
**Pointing and reference in sign language and spoken language:**

**Anchoring vs. Identifying**

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Abstract
In both signed and spoken languages, pointing occurs to direct the addressee’s attention to the entity one is talking about. These entities may be present or absent in the physical context of the conversation. In this paper we focus on pointing directed to non-speaker/non-addressee referents in Sign Language of The Netherlands (Nederlandse Gebarentaal, NGT) and spoken Dutch. Our main goal is to show that the semantic-pragmatic function of pointing signs and pointing gestures might be very different. The distinction will be characterized in terms of anchoring and identifying. While pointing signs can have both functions, pointing gestures appear to lack the anchoring option.

Keywords: co-speech gesture, Dutch, modality, pointing, reference, Sign Language of The Netherlands (NGT), space

1. Pointing at issue
Manual physical movements that co-occur with spoken language are called gestures, which are supposedly unconventionalized and not language-like. Manual physical movements of signers are called signs, which in most cases are conventionalized and language-like (McNeill 1992, 37). This seems to be a very clear and straightforward distinction. However, in the case of pointing, the matter is complicated. Pointing occurs in both spoken language (co-speech) and sign language and shows a high degree of similarity on the form level. The aforementioned distinction would lead us to believe that pointing that co-occurs with spoken language is gesture and the pointing in sign language is sign. This distinction is too strict. In this paper we will argue that pointing signs in NGT and co-speech pointing gestures in Dutch do not fulfill the same discourse functions.

The comparison of pointing gestures and pointing signs has been made by several researchers (Cormier 2012; Liddell 2003; Pfau 2011). Pointing gestures that co-occur with speech have been consistently analyzed as a separate category in the gesture literature, opposed to other co-speech gestures (Kendon 2004; McNeill 1992). They seem to
constitute an innate human strategy across cultures (with a variety of possible articulators), which is used for indicating. In the case of pointing gestures, speakers rely heavily on the location (of an entity) that occurs in the direct physical environment of speech participants (Kendon 2004). Many researchers have addressed the question of what kind of information a co-speech pointing gesture carries and what discourse function it has (Clark 2003; Goodwin 2003; Lascarides and Stone 2009). The general starting point has been to look at both speech and the pointing gesture and derive the intended interpretation of the pointing gesture. Pointing can occur with all kinds of verbal material (verbs, nouns, pronouns, hesitations, adjectives, interjections, and so on), and, in some contexts, it can be more obligatorily used than in others. In summary, the informational status of a pointing gesture is not yet clear.

As for pointing signs, it has been shown that they do not form a homogeneous syntactico-semantic category in sign language and this has led to many different analyses of pointing signs. Wilbur (1979) is one of the first sign language researchers to hypothesize that the definite/indefinite distinction in American Sign Language (ASL) may be due to the contrast between the absence or presence of an overt determiner, which is realised as a pointing sign. Some other authors observe systematic differences between the syntactic positions that pointing signs occupy (MacLaughlin 1997; Neidle et al. 2000). Prenominal pointing signs correlate with definiteness and can express plurality, while postnominal pointing signs may be used both for definite and indefinite referents, but they are not marked for plural. Postnominals should be better analyzed, according to these authors, as adverbials. Another analysis is that sign languages have a right dislocation with a pronoun copy at the end of the sentence (Bos 1995, but see Crasborn et al. 2009). In the case of pronominal pointing signs, pointing signs are said to mark a first/non-first distinction (e.g. Engberg-Pedersen 1993; Meier 1990) or a distinction between first, second and third person category in sign language, just like in spoken languages (Alibašić and Wilbur 2006; Berenz 2000) or even no person distinctions at all (McBurney 2002; Liddell 1990, 2003). Moreover, the complexities of the use of pointing signs are evident when we look at their use and the location established in signing space. As reported in Johnston (1991) and Van Hoek (1992), two locations may be associated with a single referent and Nilsson (2010) shows that a single location may be associated with multiple absent referents.
Thus, many different accounts have been proposed for a seemingly similar phenomenon. The problem for comparing pointing signs and pointing gestures is that these analyses work on different levels: for co-speech gestures, research mainly focuses on a semantic-pragmatic level (Clark 2003; Kendon 2004), while for pointing signs the focus has been more on the phonological and morphosyntactic level (Crasborn et al. 2009; Pfau 2011). In this paper we propose a qualitative analysis for comparing pointing signs that are directed to non-sender/non-addressee\(^1\) oriented referents in Sign Language of the Netherlands (henceforth, NGT) and pointing gestures that co-occur with spoken Dutch by analyzing them on a discourse structure level. The examples from the corpus NGT (Crasborn, Zwitserlood and Ros 2008) are taken from the Discussion task and the task Find the Difference (both participants had a drawing available in front of them and had to find the differences on the other persons drawing by describing it). The examples from the Radboud Corpus of Dutch Gestures are taken from several tasks, including both tasks with and without salient physical objects available. Thus, in both corpora there were tasks in which objects that were important for the ongoing discourse were present and tasks in which there were no objects present.

