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LAURA SPIJKER AND
MARLOES OOMEN

Hesitation Markers in Sign Language of the Netherlands A Corpus-Based Study

Abstract

We present one of the first detailed studies on hesitation marking in a sign language. Based on the analysis of a set of monologues and dialogues from the *Corpus NGT* (Crasborn and Zwitserlood 2008; Crasborn, Zwitserlood, and Ros 2008), we describe the form and position of manual and nonmanual markers of hesitation in Sign Language of the Netherlands (NGT). We show that *PALM-UP*, used as a hesitation marker, is akin to a “filled pause” in spoken language, both in its formal properties and its distribution. *PALM-UP* is regularly used to mark hesitation in dialogues, but far less commonly in monologues, which we suggest indicates that *PALM-UP* is used deliberately by signers to signal a delay in signing (cf. e.g., Maclay and Osgood 1959). Other manual markers of hesitation include sign holds and breaks in signing; their form and patterning in the data suggest they are closer to “unfilled pauses” in speech. As for non-manuals, we show that all instances of hesitation in our data are marked by a change in the direction of eye gaze, suggesting that this is a clear pragmatic cue that signers use—intentionally or not—to signal a planning problem in signing. This fits well with previous observations that eye gaze plays an important role in turn-taking regulation in sign languages (e.g., Baker 1977).

Laura Spijker has been working as an NGT interpreter since 2019. In 2020, she obtained her MA General Linguistics, with a specialization in sign language linguistics, at the University of Amsterdam. Marloes Oomen is a postdoc at the University of Amsterdam. Her research focuses on the syntax, semantics, and pragmatics of sign languages.

IN LANGUAGE PRODUCTION, be it spoken or signed, moments of hesitation are a common occurrence. Research on spoken languages has identified various forms of hesitation marking, including unfilled pauses (silence), filled pauses (*eh, um*), filler words (*well, I mean*), and repeats and false starts (Maclay and Osgood 1959; Clark and Fox Tree 2002); however, there are virtually no studies on hesitation markers in sign languages. We take a first step toward filling this gap by investigating the marking of hesitation in naturalistic corpus data from Sign Language of the Netherlands (NGT). In the spoken language literature, there are several competing theories with respect to the status of hesitation markers (particularly as it pertains to filled pauses); some researchers consider them to be symptoms of a planning problem, while others assume they have a linguistic or nonlinguistic signaling function (Clark and Fox Tree 2002). A secondary aim, therefore, is to evaluate whether the NGT data provide any indication toward one of these two main views.

Hesitation Markers

There is no generally agreed upon definition in the literature of what constitutes a hesitation marker. In this paper, we use the umbrella term *hesitation marker* to collectively refer to (a) unfilled pauses; (b) filled pauses; and (c) filler words or signs; that is, any kind of element that may be conceived of as a pause, where part of a linguistic utterance would otherwise be expected. We thus exclude false starts and repetitions from our definition (cf. Maclay and Osgood 1959). We wish to point out here that the terms *filled* and *unfilled* pauses reveal a sound-centered view on hesitation markers. After all, in spoken language, the language articulators do not produce sound in an unfilled pause and thus are imperceptible to the interlocutor, while in sign language, the language articulators are always visible to the interlocutor, even when they (temporarily) do not encode linguistic messages, as in a hesitation. In the discussion of the results from the NGT data, we therefore refrain from using the terms *filled* and *unfilled* pause. Instead, we use more sign-language specific terms such as *holds* and *breaks*, and we use glosses for specific signs that have a hesitation function, such as PALM-UP. Still, in the discussion section, we explore whether it makes sense to categorize these types of hesitation markers into two

groups that are comparable to filled and unfilled pauses in spoken languages in terms of their distribution and function.

Also note that the term *hesitation marker* reveals a bias, as it suggests that it is used intentionally by speakers or signers; as we will discuss, there are different views on whether or not that is actually the case. Although we will continue to use the term, it is not intended to be an a priori commitment to any one approach; in the discussion, we will come back to the question of whether the NGT data provide any indication for or against the deliberate use of hesitation markers by signers.

Of the three categories listed above, most of the discussion in these background sections will focus on filled and unfilled pauses, which have also been the most extensively studied in the literature, although filler words/signs are addressed on occasion. Unfilled pauses are generally defined as silences in speech with an unusual length, but Maclay and Osgood (1959, 24) additionally recognize instances of “nonphonemic lengthening of phonemes” as unfilled pauses. Filled pauses, such as *uh* or *uhm* in English, are defined by Rose (2007) as “. . . semantically empty element[s] of speech which fit a language-specific conventional phonetic form and delays (either intentionally or not) the transfer of the speaker’s message,” which is a definition we adopt. Finally, we reserve the term *filler word* for discourse markers such as *well*, *like*, or *you know*, thus drawing a distinction between filled pauses and filler words. Note that some researchers collapse filled pauses and filler words together into a single category, thus implying that filled pauses have word status (see, e.g., James 1972; Clark and Fox Tree 2002; and Laserna, Seih, and Pennebaker 2014).

Filled Pauses: Signal or Symptom

Much of the debate in the literature on hesitation markers in spoken languages has centered around the question of whether or not filled pauses, such as *uhm*, are uttered voluntarily. Under the *symptom* view, filled pauses are considered to be symptoms of a cognitive planning problem, that is, automatic, meaningless elements, of which speakers are unaware when they utter them (e.g., Levelt 1983). In contrast, under the *signal* view, filled pauses are considered to be purposefully uttered by speakers to, for instance, signal that they are in the process

of planning what to say next but wish to keep the turn (e.g., Maclay and Osgood 1959). Some authors have additionally argued that filled pauses behave like interjections, thus, in effect, assigning them linguistic word status (James 1972; Clark and Fox Tree 2002).

Several decades of research have turned up evidence in support of both views, leading De Leeuw (2007, 110) to conclude that “it is possible that hesitation markers have a signaling function for the listener, but are also a symptom of cognitive processes on the part of the speaker.” This might explain why, for instance, speakers have been shown to use hesitation markers in monologues (Schachter, Christenfeld, Ravina, and Bilous 1991) —which would be difficult to explain from a signal perspective—but, on the other hand, filled pauses clearly also have a pragmatic turn-taking function (Maclay and Osgood 1959, among others). We return to this debate in the discussion of the results for NGT.

The Position of Hesitation Markers

Various studies have focused on the question of where hesitation markers tend to be positioned in the discourse. Maclay and Osgood (1959) show that filled and unfilled pauses in English occur more commonly before lexical words than before function words, although filled pauses occur relatively more often before function words than unfilled pauses do. Moreover, filled pauses appear more often between phrase boundaries, while unfilled pauses are somewhat more common before word boundaries within phrases.

