Deictic use of Dutch demonstratives

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Abstract

This paper presents a study of the use of the Dutch proximate (dit, deze; this) and distal (dat, die; that) demonstratives. Previous studies on the use of demonstratives to refer to linguistically introduced objects addressed the notion of 'force'. Force consists of three strategies: 'givenness', 'noteworthiness' and 'foregrounding'. We show how these three strategies can be generalized to the deictic use of demonstratives to refer to objects in a visual task domain. The empirical data obtained from recorded dialogues showed that proximate demonstratives are used in cases where a speaker wants to signal to the addressee extra force to find the intended referent while distals are used in cases where the referent is more 'given' with regard to the addressee's consciousness. Our results differ from those that have been reported in the literature on the use of the English demonstrative.

Introduction

When two agents communicate while performing a task together, they must indicate, among other things, which of the available objects should be used. In a shared application domain where both agents can see the objects and their properties, they can use referential acts to refer to the domain objects. Take, for instance, the referential act which is composed of the following expression:

that red pyramid on top of the yellow block

This expression consists of a demonstrative determiner (*that*), a noun (*pyramid*) and two modifiers (*red* and *on top of the yellow block*). The noun and the two modifiers describe an object, i.e., its shape, colour and position. It is clear that these are properties which can help an addressee in identifying the object. It is less obvious how the demonstrative determiner *that* could have a similar function.

In this paper the identificational function of the Dutch demonstrative will be examined by comparing the use of the two main existing types of demonstratives: proximates and distals:

Proximate:
dit (this): neuter gender/singular
deze (this/these): rest[1]
Distal:
dat (that): neuter gender/singular
die (that/those): rest

1. 'Rest' stands for 'common gender/singular and common or neuter gender/plural', where 'common gender' means having one form for male and female.

We will focus on the deictic use of the demonstrative determiner as a component of the referential expressions. In contrast with its anaphoric use, where a demonstrative in combination with the other parts of the expression refers back to an object which has been introduced linguistically, a demonstrative is used deictically if it refers to an object which is (physically) present in the application domain. If the object can be seen, the demonstrative can be combined with a pointing act.

We will proceed as follows. In the next section we will show how the concepts which have been employed in the study of the anaphoric use of demonstratives can be generalized so as to formulate a hypothesis about deictically used Dutch demonstratives. Next, we will describe the arrangement of the dialogue situation in which the hypothesis is tested. Finally, in the last two sections before the conclusions, the main results will be presented and discussed.

The role of demonstratives in referential acts

Force as the central concept

Kirsner (1979) claims that the distal and the proximate demonstrative can be used to signal different *forces with which the addressee is instructed to find the referent*.[2] He advanced the hypothesis that, in Dutch, proximates signal stronger force (i.e., greater urging that the addressee find the referent) than distals. Kirsner argued that there are basically three strategies which people use to decide on signalling either high or low force; they are: givenness, noteworthiness and foregrounding. All other concepts which have been proposed in the literature can be seen as variations on these three concepts. We will discuss each of them in the next three sections and present proposals on how to generalize them for application to the deictic use of demonstratives.

Givenness

The strategy of givenness is that *speakers will most strongly direct the addressee's attention to entities that are not given 'in the addressee's consciousness'* (for instance, objects which were introduced rather far back in the discourse).

In order to check whether people actually apply the givenness strategy, we need criteria to determine the level of givenness of an entity. In the literature four factors have been proposed which are thought to influence the givenness of referents (see Ariel, 1988, 1990):

1. *Distance.* Distance refers to the distance between the antecedent and the anaphor (measured in terms of the number of intervening words or sentences). The greater the distance, the less given the object to which the antecedent refers is.
2. *Unity.* Antecedents which belong to the same context (e.g., frame/world/point of view/segment or paragraph) as the anaphor are more given than those that are not.
3. *Salience.* Some referents stand out more than others and are therefore more given. For example, salience is caused by the topicality of a referent.
4. *Competition.* If some objects have the same level of salience, this diminishes the givenness of the objects.

2. The notion of *force* was first proposed in García (1975).

The factor *distance* is, in the first place, useful for the analysis of anaphoric demonstratives. It, however, also plays a role in the deictic use of demonstratives. Even if an object has not been referred to previously in the conversation (e.g., it is part of the application domain instead of the linguistic context), it may be associated with an object which does have a high level of givenness due to the distance factor (i.e., recent reference to the object).

