

A Corpus-Based Typology of Negation Strategies in Turkish Sign Language*

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(Received 4 January 2021; Accepted 1 August 2021)

ABSTRACT: This paper investigates the distribution of negation strategies in Turkish Sign Language (TİD) in the light of frequency-based data from a naturalistic TİD Corpus. On the basis of frequency occurrences, this study offers a novel account of negation on typological grounds: (i) by focusing on nonmanual markers, we propose that a clause can be negated with a nonmanual element only – a pattern that has been typologically proposed for other sign languages – while previous studies classified TİD as a manual dominant language in terms of Zeshan’s typology (Zeshan, 2006), (ii) Also, we argue that backward head tilt has a syntactic characteristic, not lexically specified for NOT in contrast to Gökğöz (2011), (iii) on the other hand, in line with Pfau (2016), we show that TİD can easily be categorized as a Non-Strict NC language. In addition, we argue that TİD can be classified as a hybrid negating sign language by proposing frequency-based typological distinction.

Key words: sign language, negation, typology, corpus, negative concord

* Earlier versions of this study have been presented at SignNonmanuals Workshop 2 (2019) in Graz, Theoretical Issues in Sign Language Research Conference (TISLR13) (2019) in Hamburg and Ulusal Dilbilim Kurultayı (UDK34) [National Conference on Turkish Linguistics] (2021) in Ankara. This research was supported in part by a postdoctoral fellowship from the TÜBİTAK BİDEB-2219. TİD Corpus Project was supported by the Turkish Ministry of Family and Social Services. I am grateful to all our Deaf participants for their contributions to the TİD Corpus project, without them it was impossible to complete this project. I am also grateful to the following people for valuable discussions and insights: Josep Quer, Roland Pfau, and Onno Crasborn. I would like to thank the anonymous reviewers for their insightful comments, suggestions, and efforts in helping me improve the article. Of course, all shortcomings are my own.

<http://dx.doi.org/dad.853176>

Dilbilim Arařtırmaları Dergisi, 2021/2, 111-147.

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Türk İřaret Dilindeki Olumsuzluk Stratejilerinin Derlem-Tabanlı Tipolojisi

ÖZ: Bu çalıřma, doęal TİD derleminden elde edilen sıklık tabanlı veriye dayanarak Türk İřaret Dilindeki olumsuzluk stratejilerini incelemektedir. Sıklık görünümlerini temel alan arařtırma, tipolojik temellerde olumsuzluęa yönelik yeni bir bakıř açısı sunmaktadır: (i) el dıřı belirleyicilere odaklanılarak, tümcenin sadece el dıřı birimlerle olumsuzlanabildięi gösterilmektedir -bu örüntü, tipolojik olarak dięer iřaret dilleri için öne sürülmektedir - öte yandan, TİD'e yönelik önceki çalıřmalar Zeshan'ın tipolojisine göre TİD'i el baskın dil olarak kabul etmektedir (Zeshan, 2004; Zeshan, 2006), (ii) Gökgöz (2011)'in aksine bařı geri yatırmanın sözdizimsel göreve olduęu ve DEĞİL ile sözlüksel olarak biçimlenmedięi iddia edilmektedir. (iiii) Öte yandan, Pfau (2016)'ya kořut řekilde, TİD'in katı olmayan olumsuz dili olarak sınıflandırılabilceęi gösterilmektedir. Ayrıca, sıklık-temelli tipolojik ulamlama öne sürülerek TİD'in hibrit olumsuzlama türündeki bir iřaret dili olduęu ortaya konulmaktadır.

Anahtar Sözcükler: iřaret dili, olumsuzluk, tipoloji, derlem, olumsuz uyum

1 Introduction¹

Regardless of language modality, negation is a basic universal category of all human languages (Dahl, 1979: 80). In other words, natural languages use various linguistic strategies to change the affirmative statements to negative ones. Although there are various formal approaches to negation, categorization of negation is often based on the grammatical nature of negative elements (Payne, 1985; Dahl, 2010). The previous studies to date reveal that negation in all sign languages (henceforth also SLs) can be expressed by manual elements (mostly in sentence-final position) and nonmanual negative markers (mostly headshakes). By now, this phenomenon has received a lot of attention within the field of SL linguistics, both from a descriptive and formal point of view (e.g., Zeshan, 2006a; Quer, 2012; Pfau, 2016; Johnston, 2018; Gökgöz, 2021). However, compared to spoken languages, SL typology on negation is still an objectively young research field.

It is widely known that SLs do not use only the hands in language production but, body movements and facial expressions – nonmanuality – also mark different levels of grammatical structure of signed texts such as prosody, and discourse structure (e.g., Liddell, 1980; Wilbur, 2000; Sandler, 2012). Also, different nonmanual elements have been specified to morphosyntactic

¹ Following the adopted practice in the SL linguistics literature, the signs are typically glossed in small capitals.

phenomena in terms of their functions (e.g., Pfau & Quer, 2010; Herrmann & Pendzich, 2014). Although there are so many overlapping ways in both modalities, it is not easy to describe the functions of nonmanual elements because of their multifunctional appearance (see Pfau & Quer, 2010; Puupponen et al., 2014). The challenge of this multifunctionality has generated interest among sign linguists in the last two decades.

Turning now to the TİD literature, there have been a number of studies on the descriptive and theoretical (mostly under the Generative Grammar Framework) aspects of clausal negation in TİD literature (e.g., Zeshan, 2006b; Gökgöz, 2009, 2011; Pfau, 2016; Dikyuva et al., 2017). However, as far as we know, no examination of the frequency of negation patterns based on corpus data has been carried out for the TİD context. So, the status of both nonmanual negators such as backward head tilt and the multiple expressions of negation at both the manual and nonmanual level are in need of revision. The current study aims to contribute to this research area by using corpus-based data.

With respect to the word order, it has been suggested that TİD is an SOV language. A proposed classification of negation in TİD (Zeshan, 2006b; Kubuş, 2008; Pfau, 2016) also claims that the manual negator DEĞİL/NOT occupies a clause-final position and it is not possible to negate a clause without NOT. This manual negative sign tends to be accompanied by a backward head tilt. Generally speaking, similar to other SLs, negative constructions in TİD are composed of both manual and nonmanual components.

While it is relatively older for spoken languages (e.g., Martínez, 2003 for English; Lee, 2008 for Korean; Chan & Kit, 2010 for Chinese), the use of corpora in the classification of negation typology has come to fore in the past few years for SLs (Oomen & Pfau, 2017; Lutzenberger, 2017; Johnston, 2018; Kuder et al., 2018; Klomp et al., 2019). Still, the corpus-based typological analysis of grammatical structures in SLs are in their infancy due to various constraints such as modality effects on linguistic data (see Quer & Steinbach, 2019 for overviews and discussion), and methodological difficulties (see Johnston, 2010 for discussion).

Complementing previous studies on TİD, we analyze negation strategies based on naturalistic data from the TİD Corpus that is partially annotated and described in Dikyuva, Makaroğlu and Arik (2017). It was obtained from 116 native signers from 26 different cities, including dialogues and narratives. This study is written in the spirit of displaying the importance of corpus-based data on negation typology in SLs. That is to say, we compare the quantitative data reported in this paper to those in previous studies. The reason for the special attention devoted to negation lies in the fact that the manual and nonmanual elements interact in complex and intricate ways.

The paper is organized as follows: first, Section 2.1 introduces the relevant literature on negation through a detailed representation and describes Zeshan's

(2006a) negation typology for SLs; then, Section 2.2 outlines the findings of previous studies on TİD negation patterns; and in Section 3, the corpus data employed for the analysis as well as the methodology of the TİD Corpus are presented. Section 4 shows statistical patterns and Section 5 outlines description and distribution of negative constructions. Section 6 proposes the frequency-based negation typology in SLs, and conclusions are presented in Section 6.

2 Negation Across Sign Languages

2.1 A Basic Typological Distinction

The syntactic phenomenon of negation has recently received considerable attention in SL literature (cf. Zeshan, 2006a; Pfau & Quer 2007; Quer, 2012; Pfau, 2017). SLs like Catalan Sign Language (henceforth also LSC) and German Sign Language (henceforth also DGS) (Pfau, 2016) can be negated by negative nonmanual markers (henceforth also NMMs) only. However, SLs like Italian Sign Language, in which a sentence can be negated with negative manual element only. With respect to how negation is realized, Zeshan (2006a) analyzes the typology of negation systems in signed languages, based on a dataset of thirty-eight distinct SLs, including TİD and proposes two common types of sign language with respect to negation: manual dominant or nonmanual dominant language. In nonmanual dominant SLs, it is possible to negate an affirmative statement without a manual marker. Moreover, in nonmanual dominant SLs, negative NMMs such as headshake, eyebrow raise etc. are obligatory but manual negators are optional. On the basis of her SL sample, she also emphasizes that nonmanual dominant SLs are a majority. Let us now take a closer look at the characteristics of each type in Zeshan's (2006a) typology (see Table 1).