Focusing exclusively on filled pauses, Clark and Fox Tree (2002) identify three basic locations for them, with the intonation unit taken as the basic unit against which the position of filled pauses is identified. They show that filled pauses most commonly occur at the boundary of the intonation unit (position [I] in example 1 from Clark and Fox Tree 2002, 94), followed by the position immediately after the first word (position [II] in example 1). Filled pauses occur least frequently anywhere after the second word in the intonation unit (position [III]); unfilled pauses occur more commonly in this position, as shown in example 1. In this example, a comma marks an intonation unit boundary, a period marks a brief (unfilled) pause, and a dash marks a slightly longer (unfilled) pause. The more dashes, the longer

the pause. For clarity, we have represented the (un)filled pauses in the example in boldface.

EXAMPLE 1.

Hamlet **um** --- [II] starts, . [I] **uh** as a noble soul, th- there's no doubt that . [III] that Hamlet has got this nobility of soul

Although there is not necessarily a one-to-one correspondence between syntactic units (phrases) and intonation units, there is certainly some degree of overlap. Thus, following Clark and Fox Tree (2002), we may conclude that filled pauses tend to occur most frequently at clear (syntactic or prosodic) boundaries, such as at the beginning of a sentence (also see Shriberg [1994] on American English), although other positions are clearly also attested, as example 1 illustrates.

It is important to point out here that there may be a relationship between the position of a hesitation marker and its function. For instance, it is possible that a hesitation marker in sentence-initial position may signal a planning process for larger linguistic units, while such a marker positioned in the middle of a sentence functions to signal a more local process (e.g., that the speaker wishes to hold the floor). Similarly, it is possible that the position of a filled pause is correlated with its form. For instance, Swerts, Wichmann and Beun (1996), studying Dutch, and Clark and Fox Tree (2002) and Shriberg (1994), studying English, have shown that vocalic-nasal filled pauses (*ehm/um*) are more likely to occur at major discourse boundaries than vocalic filled pauses (*eh/uh*).

Hesitation in Sign Languages

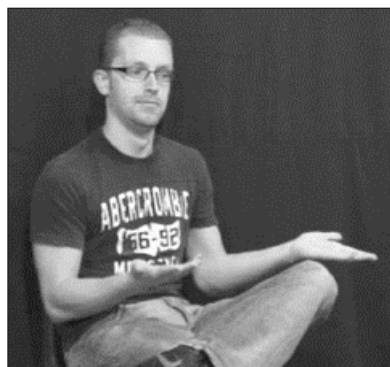
Little research has been carried out on hesitation marking in sign languages. The most extensive study, as far as we are aware, was carried out by Notarrigo (2017), who conducted a broader investigation on disfluencies in signing among native, near-native, and late signers of French Belgian Sign Language (LSFB). Notarrigo (2017) identifies a variety of manual markers of hesitation, such as PALM-UP, PALM-UP with finger wiggle (an example from NGT is illustrated in figure 1 below), the pressing together of the hand palms (as in a begging gesture), or an index sign directed upward to an unspecified location. She also describes various nonmanuals that occur in moments of hesi-

tation. For instance, she describes instances in which signers mouth *eu*h (French *eh*) or lightly press their lips together, sometimes with the mouth corners down. In addition, Notarrigo (2017) notes that hesitation may also be marked by means of differences in articulation speed, with signers slowing down in moments of hesitation or by holding or repeating the movement of a sign. Notarrigo (2017) finds that holds are sometimes used for hesitation, thus marking disfluency, but are also often used for emphasis, in which case they are rather hallmarks of fluency. As will become apparent in the discussion of the results, the types of manual and nonmanual hesitation markers we find in NGT are quite similar to those described by Nottarigo (2017) for LSF.

The sign *PALM-UP*, which is known to have a host of discourse-related functions, has been identified as a marker of hesitation in a variety of other studies as well (e.g., McKee and Wallingford [2011] on New Zealand Sign Language (NZSL); Van Loon [2012] on NGT; and Gabarró-López [2020] on LSF and Catalan Sign Language).¹ Gabarró-López (2020) additionally claims that the sign *SAME* can also be used as a marker of hesitation in LSF.

McKee and Wallingford (2011) ascribe a variety of mostly discourse-related functions to *PALM-UP*, explicitly mentioning the marking of hesitation as one of them. Specifically, the authors point out that *PALM-UP* can be used to signal the beginning or end of a conversational turn; when articulated with force at the beginning of a sentence, they suggest it is comparable to the use of *um*, *ah*, or *well* by a speaker of English. In addition, they claim that *PALM-UP* with wiggling of the fingers functions as a turn-holder “while the speaker composes her message” (2011, 233). This suggests that it has the function of signaling a planning process, in line with Maclay and Osgood’s (1959) claims about the function of filled pauses in spoken language.

For NGT, too, it has been claimed that *PALM-UP* can “fill a pause” (Van Loon 2012, 40). Van Loon (2012, 59) contemplates that “it is conceivable that filled pauses by means of *PALM-UP* in NGT may function as a signer’s cue to elicit a backchannel signal or involvement from the addressee during a signing turn. If so, *PALM-UP* may express an interlocutor-oriented function after all,” a perspective which is compatible with a signal view on hesitation marking. She suggests further research into the matter.



(a) PALM-UP



(b) PALM-UP plus finger wiggle

FIGURE 1. The signs PALM-UP and PALM-UP plus finger wiggle in NGT. Video stills are from Corpus NGT.

Figure 1 illustrates the NGT forms PALM-UP and PALM-UP with finger wiggle, which are equivalent to the NZSL forms referred to above. PALM-UP of either type can be articulated with one or with two hands.

We also wish to mention a study by Esposito, McCullough, and Quek (2001) on hesitation in co-speech gesture. The authors investigate the properties of simple and augmented holds in co-speech gesture, where the former do not involve motion of the holding hand(s), while a detectable motion is added to the holding hand(s) in the latter case (for examples of simple and augmented holds in our data, see figures 3 and 4 in the results section). They also investigate the properties of the filled and unfilled pauses in the speech that the holds accompany. The authors report that unfilled pauses and simple holds, and filled pauses and augmented holds, are comparable in terms of their frequency, duration, and position in the discourse. If this comparison extends to sign languages, then it may be hypothesized that simple and augmented holds in NGT are comparable to unfilled and filled pauses, respectively, both in use and function. We come back to this question in the discussion section.

