

PHONOLOGICAL AND MORPHOLOGICAL ASPECTS OF LEXICALIZED
FINGERSPELLING IN TURKISH SIGN LANGUAGE (TİD)

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Thesis Abstract

Süleyman Sabri Taşçı, “Phonological and Morphological Aspects of Lexicalized
Fingerspelling in Turkish Sign Language (TİD)”

In this study, we aim to analyze certain morphological and phonological characteristics of lexicalized fingerspelling in Turkish Sign Language (TİD). Fingerspelling is a system which represents the characters of a writing system by certain handshapes and compositions of handshapes in sign languages. The words are, in sign languages, expressed through hands having various configurations, movements and locations. Fingerspelling is a secondary system in sign languages which allow interaction with spoken languages in terms of code-switching, code-mixing, and borrowing. In this thesis, we focus on the structure of borrowed words which are lexicalized and listed in the lexicon of Turkish Sign Language, namely, lexicalized fingerspelling.

We explain a divergence point of TİD manual alphabet from TİD phonology which is the movement of the nondominant hand in the letter Ğ.

We have suggested several features of the phonological structure of lexicalized fingerspelling by adopting the Hand-Tier model. Two rules were posited in order to account for the hand reversal in the lexicalization of one-handed letters. Another suggestion was that the place of the hand arrangement tier in the hand configuration hierarchy should be changed. In addition, TİD data revealed that movement plane is a phonological feature which is necessary to explain assimilation phenomenon.

We have proposed that repetition or lengthening operate as morpheme structure constraints on the lexicalizations of fingerspelled letters. We categorize the polymorphemic forms which have a fingerspelled letter and a sign as compounding. In addition, we exemplify the constraints on word-formation through fingerspelling such as phonological blocking, syntactic blocking, and synonymy blocking.

The linguistic phenomena we have explained show that fingerspelling can be used by sign language. On the other hand, fingerspelling is not a part of TİD grammar because it is an invented system and it has many non-grammatical and non-linguistic features. On the other hand, the lexicalizations of fingerspelling are mostly integrated into the structure of the language.

Tez Özeti

Süleyman Sabri Taşçı, “Türk İşaret Dili’nde Harfli İşaretlerin Birimbilimsel ve Biçimbilimsel Özellikleri”

Bu çalışmada, Türk İşaret Dili’ndeki (TİD) harfli işaretlerin birimbilimsel ve biçimbilimsel özellikleri incelenmektedir. Parmak alfabesi, bir yazı sistemindeki karakterlerin çeşitli el şekilleri ve bu el şekillerinin bir araya gelmeleriyle temsil edildiği bir sistemdir. İşaret dillerinde sözcükler ellerin şekilleri, yerleri, bir araya gelme biçimleri ve hareketleri ile ifade edilir. Parmak alfabesi işaret dilinin doğal yapısının dışında ikincil bir sistemdir. Parmak alfabesi, konuşma diliyle dil kaydırma, dil karıştırma ve ödünç alma gibi yollarla etkileşim kurar. Bu tezde, Türk İşaret Dili’nin Türkçe’den ödünç alıp sözcükselleştirdiği ve kendi dağarcığına kattığı işaretlere, yani harfli işaretlere odaklanılacaktır.

Harfli işaretler hakkındaki analizler Katmanlı El modeli benimsenerek yapılmıştır. Çalışmadaki önerilerimizden biri TİD parmak alfabesindeki Ğ harfinin TİD’in birimbilimsel yapısından ayrıldığı noktaya değinmektedir. Tek elli harflerin sözcükselleşmesindeki el çevrimini açıklamak için iki kural öne sürülmüştür. Diğer bir önerimiz, el düzenleme katmanının el biçimlenimindeki mertebesinin değiştirilmesidir. Buna ek olarak TİD verileri göstermiştir ki hareket yüzeyi, benzeşme olaylarını açıklamak için birimbilimsel bir parça olarak kabul edilmelidir.

Biçimbilimsel yapıya bakılacak olursa, tekrarlama veya süre uzatmanın biçimbirim yapısı kısıtlandırmalarından biri olduğu öne sürülmektedir. İçinde bir harf ve başka bir işaret barındıran çokbiçimbirimli işaretleri birleşik sözcük olarak sınıflandırılmaktadır. Ayrıca, parmak alfabesinin sözcükselleşmesini kısıtlandıran birimbilimsel engelleme, sözdizimsel engelleme, ve eşanlam engellemelerini örneklendirilmektedir.

İncelediğimiz dil olayları işaret dilinin parmak alfabesinden nasıl faydalanabileceğini göstermektedir. Ancak parmak alfabesi TİD gramerinin bir parçası değildir çünkü parmak alfabesi, işaret dilinin aksine insanlar tarafından bilinçli olarak oluşturulmuş bir sistemdir, birçok gramatik olmayan dildışı özelliklere sahiptir. Öte yandan, parmak alfabesi sözcükselleştiğinde belli ölçülerde dilin yapısına uyum sağlayabilmektedir.

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CHAPTER 1

INTRODUCTION

1.1 Aim and Layout of the Thesis

The aim of this thesis is to give an account of a number of phonological and morphological aspects of a sample of the lexical items which contain fingerspelling in Turkish Sign Language (TİD).

Fingerspelling was firstly studied by Battison (1978) for American Sign Language. Her analyses and the subsequent literature on fingerspelling (see Brentari & Padden 2000) demonstrated that the phonological structure of the language reshapes fingerspelled letter when they are lexicalized. This was a proof of the existence of a grammatical phonological structure in American Sign Language.

With a similar point of view, we aim to explain structural motivations behind the phonological changes and morphological processes in lexicalized fingerspelling. We aim to understand the situation of fingerspelling as an extralinguistic system in the natural structure of TİD. From our data, we have drawn 130 items of lexicalized fingerspelling in total which we illustrate in Appendix D.

In Chapter 1, we introduce the Hand-Tier model, the existing literature on the morphology and phonology of TİD, our methodology, and finally, notation conventions and abbreviations which are used throughout the thesis.

In Chapter 2, the history of fingerspelling and TID manual alphabet will be presented. Later on, we will briefly touch upon the functional and sociolinguistic aspects of fingerspelling.

Chapter 3 is a short description of the phonological specifications and structural properties of TID fingerspelling.

The aim of Chapter 4 is to give an account of two phonological processes related to lexicalized fingerspelling, namely, hand reversal and assimilation.

Chapter 5 discusses word-formation through fingerspelled letters and the internal structure of compounds with fingerspelling. Moreover, we will touch on the constraints on the lexicalization of fingerspelling and listedness of lexicalized fingerspelling.

Chapter 6 targets questioning the linguisticity of fingerspelling. Towards this aim, we ask whether fingerspelling is a part of grammar, compare alphabets and fingerspelling systems, and finally discuss the linguistic and non-linguistic traits of fingerspelling.

In Chapter 7, we draw general conclusions and designate possible paths for future research.

1.2 The Hand-Tier Model

In this section, we briefly present the model we use for sign language phonology: the Hand-Tier model (Sandler 1986, 1989; Sandler & Lillo-Martin 2006). This model is inspired from non-linear models of phonology such as autosegmental phonology, hierarchical feature organization, dependency relations, syllable theory, and prosodic morphology and phonology.

There are other models of sign language phonology such as the Segmental model (Liddell & Johnson 1989, 2011), the Prosodic model (Brentari 1998), and the Visual Phonology model (Uyechi 1996). We selected the Hand-Tier model because of it was capable of capturing the phonological processes which we aimed to explain.

In sign language phonology, there are most generally three parameters of contrast: Handshape, location and movement. In the Hand-Tier model, these are put together under ‘hand configuration’ (HC).

There is a timing tier (skeleton) and we find location (L) and movement (M) segments on the timing tier. This idea is borrowed from Liddell and Johnson’s (1989) Move-Hold model. Unlike the Move-Hold model, however, which has feature bundles for each and every segment, in the Hand-Tier model, “Location, Movement, Location” segments are associated with a single hand configuration node in three-to-one fashion. Place (of articulation) is another node which is associated directly with the skeleton (L M L). See Figure 1 below for a schema of hand configuration

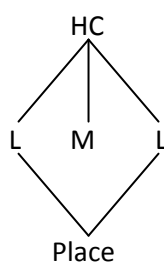


Fig. 1 Hand configuration schema

Hand arrangement, i.e. whether one hand or two hands are involved in a sign, and their functional relation to each other (Klima & Bellugi 1979), is represented by an h1 node for one-handed signs and h1 and h2 nodes for two-handed signs where two hands move independently. The selected fingers component (SF) is composed of

several handshape features and orientation. SF is linked to the hand arrangement tier. See Figure 2 below for the representation of a one-handed sign on the left, and a two-handed sign on the right. Note that HC is the top-most mother in the overall hierarchy although it appears below hand-arrangement and SF. See Figure 3 for the HC hierarchy and the feature classes of the Selected Fingers node.