We will begin with defining the distinction between concrete and abstract pointing reference, a distinction that heavily relies on the difference between presence and absence of the referent, in section 2. While both types of language (i.e. spoken and sign) use the visual-gestural modality in pointing, we will address the degree of dominance of this modality and consequently its use for each language, in section 3. The differences in modality use between sign and spoken language leads us to differentiate between two functions that pointing signs and gestures fulfill in building the structure of a discourse, namely anchoring and identifying. This will be defined and discussed in section 4. The functions will be illustrated with a selected group of examples of pointing gestures in Dutch and pointing signs in NGT.\(^2\)

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\(^1\) We have opted to adapt the general terminology into more generic terms in order to include both spoken and signed conversations. To reach this goal, and when including both modalities, we use \textit{sender}, to mean ‘speaker’ and ‘signer’; and \textit{addressee} to refer to ‘hearer’ both in sign and spoken language.

\(^2\) Examples that are taken from the Corpus NGT or the Radboud Corpus of Dutch Gestures are indicated with the corresponding time code. When not indicated, they are made up examples for the sake of clarity.
2. Concrete and abstract reference

Whenever a discourse referent has been introduced, speakers and signers refer back to this referent in the most efficient manner. This depends, among other things, on the accessibility and uniqueness of the referent, the amount of linguistic material that occurs between the first mention and further mentions, and co-reference (Ariel 1990).

2.1 Deictic and anaphoric reference: a baseline

The common function of all pronouns is that of reference, that is, linking to an earlier established or (saliently) present object. In the traditional literature two main types of referring have been distinguished: pronouns can refer to entities within the linguistic context (anaphoric reference) as well as to entities outside the linguistic context that are prominent in the physical environment (deictic reference) (Lyons 1977). (1) exemplifies deictic reference.

(1) Two people are talking on the street. A boy drives by on his bike. The two people look at him and the speaker says:
He drives by every day.

The pronoun he refers deictically to the boy. That is, the boy is present in the physical context and perceptually visible to both the speaker and the addressee. Therefore an introduction to the linguistic context with a pronominal form is felicitous. Now consider example (2) in which the boy is not present in the physical context.

(2) A boy, drives by every day, but I don’t know where he, comes from.

Since the boy is not present, he first has to be linguistically introduced with an indefinite Noun Phrase (NP) before the speaker can refer to the boy with an anaphoric pronoun.

Clearly, there is a distinction in spoken language between entities within the relevant physical context to which a speaker can refer without further introduction and entities outside the relevant physical context that have to be introduced in the linguistic context first. In both the anaphoric and the deictic reference case the accessibility of the
referent is an important factor for whether referring with a pronoun is possible at all. In fact, there is a correlation between different kinds of anaphoric expressions and the level of accessibility (i.e. prominence) of their referent (Ariel, 1990). Whenever the referent is prominently present in the physical context or in the linguistic context, referring with the reduced form in a given language is possible (e.g. in English, a pronoun is usually preferred). On the other hand, when a referent is hard to retrieve, the addressee needs more information to find out which referent is intended. In the linguistic context, factors that play a role in deciding which form of reference is best from the speaker’s perspective are distance (in number of sentences) between the linguistic antecedent and the referential expression, prominence of the referent in the discourse and other referents that are competing with the intended one (Ariel 1990).

