my uncle*

Sometimes adjectives or proper names in adjectival position can be used to express the possessor:

- (4) d. *the imperial palace*
 e. *the Soviet army*
 f. *the South London suburbs*

Let me call the objects related by a functional or relational noun to a possessor, i.e. its potential referents, the noun’s “correlates”.

Prototypical examples of relational nouns are kinship terms such as *father*, *son*, *aunt*; nouns defining social relations like *friend*, *neighbour*, *compatriot*; nouns denoting parts of other objects: *part*, *head*, *hand*, *front*, *door*, *handle*, *entrance*, *member*, *department*, *subject* (in the grammatical sense), *beginning*; nouns denoting a dimension of an object: *age*, *size*, *price*; nouns denoting all sorts of concrete or abstract entities belonging to other objects: *name*, *profession*, *phone number*, *email address*, or nouns denoting the bearers of certain functions in various settings: *president*, *capital*, *government*. For all these nouns, a definition of their meaning would essentially specify a relation of the referent to some other object. For example, the meaning of *son* could be defined as *son of x* meaning “male child of x”, involving the relational variant of the noun *child*.¹ This does not mean that the meaning of relational nouns does not also, as a rule, include sortal characteristics of the referent (cf. the characteristic “male” in the case of *son*). The crucial point, however, is that a merely sortal characterization would never capture the relational part of the meaning. From the point of view of sortal characteristics, “sons” are just males.

The underlying relations can be further distinguished in terms of the number of correlates which may be related to one possessor. Let me talk of *relational nouns in the narrower sense* if the relation is 1-to-many, which is defined as meaning that, for a given possessor, the number of correlates may be zero, one, or greater, but not *necessarily one*. If the relation is necessarily 1-to-1, the noun will be called *functional*. Whether a noun in a particular occurrence is interpreted as relational or functional may be contingent on non-linguistic facts. But there are clear examples of

¹ That the noun *child*, in the definition, is used in its relational rather than in its sortal sense can be seen from the fact that sons need not be children in the sortal sense, i.e. non-adults.

nouns which must be seen as lexically meaning one but not the other type of relation. Among the nouns cited above, the following are lexically relational in the narrower sense: *son, aunt, friend, neighbour, part, hand*. A person may have any number of sons, aunts, friends, neighbours; she may have two hands, one or none; any object may have more than one part, etc. By contrast, the following nouns are genuinely functional: *father, head, front, beginning, president, government, capital* (of a country) and all dimensional nouns. As for the others cited above, one may argue that 1-to-1 relations are at least not necessary: A person may have more than one name, profession, phone number, email address; a building may have more than one entrance and so on.

An important point to note is the fact that the distinction between sortal, relational and functional nouns corresponds to general modes of description or categorization. If we want to characterize an arbitrary object, we may specify what it is like (sortal), indicate a way in which the object is related to others (relational or functional) or specify its role or function in certain connections (functional)². We know very little about the cognitive nature of noun meanings, but they seem to be related in a complex way to structured cognitive models that not only define sortal characteristics but also the ways in which we interact with the members of the category (cf. Lakoff's (1987: pp.12 ff.) notion of the "embodiment" of categories). Let me illustrate this with a simple example: The concept connected with the noun *bed* provides a certain amount of sortal characteristics which, on the basic category level, establishes it as a certain *kind* of object; at the same time, it specifies interactional characteristics, e.g. as the object one sleeps upon or in, from which in turn the sortal characteristics of beds partially derive. Due to the combined sortal and functional characteristics of the underlying concept, the noun *bed* can be used both in a sortal interpretation ("this is a bed, not a sofa") or in a functional interpretation ("this is my bed"). In the latter case, "bed" is understood as the object slept in or upon and the actual referent need not exhibit the features of a typical bed, it may, e.g., well be a sofa. Thus, the functional part of the underlying cognitive model accounts for certain prototype effects of the noun when taken as a means of sortal characterization.

One of my claims about (in)definiteness is that nouns can be used in general in either way, sortal or functional, or to be precise, can be used as means to employ either sort of categorization. It is therefore more appropriate to distinguish not types of nouns, but types of noun uses or interpretations. I introduced the distinction at noun level because there are clear cases in the lexicon of nouns with different meanings in this regard. Many nouns, however, have a mixed sortal and relational meaning composition. All genuinely relational nouns have a sortal meaning component. And it could well be argued, in view of the general embodiment or interactional anchoring of our categories, that all sortal nouns also encode relational or functional characteristics. Even a prototypical sortal noun like *book* is to be assumed to have a meaning that relates its possible referents to ways one can interact with books: write them, read them, put them in shelves, etc. In order to distinguish between the lexical meaning of a noun and the way it can be employed, I will be dealing with sortal, relational and functional *concepts* first, before I get back to nouns and the ways in which they are interpreted in discourse. Concepts may or may not be lexicalized as noun meanings. They may be ready-made cognitive tools or constructed when needed.

² I am using the term *function* deliberately in both its technical, mathematical, sense (of a 1-to-1 relation) and in its everyday sense. If a category of objects is defined in terms of the function they have, or role they play, the category is functional in the technical sense, because any role or function is defined in terms of a 1-to-1 relation to other things-in-the-broadest-sense. For example, if I try to explain what a computer "mouse" is in terms of its function, I will relate it to the PC as a unique part of its configuration. On the other hand, any 1-to-1 relation defines a role or function of the correlates w.r.t. the "possessor". For example, the "birth" of some person x is an event with a unique role in the life of x.

1.2 Functional concepts

One important fact to be observed with functional concepts expressed by NPs is that in addition to a possessor argument they always involve a situational argument.³ Their value is in general dependent on situational co-ordinates such as time, location and circumstances. Take, e.g., the functional concept encoded by the noun *price*. The price of a particular item depends on time; it also depends – in a rough sense – on a location, viz. the place where you buy it, and it depends, as the value of every functional concept does, on the relevant circumstances. Given a certain time and a certain location, the price of an item may still vary with the circumstances. Thus, the argument domain of a functional concept of the kind discussed so far technically consists of ordered pairs of a possessor and a situation. (Situations are to be understood as complex reference points with several co-ordinates the functional concept may relate to: a time co-ordinate, a location co-ordinate, a state-of-affairs co-ordinate). In English, explicit linking of the referent of a functional (or relational) concept to its respective arguments is expressed in significantly different ways⁴. While the possessor is expressed by a possessive construction, the situational argument is expressed by an attributive adverbial (e.g. a PP) or other attributes. In

- (5) a. *the price of a tourist menu at Bologna*
 b. *the price of a tourist menu in the main season*
 c. *the future price of a tourist menu*

the possessive PP *of a tourist menu* expresses the possessor, the PPs *at Bologna* and *in the main season* and the adjective *future* specify situational arguments. To be precise, they specify different co-ordinates of the situational argument and can, hence, be combined.

So far, we have only considered functional concepts with both a situational and a possessor argument. I call them FC2s because they have two arguments. In addition, there are functional concepts, I call them FC1s, that involve only one, a situational, argument. These concepts assign a functional value to situations. FC1s include concepts for objects which play a certain, unique role in a given situation, such as what is denoted by *the sun*, *the moon*, *the earth*. While these three concepts assign the same value to a wide range of locations and, presumably, a very wide range of time, there are others whose referents (or values, for that matter) are more locally determined: *the weather*, *the atmosphere*, *the Dow Jones index*. One prototypical group of FC1 cases is proper names. Proper names, e.g. of persons, usually have a medium size domain of situations to which they assign the same value. A name like *Paul* is dependent on a narrow social setting for its unambiguous assignment of a bearer (there are so many Pauls). But it does yield a unique bearer under appropriate circumstances, and it is important to note that personal names are always used *as though* they were unambiguous designators. Accordingly, in many languages, such as modern Greek or colloquial German, personal names are used with the definite article.

