Text type, context and demonstrative choice in written Dutch: some experimental data

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Text-type, context and demonstrative choice in written Dutch: Some experimental data*

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Abstract

*Fifty Dutch native speakers were asked to identify the original demonstrative in sentences in which all adjectival occurrences of 'deze' 'this/these' and 'die' 'that/those' had been uniformly replaced with the string '***'. First, the results suggest that native speakers know which genres of written Dutch have the highest frequency of each demonstrative. Second, on average, only the identification of 'deze' improved when the sentences were presented in their original context – a result which accords with earlier studies (Kirsner, 1979; Kirsner and van Heuven, 1980, 1986) showing that 'deze' 'retrieves' previously mentioned entities over longer referential distances (cf. Givón, 1983) than 'die'. The results for the individual test-sentences show that other factors contributing to an increase of correct identification of 'deze' in context are (a) information in the context about either the referent or the speaker's attitude towards it, and (b) information within the test-sentences themselves provided by verb-tense and lexicon. That this particular cluster of factors should influence demonstrative choice lends credence to the view of 'deze' as instructing the addressee more forcefully than 'die' to seek out and attend to the noun's referent.*

1. Introduction

Demonstratives are a favorite topic of abstract theoretical discussion among both linguists and philosophers: cf. Roman Jakobson (1971) and Buchler (1940: 107-111) on Charles Sanders Peirce's categorization of demonstratives as 'indices' rather than 'icons' or 'symbols.' However, with the notable ex-

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ceptions of Jarvella and Klein (1982) and Weissenborn and Klein (1982), there has been little *empirical examination* of the actual use by native speakers of specific demonstratives in individual languages.

Such empirical work is the concern of the present exploratory study. Its purpose is to delineate some of the factors which lead native speakers of Dutch to prefer one type of demonstrative adjective to the other in sentences taken from various written Dutch texts. More specifically, it investigates how well native speakers are able to identify which demonstrative adjective – *deze* 'this/these' or *die* 'that/those' (including also their respective allomorphs *dit* and *dat*) – had been present in sentences in which all adjectival uses of both forms are replaced by a string of three asterisks: ***. All that the native speakers were told was that the asterisks marked the position of a demonstrative adjective. The questions investigated are: (a) *how well* and (b) *on what bases* can native speakers figure out *which* demonstrative it was?

These questions are interesting precisely because so little is known about how Dutch speakers actually go about choosing a demonstrative in a particular written context. Earlier studies (Kirsner, 1979, 1985; Kirsner and van Heuven, 1980, 1986) have been purely observational in the sense of Miller (1975: 13), correlating the occurrence of *deze* versus *die* in written texts with such factors as (i) position of the demonstrative in the sentence, (ii) whether or not the referent of the noun is human or non-human, (iii) 'new' or 'old' in the discourse and, in the last case, (iv) the magnitude of the referential distance (cf. Givón, 1983). However, there has been no *experimental* work to show which of these correlations (if any) reveal what native speakers themselves are doing when they select *deze* or *die* over its theoretical alternative. One aim of our research was to determine, by means of a questionnaire experiment, whether, and in what way, such correlations might be reflected in the behavior of experimental subjects confronting an identification task.

2. Two influences on demonstrative choice

One factor which we would surely expect to influence the native speakers is *context*. We may anticipate that if test-sentences were presented first in isolation and then in the original paragraphs from which they were extracted, the extra information contained in the latter would – in, as yet, poorly understood ways – make the choice of demonstrative less arbitrary and would thereby increase the accuracy with which the demonstratives are

identified. Ideally, a comparison of subjects' responses to isolated sentences and to contexted sentences would permit us to understand in more detail *what kind of contextual information* interacts with what *kind of intrasentential information* to help to determine which demonstrative is more appropriate. Ultimately, the appeal to the general term 'context' could be replaced by a listing of these more specific factors.

A second potential influence on demonstrative selection is 'genre', here more accurately described as 'text-type', as will be explained below. Kirsner (1979: 368-369) notes that the relative frequency of *deze* rather than *die* correlates with the choice of written versus spoken language and, in the former, the degree of difficulty and/or formality of the text. Two questions raised by these findings are whether the native speakers themselves have *internalized* such correlations and, if so, to what extent?

3. Design of the questionnaire

To make the sample as representative of written Dutch as possible, we took as the source of data two machine-readable collections of text fragments originally compiled for word-frequency studies. The first, described in detail in Uit den Bogaart (1975), was designed to give as good a picture as possible of 'the Dutch language as a whole' and totals 600,000 word tokens broken down into five subcorpora of equal size: novels, daily newspapers, family magazines, weekly magazines of opinion and analysis, and popular science. The second collection, our sixth subcorpus, is comprehensively discussed in Renkema (1981) and was originally compiled for a stylistic comparison of government language with subcorpora 2, 4 and 5. It totals 48,000 words and consists of uniform fragments four sentences long extracted from official Dutch government publications and correspondence. Given that newspapers and family magazines actually contain many different kinds of genres in the technical sense (e.g. informative pieces on current events, editorials, short fiction, advice to the lovelorn, information on health and nutrition, etc.), it is perhaps more accurate to describe these subcorpora as simply representing different text-types, as we shall do henceforth.[1]

In order to observe the impact of text-type upon demonstrative choice, it was decided to present the subjects with a neutral stimulus: equal numbers of original instances of *deze* and *die* (i.e. 50% of each) and equal numbers of sentences from each subcorpus. Furthermore, although it was impossible to

control for all variables which might correlate with text-type, we did decide to do this for the most easily quantified one: sentence-length. Finally, in view of the importance of referential distance in the earlier correlational studies cited in the introduction, we limited our sample of demonstrative-bearing NPs to those with 'old' referents.

Accordingly, from each of the six subcorpora, eight sentences containing one demonstrative adjective were selected at random such that the following criteria were met:

(a) For each subcorpus, an equal number of occurrences of the two demonstrative types, *deze* and *die*, were chosen.

(b) For each subcorpus, there were two instances of each type of demonstrative in sentences of the following lengths: 13 words, 15 words, 17 words, 19 words. These particular lengths were selected so that we could find naturally occurring examples of all the sentence lengths in each of the text types contained in the Uit den Boogaart and the Renkema collection of text fragments.

