Choosing referring expressions in Belgian and Netherlandic Dutch: Effects of animacy

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Abstract

It has been argued that animate entities are referred to with more attenuated expressions than inanimate entities, because they are more accessible in memory. Two previously untested claims made for Dutch suggest that the situation may be more complex. Firstly, it has been stated that full pronouns can only refer to animate entities, while reduced pronouns can also refer to inanimate entities. This seems to be inconsistent with the accessibility account. Secondly, inanimate entities may be pronominalized less to avoid gender-marked expressions when grammatical gender is unclear. Using a sentence completion task, we tested these claims by investigating the effect of animacy on both the choice of pronouns versus more specific expressions and the choice of reduced versus full pronouns in Dutch. We compared speakers of Netherlandic Dutch, who have generally lost intuitions about masculine and feminine grammatical gender of nouns, with speakers of Belgian Dutch, for whom these intuitions are still relatively intact. Both groups showed an effect of animacy on pronominalization, suggesting that this effect cannot only be explained as a gender avoidance strategy. At the same time, the choice between full and reduced pronouns cannot be explained by accessibility. Implications for theories of reference production are discussed.
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1. Introduction

Among the many types of expressions that can be used to refer to an entity, pronouns encode the least information about the referent (leaving aside morphologically invisible ways of referring, such as the use of zero anaphora). Languages differ in the amount of information encoded in pronouns, but for the Germanic languages it generally holds that personal pronouns convey information about person, number, gender, and/or case. Given the general nature of these features, pronouns can be highly ambiguous in everyday language: They can refer to many different things. Therefore, the restricted informational content of pronouns requires that their referents somehow be salient, i.e., be in the focus of attention, to be correctly identified (e.g., Ariel, 1990; Givón, 1976; Gundel et al., 1993). Several discourse factors have been found to influence the salience of a referent, for instance whether it was the subject, the topic, or the first mentioned entity in the previous sentence (e.g., Gernsbacher and Hargreaves, 1988; Gordon et al., 1993; Grosz et al., 1995). In addition, the salience of a referent can also be influenced by its intrinsic properties, such as its animacy. Human referents may be inherently more salient than other animate referents (e.g., animals), which are in turn more salient than inanimate

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referents. The animacy hierarchy, given in (1), which was originally proposed as an implicational hierarchy to explain certain grammatical phenomena (e.g., Comrie, 1989), may therefore also be seen as a salience hierarchy.

(1)   *Animacy hierarchy*
        Human > Animate > Inanimate

Indeed, many psycholinguistic studies have shown that human or animate referents are more likely to be placed in subject position, or to be mentioned earlier in the sentence, than inanimate referents (e.g., Bock et al., 1992; Bresnan et al., 2007; Prat-Sala and Branigan, 2000; Rosenbach, 2005; Van Nice and Dietrich, 2003). These effects are generally explained as conceptual accessibility effects. That is, mental representations of human or animate entities are more activated in memory and therefore more easily retrieved than those of inanimate entities (Bock and Warren, 1985). Crucially, if animacy affects the accessibility of a referent in memory, it is also expected to affect what type of referring expression is chosen to refer to that referent. It is generally assumed that more accessible referents are referred to with more attenuated referring expressions (e.g., Ariel, 1990). According to Ariel, referents with a low accessibility are preferred to be referred to with a full definite description; referents of intermediate accessibility can be realized with demonstrative pronouns, for example; and highly accessible referents are preferably referred to with unstressed, reduced pronouns or zero anaphora. This is expressed by the accessibility scale in (2). Mapping the animacy hierarchy in (1) on the accessibility scale in (2) results in the prediction that the more animate a conceptual representation of a referent is, the more attenuated the expression referring to that referent will be.

(2)   *Accessibility scale* (simplified version of the scale presented in Ariel, 1990)
        Zero > Reduced pronoun > Full pronoun > Proximate demonstrative > Distal demonstrative > Full NP

Indeed, in a corpus of Swedish texts, Dahl and Fraurud (1996) found that antecedents denoting humans were more than four times as likely to be referred to with pronouns as inanimate antecedents (as opposed to full noun phrases; see also Yamamoto, 1999 for corpus data on English and Japanese). In a story completion experiment, Fukumura and Van Gompel (2011) found a similar, but weaker, tendency in the frequency of the English third person plural pronoun *they*, which was higher when participants referred to animate entities than when they referred to inanimate entities. Fukumura and Van Gompel argued that this effect was not due to the avoidance of the ambiguity that is inherent to pronouns, since the same effect was found in contexts in which a pronoun was not ambiguous. In addition, they found that the effect was independent of the grammatical function of the antecedent noun, suggesting that it cannot be explained as an effect of discourse salience. Fukumura and Van Gompel proposed that references to animate entities are more often attenuated than references to inanimate entities because human or animate referents are inherently more accessible in memory. Therefore, less information from the conceptual representation needs to be encoded in a referring expression to activate that representation.

The direct mapping of the animacy of the referent to the degree of attenuation in referring expressions is not unproblematic, however. Firstly, it has been claimed that in languages that have a distinct set of pronouns that are phonologically or morphologically reduced and cannot be stressed, these reduced forms can be used to refer to both animate and inanimate entities, while their full counterparts, which can be stressed, can only refer to animate (human) entities (e.g., Cardinaletti and Starke, 1996). This goes exactly counter to the idea that expressions referring to animates are more likely to be attenuated, since that would predict that reduced pronouns are more frequent in reference to animate entities than full pronouns. Secondly, in both English and Swedish, the languages investigated in the studies mentioned above, the relation between the animacy of the referent and the choice of a certain referring expression has been grammaticalized to some degree. For example, masculine and feminine pronouns in those two languages are used almost exclusively for animate (human) referents (e.g., Corbett, 1991). In English, the neuter pronoun *it* is used to refer to inanimate entities, and, when used anaphorically, English demonstrative pronouns, which do not have a gender distinction, often have antecedents that are not individuals (e.g. propositions or composite entities; Brown-Schmidt et al., 2005). In Swedish, the common gender pronoun *den* and the neuter pronoun *det* typically refer to non-human entities, as illustrated by the ungrammaticality of (3b) as opposed to (3a).

(3)   a.   *Jag gick på Skyfall istället för på the Hobbit$_i$, eftersom jag tyckte att den$_i$ verkade tråkig.*
             I   went to S   instead of to TH   because I   thought that that/it seemed boring
             'I went to see Skyfall instead of The Hobbit, because that one seemed boring.'
       b.   **Jag gick till Simon istället för till Hugo$_i$, eftersom jag tyckte att den$_i$ verkade tråkig.*
             I   went to S   instead of to H   because I   thought that that/it seemed boring

Hence, the tendency to use different types of referring expressions to refer to animate and inanimate entities may be influenced by the fact that some forms already encode animacy. This raises the question whether the effect of animacy on

the choice of referring expression can be generalized to languages that do not have animacy grammaticalized in the pronominal system.

In this paper, we investigate whether and how animacy affects the choice of referring expression in two varieties of standard Dutch. Dutch is a language well-suited for investigating the two issues raised above. Firstly, it has a set of both full and reduced third person pronouns, which allows us to test whether animate entities are referred to with more attenuated expressions also on a more fine-grained level, or whether there is an opposite tendency within the use of pronouns, as suggested by Cardinaletti and Starke (1996). Secondly, Dutch has no pronouns that exclusively refer to animate or inanimate entities. In principle, masculine, feminine and neuter personal pronouns can all be used to refer to animates as well as inanimates, as in German.[1] The same holds for demonstrative pronouns, as illustrated by the Dutch variants of (3), given in (4).

(4) a. *Ik   ben   naar   Skyfall   gegaan   in   plaats   van   naar   The Hobbit$_i$,   omdat   die$_i$ me   saai   leek.*
         I   am   to   S   gone   in   place   of   to   TH   because   that   me   boring   seemed
         'I went to see Skyfall instead of The Hobbit, because that one seemed boring.'

     b. *Ik   ben   naar   Simon   gegaan   in   plaats   van   naar   Hugo$_i$,   omdat   die$_i$ me   saai   leek.*
         I   am   to   S   gone   in   place   of   to   H   because   that   me   boring   seemed
         'I went to see Simon instead of Hugo, because he seemed boring.'

Thus, whereas speakers of English and Swedish need to take into account the animacy/humanness of the referent to choose a pronominal referring expression, speakers of Dutch only need to select a pronoun with the correct gender. If personal pronouns are more frequent in reference to animates than to inanimates also in Dutch, this would provide additional evidence for the hypothesis that the increased conceptual accessibility of animate entities makes them more likely to be referred to with attenuated expressions.

Another reason why Dutch is well-suited for investigating the questions at hand is that there are two varieties of the Dutch standard language, spoken in the Netherlands and Belgium, respectively, that differ in the degree to which speakers have intuitions about the grammatical gender of nouns. While Dutch originally had a three-way gender distinction (masculine, feminine, and neuter) in the nouns, modern standard Dutch nouns morphologically distinguish only between common gender (*de*-nouns; e.g., *de man* 'the man', *de vrouw* 'the woman') and neuter gender (*het*-nouns; e.g., *het kind* 'the child'). On the one hand, most speakers of Dutch in the Netherlands do not intuitively know the original (masculine or feminine) gender of inanimate common gender nouns. According to Audring (2006, 2009), these speakers therefore exhibit a tendency to avoid the choice between masculine and feminine pronouns when referring to inanimate antecedents. Instead, they switch to using demonstrative pronouns or definite descriptions, which are not marked for masculine or feminine gender (demonstratives do distinguish between common and neuter gender forms). A similar tendency has been found for Swedish, where speakers sometimes use the common gender pronoun *den* to refer to persons when the antecedent's natural gender is unknown (Josefsson, 2010). This gender avoidance strategy may be another explanation why inanimate entities are less frequently pronominalized than animates.