2.2 Pointing and reference

Manual pointing is done in both spoken and sign language. In spoken language its interpretation depends on speech, while in sign language it occurs within a stretch of signs. Pointing signs can therefore undergo processes of assimilation. The hand configuration can vary due to cliticization processes where it assimilates with the handshape of neighbouring signs (Fenlon et al. in press; Sandler 1999). However, the use of an open hand versus an index finger or the use of a certain rotation of the forearm can be syntactically and semantically driven as well (Kendon 2004; Kooij et al. 2006; Pfau 2011). While handshape configuration, forearm rotation and location in pointing varies, we follow Kendon (2004) in stating that the most basic feature of all pointing signs and gestures is the projection of a line into space. We leave the issue of index fingers versus open hands and certain forearm rotations in relation to our following analysis for future research.

In both spoken and sign language, a pointing hand can be directed toward present objects or persons. An example of such an instance in spoken Dutch is shown in Figure 1.

Figure 1: Pointing towards a present object (T1_final, 00:16:44)

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3 In the transcription of spoken sentences, the square brackets indicate the stroke (i.e. the most significant part) of the pointing gesture.
In this example the speaker and her addressees are talking about the cameras in the room. The girl with the brown sweater in Figure 1 says that she does not think that the speaker of (3) (the girl with the green t-shirt) has a camera directed at her. The speaker then utters (3), while she is pointing at the camera. That is, the intended target of the pointing gesture is found in the direct surroundings of the speaker and her addressees. The demonstrative die ‘that’ is used deictically, which is enforced by the use of a pointing that is directed at the here-and-now of the discourse situation.

With anaphoric reference the antecedent, as said before, is found in the linguistic context. If a sender wants to refer to a referent that is not present by using a pointing gesture or sign, a point in space can be established in order to use it as an anchor for the non-present referent. Pointing to this point in space is then considered to be anaphoric reference. Imagine a context as in (4) where the signer is talking about a person who is not physically present in the immediate surrounding context. Therefore, the signer has to create an anchor in the signing space.4

(4) MAN IX3 WORKS UNIVERSITY
    […]
    EVERY-DAY IX3, IX1 MEET TRAIN
    ‘There is this man who works at the university. […]
    I meet him on the train every day.’5

The sign for MAN is made and next a location is established by a pointing sign directed to the signing space. If the signer then wants to continue with information about the referent ‘man’, he points toward the location in the signing space where he has localized the referent and utters the follow-up information.

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4 We follow the usual glossing conventions in the sign language literature, according to which manual signs are represented by the capitalized word corresponding to the translation of the sign. The relevant abbreviations for the purposes of this paper are the following: IX3 (non-speaker/non-addressee); #-VERB-# (verb agreeing with subject and object: the numbers refer to the grammatical person).

5 Examples (4), (20) and (21) are made-up examples to illustrate the use of pointing.
As we will see in section 4, this type of construction is very rare with pointing gestures that co-occur with spoken Dutch. However, in theory both spoken and sign language can point towards an area in the gesture/signing space when the referent is not physically present and use the area for co-reference. The distinction between deictic and anaphoric reference with pointing does not clearly fit our analysis, because the two types of reference are not mutually exclusive and can sometimes overlap. There are contexts where the difference between a deictic and an anaphoric element is blurred. For instance, in (5), the use of *she* is deictic, since it refers to someone who was present in the immediate physical context, but it is also anaphoric since it picks up a referent, although not previously introduced. In fact, some authors propose that deixis and anaphora are two parts of the same referential phenomenon (Recanati 2005).

(5) After someone left the room:
I am glad she finally left.

A pointing gesture or sign towards a present object can also be anaphoric reference in those cases where the pointing is giving further information about that referent and it is part of a coreferential chain. Pointing can thus occur in two types of construction: indicating physically present objects or locations to refer to the object or location or indicating a location to refer to an absent referent. The former type we will coin *Concrete reference*, defined in (6).

(6) Concrete reference
Reference by the pointing hand with an orientation towards an object (or a person), which is salient in the physical discourse setting because it is physically present, it was physically present, or it usually occupies the location were the pointing is directed to. The object itself is to be interpreted as the focus of the reference and it does not stand for something else.
In contrast to concrete reference, with abstract reference the location that is pointed at is not to be interpreted as the referent. A speaker can point at it, but the site is not the actual referent. We define abstract reference as follows:

(7) Abstract reference
Reference by the pointing hand with an orientation towards a location, which is a perceptible location in the actual discourse setting that is not occupied by another salient object that can be interpreted as being the focus of reference. The location on itself is not to be interpreted as the focus of the reference, but as a ‘place-holder’ for a concept or absent entity.