Another group of basic expressions which are interpreted as FC1s is personal pronouns. They differ, however, considerably in how far the corresponding FC1 is lexically determined. While first and second person singular pronouns can be considered fixed FC1s which pick out the physical producer or addressee of an utterance, plural first or second person pronouns depend on both the situation of utterance and the context, in specifying the FC1 as “the speaker/addressee plus the contextually relevant other persons” (where the speaker is excluded in the case of second person pronouns). Third person personal pronouns, singular or plural, depend entirely on the context for the FC1 to be constructed. Apart from the sparse information encoded in grammatical

³ Although I use the term *concept* in a non-technical way, my usage is compatible with more technical notions of *concept* such as the one proposed in Barsalou et al. (1993). Notably the view that all functional concepts have a situational argument is connected to a central point made there: that concepts are situated.

⁴ In this respect, English apparently resembles most European languages. There are, however, languages which do not mark the arguments differently, e.g. Japanese.

number and gender, the only information they convey is: interpret/identify the referent by the general FC1 “the one(s) contextually relevant”. Third person personal pronouns behave like definite descriptions, i.e. definite article plus noun constructions, with a head noun carrying no descriptive content.⁵

Technically, all FC2s yield an FC1 when combined with a definite possessor argument. Thus, while *the right hand* represents an FC2, the expressions *your right hand*, *Mary’s right hand*, and *the right hand of Michelangelo’s David* are FC1s.

The last group of FCs I want to mention is quite different from the cases treated so far. It is the FC2s implicitly underlying the semantic roles of verbs. For every reading event, e.g., two roles are defined: the role of the reader and the role of the read. Underlying these roles are the functional concepts of “the reader of this reading event” and “the read object of this reading event”. There are further roles which can be connected to reading events, such as the means of reading (e.g. spectacles), the medium (e.g. a book, a sign, a hard disk), the time when it takes place, the location where it takes place, the speed of reading, and others. Events can be seen as being parameterized in this sense, each parameter corresponding to a functional concept. Different roles are systematically distinguished by the rules of grammar. The FC character of semantic roles is reflected in the basic assumption of all variants of case grammars: a semantic role can only be specified once in a sentence for a given event. This would not be the case if the event-participant relations were 1-to-many. The FC2s underlying the semantic (and thematic) roles of verbs, too, have a possessor and a situation argument. The possessor argument is the event expressed; the situation argument is the situation of utterance as specified by tense and mood of the verb.

So far we have considered the nature of FCs under the perspective of the arguments they assign values to. An equally important perspective is a look into the opposite direction: taking the values (correlates) as the starting point and observing the fact that they are *linked* to the arguments by the FC. The referent of *I* is linked by the underlying FC1 to the situation of utterance. The referent of *his telephone number*, is linked to “him” as the possessor and to the current situation; “he”, in turn, itself being an FC1, is linked to the current context of utterance. The respective linkings of FC1s and FC2s can be depicted as the directed graphs in Figure 1:

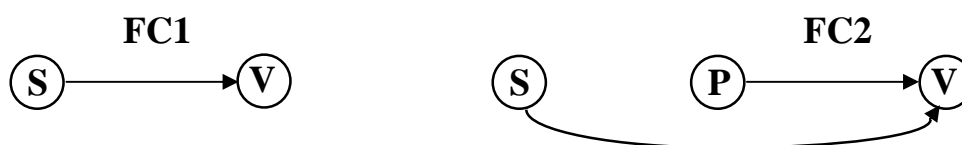


Figure 1: FC1s and FC2s

S represents the situational argument and P the possessor; V labels the value of the FC (the referent of the FC expression). In the FC2 graph, the P–V link is labelled with the FC2 itself, because it is this link which is specifically related to the particular functional concept; in contrast, the situational argument appears to matter only in a general, unspecific way.

⁵ In view of these considerations, it is necessary to distinguish between the situation of utterance and the context of an utterance. The situation of utterance is defined by a limited set of parameters (or co-ordinates) such as the immediate producer and addressee of the utterance, the time and place of the utterance and the text of the utterance itself. When I talk of “situations”, I mean the term in this narrower sense. In contrast, the context is the totality of information relevant for the interpretation of an utterance.

2. Definiteness and the function of the definite article

2.1 The semantic character of indefinites and definites

The basic point of my approach to (in)definites is the claim that, contrary to many approaches (e.g. DRT), it is neither the function of indefinites to introduce new (discourse) referents, nor is it the function of definites to refer to objects identical with already established (discourse) referents. In particular, the definite article is not anaphoric.

There is good evidence for either claim. Indefinites very often do not refer at all, but are used predicatively. This is the case with copula constructions – *Mary is a famous biologist* – as well as indefinites in attributive positions – *Mary, a famous biologist, ...*. A solution which allows a uniform treatment of “referential” and predicative uses of indefinites is to regard them as predicative in either case. The question then, of course, arises what the source of referentiality is for referential indefinites. This question will be briefly addressed in section 6.⁶

Indefinites consist of a head noun, possibly enriched with adjectival or other attributes, and, independently, a cardinality or quantity specification: a numeral, the indefinite article (which can be considered a weak form of the numeral for 1) or vague quantity specifications such as *several, some, many/much, a few/a little* and the like. In the case of bare plurals or bare mass nouns, no quantity specification is given. The head noun of an indefinite NP is usually a sortal or relational noun. The presence of a precise or vague cardinality specification expressing a value different from 1 requires a possible multitude of referents of the head noun (which in English, unlike Hungarian, is indicated by the plural form of the noun). Thus, the usual indefinite represents a non-functional variety of characterization. The only cases where an indefinite may contain a functional head noun are contexts in which the very existence of the value of the function is at stake, as is the case in

(6) *this car has a clutch / has no clutch*

or where the functional concept is sortalized, as it were:

(7) *he is a good father*

Here, the originally functional head noun is used as a sortal concept, formed by abstracting from its possessor argument.

As for the non-anaphoricity of the definite article, the data are abundant. Fraurud (1988), in an analysis of a representative range of different sorts of Swedish texts, found that roughly two thirds of all occurrences in the corpus of definite NPs were not anaphorical.

2.2 The function of the definite article

In Löbner (1985), a theory was presented that amounts to the general claim that the function of the definite article consists in indicating that the noun it is attached to is to be construed as a functional concept. The basic observation that led to this hypothesis is the fact that the definite article is redundant if the noun semantically represents a functional concept. The redundancy of the definite article takes two forms. Either the definite article is obligatory or it does not appear although the NP is definite, yielding an articleless definite NP. The definite article fails to appear (in English) with proper names and certain other FC expressions (cf. *go to school, during dinner*).⁷

⁶ Generic indefinites constitute a third class; I argued elsewhere (Löbner 2000) that these are not referential, either. Generic indefinites will be excluded from the discussion here, as will be generic definites.