In the variety of Dutch spoken in Belgium, on the other hand, many speakers still have intuitions about whether a *de*-noun is masculine or feminine. Therefore, it is unlikely that gender mismatches are a reason for these speakers to avoid pronouns when they refer to inanimate entities. Comparing the two varieties of Dutch thus allows us to test whether possible effects of animacy on the choice of referring expressions in Dutch can be explained by a general conceptual accessibility effect, or whether a gender avoidance strategy also plays a role, which has not been empirically investigated before. If the former is the case, an effect of animacy should be present in both varieties. If avoidance plays a role, the animacy effect should be larger for speakers of Dutch from the Netherlands than for speakers of Dutch from Belgium. Before moving on to the present study, which was conducted to test these predictions, the next section first presents an overview of the Dutch pronominal and nominal gender systems.

2. Pronouns and grammatical gender in Dutch

The Dutch third person personal pronouns are similar to the English ones in that there are masculine, feminine and neuter forms in the singular, and no gender distinctions in the plural. They differ from those in English in that almost all

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[1] In references to humans, it is more common in Dutch to select a pronoun based on the semantic gender of the noun, while in German the grammatical gender might also be used (although this may be less common in colloquial German). For example, the German neuter pronoun *es* may be used when the antecedent is a grammatically neuter but semantically feminine noun such as *Mädchen* 'girl' (Dahl, 2000), which would be odd in Dutch.

Table 1
The gender system of Dutch third person subject pronouns.

	Masculine	Feminine	Neuter	Plural
Full pronouns	hij	zij	–	zij
Reduced Pronouns	ie[a], die	ze	het, 't[b]	ze

[a] The reduced pronoun *ie* cannot occur sentence-initially.

[b] The neuter pronoun *het* 'it' is categorized here as reduced pronoun, as it patterns syntactically with the reduced forms (Coppen et al., 2002).

Table 2
The gender system of Dutch demonstrative pronouns and definite noun phrases.

	Common	Neuter	Plural
Demonstrative pronouns	die, deze	dat, dit	die, deze
Definite noun phrases	de man, de vrouw	het kind	de mannen, de vrouwen, de kinderen

personal pronouns, both subject and object forms, have morphologically distinct full and reduced variants. In addition, masculine and feminine pronouns are not restricted to animate reference. Table 1 lists all third person subject pronouns used in the standard language.[2]

It has been argued that the reduced pronouns cannot be stressed, coordinated or modified, while the full pronouns can (e.g., Cardinaletti and Starke, 1996; Coppen et al., 2002). In addition, according to the Dutch reference grammar (*Algemene Nederlandse Spraakkunst* (ANS); Coppen et al., 2002:§5.2.7), full pronouns (also in the object forms) typically refer to animate entities (unstressed *hij* 'he' being an exception), while reduced pronouns can be used to refer to both animate and inanimate entities. Hence, the sentence in (5a) is presented as infelicitous when *zij* 'they' refers to books, while (5b), with the reduced form *ze*, is fine in this context.

(5) a. # *Zij* *staan* *daar* *al* *een* *hele* *tijd.*
     b. *Ze* *staan* *daar* *al* *een* *hele* *tijd.*
          they stand there already a whole time
          'They have been standing there for a long time.' (they = books)

While this constraint might not be as strict as presented here (see e.g., Van Bergen et al., 2011), the same observation has been made for other languages, such as German and Italian, in which full or non-cliticized pronouns can only refer to humans (Cardinaletti and Starke, 1996). This does not seem to be in accordance with the accessibility scale, which suggests a strong tendency for more accessible referents to be referred to with more attenuated expressions (Ariel, 1990; cf. Kaiser, 2011; Kaiser and Trueswell, 2008). Since reduced pronouns are more attenuated than their full counterparts, they should be more likely to refer to more accessible, and hence more animate, referents. To the best of our knowledge, this has not yet been tested experimentally.

With respect to gender, while Dutch has masculine, feminine and neuter third person singular personal pronouns, Dutch demonstrative pronouns and definite noun phrases morphologically distinguish only two genders: common and neuter. This is shown in Table 2. As Old English and Old Swedish, Old Dutch (approx. 500–1150) had a fully marked three-way nominal gender system (e.g., Audring, 2009). Gender distinctions began to erode with the simplification of declension systems in the Middle Dutch period, until at some point the original masculine and feminine genders collapsed into one common gender category (Geerts, 1966), resulting in only two nominal genders in the present-day standard language: common gender nouns that take the definite article *de* (*de*-nouns), and neuter gender nouns that take the definite article *het* (*het*-nouns). However, some dialects (among which the southern varieties Flemish, Brabantian and Limburgish) retain the three-way gender distinction until the present day, marked morphologically by different forms of articles and adjectives (e.g., Sint Niklaas dialect: *ne grote man* 'a tall man' (masc.), *een grote vrouw* 'a tall woman' (fem.), *e groot kind* 'a tall child' (neut.); De Vogelaer and De Sutter, 2011). This has resulted in a situation in which the distinction

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[2] Note that the third person plural pronoun (*zij*, *ze*) is homophonous with the third person singular feminine pronoun. In addition, the reduced pronoun *die* 'he' is homophonous with the demonstrative pronoun *die* 'that'. However, the former cannot be stressed, while the latter can be either stressed or unstressed.

between masculine and feminine nouns is no longer felt in the variety of standard Dutch spoken in most of the Netherlands (excluding south-eastern dialects; henceforth Netherlandic Dutch),[3] while this distinction is still in use in the variety of standard Dutch spoken in Belgium (Flanders; henceforth Belgian Dutch; Coppen et al., 2002), probably because of the strong presence of dialects that still have a three-way gender system (De Vogelaer, 2006).

In sum, there is a mismatch between nominal and pronominal gender in Netherlandic Dutch, with three pronominal genders (masculine, feminine, and neuter), but only two nominal genders (common and neuter). Since Dutch does not have a common gender (or 'uter') personal pronoun, such as Swedish *den*,[4] common gender nouns have to be pronominalized using either a masculine (*hij*, *ie*) or a feminine (*zij*, *ze*) pronoun, neither of which matches the grammatical gender of the noun. In reference to persons, speakers can use the referent's natural (i.e., biological) gender to guide their choice of a pronoun (e.g., Dahl, 2000). In reference to non-persons, however, this is not possible. Here, speakers of Netherlandic Dutch typically use a masculine pronoun, which can be considered unmarked with respect to the feminine forms (De Vogelaer, 2009). According to Audring (2006, 2009), the choice for a pronoun in Netherlandic Dutch is becoming more semantically driven. That is, a process is taking place in which the choice for a masculine, feminine or neuter pronoun is determined more by semantic properties of the referent than by (arbitrary) grammatical gender (see also Corbett, 1991). Audring proposes that the relevant semantic property is the degree of individuation of the referent: The masculine pronouns *hij* and *ie* mark a relatively high degree of individuation (e.g., animals or concrete inanimate objects),[5] while the neuter pronoun *het* marks low individuation (e.g., mass nouns).[6]

For speakers of Belgian Dutch, there is no mismatch between nominal and pronominal gender, and hence they can choose a pronoun based on the original grammatical gender of the antecedent. Thus, masculine pronouns (*hij* or *ie*) typically only refer to originally masculine nouns, feminine pronouns (*zij* or *ze*) to originally feminine nouns, and neuter pronouns (*het*) to neuter nouns. There is some evidence that the three-way gender system is gradually eroding in Belgian Dutch as well, probably due to the decline in the use of dialects in favor of the standard language (De Vogelaer, 2006; De Vogelaer and De Sutter, 2011). Especially younger speakers, who have less knowledge of the dialects, may be converting to a two-way system. However, this development is still in an early stage compared to Netherlandic Dutch, as witnessed by the frequent use of grammatically agreeing pronouns in Belgian Dutch (De Vogelaer and De Sutter, 2011). The difference between the two varieties is illustrated in (6), which is taken from the experimental items of the study presented here. In this example, the common gender noun *tent* 'tent', which takes the article *de*, was originally feminine, and is assumed to be still felt as such in Belgian Dutch. Thus, speakers of Belgian Dutch are expected to be more likely to use a feminine pronoun, as in (6b), while speakers of Netherlandic Dutch will be more likely to use a masculine pronoun (the default) to refer to an inanimate antecedent, as in (6a).