Table 1. Basic Features of Manual and Nonmanual Dominant SLs (Zeshan 2006a)

Manual dominant	Nonmanual dominant
Nonmanual negation is not obligatory	Nonmanual negation is obligatory
Clause cannot be negated with only nonmanual markers, manual negator is required	Clause can be negated with only nonmanual markers, manual basic clause negator is optional
Choice of nonmanual marking depends on choice of manual clause negator	Choice of nonmanual marking does not depend on manual signs
Scope of nonmanual negation is over the manual negator only or is closely tied to the manual negator	Nonmanual negation is not restricted to the manual negator but it also spreads over the clause

In manual dominant SLs, basic sentential negation is expressed by a single manual negator. So, one might argue that the negative NMMs in manual dominant SLs are lexically specified negative elements. On the other hand, the characteristics of negators are different in nonmanual dominant SLs, in which NMMs seem to be independent of the manual negator.

From Table (1), one can easily assume that a prototypical manual or nonmanual dominant SL would never share the characteristics of the other. However, Zeshan (2006a: 43) admits that certain SLs may present a mixed negation behavior in which neither manual nor nonmanual negation can be considered as a primary way. So, frequency-based corpus data is still needed to obtain an in-depth typological classification.

On the other hand, previous studies reveal that except from the typological two-way split, signed languages also differ from each other with respect to the type of negative NMMs² such as headshake (henceforth also hs), brow raise

² Manual and nonmanual forms:

bht	backward head tilt
bl	brow lowering
bn	nonmanual completive aspect marker
br	brow raising
hs	headshaking
NMM(s)	Nonmanual marker(s)
pc	puffed cheeks
sht	sideward head tilt

(henceforth also br), backward head tilt (henceforth also bht) etc. and their interaction with other negative elements in numerous interesting ways. Examples given below illustrate selected negation patterns from the studies on negation phenomenon for (1) Hong Kong Sign Language (henceforth also HKSL), (2) TİD and (3) DGS.

- (1) hs
INDEX3 HAVE MONEY NOT³ (HKSL, Tang, 2006: 219)
'It is not true that he has money.'
- (2) bht
br
CHILD GO NOT (TİD, Dikyuva et al., 2017: 220)
'The child did not go.'
- (3) hs hs
WOMAN FLOWER BUY (NOT) (DGS, Pfau, 2008: 46)
'The woman does not buy a flower.'

Example (1) shows that the headshake only accompanies the main negative marker NOT with local spreading in HKSL. Example (2) illustrates that two nonmanual markers, namely bht and br, can together spread over the predicate in TİD. Lastly, (3) is an example of a nonmanual dominant negation construction in which a clause can be negated without (optional) manual negator. Taken together, the above examples (1-3) show that there is a crosslinguistic difference in terms of (i) the type and (ii) the spreading behavior of negative nonmanual markers in the signed modality.

Furthermore, the syntactic position of manual negators within the negative sentences can differ from SL to SL. For example, similar to TİD, LSC has an SOV word order, and the negative element usually appears in postverbal position as seen in example (4). While in American Sign Language (henceforth also ASL), the basic word order is SVO and the negative particle occupies the preverbal position as in example (5).

- (4) SANTI MEAT EAT NOT [LSC, Quer, 2012: 318]
'Santi doesn't eat meat.'

+ repetition of lexical or grammatical units

³ In SL literature, spoken language glosses (here English) are commonly used to identify the sign in its citation form along with all its phonological and morphological variants, see Johnston (2010) for a detailed coding system.

- (5) JOHN NOT BUY HOUSE [ASL, Neidle et al., 2000: 44]
 ‘John is not buying a house.’

Note that corpus-based studies also revealed that SLs have possible syntactic positions that negative elements can appear in clause structure. For example, in Johnston (2018), manual negators can precede or follow the verb in Auslan, as well as having a strong tendency for sentence final position.

Typological speaking, Zeijlstra (2004, 2008) suggests a distinction of three types of languages: Strict Negative Concord (henceforth also NC) languages, Non-strict NC languages, and Double Negation (henceforth also DN) languages. If a sentence holds negative status, despite the use of two negative elements, then it is called a NC language (Giannakidou, 2000, 2006). In other words, in NC, more than one negative element does not change the polarity of the negative statement to affirmative (Corblin et al., 2004). The phenomenon is illustrated by the Catalan example (clausal negative marker NO ‘not’ with pre- and post-verbal NC elements) in example (6).

- (6) Ningú (no) pensa res. (Catalan, Deprez et al., 2015: 77)
 nobody not thinks nothing
 ‘Nobody is thinking anything.’

In contrast to NC, DN languages may combine multiple negative elements in a sentence and the combination of two negators results in an affirmative statement (see Zeijlstra, 2004; Puskás, 2012).

Crucially, there is a growing body of literature where it is proposed that SLs are similar to spoken language in exhibiting NC patterns in their grammar, but they differ from them in modality specific aspects. That is, NC can be seen at the manual or nonmanual level (cf. Quer, 2007 [2002] for LSC; Wood, 1999 for ASL). Also, Quer (2012) proposed two types of NC in sign languages: (i) combination of manual and nonmanual element, and (ii) the cooccurrence of two or more distinct negative manual signs.

Pfau (2016), in line with Zeijlstra (2004, 2006) asserts that side-to-side headshake is the morphosyntactic feature of negative construction in DGS and it can be classified as a strong NC language. Also, he makes an argument based on linguistic data from two studies (Zeshan, 2006b) and (Gökgöz, 2011) that TİD is a Non-strict NC language and allows for NC between the negative marker NOT and an n-word. Let us now take a closer look at each case with examples (7-8) from previous studies.

- (7) *INDEX₁ SMOKE NEVER NOT [DGS, Pfau, 2016: 55]
 ‘I have never smoked.’

- (8) INDEX₁ SIGN KNOW NOT AT-ALL [TİD, Gökğöz, 2011: 54]
 ‘I didn’t know (how to) sign at all.’

Example (7) shows that in DGS, two manual negators (i.e., NEVER and NOT) cannot cooccur within a clause under an NC reading. So, this syntactic behavior indicates that DGS is a strong NC language. However, in TİD, NC involving the manual negator NOT and the negative sign AT-ALL is possible as seen in (8). So, more than one manual negator do not cancel each other out and the sentence is still interpreted as a negative statement. To sum up, although the linguistic expression of negation in SLs may at first seem to a two-way typological classification (i.e., manual dominant and nonmanual dominant SLs), beyond this two-way typological split, SLs within the two categories may also differ from each other considerably.

2.2 Previous Studies on Negation in Turkish Sign Language

TİD has an SOV canonical word order, and the verb is usually on the right position (Açan, 2001; Sevinç, 2006; Kubuş, 2008; Göksel & Kelepir, 2016; Dikyuva et al., 2017). First of all, various manual negators such as NOT, NEVER, CANNOT, NO-NO have been previously documented (Zeshan, 2006b; Gökğöz, 2009; Dikyuva et al., 2017). In contrast to DGS, Zeshan (2006b) argues that it is impossible to negate a sentence without the manual negator NOT, articulated with a flat hand, palm facing outward and single down to up movement (see Figure 1).

Figure 1. The Manual Negator DEĞİL/NOT in TİD (Dikyuva et al., 2017:220)



So many studies in the literature document the syntactic position of NOT in TĪD and claim that it is in a postverbal position in sentences with respect to word order as seen in Example (9) (cf., Zeshan, 2006b; Kubuş, 2008; Gökgöz, 2011). Also, as pointed out by Zeshan (2006b) and Gökgöz (2011), backward head tilt is considered to be a major NMM in negative constructions in TĪD. With respect to the domain of this nonmanual marker, it usually cooccurs only with a manual negator, as illustrated in (9).

- (9) bht
 INDEX₁ BANANA THROW_{FRONT} NOT (TĪD, Gökgöz, 2011: 66)
 ‘I did not throw the banana to the front.’

Although Gökgöz (2009: 58) shows TĪD examples of nonmanual only negation, as already mentioned, Zeshan (2006a) claims that there are two typological types of SLs with respect to negative sentences: manual and nonmanual dominant. Example (10) is used by Zeshan (2006b) to support her claim that nonmanual negation on its own cannot change the polarity of the clause in TĪD. However, even if no example is attested, Gökgöz (2011: 51) argues that the question of whether TĪD clauses are negated by manual only negatives should be taken with caution.

- (10) neg
 *INDEX₁ UNDERSTAND (TĪD, Zeshan, 2006b: 45)
 ‘I did not throw the banana to the front.’

Besides the standard negation, there are many types of negative manual negators that change the polarity of the clause on its own: negative adverbs such as NEVER (11), negative modals/auxiliaries such as CANNOT, MUST-NOT (see 12), negative existentials such NOT-EXIST (13) and negative verbs such as WANT-NOT and RECOGNIZE-NOT (TANIMAK-DEĞİL using index and middle fingers) (14) (see Zeshan, 2006b; Dikyuva et al., 2017).

- (11) neg
 INDEX₂ BOOK GIVE NEVER
 ‘You have never given the book to me.’

- (12) neg
 INDEX₁ EVENING WORK FINISH CANNOT
 ‘I cannot finish the work this evening.’

- (13) neg
 TABLE DIRTY NOT-EXIST
 ‘There is no dirty on the table.’

- (14) _____ neg
 TOMORROW MEETING JOIN WANT-NOT
 ‘I don’t want to join the meeting tomorrow.’