(c) The noun phrase containing the demonstrative adjective did not introduce a new referent into the discourse but 'retrieved' one mentioned earlier.

(d) There was sufficient context in the corpus to contain that mention of the referent which was immediately prior to the mention with the noun phrase containing the demonstrative adjective.

This yielded 6 (text types) × 2 (demonstrative types) × 2 (instances of demonstrative type) × 4 (sentence lengths) = 96 test sentences and their associated contexts (spanning maximally 5 sentence boundaries).

Two versions of the test sentences were prepared: one containing the complete text fragments described above, and one containing only the final sentences with the crucial demonstrative adjective. In all cases, this demonstrative was replaced by a sequence of three asterisks (***), including instances of original *deze*, so that the size of the gap would not betray the identity of the deleted demonstrative.

Sentences and paragraphs were subsequently typed out in two separate randomized blocks, so that there was one listing of isolated sentences in one random order, and a second listing of contexted sentences in a second random order. Subjects were instructed to attempt to determine what the deleted demonstrative 'must have been' (i.e. what the *** stood for) and were given a forced choice between *deze* (and its allomorph *dit*) and *die* (and its allomorph *dat*). One half of the respondents received both the isolated sentences

and the paragraphs in their reversed order so as to counterbalance potential order and learning effects. In each of the two versions of the questionnaire, subjects were given the 96 isolated sentences prior to the block of 96 paragraphs. Subjects were instructed not to look back or change earlier answers.

The questionnaires were administered to 50 undergraduate students (male and female in roughly equal proportions) enrolled in an introductory linguistics class at Leyden University. All were native speakers of Dutch. Respondents participated on a voluntary basis and received some remuneration for their efforts.

4. Results

The responses of the 50 subjects were treated as a collective measure of demonstrative identifiability, as follows: initially, two groups of 25 subjects (one for each of the two versions of the questionnaire) were asked to identify the missing demonstrative in two groups of 96 sentences (one group in isolation, then another group in paragraphs [context]). Accordingly, we began with 25 judgements on each of 384 sentences. An initial measure of the identifiability of the demonstratives was then defined as the percentage of correct identifications in the 25 judgements. Defined in this manner, the *mean* percentage of correct identifications for all demonstratives in all sentences was 65.9% which, though far from perfect, is significantly above the chance (50%) level, $\chi^2(df=1)=968$ ($p < .001$).[2] It was next determined that the effect upon this percentage of the two different orders in which the sentences had been presented was not significant, $t(382) = -1.32$ ($p = .18$, two-tailed).Percent correct was henceforth expressed relative to 50 responses per case, across order of presentation.

4.1. *Text-type*

Overall, (i.e. when one combines the results for the 96 isolated sentences and the 96 contexted sentences), neither demonstrative was identified correctly significantly more often than the other; the percent correct for *deze* was 66.1, and for *die* 65.7, $t(190) = 0.14$ ($p > .8$). However, when one analyzes these results per subcorpus, the trends emerge which are shown in Figure 1. As will be discussed in more detail in Section 5.1, Table 1, the order of text-

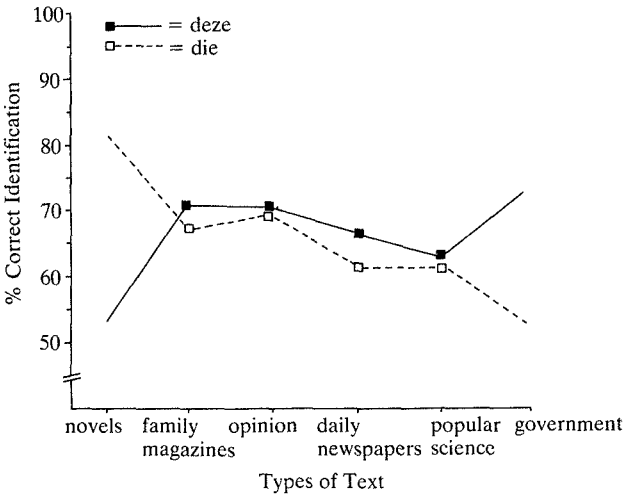

Figure 1. *The influence of demonstrative-type and text-type on the percentage of correct identifications of the demonstrative adjective*

types along the *X*-axis (from left to right) reflects the relative frequency of *deze* versus *die* in sentences containing one demonstrative adjective in a 4200-sentence sample of sentences from the six subcorpora in question.

Note that in novels, *deze* is identified at a very bad, near chance, level; *die* is identified very well, about 80% correct. This difference is shown by a *t*-test (two-tailed) to be significant at the .01 level. On the other hand, in government language, *die* is identified badly (at 52.8%; chance level) while *deze* is identified well (at 73%), with again the difference in percentage correct being significant at the .01 level. Observe further that in the text-types in the middle, both demonstratives do equally well and there is no significant difference in percentage of correct identifications. For the sake of brevity, we shall call this reversal of percentage correct for *deze* and *die* in novels and government language the 'text effect'. An explanation will be offered in Section 5.1 below.

4.2. *Context*

As one would expect, the percentage of correct identifications is higher for demonstratives in the contexted sentences (67.6%) than in the isolated sentences (64.1%). This overall difference, however, is not statistically significant,

$t(190) = -1.21$ ($p > 0.1$, one-tailed). However, if one separates the figures for the two demonstrative types, a striking asymmetry is observed. Consider Figure 2:

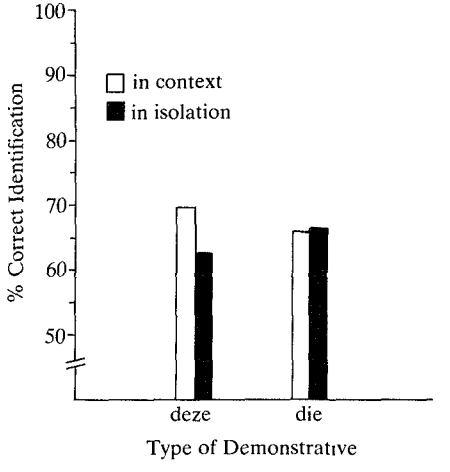

Figure 2. *The influence of demonstrative-type on the context effect*

The fraction of correct identification for *deze* is 69.7% in context and 62.5% in isolation, which is a significant difference, $t(94) = -2.01$ ($p < .03$, one-tailed). In contrast, the fraction of correct identifications for *die* is 65.6% in context and 65.7% in isolation, which is not a significant difference, $t(94) = -0.02$ ($p = .98$). It would appear, then, that adding context improves the identifiability of *deze* but not of *die*. For the sake of brevity, the trend shown in Figure 2 will be termed the 'context effect'. Possible explanations for it will be taken up in Section 5.2.