(6) a. Netherlandic Dutch

    *Met   slecht   weer   wordt   de   tent   beschut.   Is   **hij/ie**   gemakkelijk   verplaatsbaar?*
    with   bad   weather   becomes   the   tent$_C$ sheltered   is   he   easily   movable

   b. Belgian Dutch

    *Met   slecht   weer   wordt   de   tent   beschut.   Is   **ze**   gemakkelijk   verplaatsbaar?*
    with   bad   weather   becomes   the   tent$_F$ sheltered   is   she   easily   movable

    'In bad weather, the tent is sheltered. Can it be moved easily?'[7]

Crucially, however, speakers of Netherlandic Dutch may be uncomfortable with the use of a masculine pronoun here, since that would suggest that it refers to a masculine antecedent, while there may still be some awareness that the antecedent might possibly be feminine. Thus, the loss of intuitions about the masculine-feminine gender distinction could result in uncertainty about pronoun choice. It has been claimed that because of this uncertainty, there is a tendency in Netherlandic Dutch to avoid pronoun references to inanimate entities altogether (Audring, 2009). This leads to the use of

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[3] There are still certain morphological criteria that indicate the original grammatical gender of an inanimate common gender noun. For example, words ending in –*ing* or –*heid* are always feminine. However, even these criteria are not part of the internal grammar of many speakers, given frequent agreement errors such as *de regering en zijn ministers* 'the government$_F$ and its$_{M/N}$ ministers'.

[4] A reviewer notes that the development of Dutch demonstrative pronoun *die* may parallel that of Swedish *den*, in that *die* is on its way to become a personal pronoun (see also Audring, 2009:104). Since this development is arguably still in an early stage, however, we would like to maintain the distinction between demonstrative and personal pronouns here. See also footnote 10.

[5] Even when an animal's natural gender is clearly female, such as in the case of *koe* 'cow', some speakers will use *hij* 'he' (Audring, 2009).

[6] The feminine possessive or object pronoun *haar* is sometimes used to refer to collectives or abstract nouns, even when these nouns were originally masculine or neuter (see Audring, 2006, footnote 9; Van der Sijs, 2004).

[7] In this example and elsewhere, M stands for masculine gender, F for feminine gender, C for common gender, and N for neuter gender.

other types of referring expressions, such as demonstrative pronouns (which do have common gender forms) or full noun phrases. Audring (2009) cites the following example:

(7) | *De* | *mummie* | *zal* | *eerst* | *een* | *CT-scan* | *ondergaan* | *voordat* | *deze* | *tentoongesteld* | *wordt* | *in* | *het*
    | | the$_C$ | mummy$_C$ | will | first | a | CT-scan$_C$ | undergo | before | this.one$_C$ | exhibited | | becomes | in | the
    | *Sakkara* | *museum.*
    | Sakkara | museum
    | 'The mummy will first undergo a CT-scan before it is exhibited in the Sakkara museum.'
    | (Audring, 2009:47)

In (7), the common gender proximal demonstrative *deze* 'this' is used to refer to the common gender noun *mummie* 'mummy', despite the fact that there is a preference for demonstratives to refer to the most recent antecedent rather than to the subject of the previous clause, and hence *CT-scan* would be a more preferred antecedent. If this use of a demonstrative pronoun is due to uncertainty about whether *mummie* should be referred to with a masculine or a feminine pronoun, the choice of referring expression should be less problematic for a speaker of Belgian Dutch who knows that *mummie* is grammatically feminine, and hence prefers the use of the feminine pronoun *ze*.

3. Predictions and experimental design

In this paper, we investigate to what extent the observations about pronoun use in Dutch outlined in the previous section are in line with a *conceptual accessibility account*. This account assumes that animate entities are more accessible than inanimate entities, and hence that references to animates should be more reduced than references to inanimates. Firstly, this account predicts that reduced pronouns in Dutch (*ie*, *ze*) are more frequent than full pronouns (*hij*, *zij*) in reference to animate entities. Secondly, animate entities are predicted to be more likely to be pronominalized than inanimate entities, and this effect should be present both in Netherlandic Dutch and in Belgian Dutch. According to the *gender avoidance account*, however, the animacy effect could also partly be explained by speakers being uncertain about choosing gender-marked pronouns for inanimate nouns. Hence, the tendency to use fewer pronouns for inanimate referents should at least be smaller in Belgian Dutch, since speakers of Belgian Dutch do not need to avoid gender-marked forms due to the one-to-one mapping between nominal and pronominal gender. To test these predictions, we conducted a spoken sentence completion experiment with a group of Netherlandic Dutch speakers and a group of Belgian Dutch speakers, in which participants read sentences aloud and produced referring expressions for animate and inanimate antecedents.

4. Materials and methods

4.1. Participants

Twenty-four native speakers of Dutch from Belgium (14 female; aged 45–93; mean age 58.3), and seventeen native speakers of Dutch from the Netherlands (9 female; aged 27–65; mean age 48.2) participated in this study. The participants from the Netherlands did not speak any dialect with a three-way gender distinction (no Brabantian, Limburgish, Achterhoeks or Twents). The participants from Belgium were all from Brabantian or Flemish (East Flemish, West Flemish[8]) speaking areas. No participants from Belgium under the age of 40 were recruited, because of the possibility that knowledge of grammatical gender is declining in younger generations.

4.2. Materials and design

The materials included 16 short texts, each consisting of two sentences written in Standard Dutch. The first sentence always described a transitive event involving an animate and an inanimate entity, e.g., *Plotseling valt de inbreekster tegen de klok aan* 'Suddenly the (female) burglar falls against the clock'. The second sentence was always a question addressing the first sentence, in which the subject constituent was replaced by a gap, e.g., *Is ___ kapot?* 'Is ___ broken?'. Each text occurred in four different versions: (a) the subject of the question referred to the inanimate entity, which was the subject of the first sentence; (b) the subject of the question referred to the animate entity, which was the object of the first sentence; (c) the subject of the question referred to the inanimate entity, which was the object of the first sentence; (d) the subject of the question referred to the animate entity, which was the subject of the first sentence. The four versions are exemplified in (8).

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[8] A tendency toward a (semantically motivated) two-way nominal gender distinction may also be seen in West Flemish (De Vogelaer and De Sutter, 2011). However, we did not observe such a trend in our two participants from West Flanders (including a 93 year old).

(8)   a.   *Plotseling valt de klok tegen de inbreekster aan. Is _____ kapot?*
            'Suddenly the clock falls against the (female) burglar. Is _____ broken?'
      b.   *Plotseling valt de klok tegen de inbreekster aan. Is _____ nu verraden?*
            'Suddenly the clock falls against the (female) burglar. Has _____ now been betrayed?'
      c.   *Plotseling valt de inbreekster tegen de klok aan. Is _____ kapot?*
            'Suddenly the (female) burglar falls against the clock. Is _____ broken?'
      d.   *Plotseling valt de inbreekster tegen de klok aan. Is _____ nu verraden?*
            'Suddenly the (female) burglar falls against the clock. Has _____ now been betrayed?'

Which entity was the target referent was made clear by a disambiguating context in the second sentence. For example, *Is ___ kapot?* 'Is ___ broken' can only refer to an inanimate entity, while *Is ___ nu verraden?* 'Has ___ now been betrayed?' can only refer to an animate entity. Hence, we expected participants to refer to the clock in (8a) and to the burglar in (8b). Versions (c) and (d) were included to control for the effect of grammatical function on the choice of referring expression. We used interrogative sentences with subject-verb inversion to enable the use of the masculine reduced pronoun *ie*, which cannot appear sentence-initially. The animate nouns had either feminine or masculine gender (corresponding to female and male natural gender, respectively), while the inanimate nouns always had feminine gender, according to the Van Dale dictionary.[9]To check whether the nouns were felt as feminine by Belgian Dutch speakers, but not by Netherlandic Dutch speakers, 11 Belgian Dutch and 14 Netherlandic Dutch speakers not participating in the experiment were asked to make a forced choice between a feminine pronoun (*ze* 'she') and a masculine pronoun (*ie* 'he') to refer to a set of (originally feminine) inanimate nouns. This test consisted of 57 short texts, similar to the ones used in the experiment, except that the initial sentence only contained one noun phrase, which was always inanimate and feminine. There was only one version of each item. An example is given in (9).

(9)   *Weer valt de klok. Is _____ kapot?*
      'The clock falls down again. Is ____ broken?'

Only nouns for which at least 75% of the Belgian Dutch speakers chose *ze* and at least 75% of the Netherlandic Dutch speakers chose *ie* were used in the experiment.The materials were further checked for acceptability by 27 native speakers of (Netherlandic) Dutch, who were asked to indicate the degree of semantic well-formedness of the first sentence and the degree of coherence between the first sentence and the second sentence (with the gap filled in). Only materials with medium to high acceptability scores (e.g., 3 or above on a 5-point Likert scale) were selected, although we were not always able to avoid the use of slightly contrived sentences due to the structure of the materials. In addition, care was taken that the materials contained no words or expressions that are exclusively used in the Netherlands or Belgium, which was checked by the first and second author (native Netherlandic Dutch and native Belgian Dutch, respectively). In addition to the experimental materials, 20 fillers were constructed. These were similar to the experimental materials, but some had two animate or two inanimate entities (either feminine or masculine), and not all contexts were disambiguating. This was done to avoid task strategies and to encourage variation in the choice of referring expressions. The filler items had only one version.