⁷ Cross-linguistic comparison suggests that there is a universal implicational scale along which the marking of definiteness is established in a particular language. The beginning of the scale is constituted by those cases where the definite article is not redundant, in particular in its deictic and anaphoric uses. These cases are

If an FC noun is capable of taking an article, the definite article is obligatory unless the NP occurs in the kinds of sentences mentioned above in exs. (6), (7). Some caveat is, however, in order here. Languages with definiteness marking differ in the conventions of marking FC2 nouns. In English, it appears to be obligatory to mark the possessor of an FC2 noun explicitly, e.g. with a possessive pronoun, if the possessor is animate. German and French are different in this respect. Compare the following constructions:

- (8) E: *she put her hand on his knee / * she put (him) the hand on the knee*
 G: *sie legte ihm die Hand aufs Knie / ? sie legte ihm ihre Hand auf sein Knie*
 F: *elle lui a posé la main sur le genou / ? elle lui a posé sa main sur son genou*
- (9) E: *she took her hat off / ?? she took the hat off*
 G: *sie nahm den Hut ab / sie nahm ihren Hut ab*
 F: *elle s'est ôtée le chapeau / ? elle s'est ôtée son chapeau*

I take it that, in absence of the possibility of to combine prenominal possessives with the indefinite article (as given in Italian), these possessive constructions are definite. Thus, *his knee/John's knee* is semantically equivalent to *the knee of him/John*.⁸

If the possessor is inanimate, the definite article is appropriate with FC2 nouns in English. Consider the following quotation which nicely illustrates the different treatment:

- (10) *When the front door was safely shut and we'd move into the hall, Eva hugged Dad and kissed him all over his face, including his lips.* (Kureishi 1990: 9)

The nouns *front door* and *hall* here are FC2 nouns with an implicit inanimate possessor (Eva's house).

Historically, the definite article in English and many other Indo-European languages derives from deictic pronouns and this source is still active. In addition to triggering an FC interpretation of the following noun, the definite article has a second function: It binds the situational argument in linking the referent to the current situation. Apparently, this linking is not deictic in the narrower sense. It may relate the referent not only to the situation of utterance, but also to the discourse context in the case of anaphoric definites.

3. A closer look at FC2 nouns

Before we proceed towards the analysis of associative anaphora, let us take a short closer look at FC2 nouns. Three properties will be important for the considerations to follow.

1. Partiality. One characteristic property of FC2 nouns is the fact that, as functions in the mathematical sense, they are in general only partially defined: functional concepts do not assign a value to every argument that is logically possible, but only to a limited range. For example, FC2s usually yield a correlate only for a subset of the objects that fulfil the selectional restrictions for the possessor argument. The same holds for the situation argument. For example, the FC2 noun *address* assigns a value to some, but not all persons and it may assign a value to a particular person at some times, but not at others.

followed by complex FC expressions, e.g. NPs involving a superlative or an ordinal. FC1 concepts are placed even higher on the scale; its end is marked by proper names. There are languages, such as Modern Greek, which mark virtually all definite NPs with an explicit definiteness marking, while others, e.g. English, stop marking definiteness explicitly at a certain point of the scale. The definiteness scale appears also relevant for the historical development of definiteness marking. The history of German, e.g., clearly shows a gradual growth of the range of definiteness marking along that scale (cf. Behaghel 1923-1932, vol. I, p.33).

⁸ As to possessor NPs in copula constructions such as *she is my friend*, see Löbner (1985: section 3.4).

2. Transparency. (a) If an NP has the form ‘*the*+FC2+argument NP’, its overall referential properties are identical with those of the explicit argument NP. To see this, consider the following NPs:

- (11) a. *the footprints of a yeti*
 b. *the office of every teacher*
 c. *the author of the book*
 d. *the phone number of you /
 your phone number*

Since the argument term *a yeti* in (11a) is indefinite, the whole NP is indefinite: it is semantically equivalent to the bare plural NP *a yeti’s footprints* or just (roughly) *yeti footprints*.⁹ Likewise, the NP in (11b), as a whole, is quantificational, equivalent to *every teacher-office*. The NPs in (11c) and (11d) are definite as a whole since their respective argument NPs are. Furthermore, *the author of the book* is anaphoric if and only if the argument NP *the book* is anaphoric. The NPs in (11d), as a whole, are deictic, due to the deictic status of the argument NP. Thus, NPs of this form inherit their referential status from their possessor argument. The FC2 noun is transparent, as it were.

An FC2 NP with explicit possessor expression not only inherits its referential status from its possessor, but also its concept type. The NP in (11a) yields a sortal concept. The NPs in (11c) and (11d) yield FC1s, since their possessor arguments are FC1s.

In view of this result, we can strengthen our claim about definite NPs: all definite NPs not only are interpreted as FCs, but more specifically as FC1s. A definite NP headed by the definite article has a head noun which is either directly interpreted as an FC1 or is to be interpreted as an FC2; in the latter case, the definite NP will not be definite unless the possessor is specified by an FC1, which yields a FC1 interpretation for the whole NP. Conversely, the presence of the definite article is not a guarantee for an NP to be definite. The role of the definite article is limited to indicating a functional anchoring of the referent of the following noun either to the situation directly or to some possessor, which may itself be anchored differently.

(b) A special case is provided by NPs of the form ‘definite article+FC2 noun’ without possessor phrase. These NPs are invariantly interpreted as involving an implicit definite possessor, which results in an interpretation of the NP as definite and FC1. One type of case is represented by the classical pattern of associative anaphora:

- (12) a. *reading the book, I fell in love with the author*

but it should be emphasized that the implicit argument is not always construed anaphorically. It may be construed deictically, as in (12b) when uttered in front of a house without the house being mentioned before:

- (12) b. *why don’t you try the bell*

or it may be construed as a bound anaphora:

- (12) c. *every house has a bell at the front door*

3. The chaining property. This property can be seen as a special case of the transparency property just mentioned. If an FC2 noun is combined with an FC2 NP as possessor, the result is an FC2 expression. Thus, we can pile up FC2s to complex FC2s. The NPs

- (13) *the car of the mother of the wife of the father of .../
 ...’s father’s wife’s mother’s car*

⁹ For a discussion of similar cases see Woisetschlaeger (1983).

yield a concept of the structure $CAR(MOTHER(WIFE(FATHER(...))))$, an overall FC2 which results in a concept of the type of its possessor argument. The chaining property will play an important role in connection with the construction of discourse structure below¹⁰. The complex FC2 expressed in (13) is shown in Figure 2.

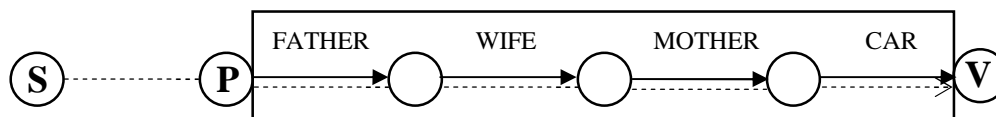


Figure 2: a chain of FC2s

The value of *father* is the possessor of *wife*, the value of *wife* is the possessor of *mother* and so on. The situation argument is depicted as being passed through every node of the chain.

4. The analysis of associative anaphora

4.1 Earlier characterization

Influential theories of definiteness, such as the approaches of Hawkins (1978) and Heim (1982), regard the anaphoric use of the definite article as the paradigm, or prototypical, use. From this point of view, all first-mention uses of definite NPs, in particular DAAs, appear as exceptions to be explained. The question, then, arises under which conditions these exceptional uses are possible.