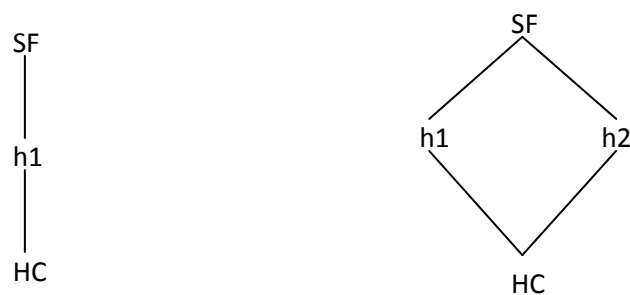


Fig. 2 Hand arrangement in the Hand-Tier Model

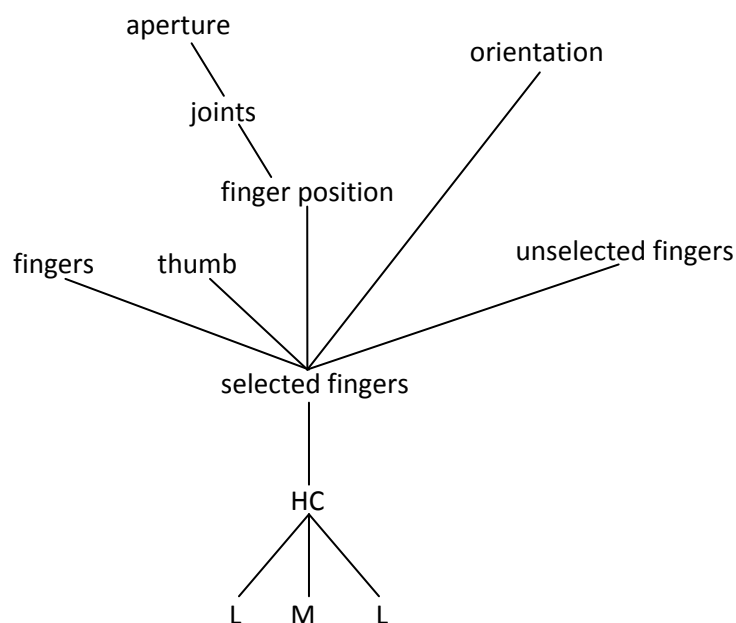


Fig. 3 Schematic representation of 'selected fingers' and its feature classes in the HC hierarchy

As for place of articulation, there are major body areas such as trunk, head, h2, etc.

This place node has a setting specification such as low, high, proximal, distal, etc.

Movements which have a setting change are called ‘path movement’ and indicated as a feature bundle of the M segment. Movements which occur in the hand (e.g., movement of fingers) are called hand-internal movement. They are represented as branching of the ‘aperture’ nodes (opening or closing the fingers selected in the sign), or branching of the orientation node. See Figure 4 below for sample representations of hand-internal movement (e.g., orientation) and path movement.

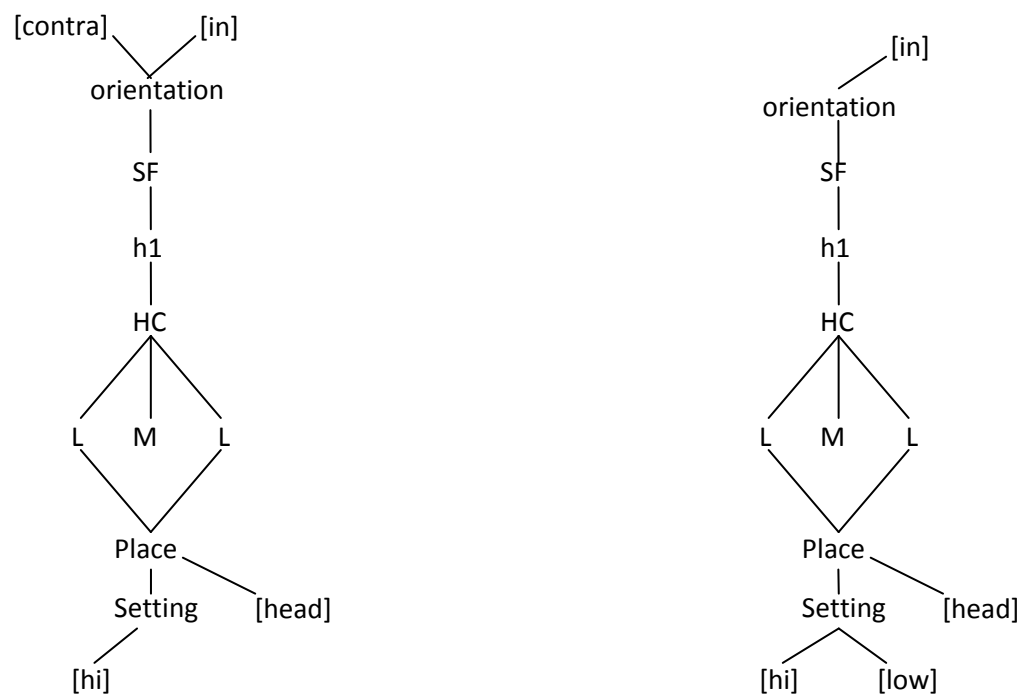


Fig. 4 Sample representations of hand-internal movement (on the left) and path movement (on the right)

We will expand on specific aspects of the Hand-Tier model in the subsequent chapters.

1.3 Previous Works on TİD Morphology and Phonology

In the bulk of this thesis, we have benefited and drawn from Kubuş (2008) which is the first comprehensive study on TİD morphology and phonology. This work involves a handshape inventory of TİD, allophonic handshapes, the TİD manual alphabet and phonological processes related to the manual alphabet. Kubuş's study involves morphological processes such as nominalization, pluralization, borrowing through fingerspelling, negation, fused signs, and numerical incorporation. Previously, Zeshan has two papers (2002, 2003) about the grammatical structures of TİD such as non-manual marking and incorporation. Compounding (Kubuş 2008; Kan & Gökgöz 2009), and especially classifiers (Kubuş 2008; Zeshan 2002, 2003; Arık 2009) have been topics of study in TİD.

Again we will refer to these studies in more depth in the subsequent chapters.

1.4 Methodology

The data of this study were extracted from the following web dictionaries: The TİD source page of Boğaziçi University (2008-2010), Koç University Turkish Sign Language page (Özyürek, İlkbaşıran, Arık 2004), SpreadtheSign.com which is published by European Sign Language Center (2010).

In addition to the data from those websites, we used the TİD course material by Dikyüva and Zeshan (2008) and a TİD dictionary by Ministry of Education

(1995). We have also consulted one native deaf signer and two near-native deaf signers for additional data and clarifications.

We searched these sources and found the items which are lexicalized through fingerspelling. Nevertheless, we can be missing some lexicalizations since we do not know the etymology of signs. For example, KURS ‘course’ and FESTİVAL ‘festival’ might be lexicalized signs by employing fingerspelling. We can not claim with certainty that they have a fingerspelled origin since the handshapes contained in K () and F () are members of the handshape inventory of TİD. In other words, these handshapes are also attested in TİD signs which are not related to fingerspelling. We left out this kind of items from our data.

There are 130 items of lexicalized fingerspelling in total which are listed in Appendix D. As for the items from the Spreadthesign (Appendix D-iv), we have excluded the items which have multiple letters or words of which all letters are fingerspelled one by one.

1.5 Notations and Abbreviations

In this section, we present the notation conventions existing in the literature and expansions of abbreviations which are used in this study.

- Capital letters indicate:

- (i) Turkish gloss for a sign. e.g., HIZLI ‘fast’, TÜRK-EDEBİYATI ‘Turkish Literature’, LİSE ‘high school’
- (ii) One-by-one fingerspelling. e.g., Y-T-L, H-A-S-A-N

- Underlined capital letters indicate the fingerspelled letter which is lexicalized and appear in the sign. e.g., LİSE ‘high school’, TÜRK-EDEBİYATI ‘Turkish Literature’

- Body contact and classifiers are regarded as morphemes and indicated by lower case letters and book style capitalization. Classifiers have “CL” in the subscript. e.g., ‘potato’ = Mouth-Contact^round-object_{CL}

“^” : When there is a morpheme by morpheme glossing in polymorphemic forms, symbol is used to indicate a morpheme boundary. e.g., TÜRK^E

“-” : Turkish words with a dash between indicate the Turkish translation. e.g., TÜRK-EDEBİYATI

“=” : The translation of a sign is on the left hand side of “=”. Morpheme by morpheme glossing of a sign is on the right hand side of “=”. English translations and English glosses are in parantheses with lower-case letters. e.g., TÜRK-EDEBİYATI = TÜRK^E (‘Turkish Literature’ = Turkish^E)

“/” : The mouthed words are put inside slashes. e.g., /cemiyet/

Abbreviations:

ASL American Sign Language

AusLan Australian Sign Language

BSL British Sign Language

CL Classifier

DGS German Sign Language

FS Fingerspelling

h1 dominant hand

h2 non-dominant hand

HC	Hand Configuration
L2	Second language
LSF	French Sign Language
NGT	Sign Language of the Netherlands
TİD	Turkish Sign Language
SF	Selected Fingers

CHAPTER 2

BACKGROUND ON FINGERSPELLING

In this chapter, we define and explain the types of manual alphabets which are used in sign languages from various parts of the world. Later on, we tell the story of manual alphabets from a historical perspective. Next, by presenting original evidence from our interviews¹ and archival documents² we will portray the history of the two types of fingerspelling in Turkey one of which has become obsolete now. Finally, we will point to the functional aspects of fingerspelling in sign languages such as usage frequency, code-mixing, and mouthing.

2.1 Manual Alphabets

The manual alphabet is a collection of signs which are based on the shapes of the letters of a script. If a manual alphabet uses one hand, it is called *one-handed manual alphabet* (See Figure 5, Section 2.1.1). If both hands are used in a manual alphabet, it is called *two-handed manual alphabet* or *bimanual alphabet* (See Figure 6, Section 2.1.1). One-handed manual alphabets are predominant across sign languages. For example, the most widely studied sign languages such as ASL, NGT, and DGS have one-handed manual alphabets. Two-handed manual alphabets have

¹ Some of these interviews were conducted with my colleague Deniz İlkbařaran for our ongoing research (İlkbařaran & Tařçı forth.)

² I owe great thanks to Kadir Turgut for helping me find important historical documents and transliterating them into Turkish during the preparation of Turgut & Tařçı 2011.

been attested in the former Yugoslavia, Indonesia, Grand Cayman, Germany, Norway, the USA, and the British Isles (Sutton-Spence 2006). Today, some languages which have two-handed manual alphabets are Turkish Sign Language, Czech Sign Language, British Sign Language, Australian Sign Language, and New Zealand Sign Language.