   The design of the experiment consisted of the two within-participant factors Animacy (animate referent or inanimate referent) and Grammatical function (subject or object), and the between-participant factor Variety (Belgian Dutch or Netherlandic Dutch). This resulted in a 2 × 2 × 2 mixed design. Two stimulus lists were created, each of which contained two versions of each item: a version with the inanimate entity as the subject and its counterpart with subject and object swapped around (e.g., (9a) and (9c), or (9b) and (9d)). This was done because grammatical function was only included as a control, and it would have complicated the design if subject and object references were also distributed over multiple stimulus lists. Participants were randomly assigned to each list. The lists were divided into two blocks, to keep the two versions of the same item as far apart as possible. The filler items were intermixed pseudo-randomly with the experimental items, with at most two experimental items appearing in consecutive order.

4.3. Procedure

   The experiment was run from a web server on a laptop using WWStim (Veenker, 2003). The items were presented one by one, and each sentence pair immediately appeared in its entirety upon mouse click. Participants were instructed to first

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[9] Until recently, most Dutch dictionaries gave the original gender of a lexeme, with the 'new' gender as felt by most Netherlandic Dutch speakers given in brackets. The latest editions often omit gender information when a lexeme is feminine for Belgian Dutch speakers but common (masculine) gender for Netherlandic Dutch speakers.

carefully read the complete sentence pair silently, think of a word or phrase to fill in the gap, and then read the whole text aloud while filling in the gap. Participants were further instructed not to ponder too long, but there were no time restrictions on the trials. The experiment started with three practice trials, and it took about 10 min to complete the experiment. All speech was recorded.

To investigate the degree to which the Belgian participants would use the grammatical gender of nouns in choosing a pronoun when using the standard language, these participants were given a written gender test after the experiment, in which they had to make a forced choice between a masculine (*ie*) and a feminine (*ze*) pronoun to refer to originally feminine inanimate nouns (the same test as the material pretest). As a control, 5 participants from the Netherlandic Dutch group also performed this task. The test was done post hoc to avoid influences on the experiment. The results showed that across all Belgian participants, a feminine pronoun was used in 75% of the cases. Individual scores ranged from 39% to 95%. The scores correlated with age: Older participants were more likely to have higher proportions of feminine pronouns (Spearman's $\rho = 0.61$; $p < .01$). Individual chi-square tests showed that for 7 participants, the number of feminine pronouns was not significantly ($p > .05$) higher than chance (but none of them used significantly more masculine than feminine pronouns). Because our main interest was in comparing groups of participants that differed in their intuitions about the three-way gender system, these participants were excluded from further analysis. The remaining 17 participants used feminine pronouns in 85% of the cases on average. All subsequent analyses are done using this subset of the Belgian participants.

The Dutch participants that completed the same task used a feminine pronoun in 29% of the cases, with a range from 0% to 44%. Individual chi-square tests showed that the scores were either not different from chance, or that there were significantly more masculine pronouns. A logistic regression analysis with language variety as a factor and the log odds for a feminine pronoun as the dependent variable showed that the Belgian participants used significantly more feminine pronouns to refer to originally feminine inanimate nouns than the Dutch participants ($\beta = 2.00$; $SE = 0.15$; $p < .001$).

4.4. Data coding

From the 17 Netherlandic Dutch participants (henceforth NLD speakers) and the remaining 17 Belgian Dutch participants (henceforth BD speakers), we transcribed all referring expressions used to fill in the gaps in the experimental items. We coded for the following categories: full noun phrases preceded by a demonstrative pronoun (e.g., *deze tent* 'this tent'); full noun phrases preceded by a definite article (e.g., *de koopman* 'the merchant'); demonstrative pronouns (*die*, *deze*, *dat*, or *dit*); masculine full pronouns (*hij*); feminine full pronouns (*zij*); masculine reduced pronouns (*ie*); feminine reduced pronouns (*ze*); neuter pronouns (*het*). The masculine reduced pronoun *ie* has a variant that is homophonous with demonstrative *die*. Since the two types of *die* are practically indistinguishable, we counted all occurrences of *die* as demonstrative.[10] In addition, when the previous word ends in /t/, *die* is sometimes also indistinguishable from *ie* (e.g., *gaat (d)ie* 'goes he'). Only cases in which a clear /d/ could be perceived were counted as *die*.

We excluded 38 cases in which participants were clearly referring either to the wrong noun phrase (which would cause a semantic mismatch in the interrogative sentence) or to something that was not mentioned in the previous sentence.[11] Non-verbatim rephrasing of the target referent was allowed (e.g., *kraan* 'crane' for *hijskraan* 'hoisting crane'). We also excluded 14 cases that contained self-repairs, and 3 cases in which the referring expression remained unclear after discussion. We excluded 4 cases in which the use of a neuter pronoun (*dat* 'that' or *het* 'it') enabled a reading in which the pronoun refers to something else than a noun phrase (e.g., to a whole proposition), and 2 cases in which participants misread (part of) the sentences such that this could influence the interpretation of the referring expression. In addition, there were 5 missing cases. In total, 66 cases (6.1%) were excluded.

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[10] We also conducted analyses on a data set in which occurrences of *die* were counted as demonstratives when stressed, and as variant of *ie* otherwise, in line with the Dutch reference grammar (Coppen et al., 2002). Stress was established by four annotators (including the first and second author), who scored the degree of accentuation on each occurrence of *die* (either 'strongly accentuated', 'weakly accentuated', or 'not accentuated'). Occurrences of *die* that were agreed on by at least three of the four annotators to be unaccented were counted as 'masculine reduced pronoun'. Occurrences in which two annotators heard no accentuation but the other two did were labeled as 'unclear' and excluded from analysis. All other occurrences were categorized as 'demonstrative pronoun'. However, the distribution of unstressed *die* patterned more like stressed *die* than like reduced *ie*, being more frequent in references to objects than to subjects and not found at all in references to humans. In any case, statistical analyses showed that effects of Animacy and Variety were similar for the two types of categorization. Only effects of Grammatical Function did not reach significance anymore when occurrences of *die* were categorized differently based on stress.

[11] For pronominal references it cannot always be determined whether the participant indeed chose the correct antecedent, since masculine and feminine pronouns might be used for both the animate and the inanimate entity. These cases were therefore always treated as correct references.

5. Results

5.1. Data exploration

Tables 3 and 4 list the frequencies of occurrence of all different types of referring expressions used by the 17 Dutch participants and by the 17 Belgian participants that scored above chance level on the grammatical gender test (henceforth 'three-way gendered Dutch'), split by the animacy and the grammatical function of the antecedent. From Tables 3 and 4 it becomes clear that both groups of speakers prefer to use full pronouns (*hij*, *zij*) to refer to animates, although the reduced feminine pronoun is also used frequently, unlike the reduced masculine pronoun. An interesting difference is that the NLD speakers use a fair amount of full NPs to refer to animates, whereas these are virtually non-existent in the BD speakers. Instead, these speakers tend to use more reduced pronouns.

When participants refer to inanimate nouns (recall that these were always feminine), the differences become more striking. The NLD speakers use all kinds of referring expressions, with a tendency away from full pronouns toward either

Table 3
Absolute and relative frequencies of referring expressions used by the NLD speakers, split by the animacy and grammatical function of the antecedent. The three pronominal categories (demonstrative, full and reduced) are broken down in the different forms within these categories (n = neuter gender; c = common gender).

	Netherlandic Dutch			
	Animate antecedent		Inanimate antecedent	
	Subject	Object	Subject	Object
Definite full NP	**18 (14%)**	**19 (16%)**	**42 (33%)**	**38 (30%)**[a]
Demonstrative	**1 (1%)**	**2 (2%)**	**25 (20%)**	**46 (36%)**
dat 'that' (n)	0 (0%)	0 (0%)	1 (1%)	1 (1%)
die 'that' (c)	1 (1%)	1 (1%)	9 (7%)	25 (20%)
deze 'this' (c)	0 (0%)	1 (1%)	15 (12%)	20 (16%)
Full pronoun	**85 (68%)**	**83 (69%)**	**41 (32%)**	**28 (22%)**
hij 'he'	52 (42%)	49 (41%)	34 (27%)	23 (18%)
zij 'she'	33 (26%)	34 (28%)	7 (5%)	5 (4%)
Reduced pronoun	**21 (17%)**	**16 (13%)**	**20 (16%)**	**16 (13%)**
ie 'he'	1 (1%)	0 (0%)	8 (6%)	6 (5%)
ze 'she'	20 (16%)	16 (13%)	6 (5%)	4 (3%)
het 'it'	0 (0%)	0 (0%)	6 (5%)	6 (5%)
TOTAL	**125 (100%)**	**120 (100%)**	**128 (100%)**	**128 (100%)**

[a] Including 1 NP preceded by a demonstrative determiner.

Table 4
Absolute and relative frequencies of referring expressions used by the BD speakers split by the animacy and grammatical function of the antecedent. The three pronominal categories (demonstrative, full and reduced) are broken down in the different forms within these categories (n = neuter gender; c = common gender).