Although Zeshan (2006b) proposes that backward head tilt is a formal nonmanual part of negation and a statement cannot be negated without manual clause negator NOT, she does not address the question whether TİD users would negate sentences only with other negative nonmanual elements such as puffed cheeks, eyebrow raise etc. Gökgöz (2009: 68) suggested following Pfau & Quer (2002, 2007) that head tilt is a morpho-syntactic marker and brow raising is a purely syntactic marker in relation to the optionality/obligatoriness of these NMMs in TİD.

Later, Gökgöz (2011: 66) provides a table of both functional and distributional properties of negative NMMs attested in his database (n= 56 negative sentences), as seen in Table (2). Researchers have recognized that backward head tilt (attested 48% of the negative sentences in his database) is classified as a lexical negative NMM and spreads locally over the manual negative marker only or the predicate. Remember that, (9) is an example of negative clauses where bht cooccurs with the basic manual negator and does not spread over the predicate. If the bht has a lexical function only, we must further assume that it must be attached to the manual negator.

Table 2. NMMs Observed in Negation in TİD, with Hypotheses about Their Functions in the Grey Cells (Gökgöz, 2011: 66)

NMM	Local	Spreading	Lexical	Grammatical
Backward head tilt	√		√	
Headshake-1	√		√	
Headshake-2		√		√
Single head-turn	√		√	
Non-neutral brow position		√		√

Contrary to previous studies, Gökgöz (2011) also combines brow lowering and brow raising, and labels them as “non-neutral brow position” (henceforth also nbp). Although Gökgöz (2011) argues that nbp (attested 71% of the negative sentences in his database) should be considered as a syntactic negative marker, he provides no examples of this option where a statement is negated with nbp only. So, the crucial question is whether or not a sentence can be negated by “nbp” only. Leaving theoretical issues aside, as seen in here, the status of

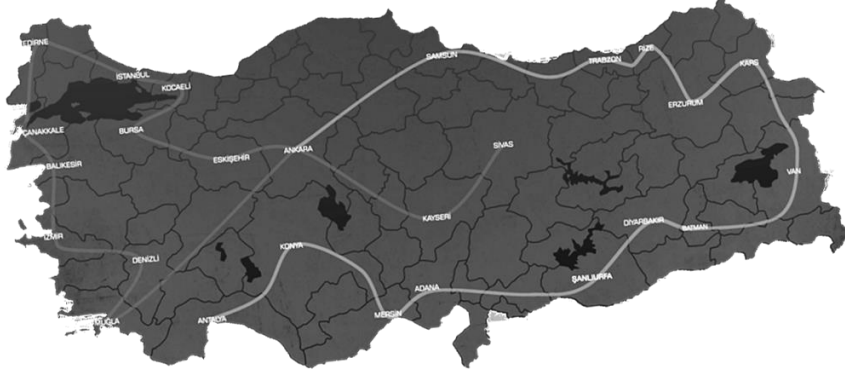
negative NMMs is now out of date and the grammatical behavior of NMMs in TİD is not clear at all.

As mentioned before (in Section 2.1.), Pfau (2016) argues that NC involving two or more manual negative elements is possible in TİD. (8) is an example of NC in which the manual negative adverbial AT-ALL follows the basic manual negator NOT. In sum, we have seen that Gökgöz (2011) assumes that TİD is a Non-Strict NC language, and *nbp* and headshake are grammatical negative NMMs. Taken together, the next question to ask would be whether the combination of at least two or more independent negative nonmanual markers in linear order and not synchronized will not cancel each other out. Even though Gökgöz (2011) does not address the availability of NC involving two independent nonmanual negators, let us briefly consider this possibility. If this alternative scenario is possible, the question then can help to test the typological characteristics of negation construction in TİD. This will be discussed in detail in Section (5.3)

3 Method

The distribution of negative clausal data is based on the TİD Corpus (Dikyuva et al., 2017) which consists of approximately 6240 minutes of digital video recordings, collected from 116 native TİD signers from 26 different cities (see Figure 2) and 7 geographical regions across Turkey. Aged between 12 and 60, the participants were deaf (≥ 75 dB pure-tone average in the better ear, confirmed by their audiometric test reports) from birth or had lost their hearing between the ages of 0 and 3 and were exposed to TİD in their earlier ages. All participants stated that they had daily contact with TİD in the Deaf community for more than 10 years (see discussions for signers' qualifications in linguistic research, Mathur & Rathmann, 2006). Semi-structured elicitation tasks in the TİD Corpus consisted of a list of topics, pictures, and movies used as material to create a natural communicative environment in signing conversations (see discussions for methodology on sign language corpora, Fenlon et al., 2015).

Figure 2. Regional Distribution of the TİD Corpus⁴



The corpus was collected in the cities in which the participants resided to get video recordings as naturalistically as possible and unaffected from sociolinguistic factors such as interlocutor-related or setting-related style shifting. Because TİD is a full-fledged natural language with its own unique grammatical rules, the topics in the list consisted of mostly a single written word to avoid the effect of Turkish as much as possible. Participants were told that they would start talking about anything related to the randomly selected topic and were informed to either change the topic from the list or use their own new topic in conversation at any time they wished. Thus, the topics in the list were only used to trigger the TİD conversations.

Due to both financial and methodological constraints, less than 30% of the TİD Corpus (approximately 240,000 sign tokens) has to date (January 2021) been transcribed (i.e., ID-gloss etc.) by the Deaf research assistants using the ELAN annotation tool (Sloetjes & Wittenburg, 2018). To begin with, the glossing of each participant file continued until our target of 10 minutes of video recordings was reached and then we proceeded onto the next video file of other participants. So, the dataset sample which was edited into 116 video clips for detailed annotation, consists of 1160 minutes of digital video recordings (see Makarođlu, 2021 for detailed information).

For the current study, the dataset consists of 520 minutes of dyadic video conversation taken from the TİD Corpus (52 files – two files for each city – almost 28% of the corpus) and was re-coded in terms of negation properties following the coding schema in Appendix 1. In addition, the information here is

⁴ The left line shows the fieldwork route — starting from Ankara, the capital of Turkey — of the first research team called the Western Team and the right line shows the route of the second research team called the Eastern Team.

only provided about the discussion topics. While the main purpose of this paper is clearly to document negation strategies in negative sentences, other negative elements (e.g., negative existential forms) have been included in the initial coding. Eventually, this paper reports the preliminary findings from the Specialized TID Negation Sub-Corpus including 66,199 sign tokens collected as part of the TID Corpus Project. The following section reveals token frequency occurrences of negation strategies and it also discusses the similarities and differences in terms of realization of negation with other SLs.

4 Frequency of Negation Strategies

Preliminary findings based on 1,249 negative sentences show some similarities to the previous descriptive studies as well as some considerable differences. Negation sentences (n= 1249) were found on average 2.4 times per minute in the dyadic interview groups and they have high occurrence compared to Kata Kolok (henceforth also KK) (Lutzenberger, 2017). As has been observed in other papers, the negation strategy with manual negators roughly corresponds to a high percentage of the frequency occurrence dataset as seen in Table (3). The simultaneous use of manual and nonmanual negative elements in negative sentences leads to a series of negative strategy possibilities. It was found that the negative sentence dataset includes 47 combinatorial options (i.e., NOT+bht+br, NOT+hs, NEVER+bht+br etc.). Let us now take a closer look at each case from our database.

Table 3. Rank Frequency Profile of the 15 Top-ranked Negative Patterns (n=47 Different Negative Strategies)

Rank	Negative strategy	N	Per (1000)	% Database	% Cumulative
1	NOT+bht+br	303	242,6	24,26%	24,26%
2	NOT+bht	206	164,9	16,49%	40,75%
3	NOT+bht+bl	116	92,9	9,29%	50,04%
4	NOT+bl	62	49,6	4,96%	55,00%
5	bht+br	34	27,2	2,72%	57,72%
6	NOT+sht	32	25,6	2,56%	60,29%
7	bht	29	23,2	2,32%	62,61%
8	NOT+hs	28	22,4	2,24%	64,85%
9	pc	23	18,4	1,84%	66,69%
10	br	22	17,6	1,76%	68,45%
11	bl	22	17,6	1,76%	70,21%
12	bht+bl	17	13,6	1,36%	71,57%
13	NEVER+hs	14	11,2	1,12%	72,69%
14	NEVER	13	10,4	1,04%	73,74%
15	NEVER+bht+br	13	10,4	1,04%	74,78%

First, it can be argued that the manual negator NOT plus backward head tilt is a distinctive pattern for negation in TİD. To make it clear, the top 3 negative patterns including NOT and bht – NOT+bht+br, NOT+bht and NOT+bht+bl – make up 50,04% of the data. On the other hand, 6 of the top 15 negative patterns (11,76% of the data) - labelled in grey- are categorized as a nonmanual only. In Section 5.1, we will discuss the spreading behavior of these markers in negative sentences without the basic manual negator NOT. As Table (3) shows, the top 15 negative patterns represent 74.78% of the current data. Overall, these data, do clearly show that NMMs (most often bht+br) can be used to negate a sentence without a manual negative sign. It is therefore clear that TİD cannot be roughly classified as a manual dominant SL since there is a substantial amount of data in which independent nonmanual negative elements can change the polarity of the statements. Also, it is worth mentioning here that Oomen & Pfau (2017), Lutzenberger (2017), and Johnston (2018) all found similar discrepancies with similar categorical claims regarding NGT, KK, and Auslan, in their corpus studies.