We present the type of reference with pointing here as a dichotomy: concrete versus abstract reference. However, it should be noted that in our Dutch gesture data, we have encountered instances of pointing at concrete entities to represent absent entities. Figure 2 is an example of what we call indirect reference.

Figure 2: Indirect reference: pointing towards a piece of paper (D2_final, 00:21:40)

(8) Er is een [man]
There is a [man]

In (8) the speaker mentions ‘a man’. However, there is no man present in the surroundings of the speaker and her addressee. Instead, the speaker is pointing at the piece of paper on the table on which a situation is described which involves a man. Thus, the speaker is pointing at the description on the piece of paper, to refer to the man. In this case, the entity that is being pointed at is closely linked to the idea that the speaker is actually referring to, namely the man in the world. The link between the referent that is being talked about and the entity that is being pointed at can be made by the addressee, even though the entity that is being pointed at is not exactly the same thing as the referent that is being talked about.

While in abstract reference the orientation of the pointing hand is random, in indirect reference the pointing hand is always directed towards an entity that has a strong contextual link with the actual referent that is to be interpreted (Clark and Marshall 1981). The link is thus motivated. Exactly how bridging is obtained between the pointing gesture
directed to an object and the concept uttered is an aspect that needs to be accounted for. Also, whether there are possible differences on these bridging connections between pointing gestures and pointing signs provides an interesting comparison that deserves more attention in the future. For now, we will take the dichotomy of abstract and concrete reference as the main distinction for this paper and leave the matter of indirect reference for future research.

3. Modality and use
In this section we will focus on the division between the visual-gestural and audio-vocal modality.

3.1 Modality
Spoken language makes use of both the audio-vocal and the visual-gestural modality while sign language is ‘restricted’ to the visual-gestural modality. However, it is important to note that in spoken language the audio-vocal modality is the dominant modality on which the visual-gestural modality depends (Clark 1996; Gershkoff-Stowe and Goldin-Meadow 2001; Kendon 2004; Lascarides and Stone 2009). Lascarides and Stone’s (2009) formal semantic analysis of gesture leaves the meaning of a gesture by itself (looking only at the form) to be highly underspecified. According to Lascarides and Stone, the highly underspecified representation of a gesture can be filled in by taking into account the co-occurring speech, the rhetorical relations within the discourse and commonsense reasoning. Their model holds that anaphoric pronouns and other anaphoric reference material can be picked up by gesture, that gesture can be linked to preceding gestural material, but that spoken elements can never pick up referential material that has been introduced in gesture only. To illustrate this latter point, consider example (9), taken from Lascarides and Stone (2009, 407).

(9) [These things] push up the pins.
   The speaker points closely at the front-most wedge of the line of jagged wedges that runs along the top of a key as it enters the cylinder of a lock

The phrase ‘these things’ refers to an abstract set of wedges that is exemplified by a pointing gesture at the front-most wedge of an actual key. This results in a discrepancy
between the referent of the speech, i.e. a whole (abstract) set of possible front-most wedges, and the referent of the pointing gesture, i.e. a specific front-most wedge of a real key in physical space. The latter referent is only introduced in gesture and can therefore not be picked up by speech. That is, a continuation of the utterance in (9) by ‘It has the right height’ would be infelicitous, because the element ‘it’ refers to the specific front-most wedge on the real key, which is introduced into the discourse by gesture only.

This, however, does not mean that a pointing gesture and the referential expression in speech need to be aligned in time. Enfield (2009) refers to this as *semiotic unity*: when multiple signs are presented together, take them as one. This leaves the possibility open for pointing gestures to occur earlier or later than the referential expression, but not independently. This is not to say that the communicative value of a pointing gesture is inferior to that of speech. As Pfau (2011: 144) notes “some utterances simply cannot be interpreted without taking into account the accompanying pointing gestures”. For instance, consider (10).

(10) I’ve read [that book] and [that book]
    (while pointing first at one book and then at another)

The distinguishable elements in (10) are the pointing gestures (indicated by square brackets) and not the speech (*that book*), which is the same for both referents. In this case the pointing gestures provide a significant source of information for the interpretation of (10) as a whole (Enfield et al. 2007; De Ruiter and Wilkins 1998).