In a situation where two dialogue participants can see some part of the application domain, its spatial properties may actuate associations (*unity*) between objects. Objects may, for instance, be grouped into those which are close to the participants and those that are far away. In fact, proximate demonstratives are usually thought to refer to nearby objects and distals to objects that are far away. This kind of use will not be examined in the present study.

We will concentrate on situations in which all objects are roughly the same distance from both dialogue participants. In such situations what counts is the distance between the objects themselves. Following Cremers and Beun (1995), we will assume that if one object is at the centre of the attention of the dialogue participants, then part of the attention will rub off on to the objects which are adjacent to it. Grosz and Sidner (1986) describe the object at the centre of attention as the object in *focus*. Focus is the highest possible level of givenness that an object can acquire. We propose to describe the objects that are adjacent to the object in focus as in *implicit spatial focus*. The focus and the objects in spatial implicit focus together form the *focus area*.

The factors *distance* and *salience* determine whether an object is in focus. All objects referred to in the most recent utterance are candidates for being in focus. If only one object was referred to, then that object will automatically be in focus. If more than one object was referred to, the most salient one will be in focus. An object may, for instance, be spatially salient because it has been manipulated as a part of the task.

Salience can also arise through task-independent events, e.g., an object which unexpectedly explodes will draw attention even if the object is not relevant to the task at hand.

Another task-independent source of spatial *salience* is the visually perceptible properties of objects. Objects which have an exceptional property with respect to the other objects in the application domain are more salient than those that do not have such a property.

Competition means that, if a number of objects have the same level of salience, this decreases their givenness. In our study this factor will not be taken into account, because two levels of givenness (i.e., given and not given) suffice for the study of the two types of demonstrative determiners (distal and proximate). If an object is in some way or another salient in the application domain, then it is judged to be given.

Noteworthiness

The strategy of noteworthiness is that *speakers will most strongly direct the attention of the addressee to entities that the speaker is most interested in talking about.*

The notion of noteworthiness, or importance, is rather problematic. Kirsner (1979), for instance, suggests that objects are noteworthy by virtue of being single objects, named objects or human beings. This claim may have been appropriate for the kind of texts which he examined, viz., a book on analytical philosophy and a novel, but it is certainly not universally applicable. For example, a bricklayer who tells his assistant which bricks he needs, is at that moment more interested in the bricks than in the person who hands him the bricks.

Noteworthiness seems to depend on the context (in particular, the task at hand). In a novel, which is an attempt to create a psychologically plausible picture of the main characters, these characters are obviously important. A bricklayer's task requires a completely different filling in of the notion of noteworthiness.

Noteworthiness is a sufficiently general concept to be useful for the analysis of the deictic use of demonstratives. It does not depend directly on the domain but rather on the task which has to be carried out in the domain (or the shared goals of the participants if there is no explicitly stated task). The task determines which objects in the domain are noteworthy and which are not.

Foregrounding

The strategy of *foregrounding* is that *if a speaker wants to apply strong force to coerce the addressee to find the referent (because it is noteworthy or not given), then he will use all available and appropriate means to do so*.

We will try to show that the type of demonstrative (distal or proximate) is one means for signalling strong or weak force. A different means to signal strong force is to put the referent to the foreground. Kirsner (1979) suggests that in a text a referent can be foregrounded by putting its referring expression (a) in a main clause instead of a subordinate clause, (b) at or near the beginning of a sentence or (c) in the first sentence of a paragraph.

In a situation where objects are present in the domain and can be seen by both participants, an appropriate means to foreground an object is *to point at it*.

Results on anaphorically used demonstratives

Kirsner (1979) and Kirsner and Van Heuven (1988) reported studies in which the use of the Dutch demonstratives was analysed. The hypothesis, in both studies, was that *the proximate signals a stronger force than the distal demonstrative*. This hypothesis was confirmed by the quantitative analyses which showed that proximates are preferred to distals to refer to objects that are given and/or important (i.e., noteworthy).

In Sidner (1979), a similar claim to the role of importance has been made for the use of the English demonstrative. Exactly the opposite claim has, however, been put forward with respect to givenness: English distals are preferred to refer to less given objects than English proximates (Ariel, 1990). Ariel does not, however, present any quantitative evidence for this claim. Such evidence can be found in Gundel, Hedberg and Zacharski (1993). Gundel et al. found correlations between the different forms of demonstratives and different levels of givenness, specifically that distals are associated with a lower level of givenness than proximates.