Furthermore, as seen in Table (3), one would deduce that bht is not lexically specified for NOT, and the manual negator can also be combined with other nonmanual markers such as brow lowering (i.e., 4th of the 15 top-ranked

negative strategies with 62 occurrences), sideward head tilt⁵ (i.e., 6th of the 15 top-ranked negative strategies with 32 occurrences), headshake (i.e., 8th of the 15 top-ranked negative strategies with 28 occurrences) etc. as well.

In Table (4) we provide an overview of the frequency profile of the 10 top-ranked negative marker tokens. Many negative sentences include more than one nonmanual negative element. So, this pattern explains that there were 2.1 negative marker tokens per negative sentence. Across all data, 6 of the top 10 negative marker tokens (62,13% of the data) - labelled in grey - are categorized as nonmanual elements and the high frequency of *bht* identifies it as the main nonmanual negator. Therefore, it is more insightful to determine the typological characterization of negative markers in terms of their token frequency occurrences.

Table 4. Rank Frequency Profile of the 10 Top-ranked Negative Marker Tokens (n=2672)

Rank	Negative marker	N	Per (1000)	% Database	% Cumulative
1	NOT	844	315,9	31,59%	31,59%
2	<i>bht</i>	745	278,8	27,88%	59,47%
3	<i>br</i>	452	169,2	16,92%	76,38%
4	<i>bl</i>	272	101,8	10,18%	86,56%
5	<i>hs</i>	95	35,6	3,56%	90,12%
6	NEVER	77	28,8	2,88%	93,00%
7	<i>sht</i>	58	21,7	2,17%	95,17%
8	<i>pc</i>	38	14,2	1,42%	96,59%
9	NO-NO	19	7,1	0,71%	97,31%
10	CANNOT	17	6,4	0,64%	97,94%

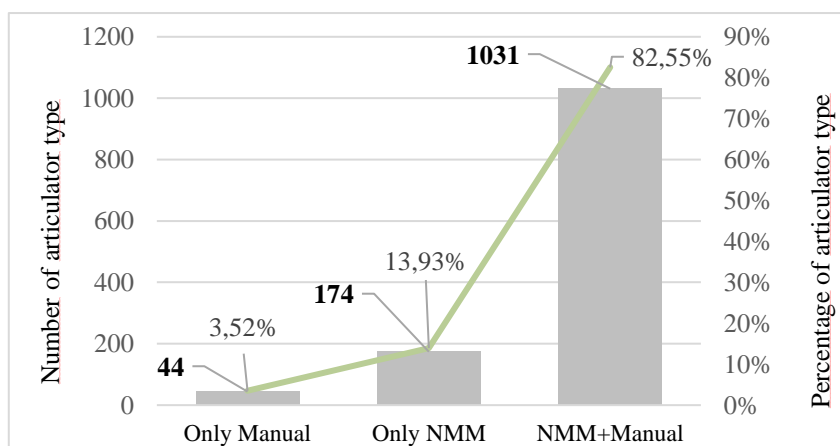
Typologically speaking, the side-to-side headshake nonmanual negator is found most frequently in European SLs, whereas using the backward head tilt is the main nonmanual strategy in Eastern Mediterranean SLs even though studies have shown that they also use headshake. Nonetheless, headshake also exists but occupies a relatively smaller proportion of nonmanual marker tokens in these SLs (see Zeshan, 2006b for TID, Hendriks, 2008 for Jordanian Sign Language, and Antzakas, 2006 for Greek Sign Language). In the current study, as Table (4) shows, headshake is ranked 4th most frequent nonmanual marker with 95 occurrences.

Another comparison can be made when looking at the occurrences of negative elements in terms of articulator type. As seen in Figure (3), the

⁵ As far as we know, this nonmanual negator has been reported for the first time in the current study.

synchronized combination of manual and nonmanual negators was the most frequent articulator type, totaling 1031 negative sentences or 82,55% of the entire data. The second most frequently used articulator type was nonmanual realization appearing in 174 negative clauses, or 13,93% of the data. The third, manual only marking (i.e., NEVER and ZERO) was seen in only 44 negative sentences or 3,52% of the data. Moreover, across all data, the majority of negative sentences (n=1205 and 96,48%) contain negative nonmanual elements, specifically, backward head tilt, brow raising and brow lowering.

Figure 3. Distribution of Articulator Type in Clausal Negation

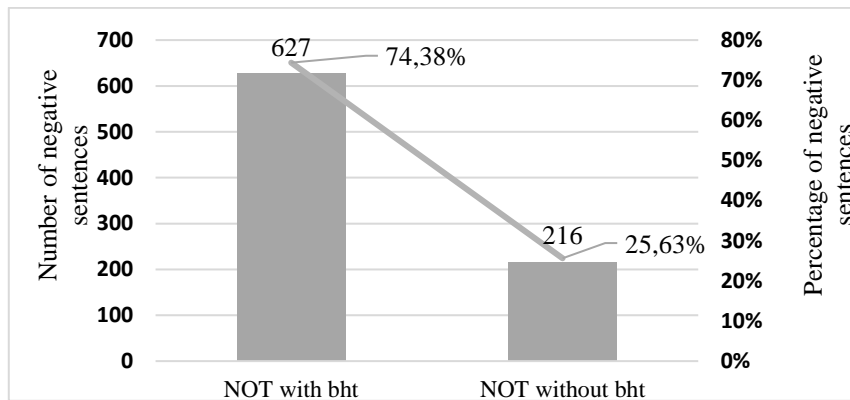


As seen in Figure (3), this distribution also changes the typological perspective of the negation phenomenon in TİD. 13,93% of nonmanual-only-negation cannot be ignored as an exceptional behavior when categorizing TİD as a manual dominant language in terms of traditional negation typology. Keeping these necessities in mind, the corpus-based data may raise a question of how much divergence (or exceptions in a traditional way) is acceptable to still categorize TİD as a manual dominant SL. Thus, TİD negation system cannot be easily classified either as manual-only or nonmanual-only as claimed before (Zeshan, 2006b; Pfau, 2016).

As is illustrated in Figure (4), the cooccurrence of backward head tilt and basic negator NOT is observed in 74,38% (n=627) of the negative sentences including manual negative marker NOT. However, this means that there were 216 negative sentences involving the manual negator but no backward head tilt. It further reveals that in 25,63% of the cases, the manual negator on its own can change the polarity of the clause or combines with the other nonmanual markers but not bht. Based on the distribution of backward head tilt, one might argue that

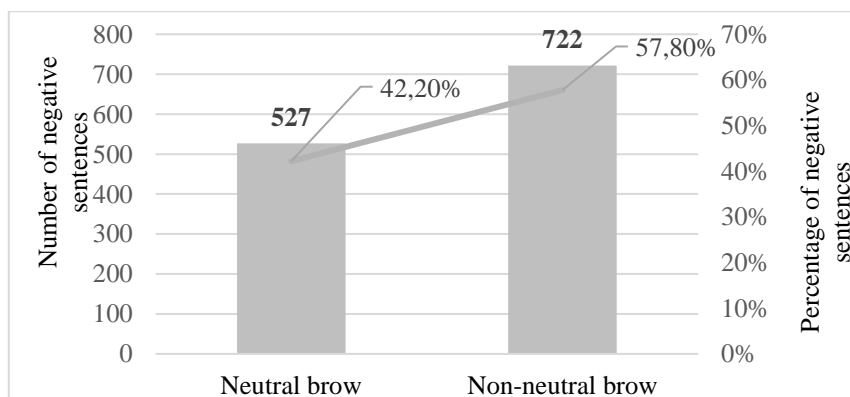
it is not lexically specified for NOT. This assumption will be discussed in detail in Section (5.1.1)

Figure 4. Distribution of Backward Head Tilt ($n=843$ Negative Sentences Involving Manual Negator NOT)



As we stated earlier, the distribution of brow position (i.e., brow raising or lowering) is another issue in negative constructions in TİD. From Figure (5) one can see that 722 negative sentences or 57,80% of all the data were negated nonmanually with non-neutral brow marking. It accounts almost for two third of the whole negation dataset. These occurrences in turn raise the question whether non-neutral brow position can be classified as a grammatical or lexical marker in negation of TİD. The issue of non-neutral appearance of the brow will be briefly addressed in Section (5.1.2).

Figure 5. Distribution of Non-neutral Brow Position in All Negative Clauses ($n=1249$)



To sum up, we find that contrary to nonmanual dominant SLs (such as DGS, headshake), TİD has more than a single NMM having a grammatical function in negative sentences. Note that, even if they make up relatively a smaller proportion of the negative patterns, TİD signers can negate the sentence only with negative nonmanual markers (i.e., bht, br, bl, puffed cheeks etc.). At the same time, the cooccurrence of the manual and nonmanual negative elements represents most of the data (82,55% as illustrated in Figure 3) and has long been recognized to be a very common negation behavior in TİD grammar. Recall that bht can function as the only negating marker in a sentence. It could be argued that the frequency data on bht illustrated in Figure (4) provides an argument against previous claims for TİD that in 25,63% of the cases, the basic manual negator NOT on its own can change the polarity of the clause or combines with the other nonmanual markers but not bht (Section 2.2).