Haviland (2000) states that deictic gestures do not merely accompany the referring expressions, but can even replace them. Cormier et al. (under review) give some nice examples of how pointing gestures can sometimes be used to fill the same slots as pronouns (examples come from Cormier et al. under review, 33):

(11) Pointing gesture substitutes for a noun or pronoun to be more specific
    *Question: Who are you looking for?*
    *Answer: <pointing gesture to person>*

(12) Pointing gesture substitutes for a noun or a pronoun to be more appropriate
Are you looking for <points head in direction of person>?

However, Cormier et al. (under review) also note that these kind of instances are pretty rare and, moreover, the act of pointing is still introduced by the use of speech.

Thus, a listener gets the cues for interpreting the pointing gesture from the dominant modality that co-occurs with it, in combination with the physical environment surrounding the speech participants. In contrast, in sign language the addressee interprets the pointing sign expressed ‘only’ in the visual-gestural modality by considering the surrounding and simultaneously occurring signs and the physical environment.

3.2 Use

As a result of the dependency of the visual-gestural modality on the audio-vocal modality in spoken language, we expect the grammatical use of the former modality to be different in the two types of languages. With abstract reference a pointing is directed at a random location in the gesture/signing space in order to refer to something that is not physically present in the actual discourse situation. In sign language this type of reference is common. It is used in constructions like (4) in the previous section, where the sign for MAN is made and established by the pointing sign at a random location in the signing space. After this establishment the signer can refer back to this referent by pointing at the location that was assigned to it. In theory, there is no reason why it would be impossible for speakers to produce such constructions. However, in the Dutch gesture data we did not find an example of this type of co-reference by pointing. This is not surprising given the fact that the visual-gestural modality is not the dominant modality in spoken language and is therefore less likely to carry coreferential information. Since language users prefer not to say the same thing twice, the coreferential encoding in speech is sufficient. Moreover, we did not find examples of coreferential sequences of pointing gestures in concrete reference. This is even more telling, since a physical entity can be easily pointed at in the maintenance of reference. That is, it is not the case that the absence of a physical entity blocks co-reference with pointing gestures, since it is also not done consistently in concrete reference.
4. Anchoring vs. Identifying

In this section we will further discuss the difference between pointing signs and gestures by formalizing the observed discrepancy in File Card Theory (Heim 1982). For this purpose, we will first discuss the notion of file-cards.

4.1 File-cards

With the first mention of a referent, a sender creates an anchor for further reference. Anchoring is a term inspired by formal discourse approaches (Heim 1982; Kamp and Reyle 1993; Reinhart 1981; Vallduví 1992; Webber 1979). These approaches use the idea of a file-card (Heim 1982), which stands for a linguistic construction that registers all the information about entities introduced in the discourse. In this view, discourse is the management of files. Each file-card in a file corresponds to a referent. With every first mention of a referent a new file-card is added to the file. Discourse referents that are picked up from prior discourse correspond to file-cards that are updated. Heim illustrates the file-card theory with the following example (Heim 1982, 275). A utters (13):

(13) A woman was bitten by a dog.
    She hit him with a paddle.
    It broke in half.
    The dog ran away.

By listening to A, B’s task is to construct a file with a specific file-card for each referent. In this case, B creates a new file-card for ‘woman’ and adds the new information related to this referent. B also creates a different file-card for ‘dog’, whereat all its attributes are linked. And finally, a third file-card for ‘paddle’ is also added to the file. The simplified representation for the file-cards of these three referents in this fragment of discourse is as follows.
The creation and update of these files is done as discourse progresses. Each file-card’s content is a contribution to the creation of discourse context that interlocutors share. The context is then constantly being built by the additional information that interlocutors keep adding to the conversation. As we will see, the difference in use and informational value of pointing signs and gestures is accounted for in terms of creating a file-card and adding information to it.

4.2 Anchoring and identifying

4.2.1 Anchoring

Referential expressions are crucial for the creation and updates of file-cards. In NGT there are different ways to create or update a file-card. One of them is by using pointing signs. When the referent is mentioned for the first time, pointing signs (either with or without a nominal sign) create a file-card. When the referent is picked up from previous discourse, pointing signs guide the addressee to the corresponding file-card.. In this case, an already existing file-card is re-activated.