4.3. *The combined effect*

The context effect is not homogeneous but varies according to subcorpus. As shown in Figure 3, adding context improves the identifiability of *deze* very significantly in the opinion and analysis sample ($p < .005$), and almost significantly in the popular science sample ($p < .1$), as measured by the t-test (one-tailed).

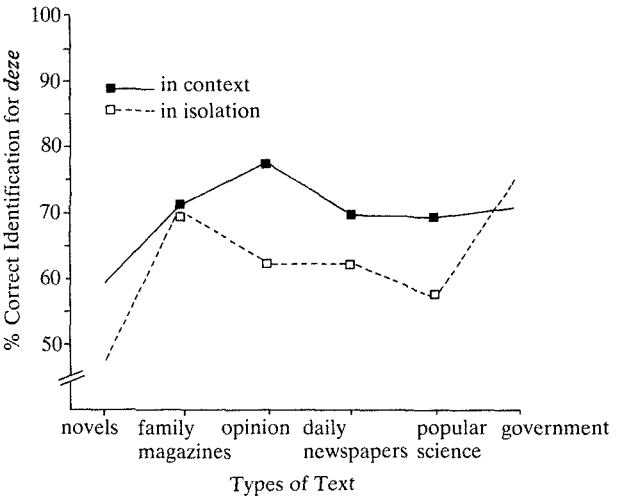

Figure 3. *The context effect for* 'deze' *according to text-type*

Adding context does not significantly improve the identifiability of *die* in any subcorpus, as shown in Figure 4.

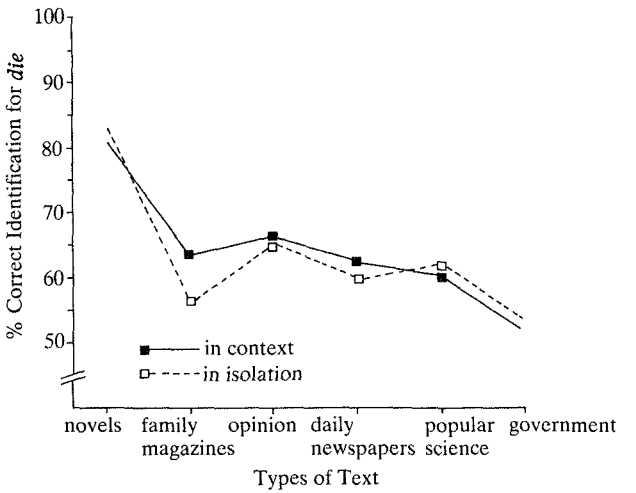

Figure 4. *The context effect for* 'die' *according to text-type*

In Section 5.2.1. we shall offer a partial explanation for the occurrence of significant and near-significant context effects for *deze* in the opinion and analysis and the popular science subcorpora, but nowhere else.

5. Discussion

5.1. *Linguistic expectancy and the text effect*

Evidence continues to accumulate supporting the view that native speakers are aware of the relative frequency of different grammatical forms in language use. Thus, frequently used words are recognized better than uncommon words; when a low-frequency word is not correctly recognized, a higher-frequency word is responded with instead, but not vice versa (cf. e.g. Grosjean, 1980, and the references given there). Similarly, van Heuven (1978: 184–185) demonstrates that the interpretation which experimental subjects give ambiguous verb endings in Dutch can be predicted from the text frequency of these endings in their different grammatical functions. It may be hypothesized that the subjects have learned through long exposure how often a particular form will have a particular function, and that they interpret unclear cases in the light of what they have come to expect.

We would suggest here that the explanation for (i) the abnormally low percentage of correct identifications of *die* in government language and of *deze* in novels and (ii) the abnormally high percentage of correct identifications of *deze* in government language and of *die* in novels is similarly due to our subjects' internalized knowledge of the relative frequency of the two types of demonstratives in different kinds of texts (which can often be distinguished simply on the basis of lexical content). Consider the data in Table 1, adapted from Kirsner and van Heuven (1986).

Table 1. *Relative frequency of 'deze' and 'die' in sentences containing one demonstrative adjective in a sample of such sentences in the Uit den Boogaart 1975 and Renkema 1981 collections. Sentences sampled were those for which the NP containing the demonstrative could be classified unambiguously for both grammatical function (subject vs. object) and clause environment (main clause vs. elsewhere)*

	deze	*die*	*deze*
	(N)	(N)	(%)
Novels	135	358	27.4
Family	365	381	48.9
Opinion	493	366	57.4
Newsp.	518	216	70.6
Pop. Sci.	669	254	72.5
Govt.	418	75	84.8
Total	2598	1650	

We suggest that Dutch speakers 'know' that *deze* is relatively infrequent in novels and frequent in complicated prose, such as government language, and that the reverse holds for *die*. Accordingly, it makes sense that, when given an artificially designed 50-50 sample, as was done in the questionnaire, speakers underestimate the number of *deze*s in sentences from novels and underestimate the number of *die*s in sentences from government language. When the stimuli are ambiguous, the subjects will react according to their own prior experience, experience which is summarized in Table 1. This view receives strong support from the high correlation ($r = .89$, $p < .01$, $N = 6$) which was found between (a) the average number per subcorpus of *deze*-responses on the questionnaire and (b) the percent of *deze* occurrences as a function of text-type, shown in Table 1. This correlation remains both high and statistically significant whether one combines the results for the isolated and the contexted sentences, as we have done, or splits them. Note that for the sentences presented in isolation, the degree of correlation is slightly lower and less significant: $r = .80$, $p < .03$, $N = 6$; for the sentences presented in context, the result is slightly higher and more significant: $r = .95$, $p < .003$, $N = 6$.

