Displaced reference in the evolution of language and cognition

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1. Displaced reference and the language evolution debate

In the debate about language evolution, the fact that there is no direct evidence about the emergence of language plays an important role. Researchers from various backgrounds have developed ways to collect indirect evidence and sketch a picture of how human language came about. In this article we will focus on a phenomenon that is relevant for many aspects of language evolution: displaced reference. Below we will focus on different kinds of research in which displaced reference is studied, but let us first look at what displaced reference is, and why it is interesting to study from the perspective of evolution of language.

'Displaced reference' (henceforth DR) means reference to things that are not present *here* and *now.* In other words, to objects or events that are remote in space or in time. It has been indicated as interesting from the point of view of language evolution as early as the 1960's. Charles Hockett, in an article on the origin of speech (Hockett (1960)), lists four design features that are unique (or practically unique) to human communication. 'Displacement' is one of them:

> Man is apparently almost unique in being able to talk about things that are remote in space or time (or both) from where the talking goes on.

DR is present in human communication, and seems to be absent in animal communication. But, according to Hockett, it would not be in principle impossible to have displacement in simple communication systems:

> It is also possible to see how faint traces of displacement might develop in a call system even in the absence of productivity, duality and thoroughgoing traditional transmission.

The fact that DR is present in human communication and not in animal communication, but that faint traces of it might develop in simple call systems, makes the notion interesting to study in the light of language evolution. Moreover, DR seems to exist not only in language:

> Something akin to communicative displacement is involved in lugging a stick or a stone around — it is like talking today about what one should do tomorrow.

That makes DR even more interesting, because it is something that not only belongs to language but is also recognized in other domains.

Above it was claimed that DR is studied throughout the field of language evolution. Below we will focus on two major approaches, the 'windows' and the 'comparative'

approach.[1] Before comparing the treatment of DR I will provide a short description of each.

The windows approach studies language evolution from a linguistic background: it studies restricted linguistic systems, such as pidgin languages, home sign systems and early stages of untutored second language acquisition by adults. The situations in which these language forms arise are all abnormal: the resources that are available for first language learning under normal circumstances, are for various reasons unavailable. Studying the structure of the language forms that appear in these situations may tell us something about the cognitive strategies on which language builds, and thereby contribute to the language evolution debate.[2]

The comparative approach uses techniques from comparative biology applied to language and cognition: it studies other species in order to draw conclusions about our own. One of the leading principles is that if a feature (either physical or behavioral) is present in some species that evolutionarily precedes another, then that feature is present in the later species, unless it has been selected against.[3] A key goal in the comparative approach to language evolution is to find out to what extent humans are unique, and what the key differences between us and animals are.

Although both approaches study language evolution, the two are quite different from each other. Promising analyses have been put forward from within both of them, but the results are hardly ever combined or compared. And this is not completely surprising, as the approaches have different backgrounds, answer different questions, and use different terminology. However, it has been recognized by various authors (see e.g. Kirby (2007)) that in order to make the picture of language emergence and evolution a more complete one, we need to bring the approaches together and combine their strengths.

Displaced reference, or at least something akin to displaced reference, appears in research within both the comparative and the windows approaches. In the present paper I will show that the results of these studies are worth combining. Although the terminology is slightly different, it is possible to relate the results to each other and sketch a more complete picture about displaced reference, in connection to the language evolution debate. Below we will first focus on an analysis of displaced reference that was put forward in the comparative approach, on the basis of studies of animal cognition. There, an evolutionary path is sketched from the cognitive phenomenon of object permanence in animals to displaced reference in human

[1] For an overview on the main recent approaches to the evolution of language, and their main research questions, see Kirby (2007). Kirby distinguishes between the comparative approach, protolanguage research and the complex adaptive systems view. The first two are more or less covered in this paper.
[2] Formulating exactly what the windows approach can make predictions about, and what the status of these predictions is, is a delicate issue, but space does not permit to go into this discussion. The reader is referred to Botha (2005, 2007) and Jackendoff (2002) for further reading. See also section 3, for a more specific discussion about the evolutionary conclusions based on early stages of L2 acquisition.
[3] See Harvey et al. (1991).

language. Subsequently I will present work from the windows approach that connects to this picture and supports it.