Gundel et al. (1993) examined various kinds of data ranging from transcripts of casual conversations to technical specification documents. Levels of givenness were determined by having at least two people independently determine the level of givenness of referents. The coders were given general guidelines, such as, 'if an object can be assumed to be part of general cultural knowledge or shared personal experience of speaker and addressee, or if it has been mentioned previously in the discourse in question, the status is at least familiar'.[3]

Our approach for deictically used demonstratives differs in at least two respects from that of Gundel et al. (1993). Firstly, we will examine a very restricted dialogue situation. This enables us to control the following parameters: the task, the mode of interaction and the domain of conversation. This is important because both the hypothesis and the results depend on them. Secondly, we will formulate a number of objective criteria to determine the givenness of a referent. This makes it easier for others to replicate our observational study.

The hypothesis

Our hypothesis is based on the findings of Kirsner (1979) and Kirsner and Van Heuven (1988) for the Dutch demonstrative determiner.

We hypothesize that the deictically used Dutch proximate demonstrative determiner signals stronger force than the deictically used Dutch distal demonstrative determiner. The following results are predicted:

1. (Givenness). Proximates are preferred to distals for referring to objects which have a low level of givenness.
2. (Noteworthiness). Proximates are preferred to distals for referring to noteworthy/important objects.
3. (Foregrounding). Proximates are combined more frequently than distals with devices to foreground an object.

In the next section we will describe the dialogue situation which we used to examine this hypothesis and give an operational formulation of the hypothesis.

The dialogue situation

Arrangement of the dialogue situation

The data from which we will draw our conclusions consist of a set of (transcriptions of) ten dialogues.[4] In Figure 1 the arrangement of the dialogue situation is depicted schematically. Ten pairs of Dutch subjects participated in the observational study. Half of the subjects were male, the other half female, and their ages varied from 20 to 60 years.

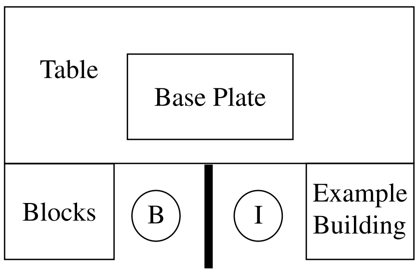

Figure 1: Arrangement of the dialogue situation.

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3. Gundel, personal communication, 1995.
4. The transcriptions were made on the basis of video-tape recordings because the dialogues involved gestures.

The application domain consisted of a number of blocks[5] that could be removed, replaced and reoriented. The blocks represented some sort of abstract building, placed on a green base plate (38x38 cm) which functioned as a shared workspace. The blocks were of four different colours (red, yellow, green and blue, respectively), three sizes (small, medium and large) and four shapes (square, bar, convex and concave). We chose these types of objects because we wanted a simple and non-figurative application domain in order to avoid extensive reasoning based on domain-specific knowledge by the participants.

The task of the participants was to rearrange the blocks into an example building. One of the participants (the instructor I) had to instruct the other (the builder B); only the instructor could see the example building. Hence, the replica represented the goal state of the application domain which was known only to the instructor.

Both the builder and the instructor could point at and observe all objects present on the base plate, but only the builder was allowed to manipulate the objects with his or her hands. The builder and instructor were separated by a screen to avoid communication other than by spoken language and gesturing.

Force in the dialogue situation

An object was judged +Given if it fulfilled at least one of the three criteria below. An object that met none of the three criteria was classified –Given. An object was said to be in focus if it was referred to in the most recent utterance, and distinguishable from possible other objects referred to in that utterance because it was the only object manipulated.

1. *Spatial Unity.* The object is adjacent to the object in focus or is itself in focus. In other words, the object lies within the *focus area*.
2. *Spatial Salience.* The object in question has an exceptional shape. The convex and concave blocks met this criterion. They stood out clearly among the rectangular blocks, which were in the majority.
3. *Focusing Expressions.* The object lies in an area to which the speaker has explicitly directed the attention of the addressee. This is marked by what we will call focusing expressions as in '*Wat nou helemaal naar voren zit*, daar zit die rode dwars' (literally: '*What now entirely to the front is*, there is that red one oriented transversely').

We expect distals to be preferred to refer to +Given objects and proximates to be preferred to refer to –Given objects.

We can determine whether a block is *noteworthy* by examining whether the utterance in which the referential act to the block occurs is an instruction to manipulate it. Note that objects are referred to not only because they have to be manipulated. They can also be referred to in order to specify other parameters of manipulations. Consider '*Put the red block on top of the yellow block*'. The yellow block is referred to in order to provide a precise specification of the manipulation of the red block. In this case the red block will be considered more noteworthy than the yellow block.