5.2. *The context effect*

5.2.1. *Referential distance*

In a number of studies (Kirsner, 1979, 1987; Kirsner and van Heuven, 1980, 1986), it has been shown that *die* tends to be used to repeat reference to an entity mentioned earlier within the very same sentence that contains the demonstrative-bearing NP, while *deze* tends to be used to 'retrieve' referents mentioned only in earlier sentences.[3] Following Givón 1983), we shall call the distance from the demonstrative-bearing NP to the first *prior* mention of the referent the *referential distance* (henceforth: RD). We shall measure RD in terms of the number of orthographic sentence boundaries between the demonstrative-bearing NP and this first prior mention. Accordingly, we may restate the result of earlier studies by saying that *deze* tends to be associated with RD $\geqslant 1$ and *die* tends to be associated with RD = 0.

As an illustration, Kirsner and van Heuven (1986), Table 6, presents data on 526 sentences (containing only one demonstrative adjective) from 5 separate text samples. Of these, 266 sentences contain *deze* and 260 *die*. Of the NPs with *deze*, only 39, or 15%, have RD = 0. Of the NPs with *die*, fully

104, or 40%, have RD = 0. More specifically the mean RD associated with *deze* is 1.045 sentence-boundaries, which is 35% greater than the mean RD of *die*, 0.7731 sentence-boundaries. Both the parametric *t*-test and the non-parametric Mann-Whitney U test indicate that the difference between the RDs associated with *deze* and the RDs associated with *die* is highly significant, $p < .001$. In other words, the difference between the two populations of RDs could arise by pure chance less than one time out of a thousand.

Data such as these suggest that if one removed prior sentences from the context (as was done in the first part of the questionnaire), one would tend to remove information justifying the choice of *deze* more frequently than information justifying the choice of *die*. In consequence, one might well expect that original *deze*s would be identified less well than original *die*s if both were replaced by *** in the test sentences. Furthermore, since *die* is used more often for *intra*sentential retrieval of the referent and *deze* more often for *inter*sentential retrieval, we would expect identification of *deze* to be much more sensitive to information in the prior context than identification of *die*. Accordingly, the difference in referential distance associated with *deze* and *die* suggests an immediate explanation for the context effect illustrated in Figure 2. With this concept, we can understand items (a) and (b) but not (c) of the following: (a) why the level of *die*-identifications remains constant, (b) why *deze* is identified less well in isolation than *die*, (c) why *deze* is identified better in context than *die* is. What the concept of referent distance still does not seem to explain is why *die* and *deze* do not do *equally* well when the *full* context is provided. We shall see below, however, that this is not the case; i.e. that the difference in RD between *deze* and *die* can also explain why, in full context, *die* still does not do as well as *deze*.

Although the difference between the average RD shown by *deze* and by *die* in the questionnaire sentences is not as pronounced as in the larger sample discussed above, it is still appreciable. For the 48 test-sentences containing *deze*, the mean RD is 1.29 sentence boundaries; for the 48 test-sentences containing *die*, the mean RD is 1.08 sentence boundaries, about 17% less. The difference is statistically significant by a Mann-Whitney U test: $p < .05$, one-tailed. If we now examine the RD-values for *deze* and *die* in the test-sentences from each of the subcorpora, we will observe an interesting connection with the context effect per subcorpus illustrated in Figures 3 and 4 seen previously.

Figure 5, following, gives the mean referential distance for *deze* and *die* for each text type; the ratios may be compared with the size of the context effect for *deze* shown in Figure 3 above:

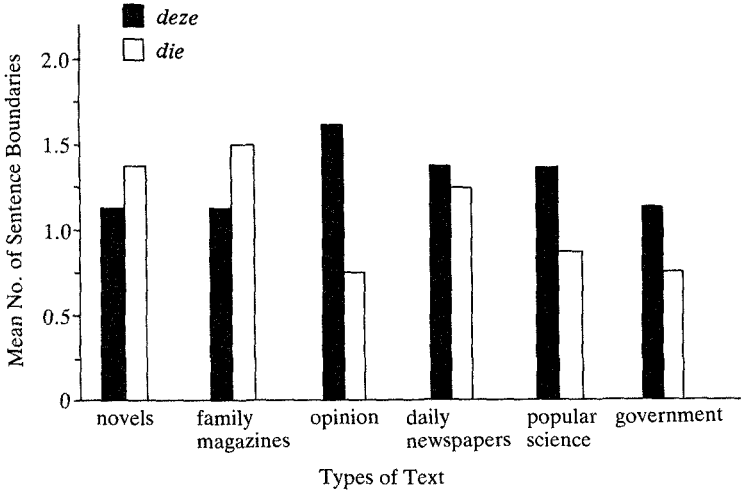

Figure 5. *Mean referential distances for* 'deze' *and* 'die' *in the questionnaire sample of text-types*

Table 2 below indicates for each corpus: the mean RD in sentence boundaries for the eight test sentences containing *deze*, the mean RD for the eight test sentences containing *die*, the significance of their difference (Mann-Whitney test), the quotient of the mean RD for *deze* divided by the mean RD for *die*, and, finally, whether there was a significant context effect for *deze* in the corpus, as indicated by the responses of the 50 subjects:

Table 2. *Strength of context effect as a function of the ratio of the mean referential distance for* 'deze' *and* 'die'

Corpus	RD *deze*	RD *die*	Significance	Ratio	Context Effect
opinion	1.63	0.75	$p < .02$	2.173	$p < .005$
pop. sci.	1.38	0.88	$p < .03$	1.568	$p < 0.1$
govt.	1.13	0.75	$p < .05$	1.507	ns
dailies	1.38	1.25	ns	1.104	ns
novels	1.13	1.38	ns	0.818	ns
fam. mgs.	1.13	1.50	ns	0.753	ns

Note that the difference in RD is statistically significant in three corpora – magazines of opinion and analysis, popular science, and government language – and that this group contains the one corpus – opinion and analysis – which shows a statistically significant context effect. Observe furthermore that there is no case of a significant context effect without a significant difference in the RD for *deze* and *die*. (That would of course instantly invalidate the hypothesis that the difference in referential distance between *deze* and *die* somehow underlies the context effect.) It thus appears that the existence of a statistically significant difference between the referential distances associated with *deze* and *die* is a *necessary* but not a *sufficient* condition for the context effect. One might speculate from Table 2 that the difference must not only be statistically significant but must also reach some threshold magnitude, perhaps a quotient of the RD for *deze* and *die* of about 2.00. Other factors than RD must also be involved in demonstrative choice. Some of these will be taken up in Section 5.2.2.