2. Displaced reference in the comparative approach

Central to the comparative approach is the study of different animals and the differences between them and humans. At many places in the comparative literature on language evolution, solely human and animal *communication* is focused on.[4] For several reasons, when studying displaced reference in the present paper we will focus instead on animal *cognition*. First of all, there seems to be no displaced reference at all in animal communication,[5] and so there would be no basis for comparison. Moreover, animal cognition is a useful area to look at:

> [Data revealing rich cognitive abilities in nonhuman primates] increasingly paint a picture of nonhuman primates as having quite complex minds, particularly in the social realm, but lacking a communicative mechanism capable of expressing most of this mental activity. (Fitch 2005:206)

Looking at cognition instead of language means that 'displaced reference' is no longer what we are looking for: it would be inappropriate to speak about 'reference,' when cognitive capacities are concerned. It is, however, possible to *think about* or *be aware of* displaced objects: in the literature, this capacity is called 'object permanence'.[6] An overview of research concerning object permanence is provided in Hurford (2007). Below, we will see some of Hurford's main conclusions.

When an animal has achieved object permanence, it is aware that an object continues to exist, also when no sensory information about the object is available. There are an enormous number of articles about object permanence in the literature on animal cognition. In these articles, results are presented of tests done on various animals, in order to see whether they have achieved object permanence. To test an animal for the capacity of object permanence, two kinds of test are used.

> **Visible displacement**: an object is visibly (to the animal subject) moved behind an obstruction, and the animal is tested to see whether it searches for the object behind the obstruction.

> **Invisible displacement**: an object is, in sight of the subject, placed inside a box. Then the box is moved behind an obstruction and the object is removed from the box, without the animal seeing this. Then the subject is shown the empty box, and the experimenter observes whether the animal looks behind the obstruction. (Hurford 2007)

The results of these tests, as summarized in Hurford (2007) are the following:

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[4] See the description of the comparative approach to language evolution in Kirby (2007).
[5] Although some authors consider honeybees to display displaced reference in their communication, the term seems inappropriate; although the language of bees *seems* to be very complex, it is only automatic behavior and therefore the bee dance should not properly count as communication. See Sjölander (1997) for discussion.
[6] This term was introduced by Jean Piaget.

- Most vertebrates that were tested (including avians, non-primate mammals, and primates) succeed in the visible displacement test.
- Some animals, including domestic dogs, parrots and apes succeed in the invisible displacement task.
- Every animal that is able to do invisible displacement is also able to do visible displacement.
- Within primates, the closer the genetic relation to humans, the greater the chance that the animal will succeed in the invisible displacement task.
- Surprisingly, parrots perform better than some monkeys.

Thus, there are animals that solve the invisible displacement task, and this shows that in these animals, the representation of an object is controlled by knowledge (or memory), and not merely perception. Moreover, the fact that primates that are closest related to humans perform best at the displacement task suggests that displacement is a key capacity in the development of animals towards a linguistic capacity. Or, to put it in Hurford's words:

> The capacity to know something about an object, even when 'it isn't there' is a first step along the road to the impressive characteristics of human languages, their capacity for displaced reference. (Hurford 2007:72)

Here a path is sketched, starting from animal cognition, that results in displaced reference in human language, on the basis of evidence from comparative studies. In the next section we will consider results from the windows approach to language evolution that can contribute to a more complete sketch of this path, by providing additional evidence.

3. L2-acquisition as a window on language evolution

An example of a restricted linguistic system is the initial stage of untutored second language acquisition in adults. In the present section I focus on why this is so, and in the next section I present data and provide conclusions concerning displaced reference.

From research on different cases of second language acquisition outside the classroom, it has become clear that adult L2-learners, at some stage in the acquisition process, develop a relatively stable version of the target language. That language has the following characteristics:

- It appears to be organized by a small number of organizational principles.
- It is to a great deal independent of both the source language and the target language of the speaker.
- It is simple, but rather successful for many communicative purposes.
- Approximately one third of the learners fossilizes at this stage.