2.1.1 History of Fingerspelling

Historical accounts show that in the times of antiquity in Greece and Rome, a type of fingerspelling was used among some people (Padden & Gunsauls 2003). The earliest documented fingerspelling system, however, goes back to the seventh century monastic institutions. Certain monasteries³ had a silence tradition which prohibited speaking in the monastery except at certain times of the day for religious reasons⁴ (Kendon 2004). However, because of the need for communication, the monastery allowed a list of signs (ibid.), along with fingerspelling (Plann 1997, cited in Padden & Gunsauls 2003).

The transition from the monastic setting to the educational setting occurred when these two settings came together (Plann 1997, Padden & Gunsauls 2003). Among the well-off families, there was a tradition of sending children with disabilities to monasteries. In Spain, when the monks demonstrated that deaf children could be educated, some families hired tutors to educate their deaf children to make them legible for purposes of inheritance. According to Plann's speculations, the

³ Kendon (2004) suggests Rijnberk (1954), Umiker-Sebeok & Sebeok (1987), Kendon (1990b), Bruce (2007) for further reading.

⁴ Pfau (2011) quotes from the Rule of Benedict from the sixth century: "Therefore, because of the importance of silence, let permission to speak be seldom given to perfect disciples even for good and holy and edifying discourse, for it is written: 'In much talk thou shalt not escape sin' (Prov 10:19)."

monks introduced the manual alphabet to the children in these home-settings for teaching the articulation of sounds and reading.



Fig. 5 Bonet's reproduction of the manual alphabet from de Yebra's Book (1620) (<http://en.wikipedia.org/wiki/Fingerspelling>)

In 1593, Melchor de Yebra, a Spanish priest, wrote a book to give spiritual guidance to sick people or people having a terminal illness (Plann 1997). In Spain, Juan Pablo Bonet wrote the first book about deaf education in 1620 (ibid.) where he reproduced the fingerspelling system in Melchor de Yebra's book⁵ (Padden & Gunsauls 2003). Later on, some other educators in Europe also adopted this manual alphabet, including Laurent Clerc who eventually co-founded the Hartford Asylum for the Deaf in the United States with Thomas Hopkins Gallaudet and introduced French

⁵ De Yebra, Melchor (1593). *Refugium Infirmorum*. Madrid:Luis Sánchez. fols.174-179. pp. 361-371 (in the pdf which is downloadable in Google Books).

Sign Language there. Due to Bonet's publication, this system permeated into the Americas and to Europe (Plann 1997).

What we have discussed up to now was the history of the one-handed manual alphabet which is the origin of most one-handed manual alphabets used today. Now we will briefly introduce the history of two-handed manual alphabets. There are two types of bimanual alphabets: *Arthrological* and *Dactylological*. In arthrological manual alphabets, the letters are represented by pointing to the joints of hand. In Britain, there was an arthrological system before the eighteenth century (Sutton-

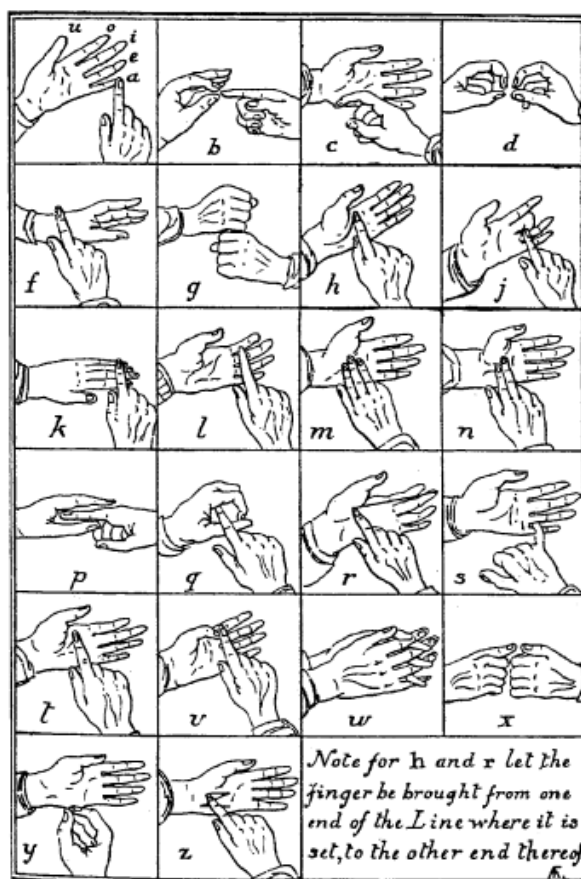


Fig. 6 The manual alphabet from *Digiti Lingua* (1698)
(From Sutton-Spence 2006, p. 271)

Spence 2006). After an anonymous publication in 1698 called *Digiti Lingua* (See Figure 6), most of the arthrological letters left their place to the two handed letters

which were composed of various handshapes (ibid). The present day British Sign Language (BSL) manual alphabet is dactylological except for vowels which are arthrological. The TİD bimanual alphabet does not have any arthrological letter. All letters are dactylological in TİD.

With the British Empire, BSL fingerspelling was brought to various parts of the world such as India, South Africa, Uganda, Australia and some areas in Eastern Canada, and these countries have manual alphabets which are very similar to those of the British two-handed fingerspelling system (ibid).

2.1.2 History of TİD Manual Alphabets

According to our knowledge so far, the first TİD manual alphabet documented was put to use at the end of the nineteenth century⁶, at the first deaf school opened in Turkey which was called *Dilsiz ve Âmâlar Mektebi* [School for the Deaf and Blind] in İstanbul (Haydar 1925, Busse 1994). The founder of the school, an Austrian Merchant Ferdi Grati adopted the manual alphabet of French Sign Language (LSF) which apparently has its roots in Bonet's book in some way (See Figure 7 and 8). Grati made some adaptations for the Arabic letters which are similar in phonetic characteristics or similar in the shape of the letter. For example, the Arabic letters which have diacritics are pointed downwards. The velar nasal (referred to as 'sağır kef' in Ottoman Turkish) is an orientation-wise modified version of alveolar nasal N (Nun). Voiced alveolar fricative (Ze) also changes its facing and

⁶ The school was founded in 1889 according to Haydar (1925). In Grati's Volta Bureau report (1898), it is reported as 1891 (cited in Miles 2009). Miles suggests that incongruence of dates is expected in the history of special schools.

becomes the voiced interdental fricative (Zel). We also realize that orientation is modified to get a letter close in the shape of the script or phonetics for the

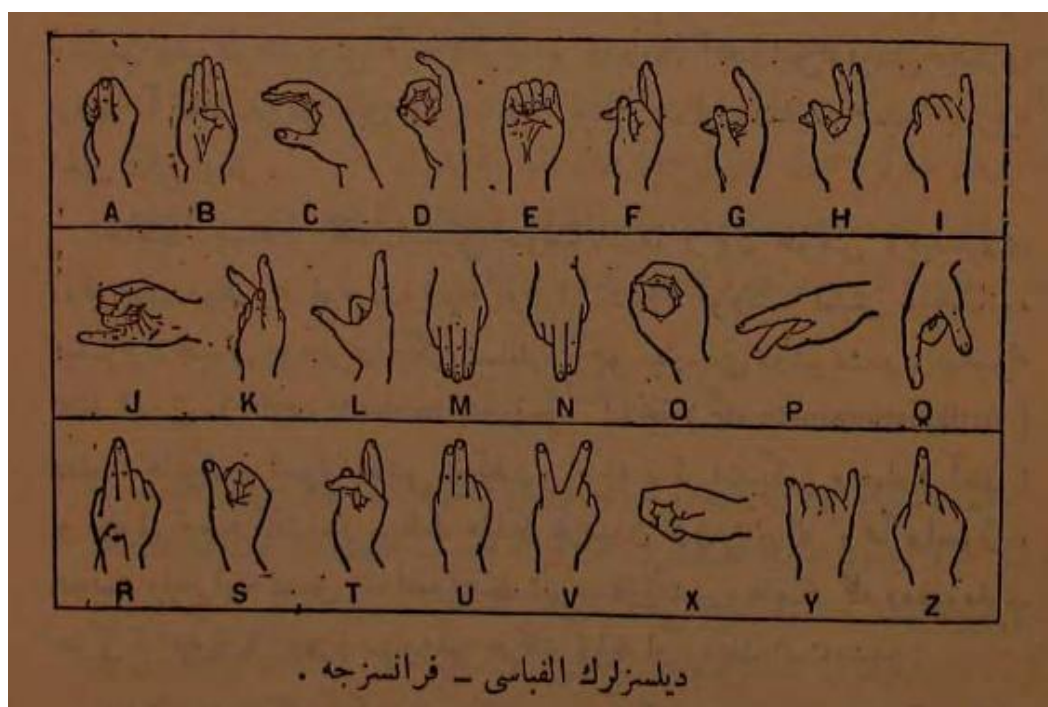


Fig. 7 The LSF Manual Alphabet in Haydar 1925, p 1243. ‘Mutes Alphabet - French’⁷



Fig. 8 First manual alphabet documented in Turkey (Haydar 1925, p.1252; Latin characters on handshapes are added by me)⁸

⁷ Transliteration to Turkish: Dilsizler Elifbâsı - Fransızca

⁸ The writing under the picture is: “Harfler sağdan sırasıyla” [The letters respectively from the right]. Then 32 letters are given, however the letter that stands for the palatal/velar nasal is missing. The line below is: “Türkçe Dilsiz Elifbası” [Turkish Mute/Silent Alphabet]. The writing at the bottom and left

following letters: Elif-Ayın [a, e]-[‘, h], Cim-Çim [c]-[ç], Dal-Dad [d]-[d, z], Ha-Hı-He [h]-[h]-[h, a, e], Nun-Sağır Kef [n], Sin-Sad [s]. In Kef-Gef pair, middle finger is added to the hand configuration of Kef. In Sin-Şın pair, Şın’s orientation is changed and index finger is extended. This fingerspelling system is shown in Haydar (1925),