A less static and quite different view of the context effect is provided by examining in detail the difference in percentage of correct identifications achieved by *each test sentence individually*, both in context and in isolation, so that *each sentence is used as its own control.* The overall result is the same as was discussed in Section 3.2: the mean difference for sentences containing *deze* is + 7.17 percentage points and is - .08 percentage points for sentences containing *die* : t (94) = 2.12 ($p < .04$, two-tailed). In other words, when one compares the percentage of the fifty subjects identifying the demonstrative correctly when the sentence is presented in context and when the same sentence is presented in isolation, there is a difference of 7 percentage points for *deze* and effectively no difference for *die*. However, it is not at all the case that each sentence containing *deze* does better in context than in isolation or that all sentences containing *die* do either slightly worse in context than in isolation or stay the same. As shown in Table 3, there are an appreciable number of instances in which addition of context leads to an increase in incorrect identifications on both sides: e.g. cases of original *die* misidentified in the contexted sentences as *deze* and cases of original *deze* misidentified in the contexted sentences as *die*. Such results suggest that the process (or processes) by which subjects identified the demonstrative was less cut-and-dried, more 'dynamic' than might first appear, and raises the question of 'Why?', Why should there be such 'confusions', especially when information is being provided in the context which should, if anything, clarify matters? Consider the data in Table 3.

Table 3. *Effect of adding context on demonstrative identification for the 96 test sentences*

Percentage of correct identifications	Original demonstrative in sentence: *deze*	*die*
Increases in context:	30 (62.5%)	17 (35.4%)
Remains unchanged:	2 (4.2%)	3 (6.3%)
Decreases in context:	16 (33.3%)	28 (58.3%)
	48 (100%)	48 (100%)

On balance, the presentation of sentences in context leads to the net increase of correct *deze* identifications in 62.5%–33.3%, or 29.2% of the test sentences, but a net decrease of correct *die* identifications in 22.9% of the test sentences (35.4%–58.3%). Apparently, addition of context made the subjects choose *deze* in more of the test sentences, whether this was appropriate or not.

At this point, it might seem that the identity of the original demonstrative is immaterial and that (as shown in Table 3) addition of context brings about not only a recategorization of 62.5% of the original *deze*-sentences as (correctly) containing *deze* but also a recategorization of 58.3% of the original *die*-sentences as also (but incorrectly) containing *deze*; the percentages are, after all, quite comparable. This view is incorrect; the identity of the original demonstrative *is* important. The only reason we have not seen it yet is that we have been examining only the fraction of test-sentences showing a switch – *any switch* – between the percentage of correct identifications in context and the percentage of correct identifications in isolation. We have been considering only the presence vs. the absence of a switch, and not its size. The picture is quite different if we look at the *average magnitude* of the switch, shown in Table 4.

As is shown in Table 4, the magnitude of the increase in identification as *deze* or *die* is always greater by nearly 7 percentage points for the correct original demonstrative. But this still leaves us with the question of the errors. Why are they made at all?

One obvious possibility suggested by the difference in referent distance between *deze* and *die* is that *those demonstratives get misidentified which behave atypically*; e.g. that if a *deze* is restored less well in context than in isolation, it is because it looks in context more like a prototypical *die* than

Table 4. *The effect of adding context*

Sentence actually contains:	Average percentage increase in (correct or incorrect) identification of demonstrative as: *deze*	*die*
deze	+ 16.87 (N=30) (correct)	+ 10.13 (N=16) (incorrect)
die	+ 10.64 (N=28) (incorrect)	+17.29 (N=17) (correct)

prototypical *deze*, and that the reverse holds for misidentified *dies*. In other words, if *deze* typically 'retrieves' referents in texts over a greater number of sentence boundaries than *die*, then (a) *dezes* which do worse in context should exhibit a smaller, more *die*-like RD, and (b) *dies* which do worse in context should exhibit a larger, more *deze*-like RD. The raw data from the questionnaire are given in Table 5.

Table 5. *Direction of context effect as a function of demonstrative and retrieval distance in the 96 test sentences*

	Referent distance (in sentence-boundaries) 0	1	⩾2	
deze				
Improves in context:	1	21	8	
Worsens in context:	0	12	4	
Stays the same:	0	1	1	
Total:	1	34	13	= 48 in all.
die				
Improves in context:	4	11	2	
Worsens in context:	3	19	6	
Stays the same:	0	2	1	
Total:	7	32	9	= 48 in all.

Observe that the percentage of *die*-sentences improving in context drops from 4/7 (57%) to 11/32 (34%) to 2/9 (22%) as the RD increases to 1 and 2 or more sentence-boundaries, but that no real trend is seen for the *deze*-sentences: 1/1 (100%); 21/34 (62%); 8/13 (62%). There is, then, some support for the hypothesis that the *dies* which are misidentified in context are

those with longer (more *deze*-like) RDs. The skew in improvement/ deterioration in context between *deze* and *die* (21/12 versus 11/19) is clearly significant for RD = 1: χ^2 ($df = 1$) = 4.58 ($p < .05$). However, it cannot be shown that this skew is slighter for RD = 0, or larger for RD $\geqslant$ 2 because of the extremely small number of observations in these subtables. For the sake of completeness, we now give in Table 6 the magnitude of the difference between the percentage of correct identifications in context and in isolation for each demonstrative type and RD.

Table 6. *Effect of adding context on percentage of correctly identified demonstratives, broken down by demonstrative type and referent distance (see text)*

Number of Sentence Boundaries	Difference in Percentage of Correct Identifications in Context vs. Isolation		Significance by *t*-test (two-tailed)
	deze	*die*	
0	+6.00 (N = 1)	+4.00 (N = 7)	$p > .8$
1	+8.41 (N = 34)	-1.13 (N = 32)	$p < .04$
$\geqslant 2$	+4.00 (N = 13)	+0.44 (N = 9)	$p > .5$

Observe that the difference between these differences is statistically significant only in the sample with RD = 1. We find that the mean 'improvement' in context is + 8.41 percentage points for the sentences with original *deze* and - 1.13 percentage points for the sentences with original *die*. Since *die* tends to be used for intrasentential retrieval and *deze* for extrasentential retrieval, it makes sense that when the referent is last mentioned in the immediately preceding sentence, identification of *deze* would improve in context while identification of *die* would deteriorate. At least some of the *dies* are misidentified as *deze* because the referent distance with which the subjects are confronted is more characteristic of a typical *deze* than a typical *die*.