5 Negation Strategies in Turkish Sign Language

As stated above, NMMs, such as brow raising and backward head tilt, play a crucial role in the TİD grammar. Taking into account the nonmanual negative formation, one of the central questions in the field of SL linguistics is the combination of two or more negative NMMs, and whether they are able to change the polarity of the sentence independently of each other. As it has already been pointed out in the beginning of the paper, negative NMMs – be it a backward head tilt, brow raise, headshake etc. – can be realized together to convey clausal negation. However, there is limited data in the TİD literature on negative nonmanual negators being independent of manual negative elements. The preceding section provided a detailed linguistic analysis of negative nonmanual markers in TİD grammar with assumptions on their functions.

5.1 Nonmanual Negators in Negation

Although Zeshan (2006b) strongly claims that a clause cannot be negated only by means of nonmanual negators in TİD (see example 10), we have shown in previous sections that it is possible to negate a sentence by means of only nonmanual elements – (i) non-neutral brow position, (ii) negative completive marker – puffed cheeks (pc)⁶, (iii) backward head tilt – which can change the polarity of sentences on their own without the clausal negator NOT. The following examples thus reveal that TİD does not strictly feature a manual dominant negation system – at least at first sight –, against what Zeshan (2006b) suggest. In a manual dominant system, on the other hand, a proposition can exclusively be negated by a manual marker, except for some specific contexts. In the

⁶ Portmanteau marker conveying both aspect and negation.

following discussion, however, we only include backward head tilt, brow raising and puffed cheeks.

5.1.1 Backward head tilt

The first nonmanual element we discuss in some detail is backward head tilt. As stated in Table (3), only backward head tilt marking showed up in 29 negative sentences or 2,32% of the dataset. Although Zeshan (2006b) and Gökgöz (2011) assume that the clausal negator NOT is lexically specified for backward head tilt, it can be noticed that NOT is not obligatorily accompanied by the negative NMM (cf. Table 3). Considering the example in (15), while TĪD is previously classified as a manual dominant SL, the negative sentence includes only a single nonmanual negative element. We have seen that it is possible for bht to only accompany the verb (similar to headshake in DGS, example 3).

(15)



_____ bht
STILL GROWN-UP IX₃
[65:005 S:00:05:36 E:00:05:38]⁷

‘He still hasn’t grown up.’

As is illustrated in example (16), although the manual negator NOT occurs in the sentence-final position, it is clearly seen that bht only spreads over the verb REMEMBER and the preceding sign LIKE. Visual intonation is not always clear cut in SLs but in this example, we can still observe that there are not any kind of pausing or intonational break strategy. So, this example is important for the discussion of grammatical role of the bht in TĪD. Clearly, the availability and spreading behavior of bht indicates that it is not lexically specified on the clausal negator NOT, and this is indeed a counter argument to what Zeshan (2006b) and Gökgöz (2011) suggest. In addition, the manual negator seems to be an optional negative element regarding the distribution of nonmanual markers.

⁷ [plate number/city code: file code S:hour:minute:second E:hour:minute:second]

(16)



AGE SEVEN EIGHT NINE LIKE REMEMBER NOT

_____ bht

AGE SEVEN EIGHT NINE LIKE REMEMBER NOT

'My age was like seven, eight and nine, I don't remember (exactly).'

[34:019 S:00:05:58 E:00:06:01]

According to Gökğöz (2011), bht cannot spread beyond the predicate or the negative marker NOT (30% on predicate and NOT, and 70% on a single negator attested in his data). However, as seen in example (15) and (16), the backward head tilt can spread over at least the negated element (here verb), but may optionally spread over the pre-verbal (i.e., the sign LIKE in example 16) or post-verbal position (i.e., pointing sign IX₃ in example 15). On the other hand, we also observe that the spread of bht usually has a local behavior not a full spreading (over the entire sentence), similar to what Zeshan (200b) and Gökğöz (2011) described for TİD.

The status of backward head tilt raises the question whether TİD grammar displays a grammatical variation with respect to negation or not, especially for negative nonmanual markers. First of all, it should be pointed out here that there is a considerable amount of attested lexical and grammatical variation in most SLs because of various sociolinguistic factors such as signer's age, region of origin etc. (see Lucas & Bayley, 2005; Johnston & Schembri, 2010; Stamp et al., 2014). Although earlier studies investigating lexical variation in TİD found that signer's age would be a decisive factor in particular signs such as AGE1 for older users and AGE2 for young users (see Dikyuva et al., 2017), there has been no research into morphosyntactic variation in TİD.

At first glance, the current data reveals that TİD negation does not exhibit any grammatical variation with respect to TİD signer's age. To make it clear, as example (17) shows, older TİD signers can negate the sentence with bht and br only. So, there appears to be no grammatical variation on the function and spreading behaviors of bht in TİD negation.

(17)



OVEN

COOL

 bht
 br
 OVEN COOL

[17:020 S:00:03:58 E:00:04:00]

‘As for the oven, it did not cool down.’

Additionally, as you can see in Figure (6), the regional distribution of only bht negating strategy (n=29 sentences) suggest that its distribution across the cities - labelled in black - is not limited to certain regions of cities but seen almost all the cities where the corpus data collected. By using this regional appearance, we can assume that this type of negation marking applies across Turkey with no regional variation. However, further research needs to examine the regional difference of the other negative strategies more closely.

Figure 6. Regional Distribution of Only Backward Head Tilt Negating Strategy



In sum, using the frequency profile and distributional properties, we can simply argue that contrary to previous studies (Zeshan, 2006b; Gökgöz, 2011), backward head tilt has a syntactic characteristic (rather than lexical) depending

on (i) the negative function in the absence of a manual negator, (ii) the spreading possibilities to pre-verbal and post-verbal positions, and (iii) the combination availability of the manual negator NOT with other negative NMMs (such as NOT+bl, NOT+sht, NOT+hs etc. as seen in Table 3).⁸

5.1.2 Brow raising

In this section, we will focus on the nature of brow raising in negative sentences. As shown in Table (3), brow raise only marking was attested in 22 negative sentences or 1,76% of the dataset. Example (18) exemplifies negating a clause by means of brow raising only in TİD. Although it usually cooccurs with backward head tilt (cf. Table 3), it is capable of negating sentences on its own. As for its spreading behavior, brow raising accompanies only the verb UNDERSTAND in (17).

(18)



SENTENCE TOPIC UNDERSTAND

br

SENTENCE TOPIC UNDERSTAND [21:002 S:00:06:10 E:00:06:12]
'I didn't understand the things told.'

An interesting aspect in the current data is that while Zeshan (2006b) only presents the use of headshake and head tilt in her dataset, similar to Gökgöz (2011), this study reports the role of brow raising in negative clauses in TİD. As mentioned above, he categorized all the eyebrow movements (i.e., brow lowering and brow raising) as a non-neutral brow position and found that 71% of the negative sentences in his dataset have non-neutral brow position. When

⁸ Although the syntactic structure of nonmanual negation only constructions in TİD is beyond the scope of the current study, we can simply argue that bht can occupy the Neg^o and the verb moves to the head of negation phrase to combine with nonmanual negative marker. Clearly, V-to-Neg^o movement also seems to be obligatory in this negative strategy.

compared to his findings, the current paper shows that 722 negative sentences, 57,80% of the dataset contain brow raising or brow lowering regardless of their combinations with other negators (as seen Figure 5). One can therefore see that in terms of frequency of brow movements in negative sentences, this study shares similar statistical features observed in Gökgöz (2011).

As for spreading behavior, Gökgöz (2011: 65) observes that non-neutral brow position spreads over a negative sign only in 20% of the negative clauses and over the entire sentence in 80% of the time in his dataset (n= 40 negative clauses including nbp). However, in contrast to Gökgöz (2011), we have encountered a more limited number of negative sentences in our database in which nbp has a spreading behavior over the entire sentence. It is worth pointing out that there might be a relation between the spreading behavior of the nbp and the semantic scope of negation in TİD. For now, we will leave open the question whether the spreading of NMMs has an effect on the semantic scope of sentential negation for following studies.

Taken together, we can argue that similar to Gökgöz, (2011), non-neutral brow marking should be classified as a negative nonmanual marker having a syntactic role in negation of TİD. Although the negation strategy of non-neutral brow position only constitutes a very small number (i.e., both brow lowering only and brow raising only in 22 sentences or 1,76% of the dataset) when compared to other strategies such as bht, (i) its grammatical role in the absence of a manual negator and (ii) its spreading behavior are enough to consider nbp as an independent negative marker in TİD.

5.1.3 Puffed cheeks

Another piece of evidence in favor of the possibility of nonmanual negation only strategy is puffed cheeks (i.e., air holding)⁹. In addition to head and eyebrow movements, puffed cheeks are associated with the expression of aspectual negation and indicate that the event has not come to an end (see Zeshan, 2003; Karabüklü, 2016; Dikyuva et al., 2017). Example (19) shows that the puffed cheeks can function as the sole grammatical marker of negation. As seen in Table (3), only puffed cheeks marking showed up in 22 negative sentences or 1,84% of our dataset. As for its spreading behavior, it cannot spread beyond the verb and has a local behavior. For instance, this nonmanual negating strategy cooccurs with only the verb GO in (19).

⁹ Nonmanual completive aspect marker called ‘bn’ (tongue tip is pulled out and jammed into the teeth) is regarded as a positive counterpart of this marker (Dikyuva, 2011; Karabüklü, 2016; Dikyuva et al., 2017).