A pointing sign, followed or preceded by a nominal, indicates that from that moment on the area where the pointing is directed to will be associated with that nominal as long as there is no major shift in the discourse topic. Other localisation mechanisms are used in NGT as well, such as agreement verbs and nonmanuals, but here we only focus on pointing signs. Figure 3 contains a sequence of three pointing signs that appear in a discourse fragment. In (3a) the signer introduces the referent ‘couple’ with a nominal sign followed by a pointing sign directed in the signing space. After this first mention, the signer continues (3b) with adding information about this couple, namely that they started a
climbing club. Instead of repeating the nominal, the signer simply points in the direction of the early localization.

Figure 3: Anchoring in NGT (CNGT0259, s013, 00:04:21)

a. COUPLE AMSTERDAM DEAF IX3  
b. START CLIMBING IX3

‘A couple of deaf people from Amsterdam’  ‘They started a climbing club’

Importantly, the area chosen by the signer to be associated with the couple is seemingly arbitrary. That is, there is no external motivation for establishing the anchor for further reference on the left hand side. Actually, there might not even be a reason to establish the referent in space at all, other than to create an anchor for further reference. Therefore, we propose that the pointing sign in Figure 3a functions as an anchor-creator. The anchor is pointed at again in further mentions (Figure 3b) which is understood by the addressee as being coreferential with the anchored referent. That is, NGT pointing signs can be used for the creation of file-cards to keep track of discourse referents along the discourse.

As we discussed in section 3.1, the anchoring function in spoken language is achieved through the spoken element. When nominals are uttered in speech (either with nouns, proper names, or pronouns) an anchor is established and can be referred back to with an anaphoric expression. The anchor is established in speech, and the pointing gesture adds complementary information to the speech-anchor, namely spatial coordinates of the object that is being talked about. We will call this the identifying function of pointing, which will be discussed in more detail in section 4.2.3.

Example (15) illustrates this point. It is an instance of co-speech pointing in a Dutch spoken conversation. In this conversation the two speech participants are talking about the family tree of the girl in Figure 4. While she was telling about it the other girl made a drawing of the tree. At one point she made a mistake and crosses out the name of a family member. When they are finished, the addressee of the girl places the drawing on the table so that it can be checked by the girl in Figure 4. When she looks at it she notices the cross and utters (15).

Figure 4: Pointing in spoken language (D4_final, S1, 16:13:470)
(15) echt [zo’n kruisje] door Jean-Marie

‘Really [such a little cross] through Jean-Marie’

The little cross on the drawing has not been mentioned before and thus the NP zo’n kruisje
(‘such a little cross’) establishes the anchor for this referent. At the same time of uttering
zo’n kruisje the speaker points at the little cross on the drawing. Since the pointing gesture
and the verbal element occur in different modalities they can occur simultaneously. However, as was pointed out in section 3.1, the audio-vocal modality is dominant and therefore the adequate modality for the creation of the anchor. The pointing gesture that co-
occurs with it is a single use. However, this does not mean that the pointing gesture is
redundant, since it adds information about the physical position of the little cross on the
drawing. Without the pointing gesture the speaker would have had to say something like ‘a
little cross that can be seen on the drawing that you made, which is lying in between us on
the table’. However, if the speaker would not have performed the pointing gesture the
propositional content would not have been affected and the anchor would still be created.
The co-speech gesture adds additional spatial information to the anchor created by speech.

We hypothesize that co-speech pointing gestures cannot function as anchor-creators. However, in some cases a pointing gesture might appear to be almost obligatorily, giving
the impression that we are dealing with an anchor in those cases. For instance, consider the
utterance in (16) where two books are on a table in front of the speaker.

(16) This book is better than that one.

In order to distinguish ‘this book’ from ‘that one’ the addressee needs additional
information. This information can be given by an elaboration in speech or by a
simultaneous pointing gesture. Either way, the addressee has to link the referent ‘this book’
and ‘that one’ to additional information. Importantly, even when this additional information
is not given and the addressee is left in the dark about the exact interpretation of the
utterance, the addressee (and the speaker) does create file-cards for the referents ‘this book’
and ‘that book’.
Thus, in spoken language anchoring is done in the dominant, that is the audio-vocal, modality. In contrast, anchoring in sign language can be established via pointing signs which are expressed through the visual modality.

4.2.2 Anchoring at work

By anchoring, the sender establishes a referent and thereby creates the possibility for the discourse participants to keep track of different entities appearing in a discourse. When a new referent is introduced a new file-card is created. As the discourse continues and the sender refers back to an already introduced referent, the corresponding file-card is re-activated. The task of participants in a discourse is to keep creating and re-activating file-cards as referents ‘appear’ and ‘disappear’.