We may thus conclude that the referent distance concept can indeed help to explain each of the three points mentioned earlier: we can now understand not only (a) why the gross level of *die*-identifications would tend to remain constant in context and in isolation, and (b) why *deze* is identified better in context than *die*, but also (c) why the identification of *die* does not improve in context. At least a partial answer is that when the context shows that a

prior sentence contains a first mention of a referent repeated in the test sentence, subjects choose that demonstrative – *deze* – which is more closely associated with 'long distance' retrieval.

5.2.2. *Information about the referent*

In the preceding section we attempted to explain the context effect by focusing on a single aspect of the semantic contrast between *deze* and *die*: their favoring of different referential distances. A second factor contributing to the effect of context on demonstrative choice is the degree of information which the context provides about the referent of the noun. In order to appreciate this factor, however, we must briefly confront the issue of demonstrative meaning.

In Kirsner (1979, to appear) and Kirsner and van Heuven (1980, 1986: Section 7.2), it is suggested that both *deze* and *die* are fundamentally concerned not with spatio-temporal distance (as is traditionally thought) but rather the *degree of attention* which the addressee *is instructed* to give to the referent of the noun. *Deze* is hypothesized to signal a very forceful instruction to the hearer to seek out and attend to the noun's referent, while *die* is claimed to signal a weaker one. Furthermore, a forceful instruction to attend is held to be communicatively most useful either (i) when the referent-tracking task facing the addressee is more difficult than it might otherwise be, or (ii) when the speaker regards the referent as particularly noteworthy. The larger RD associated with *deze* reflects both of these aspects, in that (a) it is presumably harder for the hearer to 'retrieve' a referent over longer stretches of discourse than over shorter ones, and (b) more noteworthy entities will tend to be talked about longer: at least longer than one sentence.

However, other factors than brute distance also influence choice in a way which the 'instructional' view of demonstratives clarifies. Kirsner (1985) discusses a minimal pair of examples in which both *deze* and *die* are used to 'retrieve' a referent across the very same referential distance: a single sentence boundary also serving as a paragraph boundary. The motivation for choosing *deze* in one instance and *die* in another appears to be whether the referent was to continue to be the center of attention in the discourse (in which case *deze* – 'maximum attention!' – was used), or merely a transitory bridge to some other topic (in which case *die*, centering less attention on that particular noun's referent, was selected). Similarly, Kirsner (1987) discusses the competition between *deze* and *die* at RDs of 0 and 1 sentence boundaries in Nuchelmans (1969) in the special case when both the prior mention and the

second mention of the referent are effected with a 'bare' noun, unmodified by any adjective or prepositional phrase. In intrasentential retrieval (RD = 0), *deze* is used to re-mention referents which are of central importance in the text (and which occur elsewhere in the paragraph in question) while *die* is used for more peripheral and ephemeral entities. At referent distances of 1, *die* is used to simply repeat the referent, while *deze* is used when the referent undergoes 'development' of some kind between the mentions, e.g. when the referent is either described in detail or illustrated in some way; i.e. is explicitly *made more salient* by the speaker.

Close examination of the questionnaire sentences uncovers similar phenomena. For instance, when the context indicates that a particular referent has been considered in detail, it is reasonable to conclude that it is relatively important and hence merits greater attention (cued with *deze*) rather than less attention. One example is the following:

Het heeft na Mendelejev nog ongeveer een halve eeuw geduurd voordat *** vraag werd beantwoord.

'After Mendeleyev, it took about another half a century before *** question was answered.'

When this sentence was presented in isolation, exactly half (50%) of the 50 subjects identified the missing demonstrative as *deze* and half as *die*. Now examine the entire passage:

Maar er zijn nog meer stoffen die geen elementen zijn. Hoe kregen de elementen het voor elkaar deze stoffen op te bouwen? Anders gezegd, en algemener: als twee stoffen een verbinding met elkaar aangaan en een derde stof opleveren, wat gebeurt er dan eigenlijk? Het heeft na Mendelejev nog ongeveer een halve eeuw geduurd voordat *** vraag werd beantwoord.

'But there are many more substances which are not elements. How were the elements able to construct these substances? Stated differently and more generally: if two substances form a compound with one another and produce a third substance, what really happens? After Mendeleyev, it took about another half a century before *** question was answered.'

In context, where the question is formulated successively in two different ways, 72% of the 50 subjects correctly identified the missing demonstrative with the noun *vraag* as *deze*. (Hence, the difference between the percentage of correct identifications in context and percentage of correct identifi-

cations in isolation is 72% - 50% = + 22 percentage points, in this particular example.)

Context can also provide information about the speaker's attitude toward the referent. One instance which parallels the case discussed in Kirsner (1985), where *deze* is used to maintain attention on a referent and *die* to decrease attention, preparatory to turning away to something else, is the following:

Op *** koers hebben we naar mijn mening al veel te lang gevaren.

'In my opinion we have followed *** course much too long already.'

When this sentence was presented in isolation, 54% of the subjects identified the missing demonstrative as *deze*. However, if it is reasonable that the speaker would tend to use *deze* to refer to entities meriting continued attention, and *die* for entities *not* meriting it, any cue that further attention is not deserved would favor the selection of *die*. Examine now the entire passage and pay special attention to the adjective *absurd*:

Nol de Jong, secretaris van de ondernemingsraad, zei kernachtig: "Er is een eind gekomen aan de lijdensweg die we al sinds 1958 bewandelen, maar laten we niet weer alle ellende oprakelen. We staan aan het eind van een stuk beleid dat gelukkig voorbij is." Iedere hoop op het alsnog in een of andere vorm voortzetten van Rolma noemde hij "absurd", "Op *** koers hebben we naar mijn mening al veel te lang gevaren."

'Nol de Jong, secretary of the works council, said tersely: "An end has come to the path of suffering which we have followed since 1958, but let's not stir up all that misery again. We are standing at the end of a period of management which happily has passed." He said it was "absurd" to hope that Rolma would be continued in some other form. "In my opinion we have followed *** course much too long already".'

The adjective suggests that Nol de Jong wishes to turn away from and hence decrease attention from the course of action under discussion. It is then not surprising that, when the entire passage was presented, 78% of the fifty subjects chose *die*, the demonstrative found in the original text. (Hence, for this example, the difference between identification in context and identification in isolation is 78% - 46% = + 32 percentage points).