For Hawkins (1978, pp. 123ff), associative anaphora represents a “textual appeal to general knowledge”.

It appears that the mention of one NP, e.g. *a wedding*, can conjure up a whole set of associations for the hearer which permit *the bride*, *the bridesmaids*, etc. I shall refer to the first NP as ‘the trigger’, since it triggers off the associations, and to first-mention definite descriptions which are dependent on this trigger as ‘the associates’. (p.123)

He then states, “I can give no fully rigorous answer to this question”, the question being: “... what are the parameters defining the set of possible associates.” (p. 123). Discussing the subclass of associations based on a part-of relation, i.e. of associations between the trigger and its parts, he states:

So we see that associative anaphora presupposes not just knowledge of some part-of relationship, it reflects also both the importance (in some sense) and the frequency of this part-of relationship. (p.130)

These conditions, however, are neither necessary nor sufficient. A part-of relationship may be both frequent and important, but it will not be appropriate for the use of an associative anaphora if the relation is 1-to-many. For instance, an extremely high percentage of persons have fingers as certainly important parts of their bodies. But the following occurrence of the definite NP *the finger* would not work as an associative anaphora:

(13) *A customer entered the shop. The finger was bent.*

Replacement of the definite article by a possessive pronoun, too, would not remedy the situation. Unless in the given context we were already focussing on a certain finger, we would not know which finger is meant. What we need in general is plausibility for a 1-to-1 relationship between the trigger and the associate.

¹⁰ Technically, the chaining of FC2s is some sort of functional composition: the result of chaining f and g is the FC2 $\lambda x \lambda s (f(g(x,s),s))$.

On the other hand, frequency and importance of the relationship do not seem to be necessary preconditions either. If the relationship is 1-to-1, we can draw safely on very rare associations. For example, very few cars have a front spoiler. Yet the following DAA would work smoothly:

- (14) *When John parked his car the other day, he damaged the front spoiler.*

In view of the fact that text recipients will in general try to construct a coherent interpretation if at all possible, the requirement that the underlying association be probable in terms of the whole category represented by the trigger appears too strong. Plausibility in the given particular case – a much weaker requirement – seems to be sufficient.

Another question arising in this context is which types of relationships underlie the association. Besides part-of relationships, Hawkins mentions “attributes” of objects, such as length, colour, or weight. As we saw above, both types of relations are natural candidates for FC2s.

Heim (1982, pp. 370ff.) discusses associative anaphora and related issues at some length under the label of “accommodation”. The process of accommodation is assumed to enable the use of definites for which no DR (discourse referent) was introduced earlier. “In our terms, accommodation is an adjustment of the file that is triggered by a violation of a felicity condition and consists of adding to the file enough information to remedy the infelicity.” (p.371f). The definition, when applied to DAAs, clearly indicates their exceptional status in her approach. Reflecting the rules that govern accommodation, she states: “When a new file card is introduced under accommodation, it has to be linked by cross-references to some already-present file card(s).” (p.373) She does, however, not elaborate on the nature of the cross-references.

Among the classical psychological literature on the subject, Clark (1977) presents a comparatively broad class of types of “bridging” relations. Apart from part-of relations, he mentions “roles” in events, including time (the original numbers are given in square brackets),

- (15) a. *John was murdered yesterday. The murderer got away.* [22]
 b. *I went shopping yesterday. The time I started was 3 p.m.* [23]

as well as reasons, causes, consequences, and “concurrences”:

- c. *John fell. What he wanted to do was scare Mary.* [28]
 d. *John fell. What he did was trip on a rock.* [31]
 e. *John fell. What he did was break his arm.* [35]
 f. *John is a Republican. Mary is slightly daft too.* [36]

Among the latter examples, (15f) is different in that it does not involve a definite expression triggering the bridging. The headless relatives in (15c,d,e) can be taken as complex definites.

It appears to me that of all analyses that attempted a general description of definiteness, it is Christophersen’s 1939 “familiarity theory” that came closest to a solution. Christophersen states:

The article *the* brings it about that to the potential meaning (the idea) of the word is attached a certain association with previously acquired knowledge, by which it can be inferred that only one definite individual is meant. This is what is understood by *familiarity*. Now, in all strictness, this term is not always quite correct. Though the previously acquired knowledge may relate to the very individual meant, yet it is often only indirectly that one is familiar with what is denoted by the word. It may be something else that one is familiar with, but between this “something” and the thing denoted there must be an **unambiguous relation** [my emphasis]. Talking of a certain book, it is perfectly correct to say “The author is unknown”; this is not a contradiction in terms. The knowledge referred to in this instance is the book. As it is common experience that every book has one (and usually only one) author, the knowledge of the book automatically entails the knowledge that there is an author. This is enough; the relation between book and author is sufficiently common and unambiguous to serve as a transmitter of the reference contained in *the*. (Christophersen 1939, pp. 72f.)

Here it is: the crucial “unambiguous”, i.e. 1-to-1, relationship between the trigger and the associate, based on general knowledge.

4.2 The FC2 account

In Löbner (1985), I indicated a possible solution to the crucial question of the kind of association involved in this type of use of definites. My central claim about associative anaphora is this: *The head noun of an associative anaphora NP is taken as an FC2*. In Hawkins terms, the trigger is the possessor, while the associates are the correlates assigned by the FC2. Due to the transparency property of FC2 nouns, the FC2 status of the head noun of an NP is not sufficient for its constituting a case of associative anaphora. In addition, the implicit (or explicit) possessor must be determined anaphorically.

This characterization of associative anaphora yields the necessary precisification of the type of relation or “association” between the referent of the DAA and the possessor. The FC2 interpretation of the head noun yields a 1-to-1 relation between them, hence warranting the “uniqueness” of the referent. The FC2 corresponding to the head noun will assign a functional value not only to this particular possessor, but in general to (a significant subset of) the whole category it belongs to. Thus, it can be considered part of the general knowledge from which the existence of the referent can be inferred once the possessor is given. The conception allows for associations regardless if they are frequent or not. All we need is plausibility of the association in the particular case to be constructed.

Since in this account the definite article triggers an FC interpretation of the noun anyway, DAAs are not assigned any exceptional status. This corresponds perfectly to the observable frequency of this type of use (cf. Fraurud 1990).

The hypothesis offered allows a prediction of the problems of FC2 processing in general and DAA processing in particular:

- (A) *FC2 interpretation*: In view of the fact that nouns as such often allow for different types of interpretations, the first problem on the side of the recipient is to check if the noun can be reasonably taken as an FC2 concept, rather than a sortal concept or a relational concept with 1-to-many characteristics.
- (B) *Possessor retrieval*: If there is no explicit possessor specification, an appropriate possessor has to be constructed.
- (C) *Existence of a referent*: Due to the fact that FC2s are, in general, only partially defined, the recipient has to determine if the FC2 can be reasonably considered to assign a value to the possessor in question.
- (D) *Presence of the referent*: Even if the assumption according to (C) is plausible, the recipient has to determine if the context reasonably allows for the introduction of a value of the FC2 *into the given situation*.

Problem (C), the problem of the acceptability of the *existence* of a value, is a matter of semantics and general world knowledge. Question (D) is a pragmatic matter of consistency with the given context of utterance.