Research Goals

The primary aim of this exploratory study—one of the first extensive investigations into hesitation marking in a sign language—is to

describe how hesitation is marked and where it occurs in naturalistic signing of NGT, as well as to describe any possible interactions between the form and the position of hesitation markers. A secondary aim of this study is to contribute to the debate on whether hesitation markers are symptoms or signals of delayed speech/signing. To fulfill our research aims, we annotated and analyzed (semi-)spontaneous data from the *Corpus NGT* (Crasborn, Zwitserlood, and Ros 2008; Crasborn and Zwitserlood 2008), the details of which are described in the next section.

Given that sign languages are transmitted via a different modality than spoken languages, we expect there to be differences between NGT and spoken languages in the form of hesitation marking. After all, it is clear that sign languages do not employ filled pauses such as *uh* or *uhm*—although there is the possibility that such elements are represented in mouthings or that they are fingerspelled, in which case they may be regarded as borrowings from the ambient spoken language. In this study, we pay attention to both manual and nonmanual elements that have the potential to mark a hesitation. In terms of where hesitation markers are most likely to occur in NGT, we expect modality to have less of an effect, and thus we expect similar patterns to those reported in previous research on spoken languages.

When we initiated the study, we had no way of knowing whether NGT had hesitation marker types directly comparable to filled pauses, unfilled pauses, and filler words in spoken languages in terms of their distribution and function. Therefore, we chose not to employ this terminology in the methods and results sections of this article. Instead, we opted for using either the umbrella term *hesitation marker* or a more descriptive representation of specific hesitation markers, such as sign language glosses (e.g., PALM-UP), mouthings, or prosodic characteristics like holds. We come back to potential comparisons between types of hesitation markers in spoken and signed languages in the discussion section.

Methods

We analyzed naturalistic corpus data from the *Corpus NGT*, an open access database that consists of over 2000 video clips amounting to seventy-two hours of material, with a total of ninety-two participating deaf native signers, aged between seventeen and eighty-four years old

(Crasborn et al. 2008; Crasborn and Zwitserlood 2008). The database includes (semi-)spontaneous monologues and dialogues in which participants narrate picture book stories or comics (monologues) or discuss deaf experiences (dialogues).

Participants

We analyzed forty movie clips with twenty different signers from the *Corpus NGT*. Each selected signer participated in two different settings, once in a monologue and once in a dialogue. A diverse and representative group of participants of different genders, ages, and regions were selected (table 1).

The *Corpus NGT* distinguishes five main variants of NGT, connected to the five (former) schools for the deaf in the Dutch cities of Amsterdam (North-West), Groningen (North-East), Rotterdam (West), Sint-Michiëlsgestel (South) and Voorburg (West). Little research has been done on regional variation among these variants, and virtually no studies address variation at the grammatical level. At the lexical level, Schermer (2003) and Schermer and Harder (1986) have reported that signs from the Southern region (Sint-Michiëlsgestel) used to differ significantly from those from other regions. However, these days, the most striking lexical differences have been observed between the Groningen variant and Western variants of NGT (Klomp 2021).

Our sample includes signers from all five regions as well as some signers whose regions are indicated as *mixed* or *other*. The *mixed* category means that a signer uses multiple variants, whereas the *other* category means that a signer uses a variant distinct from one of the five listed above.

Movie Clips

All selected monologues feature the retelling of Looney Toons Tweety and Sylvester cartoons, and all selected dialogues are “discussions,” which may be about a range of topics. Generally, there were multiple videos available featuring the same signers for both of these content types. Therefore, for each participant, the first clip in which the participant signs for at least fifty-five seconds was selected for each content type.

TABLE 1. Metadata and File Numbers for the Movie Clips from the Corpus NGT Selected for Analysis

#	Participant	Sex	Age group	Signing region	Monologue	Dialogue
1	S073	Female	17–39	Amsterdam	1775	1801
2	S008	Female	17–39	Other	0122	0128
3	S065	Female	17–39	St. Michielsgestel	1538	1551
4	S059	Female	40–62	Rotterdam	1366	1383
5	S088	Female	40–62	Voorburg	2196	2220
6	S041	Female	40–62	Groningen	0912	0922
7	S003	Female	40–62	Amsterdam	0024	0015
8	S060	Female	63–84	Rotterdam	1365	1389
9	S061	Female	63–84	Voorburg	1421	1435
10	S018	Female	63–84	Groningen	0289	0294
11	S029	Male	17–39	Groningen	0605	0608
12	S077	Male	17–39	Mixed	1899	1914
13	S080	Male	17–39	Voorburg	1953	1991
14	S069	Male	40–62	Mixed	1664	1682
15	S085	Male	40–62	Amsterdam	2145	2164
16	S071	Male	40–62	Amsterdam	1716	1731
17	S037	Male	40–62	Groningen	0759	0766
18	S042	Male	63–84	Groningen	0913	0921
19	S043	Male	63–84	St. Michielsgestel	0966	0970
20	S045	Male	63–84	Voorburg	1016	1019

In total, sixty-eight minutes of material was selected and analyzed. The numbers of the selected video clips as well as the metadata are also listed in table 1.

Annotation of Manual and Nonmanual Hesitation Markers

The selected videos were annotated by the two authors, who are hearing L2 signers of NGT, both with nine years of signing experience. The first author is a qualified NGT interpreter with four years of working experience. The second author is a sign language linguist who uses NGT mostly in interaction with signing colleagues and participants. ELAN Linguistic Annotator (<https://archive.mpi.n1/tla/elan>) was used for annotation of the data.

Eight new annotation tiers were created for each selected video file. We added one tier for manual hesitation markers (Manual) and five for nonmanual markers involving the mouth (Mouth), eyes (Eyes), head (Head), eyebrows (Eyebrows), and upper body (Upper body). Annotations on these tiers were initially made by the first author and cross-checked by the second author; cases of disagreement were resolved through discussion.

Information about the position of the hesitation marker (see next section) was annotated on the Position tier. An eighth tier (Remarks) was added for comments. Both authors annotated part of the data for position of hesitation markers; all annotations were subsequently cross-checked by both authors. Cases of disagreement were resolved through discussion.

As a basic guideline, we annotated all instances of any sort of pause or interjection occurring within a discourse. This definition is rather general, but purposefully so: Given that little is known about hesitation marking in sign languages, including NGT, this research is necessarily exploratory in nature. As such, we considered it useful to cast as wide a net as possible in identifying possible hesitation markers in our data.

To give an idea of the sort of instances we identified as hesitations, we offer a couple of descriptive examples here; the results section below discusses many more. In many cases, signers started a turn, not by producing signs, but by looking up or down and nodding, as if needing a few seconds to order their thoughts. In other cases, a (manual) pause or hold was coupled with a change in the direction of eye gaze in the middle of a sentence. Such instances were identified as hesitations because they interrupt an ongoing utterance.