5.2.3. *Tense*

We will now consider briefly two sources of information *within* the sentence which may be expected to influence the subjects' choice of demonstrative in

the isolated sentences and thereby determine, though indirectly, the magnitude of the context effect. The first of these is verb tense.

One may reasonably expect there to be some interaction between the choice of demonstratives (telling the hearer how much to attend to what entities) and the tense of the finite verb, which situates the event with respect to the time of the speech event.[4] If it is assumed that the speaker's normal ('unmarked') focus of attention in the speech situation would be the present (the time which he is experiencing directly), one might expect some degree of association between the so-called 'present tense' in Dutch (actually a non-past tense) and the use of *deze* and, conversely, between the 'past tense' and the use of *die*. For the 48 test sentences containing *deze* and the 48 containing *die*, the observed breakdown is given in Table 7.

Table 7. *Cross-tabulation of tense and demonstrative type in the questionnaire sentences*

	Plain Present	Plain Past	Perfect Tenses	Total
deze	34	9	5	48
die	24	18	6	48

Limiting our attention to the 43 *deze*-sentences and the 42 *die*-sentences containing non-Perfect verb forms, we see that there is an appreciable skewing: 59% of 'present tense' verb forms co-occur with *deze* and 67% of past verb forms co-occur with *die*. The odds ratio of (34/24)/(9/18) = 2.83 indicates that *deze* is almost three times as likely to co-occur with the present tense than is *die*. A chi-square test indicates that this skewing is statistically significant: χ^2 (df=1) = 4.72, ($p < .05$).

Now it should be borne in mind that when a sentence is presented in isolation, without any other context, the effect of possible cues within that sentence is magnified, for they are all that the subjects have to go on. We would therefore expect that in the sentences presented in isolation, past tense forms would tend to favor *die*-responses and present tense forms would tend to favor *deze*-responses. However, when the context is added, we might expect some of the influence of tense to be overridden by other factors, such as the referential distance, the degree of detail with which the referent has been described, and so forth. It follows that if we examine the difference between the percentage of correct identifications of demonstratives in the contexted sentences and in the isolated sentences, different values could be

obtained for the same demonstrative in sentences containing past tense verbs and sentences containing present tense verbs.

More specifically, we would expect this difference to be larger when the original (correct) demonstrative is *not* the one that would be predicted on the basis of the tense of the finite verb. Thus, we predict that the difference between the percentage of correct identifications in context and in isolation would be greater for *deze* in past tense sentences than for *deze* in present tense sentences and that the reverse should tend to hold for *die*; i.e. that the difference between correct identifications in context and in isolation would be greater for *die* in present tense sentences than for *die* in past tense sentences.

We may also expect there to be an asymmetry in the results. One factor which we hypothesized to be capable of 'overriding' the effect of tense in the isolated sentences is referential distance. Presentation of the sentences in context reveals what the referent distance is. Because *deze* is associated with a longer referential distance than *die*, we anticipate that the context effect in *deze*-sentences containing a past finite verb will be appreciably larger than the context effect in *die*-sentences containing a present finite verb. Accordingly, we may predict that (i) the context effect for *deze*-sentences with past tense verbs will be greater than the context effect for *deze*-sentences with present tense verbs, (ii) the context effect for *die*-sentences with present tense verbs will be greater than the context effect for *die*-sentences with past tense verbs, and (iii) that the magnitude of (i) will be noticeably larger than (ii). The data are given in Table 8.

Table 8. *Mean difference between percent correct identifications in sentences in context and sentences in isolation*

Dem.	Tense	Difference	Result of *t*-test (one-tailed)
deze	present	+ 2.82% (N = 34)	$t(41) = -3.14$,
deze	past	+ 20.00% (N = 9)	$p < .002$
die	present	+ 2.17% (N = 24)	$t(37) = 1.09$,
die	past	- 3.33% (N = 18)	$p < .15$

The data accord with all three predictions; note that the difference between *deze* + past and *deze* + present is statistically significant, while the difference between *die* + present and *die* + past is not.

A good illustration of the effect of tense is provided by the following example in the past tense:

Toen onder *** omstandigheden het weer verruwde werd besloten naar de basis terug te keren.

'When under *** circumstances the weather became rough, it was decided to return to base.'

When this sentence was offered in isolation, 82% of the subjects chose *die* as the correct demonstrative. Consider now the full passage:

Omstreeks 21.00 uur geraakte de hydraulische stuurinrichting defect. Hierna werd gestuurd met het handroer op de achtersteven waar een matroos in verbinding stond met de brug door middel van een touw aan zijn polsen gebonden. Omstreeks 21.30 geraakte de scheepstelefoon defect. Toen onder *** omstandigheden het weer verruwde werd besloten naar de basis terug te keren.

'At approximately 21.00 hours the hydraulic steering mechanism broke down. After this, we steered with the hand wheel on the stern, where a sailor was in communication with the bridge by means of a rope tied to his wrists. At approximately 21.30 hours the ship's telephone broke down. When under *** circumstances the weather became rough, it was decided to return to base.'

Note that the detail provided about the circumstances makes them more likely to be regarded as important, worthy of attention, and this overrides to some extent any 'attraction' of *die* by the past tense. When the entire passage was presented, 56% of the subjects chose *deze*, which was in fact the original demonstrative in the corpus. The difference between the percentage of correct identifications in the contexted sentence and in the isolated sentence is accordingly 56%-18% = + 38 percentage points.

5.2.4. *The role of lexicon*

The second source of information within the sentence which we shall consider is lexicon. Here we encounter a more decisive factor, one less likely to be overriden by the larger context, than something as 'abstract' as tense.

For example, if some lexical item in the sentence suggests that one is confronting spoken rather than written Dutch, then the best choice of demonstrative is *die*, for as is shown by the written data in the Uit den Boogaart

(1975) and the Renkema (1981) corpora (5372 demonstratives) and the spoken data in De Jong (1979) (1498 demonstratives), *deze* is about 12 times less frequent in the spoken than in the written language. Only about 5% of demonstratives in the spoken sample are *deze*, compared with about 60% in the total written sample (all corpora).