In Klein and Perdue (1997), this stage in L2 acquisition is recognized as a separate linguistic system and it is referred to as the Basic Variety (BV). Preceding the BV, learners go through a stage that is even more primitive and is called Pre-basic

Variety. In this stage, contrary to what one would expect, very little trace of the source language is to be found. After the BV follows a stage that is called Post-basic Variety. In this stage more complex grammatical forms are displayed, although not all learners reach this stage. The three different stages, although the transitions are not always very sharp, each have their own grammatical systems. The Pre-basic Variety is based on nominal structure. The different elements of an utterance are related on the basis of pragmatic principles. Usually, utterances consist of two or three constituents: mostly nouns, but also some adjectives and adverbs; almost no verbs. The speaker, in the Pre-Basic Variety, relies heavily on context for his utterances to be interpreted correctly by the hearer. In the BV, (non-inflected) verbs appear, and the utterance is generally structured around the verb. In the Post-basic Variety, verb inflection appears and the grammar becomes more like that of the target language.

Because especially the Pre-Basic Variety and the BV are relatively independent of both source and target language, they can provide a window on language evolution. But which kind of conclusions can we draw exactly? Different views have been put forward at this point. A list of some of them is provided in Benazzo (to appear):

(a) Early stages of L2 acquisition can be interpreted as reflecting creative processes of the underlying human language faculty (Klein 2001).
(b) Early stages of L2 acquisition can be interpreted as representing a linguistic organization that is neutral with respect to the grammaticalized features of a specific language (Perdue 2006).
(c) Early stages of L2 acquisition can be interpreted as applying fossil principles from protolanguage, which modern languages often observe and frequently elaborate on (Jackendoff 1999).

In the context of this article I will adopt Jackendoff's view, although I realize that the debate about what conclusions can be drawn on the basis of windows on language evolution is a difficult one. It would, however, take too much space to elaborate on that issue here.

4. Displaced reference in the windows approach

In this section, we will investigate the role of displaced reference in human language, by looking at early stages of L2 acquisition. The data used was collected in the so-called ESF project (Perdue 1993). The ESF project coordinates researchers from different European universities, and has made available a large amount of longitudinal data from untutored adult learners of different languages. The overview in this section is based on the analyses of Benazzo (2006) and Dietrich et al. (1995), who used the ESF data to analyze the expression of temporality in early L2 acquisition.

Thus, this section studies temporality, in order to find out more about displaced reference. It might be clear that temporality is not equal to displaced reference. In one sense, temporality is *less* than displaced reference, as the latter covers also reference to things that are remote in space. In another sense temporality is *more* than displaced reference, as the expression of temporality not only concerns *reference* to things that are remote in time, but says much more. In very early stages of L2 acquisition,

however, the expression of temporality is still at a very primitive level, and, as will become clear below, not very different from displaced reference.

In fully fledged languages, there are expressive tools for temporality. Let me briefly gloss some of the main terms that are used in the analysis of L2 acquisition to depict the development of temporal reference in learner varieties.[7] A time span about which a speaker wants to say something is called 'topic time' (TT). The time span at which the event, process or state that is the subject of conversation is situated is called 'time of the situation' (TSit). The notional category of tense is taken to express the relation between the TT and the time at which the utterance is made: past tense indicates that TT is before utterance time, whereas future tense indicates TT after utterance time. The category of aspect, on the other hand, is taken to express the relation between TT and TSit. 'Imperfective aspect,' for example, is expressed when the time about which an assertion is made is included in the time of the situation.

The acquisition stage we will focus on is the Pre-basic Variety (PreV). One would expect that the PreV provides us no interesting data concerning temporality: verbs are not used in this stage, let alone inflected verbs, and learners have very little resources available. But this judgment is based on a familiar linguistic expectation: that temporal reference is expressed by tense forms. In practice, this is simply not the case; learners use smart strategies to be able to talk about past and future, despite their lack of knowledge of the language. On the basis of illustrative examples, I will explain what these strategies are.

As said in the previous section, the only resources available to the learner in the PreV are bare nouns, and some adjectives and adverbs. Thus, the only ways to express temporality are using adverbials or noun-like expressions (such as calendar noun phrases). Consider the following examples:[8]

(1)   (L1: Punjabi, L2: English), Dietrich et. al. (1995)
        punjab + I do agriculture farm
        (Punjab is a placename)

(2)   (L1: Italian, L2:German), Benazzo (2006)
        pause film + ausgang mit freund und fraulein
        film break + exit with friend and young lady

In the sentence in (1), a time span is introduced by denoting Punjab, the place where the subject used to live. The sentence means something like 'when I was in the Punjab, I was at an agriculture farm'. Here, it is illustrated that one does not even strictly need calendar expressions, but that an NP like 'Punjab' can function as a reference to a time span (a TT). The same can be observed in (2); there, 'pause film' functions as a reference to a time span.