Finally, pointing acts will be considered to be a means for *foregrounding* objects.

5. The blocks were samples of the DUPLO® series of LEGO®.

The results

We looked at those referential acts that were used for *initial* identification of objects in the application domain. In other words, we looked at deictically used referential acts since objects referred to for the first time cannot as yet be part of the linguistic context.

The ten dialogues obtained in the set-up of the dialogue situation contained 143 instances of initial referential acts. We excluded 13 referential acts which consisted of a plural and four instances of miscommunication and repair. Of the remaining 126 referential acts 102 (i.e., 81%) contained a demonstrative determiner. The distribution of these referential acts over +Given and −Given entities can be found in Table 1, in which 'distal' is a contraction of distal demonstrative expression and 'proximate' a contraction of proximate demonstrative expression. 'Other' stands for referring expressions with no determiner or a definite (de; *the*) or indefinite article (een; *a*).

Table 1: Numbers of referential acts broken down into + and −Given entities.

referential act	+Given	−Given
distal	41	6
distal + pointing	21	5
proximate + pointing	13	16
other	17	7
total	92	34
percentage	73%	27%

Note that, of a total of 126 referential acts, 73% were used to refer to +Given entities. The remaining 27% were used to refer to −Given entities. For a discussion of this finding we refer readers to Piwek, Beun and Cremers (1995).

Givenness

We used the χ^2 test for two independent samples (with the categories + Given and −Given and the groups distal (+ pointing), proximate + pointing and other) to examine the data of Table 1.

The expected number of distal (+ pointing) and +Given was 53.30 (observed number 62), whereas the expected number of distal + (pointing) and −Given was 19.70 (observed number 11). The direction of the difference between expected and observed numbers is consistent with our hypothesis that distals are preferred for reference to +Given objects.

The expected number of proximate + pointing and +Given was 21.17 (observed number 13), whereas the expected number of proximate + pointing and −Given was 7.83 (observed number 16). Again, the direction of the difference is consistent with our hypothesis: proximates are preferred for referring to −Given objects.[6] These results were highly significant: $\chi^2_{df=2} = 16.99$ with $P < 0.001$.

Furthermore, we used the binomial test to examine proximates and distals separately. The results were as follows: for the distribution of distal (+ pointing) over

+ and −Given we found a deviation from the null hypothesis with P=0.011 (with the binomial test based on the normal distribution), and for the distribution of proximate + pointing over + and −Given the deviation from the null hypothesis was found to be $P < 0.005$ (by application of the exact binomial test). In particular, the preference of proximates for reference to −Given entities is very marked according to these tests.

Noteworthiness
We now examine noteworthiness in the light of the findings for givenness. The results can be found in Table 2. An object was described as +Noteworthy if it was referred to in an utterance which described a manipulation of the object; otherwise the object was described as −Noteworthy.

The table tells us that distals are preferred for referring to +Given entities when compared with proximates: distal and +G = 62 vs. proximate and +G = 13. We do, however, see that proximates, if used to refer to a +Given entity, are preferred for referring to +Noteworthy entities: proximate and +G, +N = 10 vs. proximate and +G, −N = 3.

On the other hand, proximates are preferred for referring to −Given entities: distal and −G = 11 vs. proximate and −G = 16. Furthermore, we see that proximates, if used to refer to a −Given entity, are preferred for referring to +Noteworthy entities: proximate and −G, +N = 13 vs. proximate and −G, −N = 3.

Table 2: Numbers of distals and proximates broken down into +/− G(iven) and +/− N(oteworthy) entities.

demonstrative	+G, +N	+G, −N	−G, +N	−G, −N
distal	33	29	7	4
proximate	10	3	13	3

Foregrounding
Proximate demonstratives are always used in combination with a pointing act. On the other hand, distal demonstratives are preferred in the absence of a pointing act when they are used to refer to +Given entities. The ratio was 21 : 41 (with pointing: without pointing, with $\chi^2_{df=1} = 6.46$, $P < 0.025$). Distal demonstratives used to refer to −Given entities occur almost as many times with as without a pointing act (5 : 6). This result, however, is not statistically significant.

Discussion

All three sub-hypotheses were confirmed by our findings. This shows that the deictic use of the Dutch demonstrative can be described by means of the concept of *force* just as the anaphoric use (which was examined in Kirsner (1979) and Kirsner and Van Heuven (1988)). It is one more piece of evidence for the claim that the use of referential acts, both

6. For the category ‘other’ the expected number for +Given was 17.52 (observed number 17), and for −Given 6.48 (observed number 7). Here the expected numbers differ only marginally from the observed numbers.

in texts and in conversations, is governed by general principles of human cognition and perception.