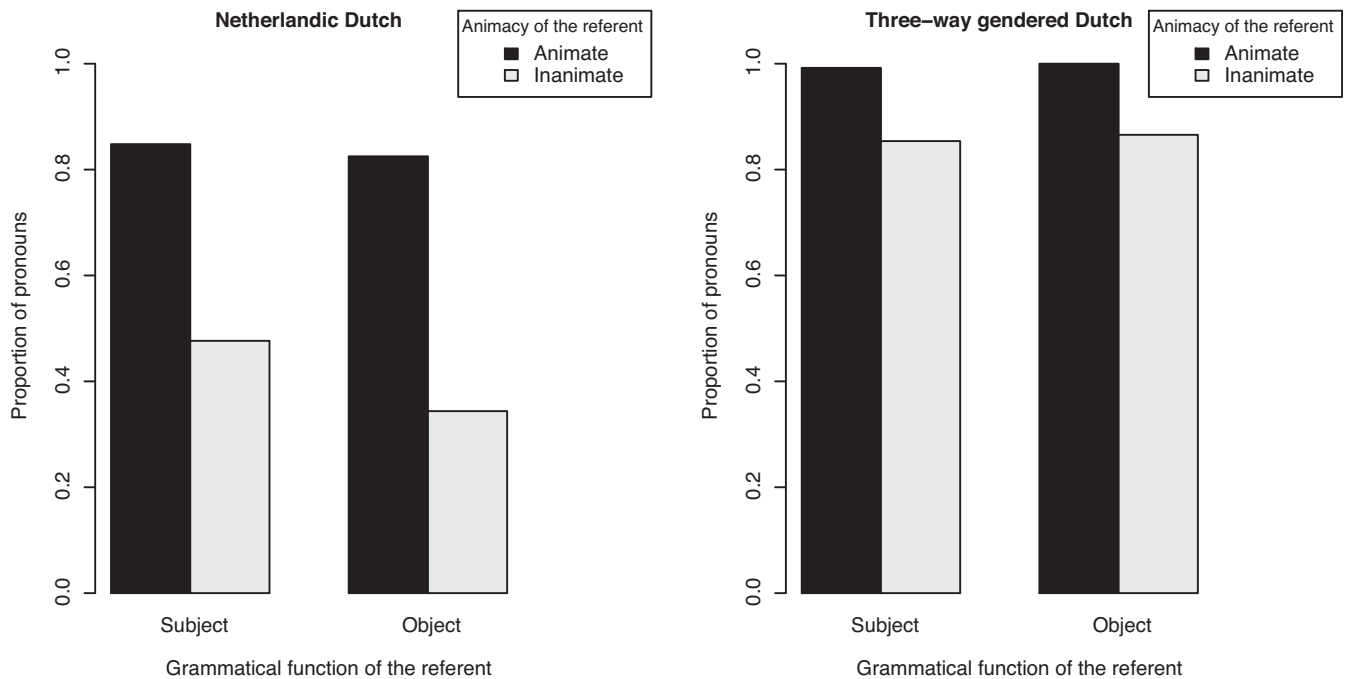|	Three-way gendered Dutch			
	Animate antecedent		Inanimate antecedent	
	Subject	Object	Subject	Object
Definite full NP	**1 (1%)**	**0 (0%)**	**4 (3%)**	**2 (1%)**
Demonstrative	**0 (0%)**	**0 (0%)**	**15 (12%)**	**16 (12%)**
dat 'that' (n)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
die 'that' (c)	0 (0%)	0 (0%)	10 (8%)	10 (7%)
deze 'this' (c)	0 (0%)	0 (0%)	5 (4%)	6 (4%)
Full pronoun	**83 (65%)**	**89 (68%)**	**42 (32%)**	**48 (36%)**
hij 'he'	56 (44%)	58 (45%)	21 (16%)	24 (18%)
zij 'she'	27 (21%)	31 (24%)	21 (16%)	24 (18%)
Reduced pronoun	**43 (34%)**	**41 (32%)**	**69 (53%)**	**68 (51%)**
ie 'he'	8 (6%)	6 (5%)	7 (5%)	5 (4%)
ze 'she'	35 (28%)	35 (27%)	61 (47%)	62 (46%)
het 'it'	0 (0%)	0 (0%)	1 (1%)	1 (1%)
TOTAL	**127 (100%)**	**130 (100%)**	**130 (100%)**	**134 (100%)**

Fig. 1. The proportion of personal pronouns out of all referring expressions as a function of animacy of the referent and grammatical function of the referent for NLD and BD speakers.

demonstratives and full NPs or reduced (masculine) pronouns and neuter pronouns. There are even some cases in which they use a feminine pronoun. By contrast, the BD speakers show a clear preference for the reduced feminine pronoun (*ze*), which is used in almost half of the cases. Other frequent pronouns are *zij* and, surprisingly, *hij*, the latter showing that the inanimate nouns were not always felt as feminine even by the BD speakers. Finally, there is also an increase in the use of demonstratives and full NPs for references to inanimates compared to references to animates, although not as large as for the NLD speakers. Another striking observation is that there are only small differences between references to subjects and references to objects. The only noteworthy difference seems to be in references to inanimates, where NLD speakers use more demonstratives when referring to an object antecedent, and fewer full pronouns.

In the next three subsections, we report the effects of Variety, Animacy and Grammatical function on the type of referring expression. We performed three logit mixed model analyses (Jaeger, 2008): one on the log odds of a personal pronoun reference (both full and reduced) out of all referring expressions (Section 5.2), one on the log odds of a demonstrative pronoun reference out of all pronominal expressions (Section 5.3), and one on the log odds of a reduced pronoun out of all personal pronouns (Section 5.4). Animacy, Grammatical function and Variety were always included as fixed factors, participants and items as random factors. The fixed factors were centered to reduce collinearity between predictors. Random intercepts and random slopes for participants and items were included to account for between-participant and between-item variation.[12] Starting with a model with a full random effect structure, we used model comparisons to determine whether the inclusion of a random slope was justified by the data. Random slopes that did not contribute to the fit of the model according to a likelihood ratio test were removed (Jaeger, 2011). Only the final models are reported here.

5.2. Proportion of personal pronouns out of all referring expressions

Fig. 1 shows the proportion of personal pronouns out of all referring expressions (personal pronouns, demonstrative pronouns and full noun phrases) as a function of the animacy and the grammatical function of the referent for NLD and BD speakers. The final logit mixed model included a by-participants random slope for Grammatical function and a by-items random slope for Animacy. Overall, animate referents were more likely to be pronominalized (91.8%) than inanimate referents (63.8%). This difference was significant, $\beta = 4.56$; SE = 0.71; $p < .001$. There was also a significant effect of

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[12] By-participants random slopes for Variety were never included, as this was a between-participants factor.
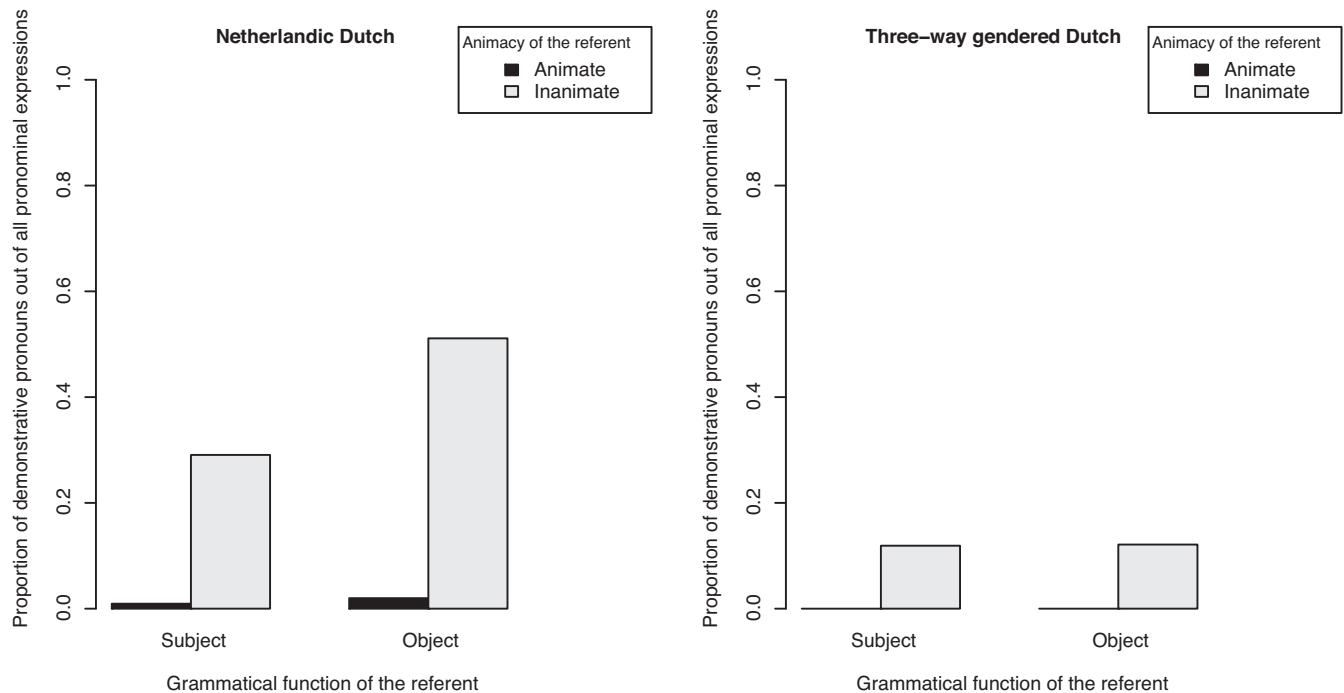
Fig. 2. The proportion of demonstrative pronouns out of all pronominal expressions as a function of animacy of the referent and grammatical function of the referent for speakers.