The four problems are interdependent. For instance, whether the head noun can be taken as relating its referents to the possessor in a 1-to-many relation or a 1-to-1 relation, may depend on the choice of the possessor and on the current context. If the underlying concept is 1-to-many, there may, under appropriate circumstances, exist exactly one correlate for the given possessor. As to (B), the retrieval of an appropriate possessor will depend on a positive solution to problems (C) and (D) and vice versa. Also, a solution to problems (B), (C) and (D) will result in a bias for a positive solution to problem (A) even if the head noun is a bad candidate for an FC2.

In general, we can assume that a recipient, as long as she is basically co-operative, will try to find a positive solution to these problems. To the extent that she will modify, or accommodate, her current construction of the context, we will observe a top-down effect of the definiteness marking. The context which determines the situation argument is modified in order to yield an appropriate result.

The problems listed above show that there is no simple answer to the question under which conditions DAA is possible. The semantic condition can be precisely formulated: the noun must be able of an FC2 interpretation. But in actual use, the conditions are much more complex, involving not only lexical, but also contextual and general world knowledge.

4.3 Analysis of a text passage

In order to illustrate and test the potential of the theory offered, I would like to discuss another passage from Kureishi's novel. I will analyze all occurrences of nouns interpreted as FC2s in the third paragraph, whether the possessor argument is implicit or explicit, and, in the latter case, anaphoric or not. The passage cited is from the beginning of the novel. I cite the beginning completely in order to provide the full context of the passage.

- (16) *My name is Karim Amir, and I am an Englishman born and bred, almost. I am often considered to be a funny kind of Englishman, a new breed as it were, having emerged from two old histories. But I don't care – Englishman I am (though not proud of it), from the South London suburbs and going somewhere. Perhaps it is the odd mixture of continents and blood, of here and there, of belonging and not, that makes me restless and easily bored. Or perhaps it was being brought up in the suburbs that did it. Anyway, why search the inner room when it's enough to say that I was looking for trouble, any kind of movement, action and sexual interest I could find, because things were so gloomy, so slow and heavy, in our family, I don't know why. Quite frankly, it was all getting me down and I was ready for anything. Then, one day everything changed. In the morning things were one way and by bedtime another. I was seventeen.*
On this day my father hurried home from work not in a gloomy mood. His mood was high, for him. I could smell the train on him as he put his briefcase away behind the front door and took off his raincoat, chucking it over the bottom of the banisters. He grabbed my fleeing little brother, Allie, and kissed him; he kissed my mother and me with enthusiasm, as if we'd recently been rescued from an earthquake. ... (Kureishi 1990: 3)

Before I start the discussion of FC2 expressions, let me briefly consider the use of the first person pronoun here. Formally, the pronoun *I* represents a deictic FC1. In a narrative text like this, it is therefore construed as referring to the narrator. However, as we know from the first sentence, the narrator is presented as not being the same person as the author of the novel (possible autobiographic traits of the novel notwithstanding). The referent of the pronoun is not anchored to the situation of utterance in the same way as, say, is the case with the occurrences of the pronoun in this paper, when I use it to refer to myself. What we can say is that, in the novel, *I* is used as a functional concept for the discourse referent presented as the narrator of the story. It is deictic in that it is anchored directly to a given situation; the situation, however, is neither part of the story world (because the reader as the addressee belongs to it too), nor is it part of the "real" world that contains the situation of utterance of the given text. (The situation would probably best be described as a fictitious communication between the narrator as speaker and you, the real reader, as addressee.) Suffice it here to state that the narrator DR is anchored in the context and in the discourse model. The pronoun being deictic, its referent is defined for the given situation of utterance. Since the situation of utterance is one and the same throughout the entire novel, the first person narrator pronoun works as a globally defined functional concept in

the text. Each time the expression occurs (except for its use in direct speech passages), its anchoring is reactivated. In this respect it differs from anaphoric pronouns, whose referents are determined by only locally defined functional concepts.

In the last paragraph of (16), three DRs are linked to the narrator DR by means of FC2 expressions with *my* explicitly specifying the possessor argument. *My father* introduces a DR for the father of the narrator. The head noun is semantically an FC2, its DR is linked to the narrator DR and thereby anchored in the context. *My mother* works the same way. Hence, problem (A) is easily assessed; problem (B) does not arise. Since the respective FC2s assign a value to every person, problem (C) is solved, too. The head noun of *my fleeing little brother*, *Allie*, can be taken as defining a relational concept further constrained by the adjective *little* (the other attribute *fleeing* is non-restrictive, as is the apposition *Allie*). A person may have more than one little brother or none at all. Here we encounter the top-down effect of definites mentioned above. Despite of the relational concept underlying, we are led to the assumption that the narrator has one and only one little brother, i.e., to a positive solution of problems (A) and (C) for this NP. A further little brother might be introduced later, but we can safely assume that the context, up to the present point of the narration, contains only one little brother of the narrator.

The matter of the presence of the three family members (problem D) is more complex. We gain some support by the information that the father hurried *home*. Since we are not informed to the contrary, we will assume that he lives with his family (which will change in the course of events). Common scenarios suggest a high plausibility of the mother being at home at the time the father returns from work. Also we are not surprised by the stipulation that two sons aged seventeen and younger are at home, since it is common at that age and in the cultural setting described to live with one's parents, and so on. Assumptions like these appear necessary to accept the ad hoc stipulated presence at that time at that place of the four persons mentioned here.

I skip over the expressions *home* and *work*, whose referential status is questionable.

Next, the definite NP *his mood*, again, involves an FC2 noun. The noun *mood* represents a dimension FC2 which is globally defined for all persons in all situations, since every person, at every time, will be in some mood or other. We, therefore, need no support in order to accept the existence and presence of a value of the function. The expression is anaphoric since its explicit possessor argument is clearly anaphoric. The anaphora resolution is supported by the fact that, in the previous sentence, we learn about the mood of the father as being not gloomy. Since what is said here, that his mood was high, perfectly matches with the former characterization of the father's mood, we are led to interpret *his* as referring to the father. In addition, there is no other male person introduced so far, except for the narrator whom the author would not have the choice to refer to with a third person pronoun here. But this condition alone would probably not be sufficient.

Let us now turn to the definite NPs *his briefcase* and *his raincoat*. Taken in isolation, the head nouns would probably qualify as providing sortal concepts. Part of the cognitive models associated with the concepts, however, are clearly functional characteristics. Briefcases and raincoats are used on certain occasions for certain purposes, serving as "the container to carry certain things around" or "the piece of garment worn to protect oneself against rain, cold etc.". Thus their referents fulfil unique roles in standard settings. We are led to imagine (the carrying of) the briefcase and (the wearing of) the raincoat as parts of the scenario which structures the father's travels from home to work and back. In this scenario, the briefcase and the raincoat not only exist, but are unique belongings of the father with a particular functional role. This scheme accounts for the possibility to construct a person as the direct possessor, as expressed by the personal pronouns. And I think it is this scenario, common to many commuters in London, which leads us to accept the *presence* of these objects.

A clear case of associative anaphora is the definite NP *the front door*. Each of us, when reading the text, will assume that the possessor (in the technical sense) of the front door is the house the family lives in and the father has now returned to. But how are we led to this assumption? The point of departure is the noun *front door*. Due to the component *front*, it represents not a sortal, but a part-of, hence a relational, concept (front-doors are not a special sort of doors but doors on the front side of something). As such, the concept provides us with selectional restrictions for its possible possessors. The prototypical case is a house. A house would be nice since the standard house even has only one front door which would allow us to use the expression as an FC2 (rather than a 1-to-many concept), as is demanded by the definite article. So we need a house. What we are told is that the father hurried home. We learn that he takes off his raincoat somewhere close to this front door. Since our schematic knowledge of the use of raincoats tells us that they are worn outdoors and usually taken off as soon as one enters a closed room, we are led to assume that the father is indoors now. (This assumption gets further support by the information that the father put his briefcase *behind* the front door). So we are indoors now. That we are, in fact, within a house is a reasonable inference on the basis of schematic knowledge about the usual living circumstances of people living in London and having work and a family.