The findings on Dutch, however, do not agree with those on English. Gundel et al. (1993) found that in English the proximate signals higher givenness than the distal. For Dutch, we found exactly the reverse. Nevertheless, a mapping is possible between the result from Gundel et al. and ours. Gundel et al. found that, whereas proximates were used exclusively to refer to activated objects, distals were used to refer to both activated and (the less given) familiar objects (Gundel et al. define activated as 'The referent is represented in current short term memory' and familiar as 'The addressee is able to uniquely identify the intended referent because he already has a representation of it in memory …').

We found that proximates are preferred for referring to –Given entities and that they always occur in combination with a pointing act. Distals, on the other hand, are preferred for referring to +Given entities and do not have to be combined with a pointing act. The mapping from our data to those of Gundel et al. is now fairly straightforward: we assume that (1) objects which have been pointed at are activated and (2) +Given objects are familiar.

The possibility of a mapping does not mean that there are no differences. For English, a hierarchy of cognitive statuses was proposed in which activated is a higher status than familiar. Next, proximates were associated with activated and distals with familiar (see Gundel et al. (1993), but also Ariel (1988, 1990)). For the deictic use of the Dutch demonstrative a one-dimensional hierarchy of givenness levels is not appropriate. What we observed can be described better in a procedural manner: if an object is –Given, then a speaker uses extra means to help the addressee to identify the object (in other words, signal extra force to find the referent). He can do this by using a proximate and pointing. The speaker thereby 'activates' the referent. Objects which are already familiar do not require activation by a combination of pointing and a proximate demonstrative expression; reference to such objects with a distal demonstrative expression suffices.

It would be interesting to see whether this pattern is also present in the data on English. This requires making a precise distinction between the level of givenness of an object *immediately before* a referential act and the level *due to the referential act itself*.

Conclusions

On the basis of a quantitative analysis it was shown that already existing results on the anaphoric use of demonstratives could be generalized to their deictic use. For that reason the notion of force, which was developed especially for linguistic contexts, was extended to an application in a visual domain. The results showed that the same cognitive principles such as focusing, foregrounding and importance underlie the process of reference to objects in both a linguistic and a visual context.

The main result was that proximate demonstratives indicate that a speaker wants to signal to the addressee extra force to find the relevant referent while, on the other hand, distals are often used in cases where the referent was more 'given' in the addressee's consciousness.

Our findings on Dutch, however, did not correspond as well to some of the reported findings on the anaphoric use of the English demonstrative. Studies on the use of the English demonstrative are based only on the notions of givenness and importance, and neglect the strategy of foregrounding. This strategy is not limited to Dutch, however. This is an interesting area for future research, i.e., examination of the deictic use of English demonstratives on the basis of the notion of force and, in particular, foregrounding.

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References

Ariel, M. (1988). Referring and accessibility. *Journal of Linguistics, 24,* 65-87.

Ariel, M. (1990). *Accessing Noun-Phrase Antecedents*. London: Routledge.

Cremers, A.H.M. & Beun, R.J. (1995). Object reference in a shared domain of conversation. *IPO Manuscript No. 1089*, submitted for publication in *Pragmatics and Cognition*.

García, E. (1975). *The Role of Theory in Linguistic Analysis: The Spanish Pronoun System*. Amsterdam: North-Holland.

Grosz, B. & Sidner, C. (1986). Attention, intentions and the structure of discourse. *Computational Linguistics, 12(3),* 175-204.

Gundel, J., Hedberg, N. & Zacharski, R. (1993). Cognitive status and the form of referring expressions in discourse. *Language, 69(2),* 274-307.

Kirsner, R. (1979). Deixis in discourse: An exploratory quantitative study of modern Dutch demonstrative adjectives. In: T. Givon (Ed.): *Syntax and Semantics: Discourse and Syntax, Volume 3,* 355-375. New York: Academic Press.

Kirsner, R. & Heuven, V. van (1988). The significance of demonstrative position in modern Dutch. *Lingua, 76,* 209-248.

Piwek, P.L.A., Beun, R.J. & Cremers, A.H.M. (1995). Demonstratives in Dutch cooperative task dialogues. *IPO Manuscript No. 1134*, submitted for publication in *Computational Linguistics*.

Sidner, C. (1979). Towards a computational theory of definite anaphora comprehension in English. *Technical Report 537.* Cambridge, Massachusetts: Artificial Intelligence Laboratory, MIT.