Fig. 9 Photograph from *Servet-i Fünûn* Journal - The students of Grati Efendi’s deaf school fingerspell “Padişahım Çok Yaşa” [Long Live the Sultan]⁹

Muallimler Mecmuası [Teachers’ Journal] (See Figure 8). In a photograph from a 1893 issue of *Servet-i Fünun* journal, we see the students and the teachers of the first deaf school in İstanbul. The pupils are fingerspelling the phrase: “Long live the Sultan” (See Figure 9).

side of the picture is: “Târih-i tesis ve küşâdı [The date of foundation and opening] 305 [1305=1889/1890, This date should be 1889 according to the exact Rumi date which Haydar gives: 19 Eylül 1305=1 October 1889]”

⁹ *Servet-i Fünûn* 1893, v.129, p.235. The circles and the names of the letters are added by me. The writing under the picture says: “Müessesât-ı Hazreti Pâdişâhî’den Dilsizler Mektebi Muallimîn ve Şâkirdânı. Şâkirdânın işâret-i vâkıâsı dilsiz lisaniyle padişahım çok yaşa dua-yı vâcib-ül edâsını îâmâ eder.” [The students and the teachers of the Mutes School, one of the institutions of the Padishah, his excellency. The signs of the students express the prayer ‘long live the padishah’]

2.1.2.1 Continuity in the One-Handed TİD Manual Alphabets

After the alphabet reform in 1928, Turkey adopted the Latin script and the Arabic script was no longer in use¹⁰. A one-handed manual alphabet appears in Gök¹¹



Fig. 10 The one-handed manual alphabet in Gök (1940, p. 17)

1940, see Figure 10) and another one-handed alphabet appears in the Ministry of Education (Milli Eğitim Bakanlığı - MEB) TİD Guide (1995)¹². Some letters indicate a continuity in the manual alphabet which appeared in 1925 -before the alphabet reform- and in two alphabets in 1940 and 1995. The manual signs for the following

¹⁰ The letters of the new Turkish alphabet were the following: A, B, C, Ç, D, E, F, G, Ğ, H, I, İ, J, K, L, M, N, O, Ö, P, R, S, Ş, T, U, Ü, V, Y, Z.

¹¹ Süleyman Gök is a prominent figure in the history of deaf education in Turkey (See Zeshan 2002, İlkbaşaran & Taşçı forth.).

¹² As Aslan-Demir (2011) states, Galip Demiray and Hasan Kurt are the authors of MEB Turkish Sign Language Guide (1995). At present, they teach at Yahya Özsoy Deaf School in Ankara.

letters are the same in all three manual alphabets: Be [b], Dal [d], Fe [f], Gayın [g], Kaf [k], Lam [l], Mim [m], Nun [n], Re [r], Sin [s], Şın [ʃ], Vav [v], Ye [y] (See Appendix A). Still, one cannot be sure of a continuity because these could have been taken from the manual alphabet generally found in Europe in rather recent years (e.g., the LSF manual alphabet in Appendix A). As a non-Latin alphabet, Turkish orthography has letters which have diacritics¹³. Interestingly, among these letters, the letter Şın [ʃ] is suggestive of a continuity, because Ş is a character not found in the widespread one-handed manual alphabets of the world (See Figure 11).



Fig. 11 Continuity in the letter Şın

Following the same line of thinking, the letters with diacritics in the alphabet of Gök (1940) have similar counterparts in the MEB guide (1995): C-Ç, Ğ¹⁴, İ-İ, Ö which indicates a continuity up to 1995 (See Figure 12).

There are three letters in the Ottoman alphabet corresponding to the letter H today and all three have different handshapes in the manual alphabet in Haydar

¹³ The letters with diacritics in the Turkish orthography are the following: Ç, Ğ, İ, Ö, Ş, Ü.

¹⁴ In the Turkish orthography, the letter Ğ is read silent and lengthens the preceding vowel. In some dialects it is a velar fricative.

(1925): Ha, Hı, He. For the letter H, it seems like He is preserved in the 1940 alphabet whereas Ha is preserved in the 1995 alphabet (See Figure 13)



Fig. 12 Continuity in fingerspelled letters with diacritics (The figures on the left hand side in each pair are from Gök 1940, those on the right hand side are from the MEB guide 1995)

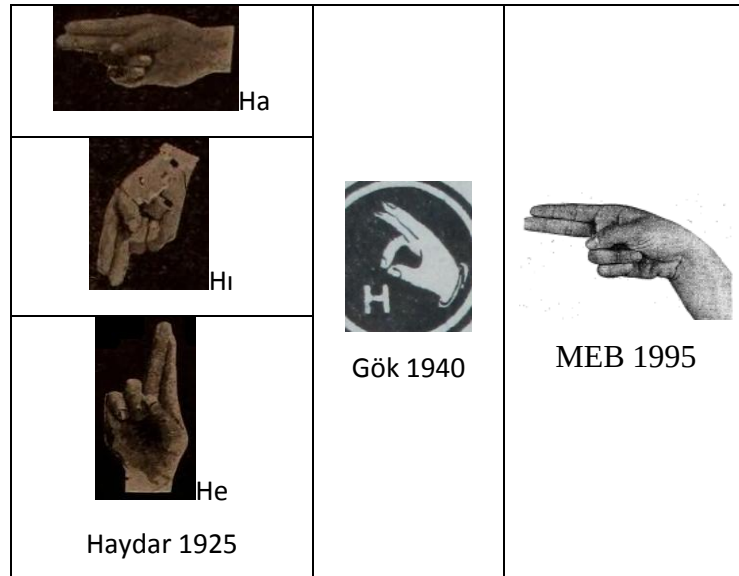


Fig. 13 Continuity in the form of the fingerspelled letter H

2.1.2.2 Transition from the One-Handed Manual Alphabet to the Bi-manual Alphabet

According to the reports of two elderly deaf signers (See İlkbaşıran & Taşçı, forth.), Süleyman Gök introduced the two-handed fingerspelling system of TİD around the beginning of 1940's. One of these deaf interviewees and another deaf woman who is

seventy-six years old, report that Süleyman Gök also gave a one-handed manual alphabet as an optional fingerspelling system. This alphabet can be found in one of Gök's books (1940, See Figure 10).

One of our informants who is eighty-two years old, told us that his friends from the deaf school in İzmir were better and faster at one-handed fingerspelling. From an interview with a relatively younger informant who attended the deaf school in Yıldız, which opened after 1953 (Yıldırım 1997), narrates that they were also taught a one-handed manual alphabet but stuck to the two-handed manual alphabet. Apparently, there was no sharp transition from the one-handed alphabet to the two-handed alphabet. These have co-existed but the predominant one has been the two-handed alphabet since 1940's.

2.1.2.3 Lexicalized Fingerspelling with the Former One-Handed Manual Alphabet

Some signs which are in use today are lexicalized signs having an old one-handed letter origin:

- (1) TEMMUZ 'july', YALOVA (a place name) (in Dikyuva & Zeshan 2008)
- (2) KIZ^TORUN 'grand-daughter' and ERKEK^TORUN 'grand-son' (in Spreadthesign.com)
- (3) RAPOR 'report', ROMANTİK 'romantic', ROMAN 'novel'¹⁵ (these three signs are homophonous).

We have found another manual alphabet, an ephemera document by Zevki İshak who calls himself an illusionist and hypnotist (See Figure 14 below, See

¹⁵ There are also the city names ŞANLIURFA, ÇANKIRI, SIVAS, and the country names HIRVATİSTAN, 'Croatia'/NORVEÇ 'Norway' (Dikyuva & Zeshan 2008) which might be lexicalizations from one-handed letters. However these have simple handshapes. Thus, one can not be sure whether these signs have a fingerspelling origin or composed of a regular handshape of the language.

Appendix B for the full view of the first and second pages). Zevki İshak writes that Turkish citizens should learn this alphabet in order to have some communication



Fig. 14 The manual alphabet of Zevki İshak (1940s), Süleyman Gök's friend.

with deaf citizens. At the reverse side of the paper, he has a photograph taken when he was in the Paris Deaf Institution. The alphabet depicted here involves letters from the one-handed manual alphabet in Gök (1940) and in the modern two-handed manual alphabet.

As one of our informants narrates, Zevki İshak was educated in Europe. He was a friend of Süleyman Gök, and Gök told İshak about the financial hardships of

the school. Zevki İshak, allegedly, created this manual alphabet, and by selling this to hearing people earned money to aid the school. We do not know the exact date of the first printing of this document but it is probably in 1940s.

2.2 Functions of Fingerspelling

In this section of the chapter, we firstly give some figures about the usage frequency of fingerspelling in sign languages. Next, we briefly mention a few discourse functions of fingerspelling attested in ASL and Australian Sign Language (AusLan). This is followed by the basic terminology about code-mixing and loan related phenomena. Finally we give a brief comparison of fingerspelling and mouthing as functional complements.

2.2.1 Usage Frequency of Fingerspelling

The percentage of fingerspelling in either one-by-one fingerspelling or in lexicalized items in conversations is 10-15% in American Sign Language (Padden & Gunsauls 2003), 10% in Australian Sign Language (Schembri & Johnston 2007), and 2.5% in New Zealand Sign Language (McKee & Kennedy 2006; cited in Schembri & Johnston 2007).

As for TİD, there is no study about the frequency of fingerspelling in conversations. However, to give an idea about the frequency of the lexicalized fingerspelled items in the lexicon we searched two sources (Boğaziçi University TİD website and Dikyuva & Zeshan 2008, See Appendix D-i and Appendix D-ii) and found that the percentage of signs having fingerspelling to all items in the two

sources is approximately 6% (56/~870). TID thus falls within the range of other sign languages considering our preliminary finding.