So far, we have constructed *a* possessor for the front door. The possessor, however, is not yet properly anchored. It is just “a house”. Due to the transparency of the FC2 expression *front door* and the definiteness of the NP, we need a definite possessor, i.e. one defined by an FC1. Hence, the house must be anchored to the situation. The way we do it, is to interpret it as *the house of the family*. We need not decide in which sense it is “their” house – whether they own it or rent it or whatsoever – but we will assume that the house stands in some 1-to-1 relation to the family (there is one and only one such house for them). All these assumptions, again, demand massive schematic reasoning, which I will not try to go into. For the sake of simplicity, let us assume that the possessor of the house is the referent of *we*. (A DR for *we* is introduced earlier when *our family* occurs in the text.) Then the house in question is determined by the FC1 HOUSE of WE and the DR for *the front door* is defined by the chain FRONT DOOR of HOUSE of WE. Let me note that, in terms of accommodation, not only the DR of *the front door* is accommodated, but also the antecedent “house” DR. Hence, *the front door* here is an instance of an *indirect* DAA.

Within the definite NP *the bottom of the banisters*, *bottom* is a genuine lexical FC2 noun encoding a function which is universally defined for all physical objects with a vertical extension. Its possessor argument *the banisters* cannot be taken as an FC1 expression, hence it is to be interpreted as an FC2, i.e. a DAA, whence the whole expression inherits this quality. What is its possessor? Banisters are parts of/belong to stairs or other structures such as balconies. As we assume that the scene described takes place inside the house, we may assume that the banisters belong to a staircase within the house. Such a staircase, in turn, can be taken as a unique part of the house. Here, again, the house scheme provides us with a possible FC2 which links an indoors staircase to the house. Now we assume that the family lives in a house with some stairs with banisters. The stairs is supposed to lead from the entrance hall up to a second floor since, then, it is possible to make sense out of the information that the father chucked his raincoat over the *bottom* of the banisters. Thus, the FC2 chain for anchoring the DR of this DAA is: BOTTOM of BANISTERS of STAIRS of HOUSE of WE. Again, not only the DR of the whole DAA is accommodated, but also the stairs the banisters belong to. Note, that the preceding anchoring of *the front door* helps linking the NP, since a DR for “our house” is already established.

One definite NP remains which I want to discuss: *the train*. The train in question must be somehow connected with the father, as it can be smelt on him. However, unlike in the cases of *his briefcase* and *his raincoat*, we cannot take *the train* as an FC2 expression with the father as the possessor. Even if there were not a requirement that personal possessors be marked explicitly,

it should at least be possible to replace *the train* by *his train*; but that sounds definitely awkward. Consequently, *the train* here is not a DAA but an indirect anaphora. I analyze it nevertheless since the anchoring of its DR reveals basically the same kind of mechanism: the construction of an appropriate chain of FC links.

The father is said to smell from the train, so the most natural assumption would be that he has been on the train. Since smells on persons evaporate when they move in fresh air, he must have been on the train a very short time before. The noun *train* is a sortal noun and does not provide directly an appropriate FC2. Part of our category knowledge of trains, however, is that some of them are vehicles one gets on in order to move from one place to another. We are told in the text that the father has hurried home from work. We have further been informed that the narrator is from the South London suburbs, from which we may conclude that this is the area of London where the narrator and his family, including the father, presently live. Our knowledge of London may comprise the information that the suburbs are typically housing areas of people who work in the city and that the suburbs are connected with the city by public transport train lines. Putting all these pieces together, we are entitled to expect that the father is one of those commuters who travel by one of those public transport trains between work and home. So “the train” is “the train on which the father hurried home from work on this day”.

My hypothesis is that this FC1 is constructed via an implicit semantic role of the event of the father’s hurrying home from work. *Hurry* is a verb of motion which in the construction used in the preceding sentence exhibits four explicitly specified semantic roles – time, agent, source, and goal – but provides for further parameters which can, but need not be specified. One of those additional parameters is the vehicle of motion (an only partially defined FC2 for this type of events, since hurrying is also possible on foot). Due to the possibility of the vehicle role, and to the capacity of trains to serve as vehicles, the particular event mentioned is a possible possessor. The event, in turn, is anchored to the situation via the inversion of the agent link to the father, which can be seen as the possessor of the hurrying. The agent role of activity verbs is special in that it can be conceived of as a 1-to-1 link in both directions. Not only belongs an agent to every event with an agent role, but also, in a given situation, to an agent belongs its activity, since it makes sense to assume that any possible agent does only one thing at a given time. We can reasonably ask: what did the father do at that time. Thus, the inversion of the agent link yields an activity link, and the complete FC chain for the DR of *the train* is: VEHICLE of ACTIVITY of FATHER of I, where the FC2 VEHICLE is enriched with the sortal information “train” and the FC2 ACTIVITY with the sortal information “hurry”.

To sum up, all DAAs can be considered as linking their DRs via a chain of FC2s to an FC1 possessor (in this case the DR of either *I* or *we*). The head noun of the DAA provides the last FC2 in the chain. If there is a DR for its possessor, there is no reason to consider the addition of the DR of the DAA as a case of accommodation. Accommodation does, however, take place if the current discourse structure lacks a possible possessor for the DAA, as was the case with the two instances of indirect DAAs, *the front door* and *the banisters*, or in other cases of indirect anaphora (*the train*). We then observe the addition of further DRs, again by FC2 links, which in this case are retrieved from general schematic knowledge. The analysis, hence, reveals an important feature of the anchoring mechanisms for new DRs: they are linked to the given discourse structure exclusively by FC2s, unless they are FC1s directly linked to the situation. At least this holds true for the DRs of definite NPs.

5. Frames and the network of discourse referents

5.1 The network of discourse referents

The analysis of the definite NPs in the text renders a complex scheme containing the DRs in a coherent network which I would like to represent in the following way:

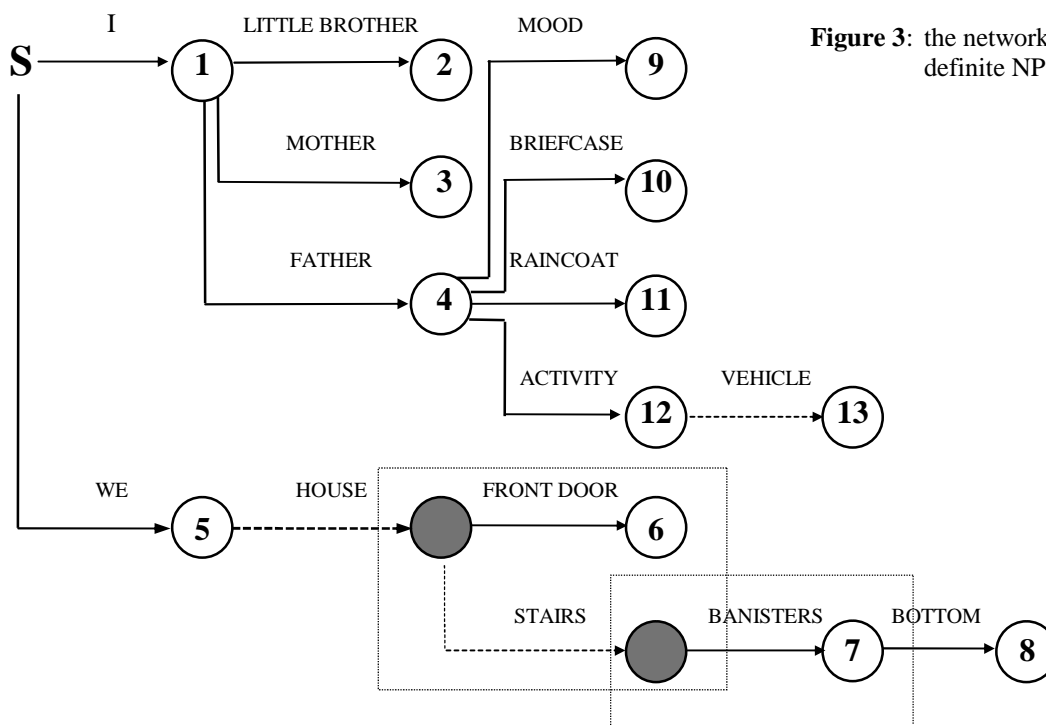


Figure 3: the network of DRs of definite NPs in (16)

The nodes of the network represent DRs, except of the initial node **S** which represents the situational argument to which the DRs of the FC1 expressions *I* and *we* are linked. The DRs carrying a number are explicitly mentioned in the text. The shaded nodes are accommodated. Each arrow between two adjacent non-initial nodes represents an FC2 link from a possessor to its correlate and is labelled accordingly. Broken arrows represent inferred links.

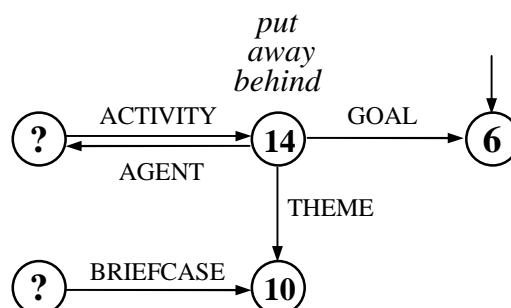
The scheme does not represent the whole information given in the text passage. It does, however, contain the DRs for all definite NPs occurring in the paragraph. (The personal pronouns not mentioned refer to the nodes 2, 4, and 11.) Much more information is attached to the DRs occurring in the network. For one there is sortal information not represented: that 13 is a train, that 2 is fleeing and named Allie, and so on. But the most important information not contained in the structure is the information introduced by the verbs in the text. For each event verb like *hurried home*, *put away*, *took off*, *grabbed* and *kissed*, an event node must be added to the network as an DR of its own. We have done so in one case (*hurried home*, node 12) in order to be able to link the DR of *the train* to the net.¹¹

The network has a highly constrained structure: each DR is represented by a node which is linked directly or indirectly to the initial **S**-node by FC links. Direct links to **S** are FC1 links, all other links are FC2 links. Due to the transparency property, there is, thus, an FC1 for every node, e.g. **FATHER** of **I** for node 4, **BOTTOM** of **BANISTERS** of **STAIRS** of **HOUSE** of **WE** for node 8. This coincides with the observation that every definite NP is interpreted as an FC1.

¹¹ Further information missing is the part-of relationship between DR 5 for “we” and the DRs for the persons belonging to that group.

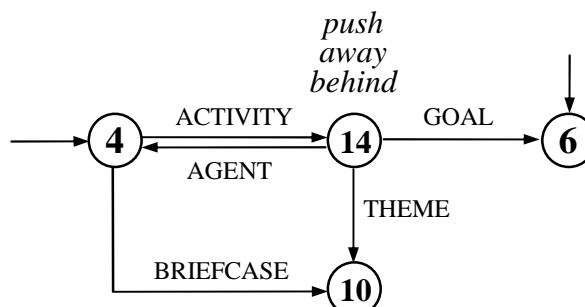
Anaphoric pronouns would be assigned an already existing DR. For instance, the sentence *he put his briefcase away behind the front door* would yield a structure as shown in Figure 4:

Figure 4: result of interpreting
*he put his briefcase away
behind the front door*



The linking of nodes already contained in Figure 3 is indicated by an arrow out of nowhere; for the sake of simplicity I labelled the event node “put away behind” in order to be able to link the DR for *the front door* directly to the event node. The anaphoric pronouns *he* and *him* are assigned two separate nodes, marked by question marks, indicating nodes to be identified with nodes already anchored. In the process of integrating the network chunk in Figure 4 into the whole structure, both nodes will be anchored by identification with node 4, yielding the part of the DR network shown in Figure 5. Again, the *ACTIVITY* link between the subject of *put away behind* makes sure that each new node is ultimately linked to S.

Figure 5: result of integrating
Figure 4 in Figure 3



We mentioned above that anaphorical pronouns yield a unspecified FC1 which is to be retrieved from context. In view of the discourse model proposed here, this can be made more precise: the contextually available FC1s for anaphoric pronouns are those corresponding to the existing nodes in the network.¹²

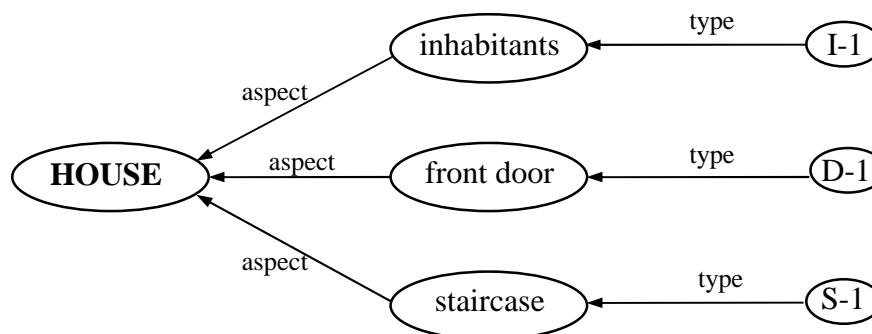
Similar to anaphoric pronouns, simple direct anaphoric definite descriptions must be assigned DRs already anchored. Due to their richer descriptive content the choice of possible assignments is more constrained than for anaphoric pronouns. Basically, a node has to be found which not only satisfies the sortal description encoded in the head noun but also fits into the rest of the new sentence. Once a successful resolution is found, the DR of the anaphora will be determined by a functional concept, i.e. by the FC (chain) which determines the position of its DR in the network, enriched with the sortal information conveyed by the head noun. Thus, in the end, the definite NP with a lexically sortal head noun acquires a functional interpretation in the given context.

¹² Of course, this is a simplification of the complex problems of pronoun resolution. It disregards the possibilities of cataphoric or deictic use and the complexities of the resolution of plural anaphoras.

5.2 The DR structure is a frame

The most important feature of the DR network is the fact that it, technically, constitutes a *frame* in the sense used in cognitive psychology (cf. Barsalou 1992). Frames are schemes based on an attribute-value structure, with attributes figuring explicitly in the scheme. Part of a frame for “house”, containing just the attributes *inhabitants*, *front-door* and *staircase* (which are certainly not representative), would be represented as in Figure 6 (cf. the Figures in Barsalou 1992).