For each case we identified, we subsequently made annotations to indicate the manual and nonmanual marking occurring at the moment of the hesitation. On the Manual tier, annotation values reflect the type of sign or manual modification used at the moment of hesitation, if present. Signs that appear to mark hesitation (PALM-UP and PALM-UP with finger wiggle) are represented with a gloss. Holds are annotated as *hold* in combination with a specification for the types of hold: *augmented* (with added movement), *simple* (no movement), or *reduplication* (repetition of the sign), following Esposito et al. (2001).

Finally, sometimes a signer did not hold a sign but rather put the hands in a resting position (e.g., by folding them or putting them on their lap). Such instances are glossed as *break*.

On the tiers for nonmanuals, any nonmanual action that occurred during the hesitation that clearly differed from the surrounding context was annotated. When no such nonmanual action could be observed, no annotation was made on the relevant tier(s). On the Mouth tier, the values used include *closed*, *open*, *open-closed*, *eh*, *ehm*, or other mouthings if present. For Eyes, the possible annotation values were *closed*, *up*, *down*, or *left/right*. Head movements were annotated on the Head tier and may have any of the following values: *nod*, *shake*, *tilt*, *down*, *left*, or *right*. On the Eyebrows tier, the only used annotation value was *frown*. The annotation values that were used on the Upper body tier are *shrug*, *backward lean*, and *left-right*.

After the annotation process was completed, the annotations, including time mark, were exported to an excel file.

Position of Hesitation Markers

In a second round of analysis, we determined the discourse position of each hesitation marker and added corresponding annotations on the Position tier. In order to facilitate comparison with previous research on hesitation markers in spoken language, we decided to follow Clark and Fox Tree (2002, 94) in distinguishing three possible places of occurrence of hesitation markers, determined at the level of the intonation unit, that is, a stretch of spontaneous speech or signing that falls under the same intonation contour (see below for further discussion on intonation units in sign languages).

The three locations that are distinguished in Clark and Fox Tree (2002)—for spoken languages—are I, at the boundary of an intonation unit; II, after the first word, and III, at any later location that is not also an intonation unit boundary. Clark and Fox Tree (2002) hypothesize for English that planning is most difficult at location I, followed by location II and then III; hesitation markers are therefore expected to occur most often at location I, then II, and then III. This is indeed what the authors found.

We adhered to the same categorization as Clark and Fox Tree (2002) and thus annotated each example in our dataset with one

of three annotation values: I, II, or III. Establishing intonation unit boundaries was not without its challenges, as research on the level of the intonation unit (or intonational phrase), and intonation in general, is still relatively scarce in sign languages. Nonetheless, it is known that clear, noticeable changes in nonmanual configurations, such as a change in the position of the head or body or an overall change in facial expressions, are of major importance in the marking of intonation unit boundaries (see, e.g., Sandler 2012). In addition, an eyeblink may separate two intonational phrases (e.g., Baker and Padden 1978; Nespor and Sandler 1999). We were also helped by an overview of common intonation patterns in NGT, presented in Klomp (2021), describing particular constellations of nonmanual articulators that may be associated with specific grammatical functions, such as polar interrogatives (raised eyebrows and head movement forward), topic (raised eyebrows and chin up), or conditional clauses (raised eyebrows, head movement forward, and chin down).

In annotating the data, we used these works as guidelines. This meant that we carefully studied the nonmanual markers accompanying the manual signs preceding and following each hesitation marker in order to determine its position. When the pattern of nonmanuals was clearly different before versus after the hesitation marker, we concluded that the hesitation occurred at the boundary of an intonation unit. When the nonmanual activity was the same, we regarded that as indication that the hesitation marker occurred within one and the same intonation contour, and we made annotations accordingly, taking into account the number of manual signs preceding the hesitation to distinguish between positions II and III. In practice, position I hesitation markers could usually be identified easily, for example, because they occurred at the start of a signer's turn, or because they were found between two different sentence types (e.g., a declarative and an interrogative).

Results

A total of ninety-two instances of hesitations were identified and annotated. Forty-three hesitations were attested in monologues, and forty-nine in dialogues. Below, we discuss the form of the manual and nonmanual hesitation markers in our data, their position in the discourse, and interactions between form and position.

TABLE 2. Frequencies of Different Types of Manual Hesitation Markers in the Dataset

Type	PALM-UP	Hold	Break	No manual marker
Monologue	4 (incl. 3 wiggle)	32	7	-
Dialogue	23	20	5	1

The Form of Manual Hesitation Markers

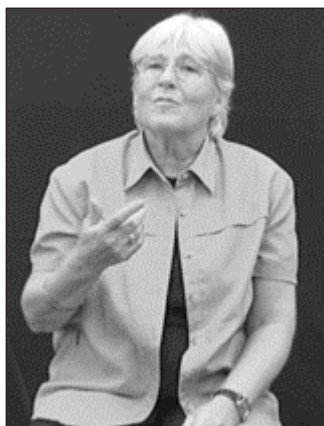
The types and frequencies of the manual markers of hesitation found in the dataset are displayed in table 2.

In monologues, holds ($N = 32$) are the most common manual marker, followed by breaks ($N = 7$) and PALM-UP ($N = 4$), of which three included a finger wiggle (figure 1). In dialogues, the most frequently attested manual markers of hesitation are PALM-UP ($N = 23$), followed by holds ($N = 20$) and breaks ($N = 5$). One of the dialogues included one instance of a hesitation that does not involve a manual marker.

There is a fair amount of variation in the exact form and orientation of PALM-UP in the data. Some instances of PALM-UP are articulated with two hands (figure 2a), others are one-handed. Often, PALM-UP is articulated with a lax handshape (figure 2b). In other cases, a handshape change occurs during articulation of the sign: It



(a)



(b)

FIGURE 2. Two forms of PALM-UP: (a) two-handed, and (b) one-handed, with a lax handshape.



FIGURE 3. Example of an augmented hold, with a detectable motion in both hands.

starts with an open hand with all fingers extended and changes into a handshape with the index finger and thumb extended and the other three fingers closed or bent. This handshape change may combine with a change in orientation, with the palm first being directed upward before facing the signer's upper body.

Interestingly, an open-handed PALM-UP with a clear finger wiggle is not common in the data, occurring only three times in monologues, as opposed to the twenty-four instances of regular PALM-UP that were attested. In all three cases, the signer was evidently struggling to come up with a particular sign.

Holds were also commonly attested in the data, occurring fifty-two times in total. We identified three different types of holds: augmented, simple, and reduplicated.