2.2.2 Discourse Functions of Fingerspelling

Several discourse functions are expressed through fingerspelling: Lexical introduction, interpersonal strategies, and technical coloring.

Lexical introduction is one function of fingerspelling which is observed in ASL. Its aim is to achieve contextual prominence even though there might be a sign for the concept which is expressed (Patrie & Johnson 2010). We observe this phenomenon in TID, too. For example, one can fingerspell F-A-C-E-B-O-O-K and then produce the sign for 'Facebook'. The authors claim that by doing this speakers: (i) disambiguate the sign from its homonyms or signs with similar meanings and (ii) ease lexical access, i.e. shorten the time interval required to perceive a word.

Fingerspelling can be resorted to for interpersonal strategies as well. Such a discourse function of fingerspelling is noted by Johnston and Schembri (2007) in AusLan. Someone might resort to fingerspelling to 'impress' another person, or in order to be opaque to a little child (Johnston & Schembri 2007).

Finally, fingerspelling can contribute a technical coloring to word meanings, thereby changing the word meaning. Padden (2006) exemplifies this from ASL in the signs DRIVE and PROBLEM. The sign for DRIVE refers to driving a vehicle whereas its fingerspelled counterpart means 'computer hard drive'. PROBLEM normally means a personal problem but it is fingerspelled by third-grade science teacher to refer to a scientific problem (Padden & Gunsauls 2003).

2.2.3 Code-Mixing and Loan-Related Phenomena

In this section, we aim to introduce the basic terminology on code-mixing and loan-related phenomena as they are connected to the functions of fingerspelling. The categories which we will describe are the following: Code-switching, code-mixing, borrowing (established loan), and local lexicalization (nonce loan).

A language speaker code-switches when she uses more than one element from a second language (McCormick 1995, cited in Van Dulm 2007). For McCormick, code-mixing is distinguished from code-switching by the involvement of single words. If we take these definitions, one could say that fingerspelling is most generally used for code-mixing reasons rather than code-switching. However, Van Dulm warns us that there is some overlap and disagreement in the code-switching literature about these terms.

As a sociolinguistic issue, fingerspelling can be deemed negative and as degrading the naturalness of sign language. However, it is natural for signers to resort to fingerspelling because most of them are bilingual in the sign language and the spoken language of the country. Mahootian (2006, p. 512) points to the naturalness of code-switching in spoken language bilingualism: “(...) many researchers believe that code switching is in fact a natural consequence of competence in more than one language (...)”. According to our view this is a generalisation also valid for sign language users. The usage of fingerspelling as code-switching or code-mixing is an indication of the bilingualism of signers rather than a weakness of the sign language itself.

Loan words are of two types: Nonce loans and established loans. Nonce loans are the foreign words which are used only once in a specific context and which are

not established in the lexicon of monolinguals (Poplack, Sankoff & Miller 1988, cited in Van Dulm 2007).

When a person's name is introduced, it is fingerspelled fully as D-A-V-I-D (Valli et al. 2005, in Johnston & Schembri, 2007). When this fully fingerspelled name occurs repeatedly during the discourse, only one letter might remain from the five-letter-string. The same process occurs in TID for person names such as H for 'Hasan'¹⁶. Brentari (1995b, in Johnston & Schembri 2007) names these discourse-bound changes local lexicalizations. These can also be called nonce loans or nonce borrowings.

On the other hand, borrowing (or established loan) is traditionally defined as a word which is taken from a second language by bilinguals and then gets into the monolinguals' usage (Mahootian 2006). A definition based on monolinguals is problematic for sign language as Sutton-Spence (2006) points out:

As almost all Deaf signers who fingerspell are bilingual to some extent, it is not possible to test for distinctions between loans and code mixing (or nonce and established loans), on the grounds that loans are used only by monolinguals. It is often difficult to know when a form from English is an established loan and when it is an instance of code mixing or a nonce loan. However, some loans must be considered established loans, purely on the grounds of their widespread use within the sign language. (p. 470)

Thus, the present challenge for distinguishing this terminology is also valid for the sign language literature and awaits sociolinguistic scrutiny.

¹⁶ It is important to note that fingerspelling is not the only way of expressing one's name. In fact, the deaf community prefer sign names. Each member of the deaf community or people associated with the deaf community have a sign name -a certain handshape in a certain location, sometimes with movement- in addition to their name in the spoken language. Our anecdotal evidence shows that the elderly remember sign names much better than spoken names.

2.2.4 Fingerspelling and Mouthing as Functional Complements

Code-mixing, and the lexical introduction functions mentioned above are also fulfilled by mouthing (Pfau & Quer 2010, Nadolske & Rosenstock 2007). Note that these functions are fulfilled by one-by-one fingerspelling as a non-lexicalized and context-bound form of fingerspelling.

Sandler and Lillo-Martin (2006) make a remark that ASL resorts less to mouthing than European sign languages, and European sign languages have less fingerspelling usage than mouthing. According to Padden's explanation as cited in Sandler and Lillo-Martin (2006), fingerspelling and mouthing might be functional complements (See also Section 5.1.1).

Another issue worth mentioning is the assumption that fingerspelling is used by signers more often if they are communicating with hearing signers who learned sign language as a second language. According to my observations, in this kind of a situation, the first strategy a signer employs is exaggerated mouthing rather than one-by-one fingerspelling. I think the reason is that generally L2 signers are not good at perceiving rapid one-by-one fingerspelling and it takes too much time to fingerspell all the letters of a word slowly. Even then, the addressee may not understand and ask the signer to repeat the one-by-one fingerspelling. Of course, this hypothesis should be investigated with controlled research designs.

To sum up, in this chapter, we introduced the history of fingerspelling and the history of TİD manual alphabets. We expanded on the story of TİD's one-handed manual alphabet which has been replaced by a two-handed manual alphabet beginning from the 1940s.

Later on, we briefly touched on the functional aspects of fingerspelling. We elaborated on the usage frequency, discourse functions, code-mixing, and mouthing related phenomena.

In the next chapter, we will describe the structural properties of the TID manual alphabet.

CHAPTER 3

STRUCTURAL CHARACTERISTICS OF FINGERSPELLING IN TİD

In this chapter we describe the phonological structure of fingerspelling in TİD with respect to stationary features (hand arrangement, handshapes, place of articulation), and types of movement. Later on, we present the features which vary among signers. Next, building up on Kubuş (2008), we discuss the violations of the TİD manual alphabet letters with respect to phonological well-formedness conditions in two respects: (i) the violation of the dominance condition, and (ii) handshapes which are not existent in the TİD handshape inventory. Within this context, we finally ask whether fingerspelled letters are compositions of TİD handshapes and to what extent they are based on TİD handshapes. The reader can refer to Section 1.1 about sign phonology models for the explanations of phonological terminology peculiar to sign languages.

The letters of the TİD Manual Alphabet can be seen in Figure 15 below. Since the main aim of the thesis is to analyze the structure of lexicalized items through fingerspelling, we do not present a detailed analysis of the TİD manual alphabet letters. The reader can refer to Kubuş and Hohenberger (2011) for a more thorough account.

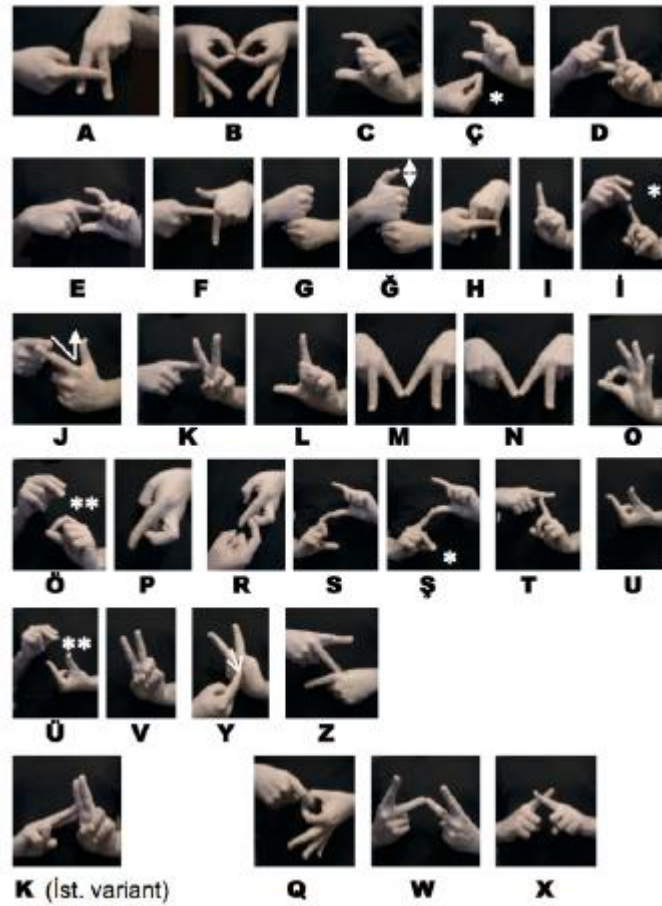


Fig. 15 TİD Manual Alphabet (Taken from Kubuş & Hohenberger 2011)

3.1 Stationary Features in TİD Fingerspelling

In this section, we describe the stationary features of the TİD manual alphabet, the features which are not related to movement. These stationary features to be described are the following:

- (i) hand arrangement,
- (ii) handshape, and
- (iii) place of articulation.

Hand arrangement indicates whether a sign is one-handed or two-handed (Klima & Bellugi 1979). TİD has a two-handed manual alphabet. Out of twenty-nine letters, twenty-two of them are fingerspelled with two hands. These are:

A, B, Ç, D, E, F, G, Ğ¹⁷, H, İ, J, K, M, N, Ö, R, S, Ş, T, Ü, Y, Z.