Figure 6



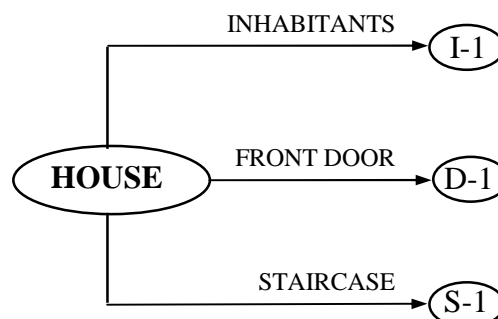
Such a frame has a central node labelled with the category the frame describes, and nodes for each attribute and its value; I-1, D-1 and S-1 represent unspecified particular values out of the range of possible values. The links between the nodes are, somewhat insignificantly, assigned general labels such as “aspect” or “type”.

Now, the crucial point that connects our discussion to the notion of frames is the fact that *the attributes figuring in frames are FC2s*. Barsalou on attributes:

What aspects of a category can be attributes? Clearly, this depends significantly on a category’s ontological domain [...]. For physical objects, attributes are likely to include *colour*, *shape*, and *weight*; whereas for *events*, attributes are likely to include *location*, *time*, and *goal*. Attributes are often *parts* of category members. [...] However, I assume that attributes can represent many other aspects of category members beside their parts. For example, attributes include evaluations (*enjoyment – music*), quantities (*cardinality – family*), costs (*sacrifices – career*), benefits (*skills – education*), and so forth. As I argue later, people are highly creative in their construction of attributes, often producing new ones relevant for specific contexts. (Barsalou 1992: 31)

An alternative form of the frame schemes would thus be a representation in the format used in here: representing values by nodes and attributes by labelled arrows connecting nodes. The diagram in Figure 6 could thus be transformed into the one in Figure 7:

Figure 7



It follows that the network of DRs, as proposed here, is one coherent frame. This approach offers a straightforward explanation for the interaction of discourse representation and general

knowledge, at least in the case of DAAs. Apparently, we can draw on frames in our knowledge base as the source of ready-made chunks for the discourse frame. For instance, the *house – front door* link in the house scheme can be transplanted into the discourse frame in order to accommodate a possessor for the DR of *the front door*.

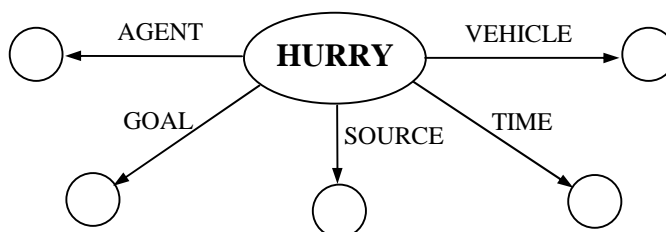
6. Consequences and open questions

If this approach is correct, it follows that not only the network of discourse referents is a frame, but the whole discourse model. Every DR can be referred to by a definite NP, hence every *new* DR must be linked to the network in a way which renders it definable by an FC1. And this is the case if and only if each DR is linked to the initial S node either directly or by a chain of FC2 links. As we have seen and will see, in addition to DRs for NPs also DRs for events have to be integrated into the overall structure. Thus, all the information in the discourse will be organized in one coherent frame structure.

In the text passage analyzed above, all new DRs we discussed were introduced by definite NPs. Many new DRs are, however, not introduced by DAAs but are associated with indefinites (whence the impression arises that these indefinites *introduce* new DRs). Indefinites, as I claim, are interpreted as sortal concepts (or 1-to-many relational concepts) and are hence incapable of providing the required link. How, then, can the construction of new DRs for indefinite NPs be accounted for?

As stated above, indefinites introduce a DR if and only if they fill an argument position of a verb of some specifiable semantic role. (This excludes, e.g. indefinites in predicative use.) Verb meanings can be represented by frames. The central node is the event node expressed by the verb, and each functional link corresponds to a semantic role. For instance, the frame underlying our conception of “hurrying” might approximately be depicted as in Figure 8.

Figure 8



When we interpret a sentence containing an event verb, we can build the relevant parts of the verb frame, i.e. the central node with its relevant links, into the discourse frame. Since, however, the central event node is to be anchored to established DRs, the frame must contain at least one link which is functional in both directions. There are several candidates. One is the agent link (if present). For any agent, it can be assumed that, at a given time, only one event is performed by them. This assumption may appear rather strong. But given that the context usually imposes very strong constraints on the possible actions of the protagonists in the current situation – usually, they will be engaged in the performance of some scenario which will to a certain extent predetermine the range of possible actions – this assumption appears not implausible. We already made use of the bidirectionality of this role when we discussed the indirect anaphora *the train*.

Another candidate for a bidirectional functional link, at least in narrative texts, is the time link. The event described by a perfective sentence will be interpreted not as *an* event of the sort, but as *the next* event after what happened before. The linking FC2 is “what happens next” Depending on the context, other roles may provide a bi-directional link, too: the event-theme link

might be inverted to “what happens to THEME”, the location link to “what happened at LOCATION”. Alternatively, instead of linking the event node via one of the semantic roles, it might be linked to other event nodes by various kinds of cross-sentential, e.g. causal, links.

If we manage to explain the introduction of event nodes for verbs, we can easily account for the interpretation of indefinites in argument positions: their DR node is provided by linking the event node to the discourse frame and adding to it the FC2 link which corresponds to the semantic role of the indefinite. The indefinite, then, merely supplies sortal (i.e. predicative) information about its DR. It does, however, not introduce the DR by itself, because the introduction of a new DR requires links which an indefinite NP cannot provide. An approach like this is not exotic. Van Geenhoven (1996, ch.5) has moved pretty far into this direction in arguing that for what she calls “narrow” indefinites the DRs are introduced by the verb.

The theory of discourse interpretation sketched here is unorthodox in the context of mainstream formal semantics, e.g. approaches based on DRT or Generalized Quantifier Theory, since the semantic representations in those theories are aimed at capturing different aspects of meaning than the aspect of anchoring centrally pursued here. The approach is, however, very close to pragmatic and cognitive accounts of definiteness in particular and information processing in general, such as Lambrecht (1994). In his chapter *The mental representation of discourse referents*, he takes the view that definiteness in general is based on frames (an idea which follows naturally from the FC approach). Relating to the category of definites, he states (p.90):

I believe that the common cognitive property which unites all instances of identifiability and therefore justifies expressions by a single grammatical category is the existence of a cognitive SCHEMA or FRAME within which a referent can be defined.

He continues with the citation of a definition of “frame” by Fillmore. After discussing the frames for various FC1 expressions with domains of varying extension, he concludes (p. 90):

Finally, the text-internal discourse world itself can be such a cognitive frame. For example the referent of [..., *example of anaphoric definite omitted*, S.L.] is identifiable to the hearer by virtue of the frame of reference established by the ongoing discourse alone, [...]

Lambrecht does not treat the anchoring of definites in such detail as we did, and it is not clear from what he says and quotes about frames if his concept of a frame is technically precisely the same as the one used here. But certainly our approach supports, and is supported by, a theory like Lambrecht’s.

Of course, the general proposal offered here raises more questions than it answers. But it appears to be a promising challenge due to the strong constraints on the discourse model and its direct relationship to the fundamental cognitive format of frames. Hopefully, among the question *answered* is the one the discussion in this paper centres around: the nature of associative anaphora.

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