(19)



pc

IX₁ IX LESS IX₁ GO [65:003 S:00:01:05 E:00:01:07]
 ‘I just haven’t gone there’

It should be pointed out here that we have not observed any example in which the manual negator NOT occurs simultaneously with puffed cheeks in negative sentences. However, these negative markers can be seen in linear order in NC constructions (as seen in example 21). To sum up, the linguistic data presented here, and the frequency profile as illustrated in Table (3) thus clearly show that it is capable of negating sentences on its own similar to backward head tilt (Section 5.1.1) and brow raising (Section 5.1.2).

5.2 Absence of Negative Nonmanual Markers

In the preceding sections, nonmanual only marking strategies have been introduced. In this section, we will present the nature of manual only marking in negative sentences. As illustrated in Table (4), we have shown that the manual marking (i.e., NEVER and ZERO) in the absence of nonmanual negative marker was seen in 44 negative sentences or 3,52% of the dataset. We therefore argue that manual-only negation is also possible in TİD as shown in example (20).

(20)



IX₁ DRINK NEVER [01:002 S:00:01:33 E:00:01:34]
 ‘I never drink it.’

In contrast to Karabüklü (2016: 163) who argues that NEVER in TİD does not negate the proposition on its own and has an emphasizing role (i.e., non-existence) in negative sentences, we observe that it can change the polarity of the sentence in the absence of negative nonmanual markers (attested 13 times in our data). For instance, it occurs without any nonmanual or manual negative element in example (21).

(21)



AGE TWENTY FOUR NEVER EUROPE SET-FOOT NEVER

‘I am 24 years old [but] never ever set foot in Europe.’

[16:002 S:00:02:35 E:00:02:36]

Let us return to the distributional behavior. The patterns of NEVER in TİD are not entirely clear to show a general tendency. In our dataset, we have observed so many combinatorial possibilities of NEVER with various negative nonmanual markers such as NEVER+hs (n=14), NEVER+bht+br (n=13), NEVER+br (n=8), NEVER+bl (n=8) NEVER+bht (n=6) etc. Although Gökgöz (2011) argues that NEVER is lexically specified for a headshake, given these patterns, we suggest that a larger study specific to NEVER in TİD is needed to systematically compare combinatorial examples of it.

5.3 Negative Concord

In this section, let us now see how combination of at least two negators can result in an affirmative statement in TİD. The current data shows that more than one negator in TİD do not cancel each other out as seen in example (22). Interestingly, based on previous discussions above (see Section 5.1), we point out that this example holds three distinct negative markers (i.e., puffed cheeks, backward head tilt and manual negator NOT), resulting in grammaticality. Thus, TİD can easily be classified as Non-Strict NC language following Pfau (2016).

(22)



pc bht
 KONYA GO NOT
 ‘I didn’t go to Konya.’

[17:004 S:00:07:59 E:00:08:01]

As you can see in example (23), NOT and the negative modal CANNOT are accompanied with a sideward head tilt (henceforth also sht) can cooccur in a sentence without changing the negative interpretation of the sentence. If we accept that sideward head tilt is an independent negative marker in negative clauses, then (23) is indeed an example of triple negation as in Example (22). However, as for spreading behavior, example (23) differs from the previous one (22) since it displays a single nonmanual marker (i.e., sht) over the two manual negators (i.e., NOT and CANNOT).

(23)



sht
 LITTLE UNDERSTAND NOT CANNOT
 ‘I couldn’t understand it a little.’

[63:010 S:00:01:52 E:00:01:53]

Similarly, in example (24), NC reading is available despite the use of two negative nonmanual markers (e.g., pc and br) and two independent markers are nonmanual elements not manual one.

(24)



$$\frac{\text{pc+}}{\text{br}}$$
 SHOPPING TAKE [17:007 S:00:00:33 E:00:00:34]
 ‘I haven’t bought anything.’

As stated above (Section 2.1), Quer (2012) proposed two types of NC in sign languages: (i) combination of manual and nonmanual element, and (ii) the cooccurrence of two or more distinct negative manual signs. Still, a third type of NC in the descriptions of signed language negation patterns is needed to characterize the combination of two discrete nonmanual markers as illustrated in example (24). We therefore argue that TİD displays a cooccurrence of two distinct negative nonmanual markers. Beyond this broad typological classification (partially changed), SLs within the three groups may also differ from each other with respect to the spreading patterns of the nonmanual negators.

Before proceeding to the frequency-based negation typology in SLs, we provide an interesting example that was attested in our database. In TİD, negative modal CANNOT2 is lexically specified with side tongue protrusion¹⁰ that is produced with protruding the tongue beyond the teeth and lips to the side of the mouth. However, as seen in example (25), the signer consciously hides this nonmanual marker in her mouth and this is not a possible articulation for TİD.

¹⁰ This nonmanual marker is also used widely for intensification as in Saudi Arabian Sign Language (see Morris & Schneider, 2012)

(25)



_____tongue
 IMPORTANT SOMETHING HAVE SPEAK CANNOT2
 ‘If there is a something important, I cannot speak.’
 [17:007 S:00:00:33 E:00:00:34]

As widely known, some mouth gestures (i.e., tongue protrusion) and handshapes (i.e., open middle finger only) in some cultures such as Turkish might be perceived as an offensive or insulting by a hearing non-signer or a hearing L2 learner (see also Loos, Cramer & Napoli, 2019 for modification of phonological parameters in taboo signs). We know, of course, that non-signers or L2 learners are sometimes a bit embarrassed to use certain facial expression. Here, we therefore assume that the social structure might affect linguistic structure of SLs. Also, this phenomenon has also been previously attested in spoken languages (see Lupyan & Dale, 2010). The implication might be that with an increasing number of L2 learners, certain language features might change (e.g., use of nonmanuals weakened)¹¹. It would be worth exploring further any other potential effects of the social structure on nonmanuals in SLs.

6 Frequency-based Negation Typology in SLs

In the previous section (Section 2.1) it was briefly mentioned that the other corpus-based studies on negation typology reveal that so many sign languages do not fit easily in any of the negation types of Zeshan’s typology. For instance, although Kata Kolok is classified as manual dominant SL (Marsaja, 2008), the corpus-based study (Lutzenberger, 2017) shows that nonmanual only negation is possible in various attested examples. Furthermore, van Gijn (2004) suggests on the basis of elicited data that the manual negator NOT is not used at all in NGT. But the corpus data discussed in Oomen and Pfau (2017) indicates otherwise, and the authors report that NGT has a great variability in sentential negation

¹¹ Personal communication with Roland Pfau.

contrary to the previous study by Coerts (1992). This clearly indicates that negative sentences in SLs hold much more possibilities than could be predicted in the classification of Zeshan's typology (cf. Lutzenberger, 2017; Oomen & Pfau, 2017; Huddleston, 2017; Kuder et al., 2018; Johnston, 2018). Beyond the strict classification of negation, intra-linguistic comparison yields quite a clear picture of possibilities in different negative constructions. So, a quantitative investigation of how negation is expressed across SLs might lead one to conclude that it is almost impossible to categorize SLs with the traditional two-way approach. We therefore argue that the frequency of negation strategies should be used to test general tendencies of negation in each specific language in the signed modality. Moreover, with the growing number of available corpus-driven studies, it is also possible to test typological hypotheses statistically.

In most typological studies, human languages have been classified as a single category (i.e., SV or VS) in a traditional way. Similarly, the negation typology in SLs (Zeshan, 2004) contains only two-way distinction (i.e., manual or nonmanual dominant). In contrast, we propose that frequency-based typology on negation in SLs helps to make more comprehensive generalizations and holds variables that are not considered in a strict typology. In contrast to the two-way distinction (Zeshan, 2004), we propose a frequency-based categorization on negation in SLs as seen Table (5)¹². The first type illustrated on the table is for SLs in which more than 80% of sentences are negated with only a manual sign. The second type is SLs in which manual only negation patterns are more than 50% of negative sentences (but no more than 80%). The third type is hybrid negating SLs in which both manual only and nonmanual only negation are less than 50% of negated sentences. We argue that TID in which both manual only (3.52%) and nonmanual only (13.93%) negation patterns do not reach this percentage is an example of this type SL. Similarly, Lutzenberger (2017: 34) shows that 14% manual only and 14% nonmanual only negation are attested in KK. So, we can conclude that KK can also be classified as a hybrid negation SL based on its frequency profile on negation. The fourth type is SLs with a moderate preference for nonmanual negating in which nonmanual only negation patterns are more than 50% of negative sentences (but no more than 80%). In their corpus-based study, Oomen and Pfau (2017: 17) reveal that 58.3% of the sentences in their dataset was negated nonmanually only with headshake in NGT. We therefore argue that NGT can be categorized to display a moderate preference for nonmanual negating. The last type is SLs where more than 80% of sentences are negated with nonmanual only.

¹² As far as we know, no one has proposed any specific cut-off criteria for SL negation yet. Thus, we propose an alternative cut-off points to tackle this question.

Table 5. Frequency-based Negation Typology in SLs

Type	Representation
Predominantly manual negating	Manual only > 80%
Moderate preference for manual negating	Manual only > 50%
Hybrid negating	Both manual only and nonmanual only < 50%
Moderate preference for nonmanual negating	Nonmanual only > 50%
Predominantly nonmanual negating	Nonmanual only > 80%

By using frequency-based types instead of categorical ones, it is possible to capture intra-linguistic variation in depth, and to determine the proportion of variability in SLs. For instance, manual only marking is seen in 3,52% of the TİD data as in Figure (3). The frequency-based classification might lead one to assume that languages in first and fifth category may be very rare across SLs.