Pointing in NGT is a way of anchoring by being directed to locations in signing space. In contexts where objects are not present in the immediate vicinity, a random abstract location is chosen for the establishment of an anchor, which is then associated with a referent. In concrete reference, the location for the anchor and the actual position of the object coincide.

In Figure 5 the signer is addressing the issue of cochlear implants. In Figure 5a she establishes the referent DEAF (person) by performing the nominal sign and then points at a specific (but random) location in space. The person she is talking about is not present. This location is then used in coreferential mentions to denote this referent (Figure 5b and 5c). The location is randomly chosen for reference tracking purposes and the second and third mentions pick up the already established referent later on in the discourse.

Figure 5: Anchoring of non-present referents in NGT

a. IX-3 CI-3
‘Suppose you implant a CI at a deaf person’

b. IX-3
‘He doesn’t choose that’
‘He doesn’t actually want that’

c. IX-3 SELF

Since the only modality is the visual one, NGT pointing signs have developed structural properties for using space for abstract reference. Theanchoring function as shown in Figure 5 is an example of the localization potential of abstract references in signing space used mainly for coreferential purposes. The corresponding simplified file-card for the semantic representation of CHILD can be seen in (17):
Even though referring to absent entities by pointing gestures is expected to be a less useful strategy, since pointing at an empty location in space might lead to confusion for the addressee, this is not to say that abstract pointing, which is directed at an empty location in space, in spoken language does not occur. (18) is an excerpt of a Dutch conversation between three girls. The girl in Figure 6 is telling the other two about the time that she was almost hit by a car when she was on her bicycle. She returned from her music lesson, carrying her cello. She tells her addressees that when she carries her cello on her back when she is cycling, she always attaches a little light to a compartment on the backpack or case. While mentioning the compartment in (18), she performs the pointing gesture in Figure 6. However, the girl in Figure 6 is not directing her pointing gesture towards a completely random location. Instead, she is pointing at a location that is highly imaginable for her and her addressees.

Figure 6: Abstract reference in spoken language (T1_final, S1, 22:06:500)

(18) Dan doe ik mijn lampje altijd aan [dat vakje]

‘Then I always attach my light to [that little compartment]’

Figure 6 is not an instance of anchoring. The file-card in (18) is created by uttering *dat vakje* ‘that little compartment’ and in addition the pointing gesture gives information about the physical location of the ‘imaginary’ referent. Thus, the information given by the pointing gesture is added to the file-card created by *dat vakje* ‘that little compartment’.
4.2.3 Identifying

So far we have hypothesized that pointing gestures cannot fulfill the anchoring function. Then what is their function? We propose the term *identifying* here. By identifying the sender does not create a file-card, but rather provides spatial information of the object that is pointed at, which is added to an already existing file-card. Both pointing gestures and pointing signs in concrete reference have the identifying function. As a consequence, when the addressee perceives the referent and its location, the addressee may perceive even more information about that referent, such as height, size and colour. However, it is important to note that identifying is understood as the codification in the language that provides information, not as a strategy to locate the object. That is, the object is already located in the reality and the function of pointing gestures is precisely to insert this information into the interpretation of the entire discourse.

We will exemplify this point with (20). The girl in Figure 7 is explaining to her addressee how a label maker works. While doing so, the actual label maker is lying between them, on the table. By uttering (20) the speaker refers to a grey button with the NP *die grijze knop* (‘that grey button’) and thereby creates a file-card for the referent ‘grey button’. At the same time the speaker points at the actual button on the label maker.

Figure 7: Identifying in spoken Dutch (D2_final, S1, 00:45:140)

(20) En als je dan op die knop # [die grijze knop] op de zijkant drukt

‘And when you press that button [that grey button] on the side’
The information given by this pointing gesture, identifying the location of the physical button, is added to the file-card as in (21). The last condition marked in italics includes spatial information about the object. Besides this pointing gesture, no other pointing gestures are directed to the grey button.

(21)

\[
\text{grey button (x)}
\]

\[
y \text{ push } x
\]

\[
x \text{ located on table}
\]

According to what we have just said, by ‘identifying’ a referent, information is added to an already existing file-card. We propose that identifying functions as an appositive; that is, as a unit that supplies additional information about a referent. To see how this works, consider the following examples:

(22) My friend Alexandra is also a linguist.