Figure 3 shows an example of an augmented hold, which is characterized by involving a detectable motion. The total duration of the hold in the figure is 240 milliseconds. The first and last frames mark the beginning and end of the hold. As can be observed, both hands of the signer move upward.

Figure 4 shows an example of a simple hold. Here, both hands stay at the same location during the hold (total duration 520 milli-



FIGURE 4. Example of a simple hold, without a motion in the hands.



FIGURE 5. Example of a reduplicated hold.

seconds). Also observe that the signer looks toward the addressee in the first frame but starts gazing away from the addressee in the second frame. In addition, a sideward movement of the head can be observed in the third frame.

Finally, reduplicated holds involve reduplication of the held sign. Five instances were attested in the data. An example from one of the dialogues is displayed in figure 5. The signer can be observed producing the sign *CONNECT/CONTACT* (total duration 690 milliseconds) with a twice-reduplicated movement of the fingers from open to closed: The fingers of the signer's right hand are open in frames one, three, and five, while they are closed in frames two and four.

Table 3 shows the distribution of the different types of holds attested in the data. More holds overall were found in monologues ($N = 32$) than in dialogues ($N = 20$). In both monologues and dialogues, augmented and simple holds are approximately equally common. The frequency of occurrence of reduplicated holds is too low to draw any meaningful conclusions.

A break (i.e., a pause of the hands to mark a hesitation) was attested twelve times in total. In figure 6a, the signer holds her hands in front of her chest, while in figure 6b, the signer places his hands on his lap. Other break positions include touching the nose with a hand and placing an index finger on the mouth.

TABLE 3. Distribution of Three Types of Holds Marking a Hesitation in Monologues and Dialogues

Type	Augmented	Simple	Reduplication
Monologue	16	13	3
Dialogue	10	8	2



FIGURE 6. Two examples of a break. (a) Hands lifted in front of the chest. (b) Hands on the signer's lap.

Finally, we found one instance of a hesitation in the data that was not manually marked. In this example, which comes from a dialogue, the signer clearly hesitates while the sign that is articulated at the same time, an *INDEX*, does not seem to be a part of the hesitation. The hesitation is thus marked only nonmanually, by means of eye gaze (away from addressee) and mouthing *eh*.

To sum up, almost all hesitations in the dataset were found to involve a manual marker. In monologues, there was a preference for using a hold to mark hesitation, while *PALM-UP* was preferred in dialogues. Breaks were also sometimes attested.

The Form of Nonmanual Hesitation Markers

This section focuses on the form of the nonmanual markers that mark a hesitation. All ninety-two hesitations were found to involve a change in the direction of the eye gaze. Table 4 shows the distribution of the different directions of eye gaze that were found during a hesitation. There are striking differences between monologues and dialogues,

TABLE 4. Direction of Eye Movement during a Hesitation

Type	Up	Down	Left/right	Closed	Total
Monologue	12	11	9	11	43
Dialogue	13	23	12	1	49



FIGURE 7. Position of the eyes (a) before the start of the hesitation and (b) during the hesitation.

especially concerning downward eye gaze, which occurred almost twice as often in the dialogues than in the monologues, and closed eyes, which occurred eleven times in the monologues but just once in the dialogues.

Figure 7 shows an example of *eyes up*, with eye gaze illustrated just before (left panel) and during (right panel) the hesitation. Between figure 7a and 7b, we can also observe a change in the position of the right hand, which moves upward, and the positions of the head (tilted) and the upper body (backward lean).

Eye gaze is the most consistently attested nonmanual marker of hesitation, but other markers were also attested with some regularity. For instance, in some cases, signers used mouth actions, usually by opening ($N = 8$) or closing ($N = 14$) the mouth at the start of the hesitation, and in one case by opening and then closing the mouth. In other cases, signers used mouthings, typically *eh* or *ehm* ($N = 11$), but there were also three instances of other mouthed words, namely *of* (“or”), *vogel* (“bird”), and *aap-poes* (“monkey-cat”). These are not necessarily hesitation markers per se. However, as they clearly accompany manually articulated hesitation markers, it appears that in these instances, signers were able to access a word in Dutch, the ambient spoken language, but had trouble coming up with the corresponding sign in NGT.

We also found multiple variations of a change in the position of the head, including head tilt (see figure 7b), sideward movement (see figure 5), headshake or nod, and downward head movement. Head movements were attested seventeen times in monologues, co-occurring with a mouth action or mouthing in eight of those cases. In dialogues, head movements were attested six times, of which three were combined with a mouth movement.

In five hesitations, all occurring in monologues, a frown was attested, which was twice combined with upward eye gaze, twice with eye gaze shifting away from the addressee, and once with downward gaze.

Finally, movements of the upper body occurred in four instances, all found in dialogues. In one case, the signer moves from left to right; in another case, the signer leans backward (figure 7b). Two examples involve a shoulder shrug (figure 2a).

The Position of Hesitation Markers

Having described the form of manual and nonmanual hesitation markers in the NGT data, we here discuss at which positions in the discourse hesitations tend to be found. As can be observed in table 5, hesitation markers occur most frequently at the boundary of the intonation unit, both in monologues (63%) and in dialogues (53%). Hesitations after the first sign are second-most common, occurring in 26 percent of the cases in monologues, and in 33 percent of the examples in dialogues. Hesitations at any other position after the first sign (and not at the boundary of an intonational phrase) are relatively rare: They occur in 12 percent (monologues) and 14 percent (dialogues) of the cases, respectively.

TABLE 5. Position of Hesitation Markers in Monologues ($N = 43$) and Dialogues ($N = 49$)

Place in discourse	Monologues		Dialogues	
	<i>N</i>	%	<i>N</i>	%
I: Intonation unit boundary	27	63%	26	53%
II: After first sign	11	26%	16	33%
III: Later	5	12%	7	14%

TABLE 6. Manual Forms of Hesitation Markers and Their Position in Monologues ($N = 43$)

<i>Monologues</i>		I		II		III	
Hold	Augmented	9		5		2	
	Simple	10	66%	2	25%	1	9%
	Reduplication	2		1		-	
PALM-UP	Regular	-	-	1	50%	-	50%
	Wiggle	-		1		2	
Break		6	86%	1	14%	-	-

Thus, the patterns observed in monologues and dialogues are similar, although hesitation markers at boundary positions are slightly more common in monologues, and, conversely, hesitation markers after the first sign are somewhat more common in dialogues.

The Relationship between Form and Position of the Hesitation Marker

In this section, we scrutinize the interaction between different manual forms of hesitation markers and their position in the discourse.