7 Concluding Remarks

As stated above, the current study is the first to investigate negation strategies on a large corpus-based data in TİD. Although the previous studies on clausal negation propose that TİD uses both manual and nonmanual negators for expressing negative statements, they differ with respect to the type and distribution of nonmanual elements (see Zeshan, 2006; Gökgöz, 2009, 2011; Pfau, 2016). On the basis of the issues discussed in this paper we argue that, in order to understand the distribution and role of nonmanual negators in a SL, we must also take into account corpus-based data which will also provide a more detailed typological classification. In other words, in terms of linguistic reality, the linguistic corpora provide an objective tool with which sign language scholars can statically characterize a complex portrayal of the typological reality.

It is also evident that, corpus-based investigation of how clausal negation in TİD is expressed differs to some extent from previous research in that (i) contrary to Zeshan (2006b) and Pfau (2016), TİD does not strictly feature a manual dominant negation system and a clause can be negated by means of nonmanuals – be it a backward head tilt, puffed cheeks, brow raising etc. – only. (see Gökgöz, 2009 for similar argument) (ii) We argue that backward head tilt has a syntactic characteristic, not lexically specified for NOT in contrast to Gökgöz (2011) since it has a negative function in the absence of a manual negator, can spread in pre-verbal and post-verbal position and combines also with other NMMS. (iii) Depending on the grammatical role in the absence of a manual negator and the spreading behavior, following Gökgöz (2011), we suggest that brow raising is an

independent negative marker in TİD. (iv) In our corpus data, we also observe that the negative adverbial NEVER in TİD can change the polarity of the sentence in the absence of NMMs contrary to the previous study by Karabüklü (2016: 163). (v) In line with Pfau (2016), we also show that TİD can easily be classified as a Non-Strict NC language. Moreover, Quer (2012) proposes two types of NC in SLs: (1) combination of a manual and nonmanual element, and (2) the cooccurrence of two or more distinct negative manual signs. Since TİD displays cooccurrence of two distinct nonmanual markers, we partially change this broad typological classification and add a third type (i.e., combination of two distinct NMMs). It should be noted here that beyond these typological aspects, some of the proposals made in the current paper are tentative especially for formal sign linguists.

It remains to be pointed out that similar to our results, the other corpus-based studies on negation typology showed that so many SLs do not fit easily in any of the negation types of Zeshan's typology. That clearly indicates that negative sentences in SLs hold much more possibilities than could be predicted in this two-way typology (cf. Lutzenberger 2017; Oomen and Pfau 2017; Huddleston 2017; Kuder et al. 2018; Johnston 2018). In contrast to this categorical distinction (Zeshan, 2004), we therefore propose a frequency-based classification on negation in SLs as illustrated Table (5) which helps to make more comprehensive generalizations and holds variables that are not considered in a strict two-way typology. By using variables, it is possible to analyze intra-linguistic variation in depth. According to the frequency-based typology, TİD can be categorized as a hybrid negating SL. Future research involving frequency-based data on negation from more SLs are expected to provide new insights into the negation typology in the signed modality.

List of abbreviations*General forms:*

DN	double negation
NC	Negative concord
neg	stand-in for the various nonmanual negators
SL(s)	sign language(s)

Sign languages:

ASL	American Sign Language
Auslan	Australian Sign Language
DGS	German Sign Language
HKSL	Hong Kong Sign Language
KK	Kata Kolok
LSC	Catalan Sign Language
NGT	Dutch Sign Language
TİD	Turkish Sign Language

Appendix 1

The coding schema used in this study.

Tier name	Glossing function	Code
manual	manual signs	
nonmanual	nonmanual markers	
translation	translation into Turkish	
neg-manual	negative manual signs	
neg-nonmanual	negative nonmanual elements (e.g., puffed-cheeks)	
negation-type	indicates the type of negation	Standard negation Negative modal Negative existential Negative completive Negative imperative Negative interjection Negative contrast
manual-neg-presence	Presence of manual elements (e.g., DEĞİL/NOT)	0 (absent) 1 (present)
br-presence	presence of brow raising	0 (absent) 1 (present)
bl-presence	presence of brow lowering	0 (absent) 1 (present)
bht-presence	presence of backward head tilt	0 (absent) 1 (present)
hs-presence	presence of headshaking	0 (absent) 1 (present)
sht-presence	presence of sideward head tilt	0 (absent) 1 (present)
pc-presence	presence of puffed cheeks	0 (absent) 1 (present)
nonmanual-other-presence	presence of other possible nonmanual markers	0 (absent) 1 (present)
negation-combination	combination of manual and nonmanual negators	0 (absent) 1 (present)
comment	additional notes	

References

- Açan, Z. (2001). *A study on sign languages and Turkish Sign Language*. Ankara: Hacettepe University MA thesis.
- Chan, H. T. & Kit, C. (2010). Two cores in Chinese negation system: A corpus-based view. *2010 International Conference on Asian Language Processing*, (pp. 87–90). Harbin.
- Coerts, J. (1992). *Non-manual grammatical markers: An analysis of interrogatives, negations and topicalizations in Sign Language of the Netherlands*. Amsterdam: University of Amsterdam.
- Corblin, F., Déprez, V., Swart, H. & Tovenia, L. (2004). Negative concord. In Francis Corblin & Henriëtte de Swart (eds.), *Handbook of French semantics*, (pp. 417–455). Stanford: CSLI Publications.
- Dahl, Ö. (1979). Typology of sentence negation. *Linguistics* 17(1–2). 79–106.
- Dahl, Ö. (2010). Typology of negation. In Laurence R. Horn (ed.), *The expression of negation*, (pp. 9–38). Berlin: Mouton de Gruyter.
- Déprez, V., Tubau, S., Cheylus, A. & Espinal, M. T. (2015). Double negation in a negative concord language: An experimental investigation. *Lingua* 163. 75–107.
- Dikyuva, H. (2011). *Aspectual non-manual expressions in Turkish Sign Language (TİD)*. Preston: University of Central Lancashire MA thesis.
- Dikyuva, H., Makaroğlu, B. & Arık, E. (2017). *Turkish Sign Language grammar*. Ankara: Ministry of Family and Social Policies Press.
- Fenlon, J., Schembri, A., Johnston, T. & Cormier, K. (2015). Documentary and corpus approaches to sign language research. In Eleni Orfanidou, Bencie Woll & Gary Morgan (eds.), *Research methods in sign language studies: A practical guide*, (pp. 157–169). Hoboken: John Wiley & Sons, Inc.
- Geraci, C. (2005). Negation in LIS (Italian Sign Language). In Leah Bateman & Cherlon Ussery (eds.), *Proceedings of the North East Linguistics Society (NELS 35)*. Amherst, MA: GLSA.
- Giannakidou, A. (2000). Negative... concord?. *Natural Language & Linguistic Theory*, 18. 457–523.
- Giannakidou, A. (2006). N-words and negative concord. In Martin Everaert & Henk van Riemsdijk (eds.), *The Blackwell Companion to Syntax, Volume III*, (pp. 327–391). Oxford: Blackwell.
- Gökgöz, K. (2009). *Topics in Turkish Sign Language (Türk İşaret Dili – TİD) Syntax: Verb movement, negation and clausal architecture*. İstanbul: Boğaziçi University MA thesis.
- Gökgöz, K. (2011). Negation in Turkish Sign Language: The syntax of nonmanual markers. *Sign Language & Linguistics* 14(1). 49–75.
- Gökgöz, K. (2021). Negation: Theoretical and experimental perspectives. In *The Routledge Handbook of Theoretical and Experimental Sign Language Research* (pp. 266-294). Routledge.
- Göksel, A. & Keleş, M. (2016). Observations on clausal complementation in Turkish Sign Language. In Roland Pfau, Markus Steinbach & Annika Herrmann (eds.), *A matter of complexity: Subordination in sign languages*, (pp. 65–94). Berlin: De Gruyter Mouton.