One such lexical item is *nou* 'now, well', historically a variant of *nu* 'now'. According to the data in Uit den Boogaart (1975) and De Jong (1979), one occurrence of *nou* is found in written Dutch every 2500 words or so (on the average), but in spoken Dutch in about every 190 words (on the average). *Nou* is thus about thirteen times more frequent in the spoken language than the written. We therefore expect that subjects encountering a *nou* in the isolated sentences would confidently select *die* as the most likely demonstrative, and this is indeed what we find:

Nou, dan moet je *** kampioenen well zichtbaar maken en een naam geven.

'Well, in that case you must make *** champions visible and give them a name.'

Faced with this sentence in isolation, 98% of the 50 subjects correctly chose *die*; when it was presented in context, 100% of the subjects chose *die*.

In some cases, the very noun co-occurring with the demonstrative indicates that the language is spoken Dutch. Pejoratives are a good example:

Als *** ellendige trut er niet tussen gekomen was, dan was ik nu met Fred getrouwd.

'If *** wretched female had not come in between, I would now be married to Fred.'

Trut is classified in the latest edition of the authoritative Van Dale dictionary (Geerts, Heestermans and Kruyskamp, 1984) as a pejorative term for 'woman'. It is therefore not at all surprising that 100% of the subjects chose *die* in the sentence presented in isolation, which was the correct form.

Examples such as these suggest that the strong association of *die* with spoken Dutch is a second factor (in addition to *die*'s smaller average referent distance) accounting for the lack of any appreciable overall context effect with *die* as opposed to *deze* (cf. Figure 2). If a sentence can be identified purely on the basis of its lexicon as colloquial Dutch, then *die* is in fact the

most likely demonstrative and (as we have seen) there will be little 'improvement' in the subjects' choice when the rest of the context is added.

6. Summary and conclusions.

This paper has presented initial data from an exploratory questionnaire experiment on factors influencing native speakers' choice of demonstrative adjectives in written Dutch sentences presented both in isolation and in context.

The first such factor is 'genre', here described more accurately and operationally as simply text-type. The results suggest first of all that native speakers have internalized to some degree the relative frequency of the two kinds of demonstratives in different texts, at least at the two extremes of overwhelmingly *die* versus overwhelmingly *deze*. Novels, being largely colloquial, are expected to contain few instances of *deze*; government language, typically regarded as legalese, is expected to contain few instances of *die*. To the extent that native speakers recognize these text-types, they choose the stereotyped form.

The second factor is referential distance, here measured as the number of sentence boundaries one must cross to go from the mention of the referent effected with the demonstrative-bearing NP back to its first prior mention in the discourse. The fact that *deze* has a larger average RD than *die* explains the observation that – on the whole – the number of correct identifications of original *deze* increases in context (when previous sentences are added), while the number of correct identifications of *die* does not. The importance of RD is also shown by examination of misidentifications in the contexted sentences. When each sentence is used as its own control, one discovers that original *die*s with relatively long RDs tend to get erroneously classified as *deze*.

A third factor influencing demonstrative choice is the presence of additional information in the context about either the referent itself or the speaker's attitude towards it. Entities which are 'developed' in the context, which are discussed in detail, or which continue to be viewed as topical are referred to with NPs receiving *deze*.

A fourth influence is the tense of the main verb in the test sentences. Everything else being equal, present tense would tend to attract *deze* and past tense *die*. But the influence of tense in isolated sentences can be 'overridden' by context factors two and three, above.

The last factor discussed was lexicon. The examples suggest that what it does is simply help the native speaker recognize the text-type (at least at the extremes mentioned above), so that demonstrative choice then proceeds via the 'stereotyping' route already described in the first paragraph.

On the whole, the responses of the 50 subjects to the identification task complement the results of the text-studies mentioned in Section 1. One might suggest that the same explanation holds for both, in the sense that both the experimental subjects and the authors of texts choose that demonstrative whose meaning is least inappropriate to the particular messages they are engaged in communicating. The association of *deze* with a long referential distance, with greater detail provided about the referent, and with the referent's continued topicality and the association of *die* with precisely the opposite lends credence to a view of *deze* – at least in its discourse exploitation – as instructing the addressee more forcefully than *die* to seek out and attend to the noun's referent.[5]

Finally, it will be recognized that the present paper raises a number of questions, not only about the Dutch demonstratives but also about the texts from which the test sentences were taken. Ideally one would want to know whether the trend towards an increasing use of *deze* seen in Table 1 is independent of verb tense in the subcorpora. If not, then the explanation for the 'text effect' may need revision. Also, why does the referential distance associated with *deze* and *die* vary in the *particular* way it does across the subcorpora in Table 2? Why is there a significant difference in the RD associated with the demonstrative only in opinion and analysis, popular science, and government but not in daily newspapers, and is this true for larger samples from the subcorpora than were used in the questionnaire? It is perhaps only to be expected that an experiment based on the actual use of demonstratives in real texts would highlight our ignorance of not only the former but of the latter as well.

Notes

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1. One of the anonymous referees has pointed out that subcorpus 6, government language, may also be viewed as containing diverse genres. For details, the reader is referred to Renkema (1981).
2. For introductory explanations of the statistics used in this study (namely, the non-parametric chi-square test cited here, plus the *t*-test, the Mann Whitney U test, the Pearson correlation coefficient *r*, the phi coefficient, and the odds ratio), the reader is referred to Butler (1985), Miller (1975), Nie *et al.* (1975), Phillips (1973), Reynolds (1979), and Siegel (1956). The Miller and Siegel texts contain clear discussions of the differences between parametric and non-parametric (i.e. 'distribution-free') tests, one-tailed and two-tailed probability estimates, and the distinctions between nominal, ordinal, interval, and ratio scaling of data.
3. We should perhaps stress the word *tend* here, since it is clear that both *deze* and *die* can be used for both intrasentential and extrasentential 'retrieval' of a referent. In other words, both demonstratives *can* contribute to the *cohesion* of a a text, in the sense of Van Dijk (1978, 1980), Halliday and Hasan (1976), and Widdowson (1978). But the point of the present study is to explore the differences between the kind of cohesion effected with *deze* and the kind effected with *die*. See further the discussion in Section 5.2.2.
4. We wish to thank Saskia Daalder of the Free University, Amsterdam, for discussion of this point.
5. For some discussion of different approaches to the semantic analysis of the Dutch demonstrative adjectives, see Kirsner and van Heuven (1986), Section 7.2.

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