As discussed in the previous section, hesitation markers occur most frequently at the boundary of an intonation unit, although other positions are also attested with some regularity. Here, we wish to investigate whether certain forms of hesitation marking have a preference for a particular discourse position. In tables 6 and 7, we provide a quantitative overview for the hesitation markers in monologues and dialogues, respectively. We must note that interpretation of the results

TABLE 7. Manual Forms of Hesitation Markers and Their Position in Dialogues ($N = 48$; one hesitation without manual marking excluded)

<i>Dialogues</i>		I		II		III	
Hold	Augmented	5		3		2	
	Simple	3	50%	4	35%	1	15%
	Reduplication	2		-		-	
PALM-UP	Regular	13	57%	6	26%	4	17%
	Wiggle	-		-		-	
Break		3	60%	2	40%	-	-

in these tables should proceed with caution, given the relatively low number of examples. Still, we can make a couple of tentative observations, which may open new avenues for future research.

With regard to the monologues, it is evident from the results in table 6 that holds are more common at boundary positions (I: 66%) than in other positions (II: 25%; III: 9%). We observe the reverse pattern for PALM-UP signs: None of the tokens attested in monologues occur at an intonation unit boundary. Instead, the four instances of PALM-UP, three of which involve a finger wiggle, occur either after the first sign (II: two tokens) or at a later position in the intonation unit (III: two tokens), despite the fact that hesitation markers in positions II and III constitute only 38% of the hesitations in monologues (see table 5). Finally, six of the seven breaks attested in monologues occur at an intonation unit boundary (I: 86%).

For dialogues, we find slightly different distributions, especially concerning holds and PALM-UP. Holds are somewhat more evenly distributed across the three positions (I: 50%; II: 35%; III: 15%) than in the monologues, although the low number of examples makes it premature to draw any strong conclusions from this. For PALM-UP, it can be observed that, in dialogues, it occurred most frequently in position I (57%), while none of the four PALM-UP signs in the monologues occurred in that position. Finally, breaks occurred in position I (60%) or II (40%), but not in position III. Although numbers are particularly small for this type of hesitation marker, it is worth observing that there were also no breaks observed in position III in any of the monologues.

Interim Summary

Above, we have described the form and position—and their interaction—of hesitation markers in naturalistic corpus data from NGT. The most commonly employed manual markers of hesitation include sign holds and PALM-UP; strikingly, in our dataset, the former are preferred in monologues, while the latter occur more frequently in dialogues. As for nonmanual markers, a change in the direction of eye gaze was found to be the most reliable marker signaling a hesitation, although a host of other types of markers, including head and

body movements, as well as mouth actions and mouthings, were also attested.

Hesitations occurred most frequently at an intonation unit boundary, followed by a position after the first sign. Scrutiny of the interaction between the form and position of hesitation markers reveals that PALM-UP generally did not occur at intonation unit boundaries in monologues, while this was a frequent occurrence in dialogues. Holds were somewhat more strongly preferred at boundary positions, as opposed to sentence-internal positions, in monologues as opposed to dialogues.

Discussion

The aims of this study were (a) to provide the first detailed description of the properties of hesitation markers in a sign language, and (b) to contribute to the debate on whether markers of hesitation should be considered involuntary symptoms of a planning problem or deliberate signals of a delay in the conveyance of a linguistic message. Below, we address the latter matter based on the description of the *Corpus NGT* data analyzed, as discussed in the previous section. Since the symptom/signal debate has traditionally been concerned with the function of filled pauses specifically, we first explore whether it is useful to maintain a distinction between filled and unfilled pauses when talking about hesitation marking in sign languages, and, if so, what type(s) of hesitation markers in NGT are comparable to filled pauses in spoken languages. We conclude the discussion section by offering some suggestions for future research.

Filled and Unfilled Pauses

In the spoken language literature on hesitation markers, a distinction is usually made between filled and unfilled pauses (in addition to filler words). Thus far, we have refrained from adopting these terms in our discussion of the results. For each type of manual hesitation marker that we have described, we consider here whether they could be comparable to filled or unfilled pauses in terms of their use and function.

Firstly, PALM-UP (with or without finger wiggle) seems closest to a prototypical filled pause in spoken languages, like the English *uh*, both

in functional and distributional properties—a conclusion at which Van Loon (2012) also arrives. This type of marker does not carry meaning on its own, but it is a conventionalized sign (cf. Rose 2007), although we have seen that there is a fair amount of phonological variation in the articulation of PALM-UP both within and across signers.

PALM-UP has been attributed a wide range of other functions in NGT, some of which—such as turn-taking and floor-holding—seem compatible or even partially overlap with a hesitation marking. Other functions of PALM-UP, such as marking evaluative and epistemic stance (respectively, a speaker's attitude toward and degree of certainty about a particular piece of knowledge; see Van Loon 2012), seem somewhat farther removed. In this context, it is worth noting that filled pauses in spoken language have similarly been attributed a wide range of pragmatic and stance functions (e.g., Le Grézause 2017). Thus, the range of functions of PALM-UP seems to be broadly comparable to those of filled pauses in spoken languages. An open question is whether articulatory variation may distinguish different uses of PALM-UP, as has been shown to be the case for filled pauses in spoken languages (Clark and Fox Tree 2002; Le Grézause 2017). We briefly come back to this question in the next section.

Secondly, breaks are formally comparable to unfilled pauses: They are essentially untypically long interruptions of the sign stream, and they are semantically void. As in spoken language, the language articulators (in this case, the hands) are in a resting position. Of course, different than in spoken languages, in sign languages, the articulators are still visible to the interlocutor. In other words, breaks are not “unfilled pauses” in literal terms, but they share similarities with unfilled pauses in spoken language in terms of their use and function.

A slightly more challenging type of hesitation marker to categorize is that of holds. A strong case can be made for considering holds as unfilled pauses, as they do not represent discrete linguistic units of their own. This is in line with Maclay and Osgood's (1959, 24) definition of unfilled pauses, which includes “nonphonemic lengthening of phonemes.” On the other hand, different types of holds (simple/augmented/reduplicated) could potentially have different functions and properties, as previously suggested for co-speech gesture by Esposito et al. (2001). Based on the analysis of audio and video material from

one speaker/gesturer in dialogue with an interlocutor, the authors suggest that augmented holds are comparable to filled pauses, while simple holds are comparable to unfilled pauses in terms of their frequency and duration.