Seven letters are fingerspelled with one hand:

C, I, L, O, P, U, V.

Zeshan (2003) documents a one-handed variant of E as well.

As for handshape, in TİD fingerspelling, the following seven handshapes occur on the dominant hand¹⁸:



We observe that the handshapes which the nondominant hand can have are more in number (twelve as opposed to seven) and are more complex than the handshapes which the dominant hand can have. Compare the h1 handshapes above to the h2 handshapes in TİD fingerspelling below:



As for location, the place of articulation is [trunk] and the setting is [proximal] while fingerspelling any letter. This location is generally referred to as the neutral signing space. The setting may remain the same, or may be changed to a

¹⁷ See Footnote 14.

¹⁸ Handshape figures used in the text are taken from Koç University TİD website, (Özyürek, İlkbaşaran, Arık 2004). These figures might not represent the phonetic details with hundred percent accuracy. See the photograph in the beginning of this chapter and Appendix C for the photographs of the TİD Manual Alphabets. Handshape photographs with a black background which are integrated in the text are from Zeshan (2003).

further position in the lateral side in each successive letter during one-by-one fingerspelling, as if writing in space.

3.2 Types of Movement in TİD Fingerspelling

There are diacritics in some of the letters in the Turkish alphabet as mentioned before in Section 2.1.2.1. The letters Ç, İ, Ö, Ş, Ü are respectively the letters C, I, O, S, U with a fingersnapping of the dominant hand (See Figure 16).

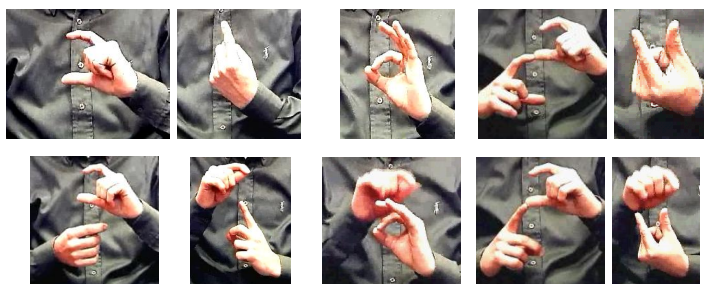


Fig. 16 Representation of diacritics with fingersnapping. Top row: C, I, O, S, U; Bottom row: Ç, İ, Ö, Ş, Ü (Pictures from Özyürek et al. 2004)

Fingersnapping is a kind of hand-internal movement. In the letter Ğ, the index finger of the non-dominant hand is moved, which is again a hand-internal movement.

Another kind of movement is path movement. In the letters J and Y, the dominant hand moves on the nondominant hand²¹.

Thus, the diacritics of the script are represented in fingerspelling either with a hand-internal movement or with a path movement.

²¹ We can say that the letter J has a movement from the setting [hi] to [low], and in the letter Y, vice versa.

3.3 Variation in TİD Fingerspelling

Although there is no dialectology study for TİD, it is assumed (Kubuş 2008) that there are at least three different dialects: 1) İstanbul dialect which is used in Marmara and Aegean Regions; 2) Ankara dialect in Ankara and nearby regions; 3) The Eastern Dialect in eastern and southeast regions²².

The variations in fingerspelling which we describe can be attributed to dialectal variation, intradialectal variation and even intra-speaker variation. Below, we present a list where the varying features in fingerspelled letters are presented.

B: orientation, position of hands with respect to each other, openness of unselected fingers can vary.

Ç: h1 has  handshape rather than fingersnapping in one variant

E: h2 can have different handshapes and arrangement with h1. For fingerspelling E, the index finger of the dominant hand and index, middle, ring fingers of the nondominant hand are used (Dikyuva & Zeshan 2008). In Zeshan's previous description (2003), the dominant hand is not included. In one dialect, E is signed with a C-handshape and I-handshape.

G: different handshape and arrangement.

Ğ: different handshapes²³. The thumb of h1 moves.

²² There is a village sign language separate from Turkish Sign Language in Mardin, Turkey. Most of the Mardin Sign Language signers have moved away from Mardin to İzmir or İstanbul. Today approximately forty people know this language (Dikyuva 2008, See also http://www.uclan.ac.uk/schools/journalism_media_communication/islands/villagesign/mardin_sl.php)

²³ There is a head movement in Ğ in Boğaziçi University TİD website when the model signs the İstanbul variant.

I-İ: different orientation in h2

J: different orientation in h2

K: different orientation or handshape in both hands

O-Ö: unselected fingers are open or closed in h2

U-V: different orientation in h2

Y: different orientation in both hands

See Appendix C to compare each letter from different sources side by side.

Finally, as for fingersnapping in the letters Ç, İ, Ş, Ü, we observe middle-finger-snapping (like the snapping in HIZLI ‘fast’) as well as index-finger-snapping. We observe these fingersnapping types in TİD signs which are not fingerspelled. In HIZLI ‘fast’ there is a middle-finger-snapping whereas in BUÇUK ‘half’ there is an index-finger-snapping.

3.4 Deviance from TİD Phonology

As we explained in Chapter 2, fingerspelling is an artificial system which appears to be created for educational purposes. Therefore, the fingerspelling system is not a natural part of sign language and can have deviations from the phonological structure of TİD signs. One such striking deviation is that one-handed letters seem well-formed except that they are signed with the nondominant hand (noted by Kubuş 2008). In this sense their behavior is different from one-handed signs.

In this section, we will mainly talk about two phonological deviations from general phonological constraints:

- (i) Violations of the dominance condition, and
- (ii) Additional handshapes not part of the TİD handshape inventory.

Lastly, we will ask whether fingerspelled letters are composed of TİD handshapes.

There are two frequently cited phonological well-formedness conditions which were previously proposed for ASL by Battison (1977) and it assumed that they also apply in TİD (Kubuş 2008). These are the Symmetry Condition and the Dominance Condition (Battison 1977):

Symmetry Condition:

(a) if both hands of a sign move independently during its articulation, then (b) both hands must be specified for the same location, the same handshape, the same movement (whether performed simultaneously or in alternation), and the specifications for orientation must be either symmetrical or identical. (p. 47)

Dominance Condition:

(a) if the hands of a two-handed sign do not share the same specification for handshape (i.e., they are different), then (b) one hand must be passive while the active hand articulates the movement and (c) the specification of the passive handshape is restricted to be one of a small set: A, S, B, 5, G, C, O (p. 50-51)

The symmetry condition applies to signs where both hands move, that is, to Type-1 signs. There is no fingerspelled letter in the TİD manual alphabet which has movement in both hands. Therefore, the symmetry condition is not relevant for evaluating the well-formedness of TİD fingerspelling.

The dominance condition, on the other hand, applies to signs where two hands have different handshapes. The majority of the two-handed letters in TİD have different handshapes. The dominance condition is violated by many two-handed letters. These are discussed in the next section²⁴.

²⁴ We would like to add a small note here. As a phonotactic tendency, Kubuş (2008) notes that in TİD, lateral movements or positions are from contralateral to ipsilateral, meaning h2 side to h1 side (p. 83-84). The letters Ö and Ü also have contra to ipsi positions in their fingersnappings. The direction of successive positions is the same in the letters Ö-Ü and TİD signs. In this respect, Ö and Ü do not deviate from TİD phonology.

3.4.1 Violations of the Dominance Condition

In this section, we analyze the two-handed letters with different handshapes with respect to the dominance condition (Battison 1977).

The dominance condition is revised by Sandler (1989, 1993a; cited in Sandler & Lillo-Martin 2006). The reason for the revision is because the signs where two hands have the same handshape but where one of them moves are not included in the formulation of the condition.

Revised Dominance Condition:

In signs in which h2 is passive (i.e. does not move), h2 must either be unspecified underlyingly, or it must be characterized by an unmarked handshape (p. 184-185)

This revision is also relevant for TĪD fingerspelling because the letters Ĝ and Š are (i) two handed, (ii) composed of the same handshape () and (iii) one hand moves. The letter Ĝ is now left out by the revised dominance condition because h2 is the hand which moves, not h1. This kind of a sign, a sign with h2 movement, is not attested in TĪD. In order to account for this phonologically irregular behavior of Ĝ, by including part (b) of Battison's condition, we propose a revision to Sandler's 'revised dominance condition' as the following:

Proposal: A further revision to the Dominance Condition

In signs in which *one of the hands is passive* (i.e. does not move), a) *h1 articulates the movement*, b) h2 must be unspecified underlyingly [the same with h1], or it must be characterized by an unmarked handshape.

Taking this revision as the basis for evaluating well-formedness, we can say that the letter 'Š' is well-formed with respect to the dominance condition whereas the

letter ‘Ğ’ is not, because the latter violates the requirement (a) in the revised condition above.