- Hendriks, B. (2008). *Jordanian Sign Language: Aspects of grammar from a cross-linguistic perspective*. Amsterdam: University of Amsterdam dissertation.
- Herrmann, A. & Pendzich, N. K. (2014). Nonmanual gestures in sign languages. In Cornelia Müller, Alan Cienki, Ellen Fricke, Silva H. Ladewig, David McNeill & Jana Bressem (eds.), *Body – language – communication: An international handbook on multimodality in human interaction (Handbooks of Linguistics and Communication Science 38.2)*, (pp. 2149–2163). Berlin/Boston: De Gruyter Mouton.
- Huddleston, K. (2017). A preliminary look at negative constructions in South African Sign Language: Question answer clauses. In Alexander Andrason & Theresa Biberauer (eds.), *Stellenbosch Papers in Linguistics 48. A special issue in honor of Johan Oosthuizen*, (pp. 93–104).
- Johnston, T. (2010). From archive to corpus: Transcription and annotation in the creation of signed language corpora. *International Journal of Corpus Linguistics* 15(1). 106–131.
- Johnston, T. (2018). A corpus-based study of the role of headshaking in negation in Auslan (Australian Sign Language): Implications for signed language typology. *Linguistic Typology* 22(2). 185–231.
- Johnston, T. & Schembri, A. (2010). Variation, lexicalization and grammaticalization in signed languages. *Langage et société* (1). 19–35.
- Karabüküklü, S. (2016). *Time and aspect in Turkish Sign Language (TİD): Manual and nonmanual realizations of 'finish'*. İstanbul: Boğaziçi University MA thesis.
- Klomp, U., Oomen, M. & Pfau, R. (2019). *Headshake patterns in Neg-raising sentences in Sign Language of the Netherlands*. Paper presented at the SignNonmanuals2, University of Graz, 3–4 May.
- Kuş, O. (2008). *An analysis of Turkish Sign Language (TİD) phonology and morphology*. Ankara: Middle East Technical University MA thesis.
- Kuder, A., Filipczak, J., Mostowski, P., Rutkowski, P. & Johnston, T. (2018). What corpus based research on negation in Auslan and PJM tells us about building and using sign language corpora. In Mayumi Bono, Eleni Efthimiou, Stavroula-Evita Fotinea, Thomas Hanke, Julie Hochgesang, Jette Kristoffersen, Johanna Mesch & Yutaka Osugi (eds.), *Workshop Proceedings. 8th Workshop on the Representation and Processing of Sign Languages: Involving the Language Community. Language Resources and Evaluation Conference (LREC)*, (pp. 101–106). Miyazaki, Japan: ELRA.
- Lee, J. H. (2008). A corpus-based study of short-form and long-form negations in Korean. Hye Sook Wang (ed.), *Korean Language in America*, vol. 13, (pp. 43–57). The American Association of Teachers of Korean.
- Liddell, S. K. (1980). *American Sign Language syntax*. Den Haag: Mouton.
- Loos, C., Cramer, J. & Napoli, D. (2020). The linguistic sources of offense of taboo terms in German Sign Language. *Cognitive Linguistics*, 31(1), 73-112.
- Lucas, C. & Bayley, R. (2005). Variation in ASL: The role of grammatical function. *Sign Language Studies* 6(1). 38–75.
- Lupyan, G. & R. Dale (2010). Language structure is partly determined by social structure. *PLoS ONE* 5(1), 1-10.)

- Lutzenberger, H. (2017). *Negation in Kata Kolok: Grammaticalization throughout three generations of signers*. Graduate School for Humanities, Amsterdam: University of Amsterdam MA thesis.
- Makaroğlu, B. (2021-accepted). What the frequency list can teach us about Turkish Sign Language?. *Poznan Studies in Contemporary Linguistics*, 57 (4).
- Marsaja, G. (2008). *Desa Kolok – A deaf village and its sign language in Bali, Indonesia*. Nijmegen: Ishara Press.
- Martinez, I. M. P. (2003). Multiple Negation in Modern English. A preliminary corpus-based study. *Neuphilologische Mitteilungen* 104(4). 477–498.
- Mathur, G. & Rathmann, C. (2006). Variability in verbal agreement forms across four signed languages. In Louis Goldstein, Douglas Whalen & Catherina Best (eds.), *Laboratory phonology VIII*, (pp. 287–314). Berlin: Mouton.
- Morris, C., & Schneider, E. (2012). On selected morphemes in Saudi Arabian Sign Language. *Sign Language Studies*, 13(1), 103-121.
- Neidle, C., Kegl, J., MacLaughlin, D., Bahan, B. & Lee, R. G. (2000). *The syntax of American Sign Language. Functional categories and hierarchical structure*. Cambridge, MA: MIT Press.
- Oomen, M. & Pfau, R. (2017). Signing NOT (or not): A corpus-based study on negation in Sign Language of the Netherlands. *Linguistic Typology* 21(1). 1–51.
- Payne, J. (1985). Negation. In Timothy Shopen (ed.), *Language typology and syntactic description. Vol. 1: Clause structure*, (pp. 197–242). Cambridge: Cambridge University Press.
- Pfau, R. (2002). Applying morphosyntactic and phonological readjustment rules in natural language negation. In: Richard Meier, Kearsy Cormier & David Quinto-Pozos (eds.), *Modality and structure in signed and spoken languages*, (pp. 263–295). Cambridge: Cambridge University Press.
- Pfau, R. (2008). The grammar of headshake: A typological perspective on German Sign Language negation. *Linguistics in Amsterdam*, 1(1), 37–74.
- Pfau, R. (2016). A featural approach to sign language negation. In Pierre Larrivé & Chungmin Lee (eds.), *Negation and Polarity. Experimental Perspectives*, (pp. 45–74). Dordrecht: Springer.
- Pfau, R. & Quer, J. (2002). V-to-Neg raising and negative concord in three sign languages. *Rivista di Grammatica Generativa* 27. 73–86.
- Pfau, R. & Quer, J. (2007). On the syntax of negation and modals in Catalan Sign Language and German Sign Language. In Pamela Perniss, Roland Pfau & Markus Steinbach (eds.), *Visible variation: Comparative studies on sign language structure*, (pp. 129–161). Berlin: Mouton de Gruyter.
- Pfau, R. & Quer, J. (2010). Nonmanuals: Their grammatical and prosodic roles. In Diane Brentari (ed.), *Sign languages: A Cambridge language survey*, (pp. 381–402). Cambridge: Cambridge University Press.
- Puupponen, A., Jantunen, T., Takkinen, R., Wainio, T. & Pippuri, O. (2014). Taking non-manuality into account in collecting and analyzing Finnish Sign Language video data. In Eleni Efthimiou, Fotinea Stavroula-Evita, Thomas Hanke, Julie Hochgesang, Jette Kristoffersen & Johanna Mesch (eds.), *Proceedings of the 6th Workshop on the Representation and Processing of Sign Languages: Beyond the manual channel*, (pp. 143–48). Paris: ELRA.

- Puskás, G. (2012). Licensing double negation in NC and non-NC languages. *Natural Language & Linguistic Theory*, 30(2). 611–649.
- Quer, J. 2007 [2002]. Operadores negativos en Lengua de Signos Catalana. In Sandra B. Cvejanov (ed.), *Lenguas de Señas: Estudios de Lingüística Teórica y Aplicada*, 39–54. Neuquén: Editorial de la Universidad Nacional del Comahue, Argentina.
- Quer, J. (2012). Negation. In Roland Pfau, Markus Steinbach & Bencie Woll (eds.), *Sign language: An international handbook*, (pp. 316–339). Berlin: Mouton de Gruyter.
- Quer, J. & Steinbach, M. (2019). Handling sign language data: the impact of modality. *Frontiers in psychology* 10. 483.
- Sandler, W. (2012). Visual prosody. In Roland Pfau, Markus Steinbach & Bencie Woll (eds.), *Sign language: An international handbook*, (pp. 55–76). Berlin: Mouton de Gruyter.
- Sapountzaki, G. G. (2005). *Free functional elements of tense, aspect, modality and agreement as possible auxiliaries in Greek Sign Language*. Bristol: University of Bristol dissertation.
- Sevinç, A. M. (2006). *Grammatical relations and word order in Turkish Sign Language (TİD)*. Ankara: Middle East Technical University MA thesis.
- Sloetjes, H. & Wittenburg, P. (2018). *ELAN (version 5.2)*. Nijmegen: Max Planck Institute for Psycholinguistics. <https://tla.mpi.nl/tools/tla-tools/elan/> (accessed 20 November 2019).
- Stamp, R., Schembri, A., Fenlon, J., Rentelis, R., Woll, B. & Cormier, K. (2014). Lexical variation and change in British Sign Language. *PLoS One* 9(4).
- Tang, G. (2006). Questions and negation in Hong Kong sign language. In Ulrike Zeshan (ed.), *Interrogative and negative constructions in sign languages*, (pp. 198–224). Nijmegen: Ishara Press.
- van Gijn, I. (2004). *The quest for syntactic dependency: Sentential complementation in Sign Language of the Netherlands*. Amsterdam: Universiteit van Amsterdam doctoral dissertation.
- Wilbur, R. (2000). Phonological and prosodic layering of nonmanuals in American Sign Language. In Karen Emmorey & Harlan Lane (eds.), *The signs of language revisited*, (pp. 215–244). Mahwah, NJ: Lawrence Erlbaum.
- Wood, S. K. (1999). *Semantic and syntactic aspects of negation in ASL*. West Lafayette, IN: Purdue University MA thesis.
- Zeijlstra, H. (2004). *Sentential negation and negative concord*. Amsterdam: University of Amsterdam dissertation.
- Zeijlstra, H. (2008). *Negative concord is syntactic agreement*. Manuscript, University of Amsterdam. <http://ling.auf.net/lingBuzz/000645> (accessed 30 November 2019).
- Zeshan, U. (2003). Aspects of Türk İşaret Dili (Turkish Sign Language). *Sign Language & Linguistics*, 6 (1), 43-75.
- Zeshan, U. (ed.). (2006a). *Interrogative and negative constructions in Sign Languages*. Nijmegen: Ishara Press.
- Zeshan, U. (2006b). Negative and interrogative structures in Turkish Sign Language (TİD). In Ulrike Zeshan (ed.), *Interrogative and negative constructions in Sign Languages*, (pp. 128–164). Nijmegen: Ishara Press.