Variety, with BD speakers using more pronouns (92.7%) than NLD speakers (61.9%), β = 5.50; SE = 1.27; p < .001. There was no significant interaction between Animacy and Variety, β = 0.85; SE = 1.25; p = .49. In addition, we found no significant main effect of Grammatical function (subject: 79.2%; object: 76.0%), β = −0.69; SE = 0.54; p = .20, but there were significant interactions between Grammatical function and Variety, β = −0.38; SE = 0.97; p < .05, and between Grammatical function and Animacy, β = −1.56; SE = 0.73; p < .05.[13]

5.3. Proportion of demonstrative pronouns out of all pronominal expressions

Fig. 2 shows the proportion of demonstrative pronouns out of all pronominal expressions (demonstrative pronouns and full and reduced personal pronouns) as a function of the animacy and the grammatical function of the referent for NLD and BD speakers. The final logit mixed model did not include random slopes, as they did not improve model fit. Demonstrative pronouns almost categorically referred to inanimate entities (animate referents: 0.6%; inanimate referents: 23.5%). The effect of Animacy was significant, β = −5.26; SE = 0.77; p < .001. There was also a significant effect of Variety, with NLD speakers using more demonstrative pronouns (19.3%) than BD speakers (6.0%). There was no main effect of Grammatical function, β = −0.47; SE = 0.78; p = .55, but there was a significant interaction between Grammatical function and Variety, β = −1.64; SE = 0.65; p < .05, suggesting that demonstrative pronouns were more likely to refer to objects than subjects, but only for the NLD speakers. The interaction between Grammatical function and Animacy was not significant (p > .1).[14]

5.4. Proportion of reduced personal pronouns out of all personal pronouns

We also investigated the proportion of reduced pronouns out of all pronoun references (excluding demonstratives). Feminine pronouns appeared to be more likely to be reduced (56.8%) than masculine pronouns (11.5%). As a result, any differences between the two varieties in the use of reduced pronouns could be due to the fact that BD speakers used more feminine pronouns to refer to inanimates (since all inanimate nouns in the experiment were feminine). Therefore, we analyzed masculine and feminine pronouns separately (excluding occurrences of neuter pronouns).

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[13] We did not include the three-way interaction in the model due to the occurrence of empty cells.

[14] Both the three-way interaction and the interaction between Animacy and Variety were not included due to the occurrence of empty cells.

Figs. 3 and 4 show the proportion of masculine and feminine reduced pronoun references out of all pronoun references for animate and inanimate referents in both language varieties. Both final mixed models included no random slopes, as these did not improve model fit. Masculine reduced pronouns were more frequent for inanimate referents (20.3%) than for animate referents (6.5%). This difference was marginally significant, $\beta = -3.91$; SE = 2.05; $p = .06$. There were no effects of either Variety, $\beta = 3.07$; SE = 4.69; $p = .51$, or Grammatical function, $\beta = 0.25$; SE = 0.84;
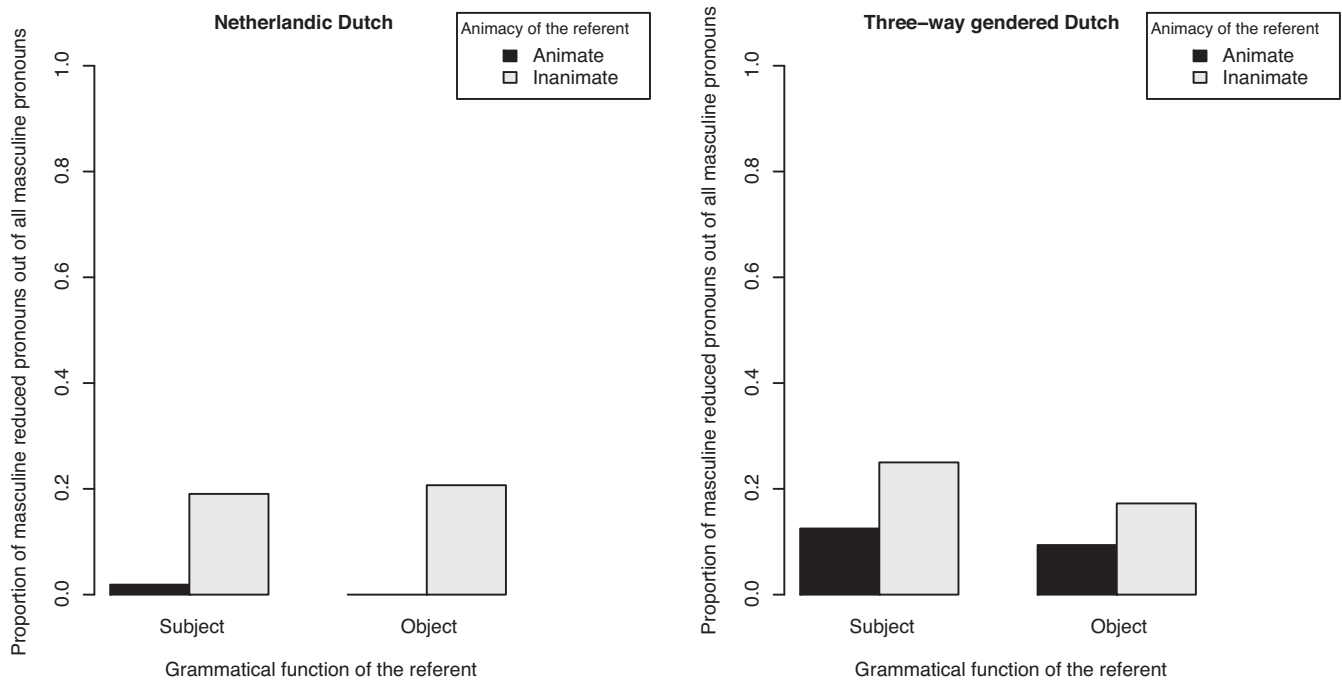

Fig. 3. The proportion of masculine reduced pronouns out of all masculine pronouns as a function of the animacy of the referent and the grammatical function of the referent, for NLD and BD speakers.
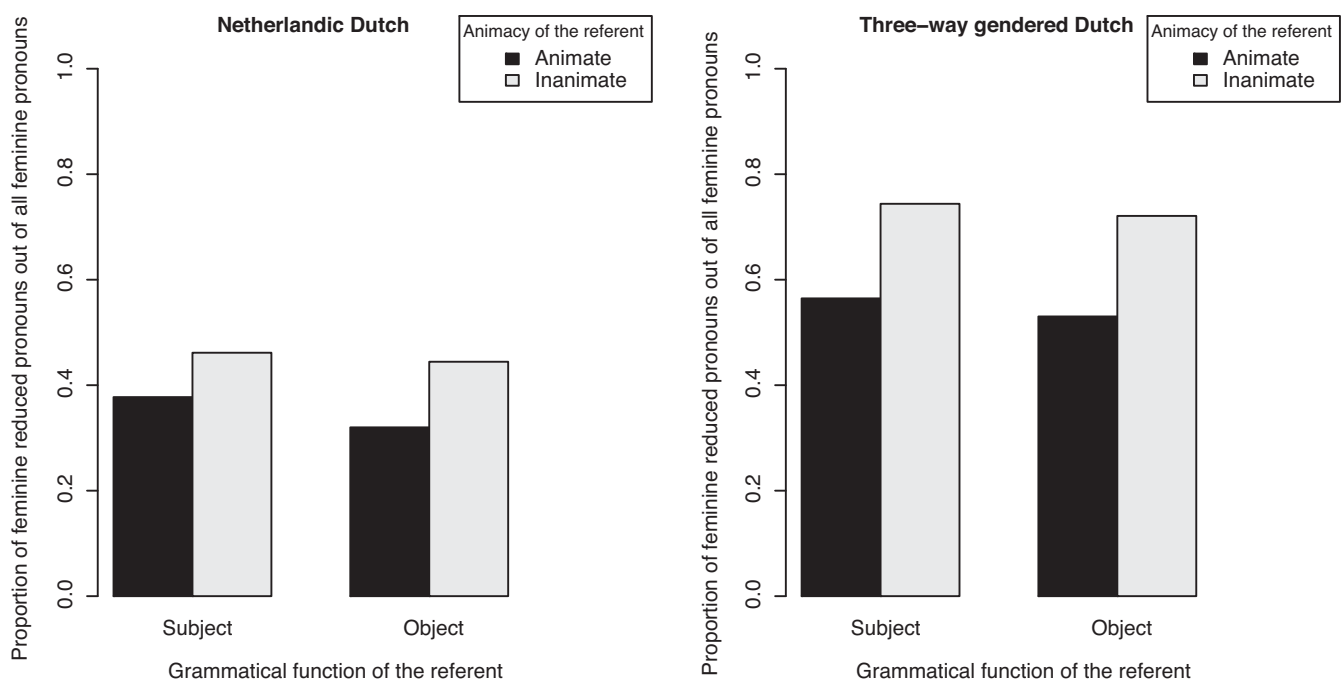

Fig. 4. The proportion of feminine reduced pronouns out of all feminine pronouns as a function of the animacy of the referent and the grammatical function of the referent, for NLD and BD speakers.

p = .77 and no interactions (all *p*s > .1).[15] Feminine reduced pronouns were also more frequent for inanimate referents (70.0%) than for animate referents (45.9%). This difference was significant, β = 1.54; SE = 0.55; *p* < .01. Again, there were no effects of Variety, β = 2.11; SE = 1.77; *p* = .23, or Grammatical function, β = −0.44; SE = 0.48; *p* = .36. The interaction between Animacy and Grammatical function was marginally significant, β = 1.88; SE = 1.01; *p* = .06, suggesting that the animacy effect might be larger for object than for subject referents. The other interactions were not significant (all *p*s > .1).