To determine the unmarked handshapes in TİD, Kubuş (2008) has made a frequency analysis among 1026 handshape occurrences in his corpus. He has extracted the unmarked handshapes according to their frequency. Then, he has eliminated the allophonic handshapes. The following four handshapes have then been determined as the unmarked handshapes which form the evaluation basis of the dominance condition:

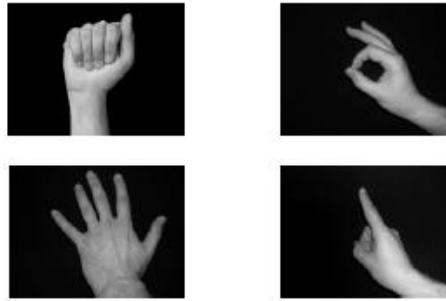
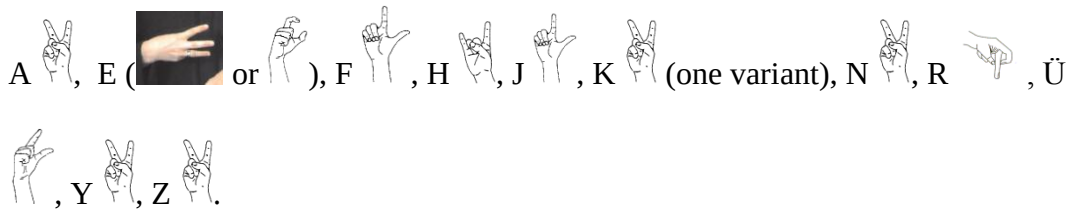


Fig. 17 The unmarked handshapes in TİD (From Kubuş 2008)

On the basis of the unmarked handshapes in TİD (See Figure 17 above) (Kuş 2008), the two-handed letters which violate part (b) of the dominance condition and their h2 handshapes are the following:



The two-handed letters which are well-formed are B, D, K²⁵ (the İstanbul variant), M, Ö, S, Ş, T, Z.

²⁵ The İstanbul variant is well-formed with respect to the dominance condition.

3.4.2 The Manual Alphabet Handshapes not Occuring in TİD

The letters E and P contain handshapes which are not found in TİD signs. (See Kubuş's TİD handshape inventory in Appendix E)

The handshape of the nondominant hand in the letter E () is a handshape used only for one variant of ÜÇ 'three'. Another handshape for ÜÇ 'three' is .

As for the letter P, Kubuş (2008) notes that this letter changes its handshape when it is lexicalized. In its non-lexicalized version, the middle finger is curved (See Figure 18, the handshape on the right). In contrast, in its lexicalized version, the index finger is curved (the handshape on the left in Figure 18).

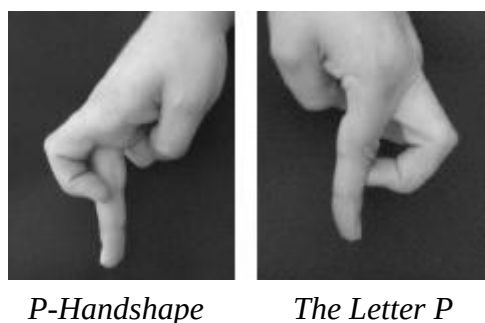


Fig. 18 P-handshape vs. the letter P (From Kubuş 2008)

3.4.3 Are Fingerspelled Letters Composed of TİD Handshapes?

So far, we have assumed that the letters of the TİD manual alphabet are composed of handshapes which occur in TİD signs except the letters E and P. However, Kubuş (2008) questions the overlap between TİD handshapes and fingerspelling handshapes and says that there is no overlap between TİD handshapes and fingerspelling.

Kubuş's argument against the existence of an overlap is that two-handed letters violate two well-formedness conditions: the symmetry condition and the dominance condition. However, as we stated above at the beginning of Section 3.4, the symmetry condition is not applicable to TİD fingerspelling because this condition applies to signs where two hands move independently and the TİD manual alphabet does not have such a letter.

As for the dominance condition, Kubuş exemplifies his argument by stating that the letter A does not conform to the dominance condition because the passive hand ( handshape) is not an unmarked handshape. The letter A is an iconic form rather than a composition of phonemes (handshapes in TİD) as Kubuş concludes. We think this conclusion does not follow from that premise because the dominance condition is about the relative complexity between the two hands. When the letter A is produced with  handshape in h2, and  handshape in h1, the form is still iconic but does not violate the dominance condition.

Another argument from Kubuş against the idea that fingerspelling is composed of TİD handshapes is that there is a difference between the letter P (where the middle finger is curved) and the P handshape (where the index finger is curved, see Figure 18 above). He presents a reason for this. Since the index finger is more common in fingerspelling than the middle finger, it is the index finger that is the passive part of the hand.

Kubuş expands his iconicity argument by comparing the P-handshape in fingerspelled letters and in other signs. In addition, he claims a curved middle finger results in a more round and more iconic P form of the hand.

Almost all of the fingerspelled letters are iconically motivated in terms of mimicking the capital letters in the Roman script used in Turkey (with a possible exception of one variant of K). Kubuş claims that this is a reason for their phonological ill-formedness and their place outside of the TİD handshape inventory.

From our point of view, this is not necessarily the case. Spoken languages and sign languages both resort to iconicity. If something is iconic, it is not necessarily non-linguistic. See Chapter 6 for a more comprehensive discussion about the linguisticity of fingerspelling, i.e. in what ways fingerspelling is linguistic and in what ways it is not.

In this chapter, we described the structure of TİD fingerspelling and discussed it in terms of its well-formedness with respect to phonological constraints. We have proposed a revision of the dominance condition (Battison 1977, Sandler 1989) and accounted for the eccentric h2 movement of the letter Ğ in TİD fingerspelling.

CHAPTER 4

PHONOLOGICAL PROCESSES IN TİD LEXICALIZED FINGERSPELLING

In this chapter we aim to discuss the lexicalization of fingerspelling and two phonological processes which occur in lexicalized fingerspelling. These are hand reversal and assimilation.

In the subsection about hand reversal we argue, following Kubaş (2008), that phonological well-formedness conditions cause hand reversal. In other words, the lexicalization leads to hand-reversal because this is required for the resulting word to be well-formed. We develop the findings of Kubaş and posit an h1-assignment rule to account for this phenomenon.

Assimilation is another phonological phenomenon which occurs in lexicalized fingerspelling. We deal with this process as it occurs in polymorphemic forms²⁶ and give their phonological representations. We explain these mechanisms by the Hand-Tier model (Sandler & Lillo-Martin 2006, Sandler 1989) which was explained in the Introduction. We also resort to other sign language phonology models when necessary.

²⁶ We classify these as compounds, see Section 5.2.

4.1 Hand Reversal

There are two independent articulators in sign language, i.e. the two hands (Sandler 2006, referred to as h1 and h2). However, these are not used with unlimited freedom. Signers stick to their dominant hand as the main articulator. For example, h1 is used in one-handed signs. If two hands are involved in a sign where one hand has a movement and the other hand is stationary, it is usually h1 that realizes the movement. Thus the dominant hand has precedence over the nondominant hand as expected. We also see this in the lexicalization of fingerspelling.

The lexicalization of a letter involves hand reversal. By hand reversal, we refer to the process where the dominant hand (h1) takes over all phonological specifications of the non-dominant hand (h2) and h2 takes over all phonological specifications of h1. Below, we first concentrate on hand reversal which was pointed out in Kubuş (2008) for one handed letters. When hand reversal applies to a one-handed letter, h1 fingerspells the letter instead, and h2 becomes passive. For example the handshape  refers to the fingerspelled letter 'V' when it is signed with h2 whereas it is the lexeme YİRÜS 'virus' when signed on h1. When hand reversal applies to a two-handed letter, h1 and h2 take over each other's phonological specifications. For example, KÖKNAR 'fir' has hand reversal in our data. Normally in the fingerspelled version of the letter K, the fingertips of h1 face upwards while h2 touches the radial side of h1. In the sign KÖKNAR 'fir' the roles of h1 and h2 are switched: the fingertips of h2 face upwards and its radial side is touched by h1²⁷.

²⁷ Signers may occasionally shift their hand dominance in signing for brief periods of discourse, for example in classifier constructions. Even though there are no physical obstacles restraining a signer's dominant hand she can resort to nondominant hand occasionally. As for the informants in our data, we observe that informants stick only to their natural in-born handedness.

Below, we analyze hand reversal for three groups of letters²⁸:

- 1) One-handed letters: C, I, L, O, P, U, V
- 2) Two-handed letters with movement: Ç, İ, J, Ö, Ş, Ü, Y
- 3) Two-handed letters without movement: A, D, E, F, G, Ğ, H, K, N, R, S, T, Z

4.1.1 Fingerspelled Signs Containing One-handed Letters

Seven letters are one-handed in TİD fingerspelling: C, I, L, O, P, U, V. See Figure 19 for these one-handed letters:

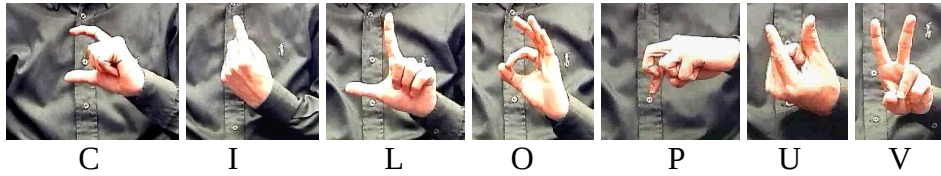


Fig. 19 One-handed letters in the TİD manual alphabet (Pictures from Özyürek et al. 2004)

Kubuş (2008) points out that hand dominance changes in one-handed fingerspelled letters when they are lexicalized. In other words, h2 is used instead of the h1 in one-handed letters. However, if a one-handed letter is lexicalized, h1 is used to sign the lexicalized form of the letter. See Figure 20 below for the comparison of L and V in their fingerspelled form and lexicalized form side by side.

VİRÜS, as a lexicalized form of the letter ‘V’ contrasts with it only in handedness. In cases where a one-handed letter is signed with movement (as in LİSE ‘high school’ where ‘L’ has a circular movement), again h1 is used. Hand reversal is also observed in polymorphemic signs which are analyzed in Section 5.2.1.

²⁸ We exclude the symmetric letters B , M , X  and W  because hand reversal is not applicable to them. (Pictures from Kubuş and Hohenberger, 2011).



(From B.U. TİD Source webpage)

‘L’

LİSE ‘high school’



(From B.U. TİD Source webpage)

‘V’

VİRÜS ‘virus’

Fig. 20 Hand reversal in the letters L and V

Kubuş (personal communication by email, 26.05.2011) has an interesting impressionistic observation on the hand choice for signing the one-handed letter in one by one fingerspelling. He has observed that deaf children of deaf parents use their non-dominant hand; deaf children of hearing parents use their non-dominant hand or dominant hand; and, interestingly, hearing children acquiring sign language use their dominant hand to sign these letters.