Turning to our data, we analyzed both the frequency and duration of simple versus augmented holds (we momentarily leave reduplicated holds out of consideration; Esposito et al. [2001] do not include this type of hold in their study). As described earlier in the results section, simple and augmented holds occurred approximately equally often in the dataset (twenty and twenty-six cases, respectively). This contrasts with the findings reported by Esposito et al. (2001): In their co-speech gesture data, both augmented holds and filled pauses occurred much less frequently than simple holds and unfilled pauses. They argue that this is due to a difference in function: Simple holds/unfilled pauses occur typically to signal the end of a sentence and/or as a turn-taking signal, while augmented holds/filled pauses are claimed to be used to signal word-search and other planning problems, which, ostensibly, occur more rarely. Note that the functions attributed by the authors to both types of pauses seem compatible with a signal rather than symptom perspective on hesitation markers; see the next section for further discussion on this debate.

Regarding duration, the simple holds in the data ($N = 21$) last an average of 740 milliseconds per hold (95% Confidence Interval [CI] 461 to 1020), while the augmented holds ($N = 26$) average 431 milliseconds (95% CI 372 to 489) in duration. This is in line with the results reported by Esposito et al. (2001), who show that unfilled pauses and simple holds are, on average, longer in duration than filled pauses and augmented holds in speech with co-speech gesture. Esposito et al. argue that this difference again corresponds to a difference in function: Simple holds and unfilled pauses tend to mark utterance boundaries, while augmented holds and filled pauses usually signal word-finding issues. However, the NGT data do not offer clear support for this view: Both types of holds occur approximately equally often at prosodic boundaries (62% of simple holds versus 54% of augmented holds, respectively) as they do in other locations, although data points are too few to draw any firm conclusions at present.

Overall, we find little reason to consider simple holds to be comparable to unfilled pauses and augmented holds to be comparable to filled pauses. We conclude that holds, of any type, are best categorized as a type of unfilled pause.

NGT Hesitation Markers: Symptom or Signal?

In this section, we consider whether our data can make a contribution to the symptom versus signal debate on hesitation markers. Since the literature is typically focused on the function of filled pauses in particular, we focus our attention on PALM-UP in this section, which we have just shown to pattern most similarly to filled pauses in spoken languages.

It appears that the distribution of PALM-UP across monologues and dialogues offers the clearest cue regarding its status: We found that PALM-UP (as a marker of hesitation) was almost entirely absent from the monologues, but occurred regularly in dialogues ($N = 23$). We argue that is a clear cue that signers purposefully use PALM-UP to signal a hesitation (cf. Maclay and Osgood 1959, among others), with the intention of making clear to the interlocutor that they wish to keep their turn. In monologues, this pressure is basically absent because the interlocutor is not likely to interrupt, and subtler markers of hesitation (i.e., holds and breaks), which we categorized as unfilled pauses above, generally suffice.

Turning to the position of PALM-UP in the discourse, we found that it most frequently occurred at boundary positions, although PALM-UP was also attested with some regularity within intonation/syntactic units. These results correspond quite well with those reported by Clark and Fox Tree (2002) for English, who similarly found that filled pauses were most frequent at intonation unit boundaries, then after the first word, and then in other positions.

Another interesting observation we can make is that the three instances of PALM-UP with finger wiggle (see figure 1b) were all attested in monologues. In all three cases, the signer had problems coming up with the right sign; we thus suggest that this marker is used specifically and deliberately by signers to signal a major but local issue in sign planning. The positions of the three tokens at nonboundary locations is also in line with this perspective. This ob-

ervation has potential practical implications for NGT interpreters; see the “Practical Implications for Interpreters” section down below for further discussion.

Thus, based on the data examined here, it appears that local word-finding issues and more global planning issues in NGT are marked differently: The former is marked by PALM-UP with finger wiggle, and the latter by regular PALM-UP. One could speculate that a PALM-UP with finger wiggle is comparable to a vocalic-nasal filled pause (*um*) in spoken language, as both appear to be used for signaling a major delay in signing or speech (see, e.g., Clark and Fox Tree 2002 on spoken language *um*), while regular PALM-UP is more similar to a vocalic filled pause (*uh*). However, studies on spoken languages have previously reported an overrepresentation of vocalic-nasal filled pauses (*um*) at sentence boundaries, and underrepresentation in other positions, as compared to vocalic filled pauses (*uh*; e.g., Swerts et al. 1996; Clark and Fox Tree 2002; and Shriberg 1994)—almost exactly opposite to the pattern we describe for NGT here. It seems to us that the function of PALM-UP with finger wiggle is narrower than the function of either *uh* or *um* in spoken language. Possibly, different articulatory variations of PALM-UP (e.g., one-handed versus two-handed) better compare to the *uh/um* distinction in spoken languages; further research is needed in this area.

Future Study

There are some outstanding issues, observations, and opportunities for further research into hesitation marking in NGT and other sign languages that we wish to touch upon here.

Firstly, we have not done a thorough analysis of the phonological makeup of signs that are held to mark hesitation. It seems possible to us that there is an interaction between the phonological specifications of a sign and the likelihood that it will either be held without movement (simple), with a small trajectory (augmented), or by means of reduplication, when hesitation occurs. For instance, consider again the sign CONNECT/CONTACT (figure 5). The sign involves an aperture change (thumb and index finger of both hands move to touch) but no path movement. This may make the sign more likely to be held through reduplication than by means of a path movement. Similarly,

signs that already involve a path or tracing movement may be more likely to be held by extension of that movement. We have not systematically studied such interactions, but we see this as a fruitful area for future research. If there is such a relationship, then it may further weaken the notion that simple holds are comparable to unfilled pauses, while augmented holds are comparable to filled pauses (cf. Esposito et al. [2001] for co-speech gesture), since the difference between simple and augmented holds would simply be phonologically motivated.

Secondly, we have focused primarily on manual hesitation marking in the discussion, but we have also seen that nonmanuals frequently co-occur. Most strikingly, we found that every instance of hesitation in our data involved a change in the direction of eye gaze. This, thus, appears to be a clear hallmark of hesitation that offers an additional cue to interlocutors that there is a delay in signing as a result of hesitation on the part of the signer. This pattern does not come unexpectedly, given that it has been previously reported for multiple sign languages (e.g., Baker [1977] for American Sign Language; Johnston and Schembri [2003] for Australian Sign Language; Lackner [2009] for Austrian Sign Language; also see Baker and Van den Bogaerde [2012]) that averted eye gaze is an important signal in turn-taking regulation, and that hesitation marking often signals, be it intentionally or not, that a signer wishes to keep the turn. Indeed, the importance of eye gaze as a turn-taking cue has also been described for spoken languages (e.g., Kendon 1967).