6. Discussion

6.1. Likelihood of pronominalization

In this study, we investigated the effect of animacy on the production of referring expressions in Dutch. The results show that inanimate referents are less likely to be pronominalized in Dutch than animate referents, as has been found for other languages (Dahl and Fraurud, 1996; Fukumura and Van Gompel, 2011; Yamamoto, 1999). Whereas Fukumura and Van Gompel (2011) found that speakers of English were more likely to use the third person plural pronoun *they*, which is gender neutral, for animate referents than for inanimate referents, we found the same effect for masculine and feminine singular pronouns in Dutch. This suggests that the effect of animacy is independent of whether pronouns mark gender. It also suggests that the animacy effect can be generalized to languages in which animacy is not grammatically encoded in the pronominal system, i.e., in which masculine and feminine pronouns can also refer to inanimate entities. The results further show that in references to inanimate entities the use of both demonstrative pronouns and full noun phrases increases.

The existence of two varieties of the same standard language with different gender systems allowed us to investigate possible causes of the animacy effect. According to the *conceptual accessibility account*, one possible cause is that mental representations of animate entities are more accessible in memory than representations of inanimate entities. Given that demonstrative pronouns and full noun phrases are assumed to encode a lower accessibility than personal pronouns (Ariel, 1990), our results are in line with an accessibility account.

According to the *gender avoidance account*, the fact that inanimate entities are less often pronominalized may also be due to the tendency to avoid pronouns when the gender of the antecedent noun is unclear. Since neither demonstratives nor full noun phrases mark masculine or feminine gender (demonstratives only marking common vs. neuter gender), these forms are fit for 'escaping' the gender choice that the use of personal pronouns enforces. Given that many speakers of the variety of Dutch in Belgium have clearer intuitions about masculine and feminine nominal gender than speakers of the variety of Dutch in the Netherlands, an avoidance account would predict a difference in the effect of animacy on the rate of pronominalization between Netherlandic and Belgian Dutch. Specifically, the effect of animacy should be larger for NLD speakers than for BD speakers, the latter having no reason to avoid gender-marked forms to refer to inanimates. However, the absence of an interaction effect between Variety and Animacy suggests that the effect of animacy on pronominalization was equally large in the two varieties. That is, although speakers of Belgian Dutch pronominalized referents more frequently than speakers of Netherlandic Dutch, inanimate referents were less likely to be pronominalized than animate referents to the same degree as in Netherlandic Dutch. Hence, the animacy effect cannot just be due to an avoidance strategy in the NLD speakers.

Because we would expect variation in the use of referring expressions given the linguistic contexts as used in the present experiment, the finding that the BD speakers used a lot of personal pronouns (and few demonstratives and full noun phrases) in comparison to the NLD speakers is unexpected. This might be due to participants' idiosyncratic preferences or task strategies. For instance, of the BD speakers, 10 out of 17 always used pronouns in the experimental items. Conversely, two NLD speakers always used pronouns, while one participant always used full NPs. It might be the case that once a type of referring expression was chosen, these participants stuck to it throughout the experiment. However, removing the participants that showed no variation in the choice of referring expression did not change the pattern of results.

It might also be the case that the effect is related to a greater sensitivity of Belgian Dutch speakers to the grammatical gender of the nouns. That is, since there is a one-to-one mapping between nominal and pronominal gender for these speakers, pronouns may arise more naturally than in Netherlandic Dutch, even in animate reference. This explanation seems unlikely, however, since there are no other indications that Dutch speakers from Belgium would generally use pronouns more often than Dutch speakers from the Netherlands (e.g., a quick search in the Corpus of Spoken Dutch (*Corpus Gesproken Nederlands*; CGN) did not reveal any such difference). Alternatively, the more frequent use of full NPs by the NLD speakers might be regarded as a gender avoidance strategy after all. However, it is not clear why such a

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[15] Again, we did not include the three-way interaction due to the occurrence of empty cells.

strategy would also occur with animate antecedents, as the natural gender of these antecedents was always clear, and thus there is no reason why pronouns should have to be avoided.

Finally, the difference between the two groups might be due to the fact that the BD speakers were somewhat older on average than the NLD speakers. Perhaps the likelihood of pronoun use increases with age (see, e.g.,. Hendriks et al., 2014). However, a logit mixed model with age as predictor did not reveal a significant effect on pronoun use. More data may be needed to resolve this issue.

Another surprising finding is that there was no main effect of grammatical function of the antecedent on pronoun use. Grammatical function is generally assumed to be an important factor in determining the accessibility of the referent (notably within *centering theory*, Gordon et al., 1993; Grosz et al., 1995). Fukumura and Van Gompel (2011) also found that the subject of the previous sentence was more likely to be pronominalized than the object. The reason why we did not find such an effect may be related to task-specific factors. For example, our participants had to speak aloud, while other studies have often used written sentence completion tasks.

Still, there did seem to be an effect of grammatical function within references to inanimates in the present study, at least for the Netherlandic Dutch speakers (see Table 3 above). Here, references to objects showed a decrease in the use of full pronouns (notably *hij* 'he') with respect to references to subjects, and an increase in the use of demonstratives (notably *die* 'that'). This is in line with findings that *hij* has a preference to refer to salient entities, while *die* refers to less salient entities (e.g., Kaiser and Trueswell, 2004). The fact that these differences only occurred for references to inanimates suggests that animacy overruled the effect of grammatical function: Human entities are preferred to be pronominalized, regardless of whether they are mentioned in subject or in object position. The absence of the effect of grammatical function in (three-way gendered) Belgian Dutch might be due to the strong preference of these speakers to use personal pronouns, which could have masked effects of grammatical function.

6.2. Use of full and reduced pronouns

The results of the present study further show that when pronominalized, inanimate nouns are more likely to be referred to with the reduced forms than animate nouns. While this finding is in line with the claim that full pronouns typically refer to (human) animates (Cardinaletti and Starke, 1996), this seems more a statistical tendency than a categorical rule, given that full pronouns were also used to refer to inanimate entities in the experiment. Conversely, while the full pronoun *hij* 'he' is classified as an exception in the Dutch reference grammar in that it can refer to inanimate entities just as well as to animate entities (Coppen et al., 2002:§5.2.5.2.1), our results show that also in this case the full pronoun is more frequent in reference to animates than in reference to inanimates.[16] In addition, we found a few occurrences of the neuter pronoun *het*, which does not have a full form (i.e., it cannot be stressed, Coppen et al., 2002). All of these occurrences were references to inanimate entities.

The finding that reduced pronouns are used more often to refer to inanimate entities seems to be incompatible with the conceptual accessibility account. This account states that more attenuated forms typically mark entities that are more accessible in memory (e.g., Ariel, 1990; Gundel et al., 1993). In practice, this means that speakers will be more likely to choose more attenuated expressions for more accessible referents. For example, when a referent is given or predictable from the context, its mental representation is already highly activated, and the speaker may suffice with an attenuated referring expression. When the referent is new or unpredictable, the speaker marks the fact that there is not yet an activated memory representation by using a more elaborate expression. Since animate entities are assumed to be more accessible than inanimate entities, an accessibility account predicts that reduced (i.e., more attenuated) pronouns should be more likely to refer to animate entities. This is the opposite of what we found. Our finding is in line with Kaiser (2011) and Kaiser and Trueswell (2004), who found that the distribution of full and reduced pronouns in Dutch cannot be explained by an accessibility account.

We offer two possible (not mutually exclusive) explanations for the effect of animacy on the use of reduced pronouns in Dutch: Firstly, it could be the case that the full forms of the third person personal pronoun emphasize the encoded gender information more than the reduced forms. Thus, by using *hij* or *zij* a speaker stresses that the intended antecedent should be a masculine or a feminine entity, respectively. Especially with the loss of grammatical gender in the nouns (but perhaps also for speakers that retain it), these pronouns may be more likely to be associated with natural gender. This makes them less suitable for reference to inanimates, which do not have a natural gender. The use of a reduced form might mitigate this association, and hence may be better suited for inanimate referents.

Secondly, it could be the case that full pronouns convey more important information than reduced pronouns. Often, importance coincides with accessibility: What is accessible is typically less important, because it is already predictable.

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[16] Note that this probably only holds in inversion contexts such as in the present experiment, since the reduced pronoun *ie* cannot occur in sentence-initial position. In that position, the full form has to be used.

The two notions are not necessarily two sides of the same coin, however. For example, Watson et al. (2008) found that important information was pronounced with a higher intensity than less important information, independently of predictability. In the same vein, important information may be uttered with more prominent forms, regardless of its accessibility status.