In (22) my friend and Alexandra are in an appositive relation and have an identical referent: in this context both refer to the referent ‘Alexandra’. Appositions occur when two units are adjacent and denote the same referent, and the appositive supplies additional information.

In the case of pointing gestures, appositions are not presented linearly, but in parallel. When verbal elements and pointing gestures co-occur they are expressed simultaneously, and the manifestation expressed in the two modalities denote identical referents. (23) can be felicitously asserted without any co-speech gesture.

(23) That picture, the one that you can see on the desk that is standing in the right corner of the living room, is my favourite one

But we can also easily think of a context where the sentence is uttered together with a pointing gesture as in (24).
In (24) the appositive information is not expressed by spoken words but by a pointing gesture. The pointing gesture does not actually 'mean' this, but the directionality of the pointing gives us the spatial position of the object we are talking about. In (24) both the spoken component and the pointing gesture refer to the same object (i.e. the picture). However, where the words *that picture* establish a file-card, the pointing gesture provides the spatial information of the referent, giving the addressee the possibility to identify the physical object and add information that is obtained by this identification to the existing file-card.

In concrete reference, the intended target coincides with the actual position that the object occupies. As the object is already present in the context of signing it would be confusing and uneconomical to create an abstract anchor to localize it. In fact, the same goes for pronominal reference in spoken languages like English and Danish. Engberg-Pedersen (1993) argues that indirect speech is preferred over direct speech if the person that is mentioned in the original utterance is physically present. For instance, a speaker is more likely to say, *She told me that you would be late,* than *She told me ‘He will be late’* when the *he* is the addressee of the speaker (example taken from Engberg-Pedersen 1993, 105). Hence it is more felicitous to use the second person pronoun since it refers directly to a local discourse participant. Similarly, signers tend to establish the anchor in the same location that the object occupies.

Figure 8 is an instance of identifying in NGT. The signer is describing a picture that is lying on her lap. Her addressee has the same picture, with some minor differences. Together, without showing each other their own picture, they try to figure out what differences there are. In Figure 8a the signer points at her picture and then signs the nominal DAD. This is not a random localization of the referent. Since the referent can be seen on the picture, the signer chooses that location to establish the anchor. Strikingly, her addressee cannot see that location (although she might have an idea), but the signer still prefers to use the physical location. In the continuation of the discourse, the signer uses the anchor for further mention (Figure 8c). At the same time, the signer is identifying the
referent, thereby adding information to the file-card in (25), apparently assuming that the same referent is to be seen on her addressee’s picture.

Figure 8: Identifying in NGT (CNGT0089, s005, 01:29:215)

a. IX3a DAD ORANGE CLOTHING       b. SAY IX3b BLUE       c. IX3a
‘The dad has orange clothing’       ‘She says the clothing is blue’       ‘His clothing’

(25)

\[
\begin{align*}
\text{dad (x)} \\
\text{x orange clothing} \\
\text{x present on picture on lap of signer}
\end{align*}
\]

This is the main difference between pointing signs and gestures: whereas the former function as anchor-creators and as identifiers, the latter only act as identifier. Moreover, the identifying function of pointing signs is a result of concrete reference. Pointing gestures, while providing spatial information, clearly lack an anchoring function.

6. Conclusions
In this paper we have compared pointing signs in NGT and pointing gestures that co-occur with spoken Dutch on a discourse structure level. Our analysis distinguishes two functions of pointing, namely anchoring and identifying. Anchoring is defined as the strategy by which a referent gets associated with a spatial location to function as an anchor for further references. With the establishment of an anchor, a file-card is created. With every further mention, information is added to the file card that was created by an anchoring pointing sign. With identifying, on the other hand, a file-card is not created, but spatial information is added to an already existing file-card. It can be seen as complementary information of the spatial coordinates, which allows the addressee to identify the referent and add this information to the corresponding file-card. While pointing signs can both anchor and identify, pointing gestures can only add information to a file-card created by the speech element and thus identify. The description in this paper constitutes a first step towards the characterization of the study of pointings beyond the sentence level, which needs to be
contrasted with larger sets of data and also with other signed and spoken languages in order to expand our cross-linguistic knowledge specifically in the discourse domain.

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References