Finally, in our data, we found a subtle qualitative difference in the preferred type of eye gaze in monologues versus dialogues: The eyes were closed relatively more often in monologues, while they were more frequently open but directed downward in the dialogues. We suggest that this discrepancy can be explained as follows: The need to quite literally “keep an eye” on the interlocutor is greater in dialogues than in monologues, as there is more turn-taking regulation to be conducted than in monologues. If one breaks their gaze entirely, it could therefore complicate the turn-negotiation process. Such pressures are absent in discourse settings understood to be monologues, and thus signers can close their eyes without the risk of interruption.

Practical Implications for Interpreters

In this section, we wish to once again highlight the relative infrequency of PALM-UP with finger wiggle in our data, as we believe that this observation may be of practical use for interpreters of NGT.

As we discussed at the beginning of this paper, there are functional and distributional differences between vocalic-nasal and vocalic filled pauses in spoken languages. Importantly, however, the results reported on in this article indicate that these two types of filled pauses are not comparable to PALM-UP with and without finger wiggle in NGT. More specifically, we found that PALM-UP with finger wiggle (a) is used infrequently, and (b) is used for the specific function of signaling sign-finding problems. The use of regular PALM-UP thus seems comparable to situations where both vocalic and vocalic-nasal filled pauses are used in spoken languages.

Personal experience (one of us is a qualified NGT interpreter) led us to speculate that NGT interpreters potentially use PALM-UP with finger wiggle more frequently, perhaps due to the perception that it translates as vocalic-nasal *um*. To determine whether there is any substance to this speculation, we distributed a small, informal questionnaire with open questions among a group of twenty-five NGT interpreters ahead of an online webinar on the topic of hesitation marking in NGT, taught by the first author in the spring of 2021. In preparation for this webinar, participants were invited to think about their personal experiences with interpreting hesitations from Dutch to NGT. Interpreters were asked to reflect on how they would normally represent the hesitations of a speaker, whether they were generally aware of their own hesitations while interpreting, and if so, how they tended to express them.

The results of the questionnaire indicated that interpreters most frequently interpret hesitation on the part of the speaker by various signs, including PALM-UP with or without finger wiggle. Interestingly, the PALM-UP with finger wiggle ($N = 11$) was cited as a marker more often than regular PALM-UP ($N = 4$), even though we have seen that the former is much rarer in naturalistic NGT conversation.

Other signs mentioned by interpreters to mark hesitation include DOUBT, THINK, and fingerspelled EH (*uh*). Filler phrases that can be

translated as “where was I” or “let me think” were also mentioned as strategies, as well as the use of gestures that may be used during prolonged thinking (e.g., rubbing the chin). In addition, interpreters may point, look, or lean toward the speaker to indicate that the hesitation is the speaker’s. Changes in the direction of eye gaze as well as facial expressions like frowns were also mentioned. Finally, some interpreters indicated that they sometimes mouth *uh* or *uhm* to represent a speaker’s hesitation.

Thus, it is evident that interpreters use a wide range of strategies to reflect hesitation on the part of the speaker. Strikingly, many of these strategies involve the use of phonologically relatively heavy signs or sign strings, as exemplified by the fact that PALM-UP with finger wiggle was mentioned more often as a strategy of choice than standard PALM-UP.

We also asked the interpreters about what they do in situations in which they, themselves, are hesitating (e.g., when they have trouble understanding the speaker they are interpreting for). Interestingly, the interpreters indicated they make use of an overall much subtler range of hesitation markers in such situations, which comes closer to the observed patterns in the naturalistic signing data, as described in this article. Interpreters indicated that they would, for instance, change their signing speed or would momentarily stop signing, sometimes while holding the final sign. Changes in the direction of eye gaze and in other nonmanual expressions were also mentioned.

That is, hearing interpreters represent their own hesitations in signing similarly to those of deaf signers of NGT, while they tend to make the hesitations of the speakers they are interpreting much more explicit. Of course, this makes sense, as it should be clear whether a hesitation represented in the interpreter’s production belongs to the speaker or the interpreter. Still, the results reported in this article suggest that the use of PALM-UP with finger wiggle by deaf native signers is limited to a very specific context, namely in the case of an acute sign-finding problem.

We suggest that this more restricted use may also extend to interpreting settings. To represent hesitations signaling more general interruptions in speech, the use of, for example, regular PALM-UP would suffice. Of course, as we did not inquire about which hesitation

markers interpreters typically use in which situations in the informal questionnaire, there is still much to learn here. Empirical data is also needed to confirm the interpreters' intuitions, as described above. We hope future work will shed more light on the matter.

Conclusion

In this article, we have reported on the first corpus-based investigation into hesitation marking in Sign Language of the Netherlands. We identified both manual and nonmanual markers of hesitation in twenty monologues and twenty dialogues from the *Corpus NGT* (Crasborn and Zwitserlood 2008; Crasborn et al. 2008).

Manual marking frequently takes the form of the particle *PALM-UP* or a sign hold with or without added movement. We suggested that the former is comparable to a filled pause in spoken language, while the latter, together with breaks in which the signer's hands move into resting position, appear more akin to unfilled pauses. We showed that, in our data, *PALM-UP* is used often to mark hesitation in dialogues, but hardly ever in monologues, and we argued that this indicates that signers use *PALM-UP* deliberately as a signal toward the interlocutor that they are hesitating but wish to keep the turn. Holds do not display such a distributional difference connected to signing context.

Regarding position, *PALM-UP* occurs most frequently at the boundary of an intonational phrase, then after the first sign, and then at any other position, in line with what has been reported for filled pauses in the literature on spoken language. Holds show a similar distribution.

As for nonmanual marking, all hesitation markers in the data are accompanied by a change in the direction of eye gaze. This fits well with other works that have shown that eye gaze plays an important role in turn regulation (see Baker and van den Bogaerde [2012] for an overview). We attested various other nonmanual markings as well, but none of these occur with great consistency.

As to whether hesitation markers are a symptom or a signal of a planning issue, the NGT data offered some indication that at least *PALM-UP* has a distribution that points toward a signaling function. Specifically, it occurs frequently in dialogues but only sparsely in

monologues; this suggests that signers use this sign deliberately to signal to the addressee that they would like to keep their turn. Moreover, we found that local word-finding issues and more global planning issues are marked by different variations of the PALM-UP sign, namely PALM-UP with finger wiggle and regular palm-up, respectively.

Given that hesitation marking in sign language has been little investigated, the present study was necessarily exploratory in nature. We hope to have offered a foundation for future, more large-scale, research into the topic.

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Note

1. Also see Kimmelman (2014) on doubling as a marker of hesitation in NGT and Russian Sign Language. Since we exclude repetitions from our definition of hesitation markers in this article, we do not discuss this work further.

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