Indeed, there is evidence that full pronouns in Dutch are used to refer to more important information. For example, in a corpus study, Bouma (2008) found that full pronouns were more frequent than reduced pronouns in the preverbal position in Dutch main clauses, which he argues is a position in which important information in expressed. In addition, in a story completion experiment, conducted in Dutch, Vogels et al. (2011) showed a tendency for full pronouns to be more frequent with visually salient referents, which could also be associated with high informational importance. Finally, Kaiser and Trueswell (2004) proposed, based on eye-tracking and corpus data, that contrast might be a critical factor in the distribution of full and reduced pronouns in Dutch: While reduced pronouns preferably refer to the subject of the previous sentence, full pronouns are used to signify a contrast between two or more possible referents. This use is independent of accessibility: Even though the antecedent of the pronoun may be highly accessible (which should be a prerequisite for using a pronoun in the first place), the full form rather than the reduced form is chosen to emphasize the contrasting information, i.e., the information that the speaker would like to bring forward as important (e.g., Chafe, 1976).

Kaiser and Trueswell (2004; see also Kaiser, 2010, 2011; Kaiser and Trueswell, 2008) suggest that it is probably a combination of multiple factors that determines the use of full and reduced pronouns, contrast being one of them. The present study suggests that animacy may be another one. Animate entities may be inherently more important than inanimate entities (e.g., Givón, 1983; Kirsner, 1979), for example because they are typically the instigators of events, or because we empathize with them (e.g., Kuno and Kaburaki, 1977). Therefore, pronoun references to animate entities may be less reduced than pronoun references to inanimate entities.

The apparent asymmetry between the choice to pronominalize (animate referents are more often pronominalized) and the choice to produce a reduced pronominal form (pronouns referring to animate referents are less often reduced) is in line with models of reference production that allow multiple factors to have different effects on specific referential choices. Based on the distribution of pronouns and demonstratives in Finnish, Kaiser and Trueswell (2008) argue for a *form-specific multiple constraints approach* of reference resolution, in which the interpretation of one form may be more sensitive to certain factors (e.g., grammatical function, information structure) than the interpretation of another form. On the production side, the choice to pronominalize may be most sensitive to the referent's accessibility or salience, while the choice between full and reduced forms is more sensitive to importance or newsworthiness of information, at least in Dutch.

The choice between a full and a reduced pronoun may be related to the degree of acoustic reduction in reference production. In line with findings that words and syllables become more reduced when they are more predictable based on the linguistic context (e.g., Aylett and Turk, 2004; Bell et al., 2003) or based on the nature of the task (Watson et al., 2008), Kaiser et al. (2011) found evidence that names referring to more predictable referents (referents that had previously been found to have a higher likelihood of subsequent mention) were shorter than names referring to less predictable referents. Crucially, in Kaiser et al.'s experiments predictability did not influence the choice between a name and a pronoun. Although the distinction between full and reduced pronouns in Dutch is not merely a matter of acoustic reduction (they are separate lexical forms), these findings do support our conjecture that the choice between a pronoun and a more specific expression and the choice between a full and a reduced pronoun are separate referential choices that are driven by different factors.

6.3. Open issues

A number of questions remain. First of all, the loss of the distinction between masculine and feminine nouns in Netherlandic Dutch and its preservation in Belgian Dutch possibly also has consequences for pronoun ambiguity. For example, in contexts with both an animate and an inanimate possible referent, a pronoun is ambiguous when the referents have the same grammatical gender. For BD speakers, this may lead to the avoidance of pronouns in favor of more specific referring expressions, since the same pronoun can easily refer to either the animate or the inanimate entity. For NLD speakers, a pronoun should typically refer to the animate entity in same-gender contexts, regardless of whether it could technically also refer to the inanimate entity. To investigate these predictions, we tested the effect of same-gender contexts on pronoun avoidance in the present data set. Since in our experimental materials pronouns were always eventually disambiguated, we only investigated filler items in which pronouns remained ambiguous. Only in items that contained two animate entities, and only in the Netherlandic Dutch data, we found fewer pronouns in same-gender contexts (73.8%) than in different-gender contexts (83.1%), and more demonstratives (6.2% vs. 3.4%) and full NPs (20.0% vs. 13.6%). Although this difference was not present in the Belgian Dutch data, it suggests that people are more sensitive to ambiguity when two possible referents have the same *natural* gender. Another possibility

is that referents of the same animacy are conceptually more similar, which decreases the accessibility of both referents, because they compete more for attention (Arnold and Griffin, 2007; Fukumura and Van Gompel, 2011). Further research is needed to determine whether and how similarity in grammatical gender affects accessibility and pronoun use.

Secondly, it is an open question whether the effects that we found are speaker-internal or arise from addressee-oriented processes. The avoidance of pronouns due to the speaker's uncertainty about grammatical gender seems to be a clear case of a speaker-internal process. Conceptual accessibility effects on language production have also generally been described as emerging from the speaker's own memory (e.g., Bock et al., 1992; Fukumura and Van Gompel, 2011; Montag and MacDonald, 2013; Prat-Sala and Branigan, 2000). For example, mental representations of animate entities are more easily retrieved, which in turn affects the language production process. In the case of referring expressions, Fukumura and Van Gompel (2011) argue that animate entities need less encoding of conceptual information because of their higher conceptual accessibility. Thus, speakers use shorter referring expressions when referring to animates than when referring to inanimates. Alternatively, it could also be the case that speakers are aware that addressees may be focusing more on animate than on inanimate entities. Hence, addressees expect speakers to be more likely to talk about animate entities, and speakers accommodate this expectation by using more specific expressions when it is not fulfilled (i.e., when they talk about an inanimate entity; cf. Arnold, 2010). In this case, the locus of the animacy effect is in the speaker's beliefs of the referent's accessibility in the addressee's memory. More research is needed to separate these alternative explanations.

Thirdly, a potential complication of our results is that we found that even our BD speakers sometimes used the 'wrong' gender. For example, they still used a masculine pronoun (*hij* or *ie*) to refer to inanimate entities (which should all have been grammatically feminine) in over 20% of the cases. In addition, the results of the post hoc gender test showed that not all BD speakers employed a nominal three-way gender distinction. Hence, the question arises whether the BD speakers were not also avoiding gender-marked expressions for inanimate antecedents, which might explain why we did not find differences in the effect of animacy between the two varieties. The first thing to be noted here is that in the post hoc gender test, especially participants below the age of 50 used *hij* to refer to feminine nouns. This is in line with findings that the three-way gender system in Belgian Dutch is in the process of erosion as well, and that children who are learning the language often choose a pronominal form based on semantic rather than grammatical grounds (De Vogelaer, 2006; De Vogelaer and De Sutter, 2011). The older participants in the test did make use of the nominal gender distinctions, although none of them performed perfectly according to the original gender of the nouns (as found in the dictionary and our pretest). However, this gender task was a conservative test, since all items had the same expected answer (i.e., feminine pronouns). Therefore, participants could have been reluctant to choose the same answer on each trial, adding some variation, unless they were really confident about their answer. In addition, our BD speakers were not a homogeneous group with respect to their dialect backgrounds. While all southern dialects still make a three-way distinction in the nominal genders, they may differ in whether a noun is assigned masculine, feminine or neuter gender (De Vogelaer, 2009). Thus, although all inanimate nouns were pretested for grammatical gender by BD speakers (also from different backgrounds), we cannot exclude the possibility that the grammatical gender of the words used in the experiment differed across participants due to their different backgrounds. Apart from these considerations, although there may be an increasing uncertainty about nominal gender also among speakers of Belgian Dutch, the difference with Netherlandic Dutch can be assumed to be still significant, with especially the older generations keeping to the three-way gender system. For example, De Vogelaer and De Sutter (2011) report a rate of 83.6% use of grammatical agreement for Flemish speakers above the age of 55. Hence, we assume that our BD speakers were at least more certain about grammatical gender than our NLD speakers.

Fourthly, it could be the case that gender avoidance is more common in written language than in spoken language: Especially in more formal texts, writers might be more stimulated to 'get the gender right', and hence will avoid pronouns when they are not sure about the gender of a noun (Audring, 2009). This might be less of an issue in spontaneous spoken language. Note, however, that while we elicited spoken responses in our experiment, they were not spontaneous. In fact, because participants were in a test-like situation, in which they had to fill in gaps in sentences, they might have been especially encouraged to 'get the gender right'. Hence, we should have expected a lot of gender avoidance in references to inanimate antecedents. On the other hand, the attempt to choose the correct gender might explain why some Dutch participants also sometimes used feminine pronouns to refer to inanimate entities (although not systematically), whereas this would not be expected in spontaneous language production. This finding might also illustrate the complete helplessness of the Dutch participants when it comes to grammatical gender, switching back and forth between all kinds of referring expressions. Furthermore, the use of full and reduced pronouns is also likely to be affected by register: The reduced pronoun *ie* is highly colloquial, whereas *ze* is not, although in formal written text *zij* may be more frequent (e.g., Van Bergen et al., 2011). Given these issues, at least the difference between the spoken and the written modality should be researched further.

7. Conclusions

The study presented in this paper investigated effects of animacy on pronoun use in Belgian and Netherlandic Dutch. Although speakers of Belgian Dutch appeared to use pronouns more frequently in general, animate entities were more likely to be pronominalized than inanimate entities, as was found for speakers of Netherlandic Dutch. We conclude that the tendency in Dutch to avoid the use of pronouns when referring to inanimate entities cannot solely be due to a strategy to avoid a gender choice, and is compatible with the general preference to use less attenuated forms for less conceptually accessible entities. This tendency is however countered by a preference for full over reduced pronouns when referring to animate entities, which may be related to the importance or newsworthiness of the referent rather than to accessibility.

Acknowledgments

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