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[7] I will use the terminology as put forward in Klein (1994).
[8] I followed the notation that was used in the source articles: + indicates an unfilled pause; ++ indicates a longer pause; * * enclose a sequence in a language other than the target language.

Another thing that can be observed is that both the TT and TSit ('I do agriculture farm' and 'exit with friends') are introduced, but the relation between these two (aspect) is left to the hearer's inference. The default interpretation would be that the situation holds *at* the time span that was introduced (Benazzo, 2006, p. 2), but from these two examples it might be clear that it is not easy to interpret utterances from L2 learners in an early stage.

In the next example it becomes clear that a learner can use the context for marking temporal relations. The learner first copies the temporal reference introduced by the interviewer (or the contextual now) and then introduces a new reference, by placing an adverbial:

> (3)   (L1: Spanish, L2: French), Dietrich et. al. (1995)
>   Interviewer: 'What about your husband?'
>   a.   *en el* hopital
>   In the hospital
>   b.   demain ++ permis
>   tomorrow ++ permit (= to leave the hospital)

In the examples above we have observed several things. First of all, that in the Pre-basic Variety, learners have very limited knowledge of the target language. Furthermore, that despite this fact, learners are able to refer to situations that are in the past or the future. For doing this, learners use relatively unorthodox methods (as they do not have verb inflections at their disposal) and leave much work to the hearer. Moreover, learners start using reference to a time span (tense), before they start using an aspectual perspective on situations: aspectual perspective is only developed in the BV. The most important point is that learners refer to situations that do not take place now, and thus use displaced reference. Displaced reference occurs in stages of language acquisition in which the resources are very limited, and therefore it is conceived of as an essential function of language.

From the study of early L2 acquisition we have seen above we can conclude that, as displaced reference appears very early – even before sufficient means are available to express it in the regular sense – apparently the need to talk about things that are not present now (or here) is very pressing. Apparently, speaking a language without having the possibility to refer to remote things is not enough, even in very early stages of the acquisition of a language. From this we can conclude that displaced reference is an essential element of human language, and that it must have been present in language already very early in history (in protolanguage).

As was remarked in the introduction of this article, any evolutionary picture that is sketched can be strengthened and made more complete by combining results from different approaches in the area of language evolution. In the next section I will combine the results concerning displaced reference we have seen in the previous sections.

5. An evolutionary path

In section 2, animals' performances on a displacement task were compared, and it was concluded that the capacity for object permanence has been important in the evolution of language, in the stage before there was language. A picture was sketched of an evolutionary trajectory that starts in object permanence in animal cognition and results in the property of displaced reference in human language.

The results from section 4, the windows data on temporality in L2, can support this story: if displaced reference was already present in the earliest evolutionary stages of language, the foundations of it must have matured in cognition first. The two stories, the comparative and the windows story, approach the topic of language emergence from different sides. The comparative approach studies our ancestors, animals, and makes a claim about how humans – and their linguistic capacities – could have evolved from them. The windows approach looks at language, and formulates claims about how the complex linguistic forms we have now may have looked in primitive languages. The present study on displaced reference shows that it is possible to connect the two sides and that this results in a more complete picture of how language came about. Moreover, it supports a view that has been put forward at several points in the literature lately:[9] that many layers of human cognition had emerged before humans actually started to speak.

But the story provided here is still not completely satisfactory. The two branches of research that were presented do support each other's conclusions, but the evolutionary path that was sketched is still not complete. A remaining issue is, for example, the question of what conditions should be fulfilled for an animal to start using displaced reference in communication. In other words, if an animal performs well on the most complex displacement tasks, what next is necessary to start using displaced reference in communication? This is an important question and to answer it, we need much more indirect evidence. The story above, however, indicates that when more indirect evidence is available, it is useful – and possible – to put together different kinds of results from different kinds of research.

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[9] See, e.g., Gärdenfors (2004).

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