In the data from the website Spreadthesign where one of the informants is a CODA (Child of Deaf Adult) whereas the other two informants are deaf, the bilingual model signs the one-handed letters with her dominant hand in every occurrence. These data support the observations of Kubuş. To eliminate the effects of bilingualism and to take into account Kubuş’s impressionistic observations, we base our data on the videos of two deaf informants on the website. Unfortunately, we do not have information as to their parents’ hearing status.

In the table below, we categorize the data in six rows. The numbers indicate the ratio of the reversed letters to all the signs in that category. For example, in row II, out of twenty-two single letter and mono-morphemic sign combinations, twenty-one of them are reversed. ‘Polymorphemic’ refers to a complex sign which is composed of two signs.

Table 1. Ratio of Hand Reversal among Lexicalizations of One-Handed Letters

	one-handed letters
I Reversal in single letter lexicalizations	100% (4/4)
II Reversal in single letter and mono-morphemic sign combinations	95% (21/22)
III Reversal in single letter and poly-morphemic sign combinations	100% (5/5)
IV Reversal in multiple letter and mono-morphemic sign combinations	26% (21/82)
V Reversal in combinations of multiple letters and polymorphemic signs	10% (2/20)
VI Reversal in one by one fingerspelling	16% (21/131)

The rows are separated according to (i) whether there is one fingerspelled letter in an entry or multiple letters; (ii) whether the signs which are combined with fingerspelling are monomorphemic or polymorphemic. Two points were not taken into account in the identification of polymorphemic signs. Firstly, some sign entries in the website which are classified as polymorphemic in our tables might be actually phrases or nonce forms which were created for the sake of translation and not widespread among signers. Secondly, there might be entries with simultaneous complexity which are classified as monomorphemic in our classification since this kind of complexity is not always easy to identify (See Section 5.1.3). An example for each row is given below:

- Single letter lexicalizations: QCAK ‘January’ (The letter O signed proximal to the chin)

- Single letter and monomorphemic sign combinations:

PETROL=BENZİN^P (‘petrol’ = gas^P)

- Single letter and polymorphemic sign combinations: MOTOR-FRENİ=

MOTOR^F^DUR (‘engine brake’ = engine^F^stop)

- Multiple letters and monomorphemic sign combinations:

LADİN-AĞACI=L-A-D-İ-N^AĞAÇ (‘spruce tree’ = L-A-D-İ-N^tree)

- Combinations of multiple letters and polymorphemic signs:

KEPEK = SAÇ^BEYAZ^K-E-P-E-K (‘dandruff’ = hair^ white^K-E-P-E-K)

- One by one fingerspelling: VALF=V-A-L-F ‘valve’

As seen in the first three rows above, among all the signs which involve one letter as lexicalized either by itself or in combination with other signs, one-handed letters switch to the dominant hand with the only exception of

PEROKSİT=KİMYA^O (‘peroxide’ = chemistry+O²⁹)

The lexicalizations which consist of a single letter and a sign necessarily trigger the switch to h1. In Table 1, considering the three rows below which involve the forms with multiple letters, one-handed letters are generally signed with h2 (83%). In one-by-one fingerspelling, the percentage of hand reversal is less than 10%, in other words, 90% of one-handed letters are signed with h2. This is in line with Kubuş (2008) that one-handed letters are signed with h2 in fingerspelled lexicalizations.

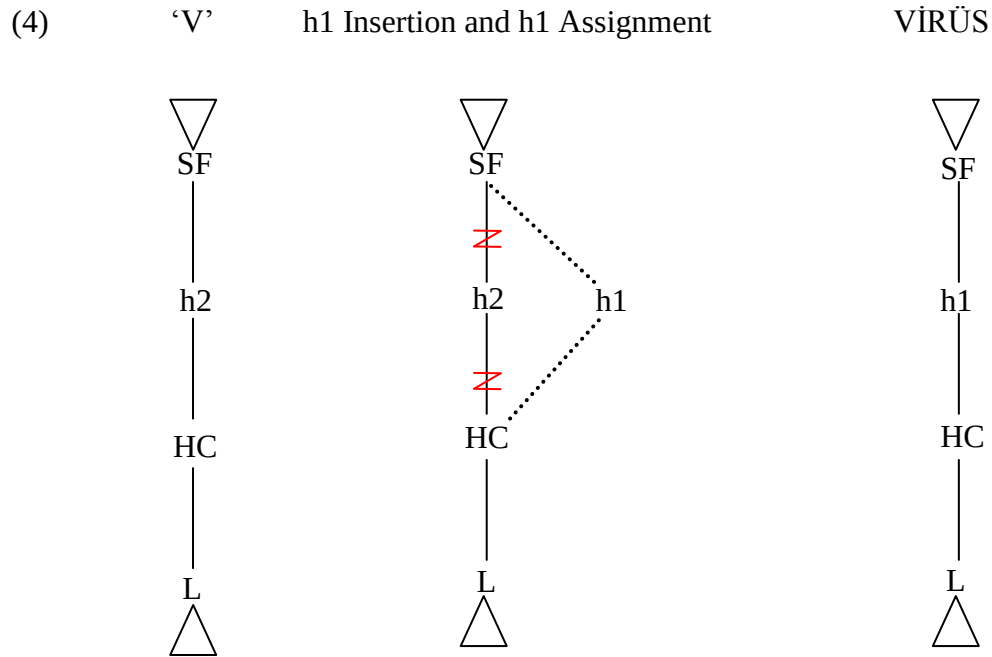
To explain these phenomena, we posit an h1 assignment rule:

²⁹ ‘O’ stands for the Oxygen (-oxide) in the chemical compound -’ as a term of chemistry-).

h1 assignment rule:

De-link h2 from its neighbors (SF and HC) and link it to the closest h1 node. If there is no h1 node, insert an h1 node and assign it to SF and HC.

Then, the derivation of VIRÜS from (the letter) ‘V’ can be represented³⁰ as the following:



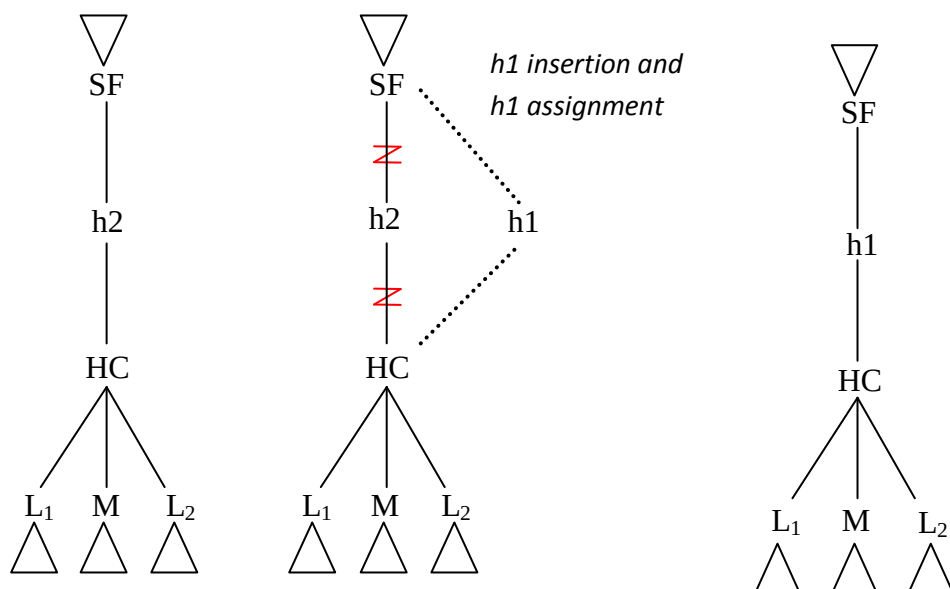
The dotted lines represent association lines which are linked through a rule or a phonological process. On the left, the representation of the letter ‘V’ has an h2 node between SF and HC. This is not straightforwardly expressable in the Hand-Tier model because in the position of h2 there can be either an h1 node, or an h1 and h2 node both of which SF and HC are linked to. We suggest that the inclusion of h2 in the representation of fingerspelled letter ‘V’ is justified by the evidence that in one-by-one fingerspelling one-handed letters are produced with the nondominant hand.

³⁰ We only indicate the relevant major feature class nodes and the features inside if they are relevant for the process.

In another lexicalization of a one-handed letter, LISE ‘high school’, there is a lexically specified circular movement of the letter L.

(5) ‘L’+movement

HIGH-SCHOOL



The leftmost representation shows the fingerspelled letter L with a circular movement. The nodes SF, h2, HC, L₁ represent the letter L. The second location node L₂ is in the representation as an effect of the circular movement which is represented by the M node. The HC representation in the middle involves h1 insertion³¹ and h1 assignment. The result of the derivation can be seen in the rightmost representation.

Thus, we have accounted for the hand reversal of lexicalized one-handed letters by h1 insertion and h1 assignment rules.

³¹ In Section 5.1.3, we will claim that some movements might have morphemic status diachronically. If the circular movement in LISE ‘high school’ was part of another sign which is combined with L, than that sign would already have retained an h1 node. Then, h1 assignment would suffice for derivation and h1 insertion would be unnecessary.

4.1.2 Fingerspelled Signs Containing Two-Handed Letters without Movement

Thirteen letters of the TİD manual alphabet are two-handed and stationary. In these letters, the two hands have different handshapes or orientations or the two hands are arranged non-symmetrically (i.e. h2 behaves as a place of articulation): A, D, E, F, G³², Ğ, H, K, N, R, S, T, Z. See Figure 21 for the pictures of these letters.

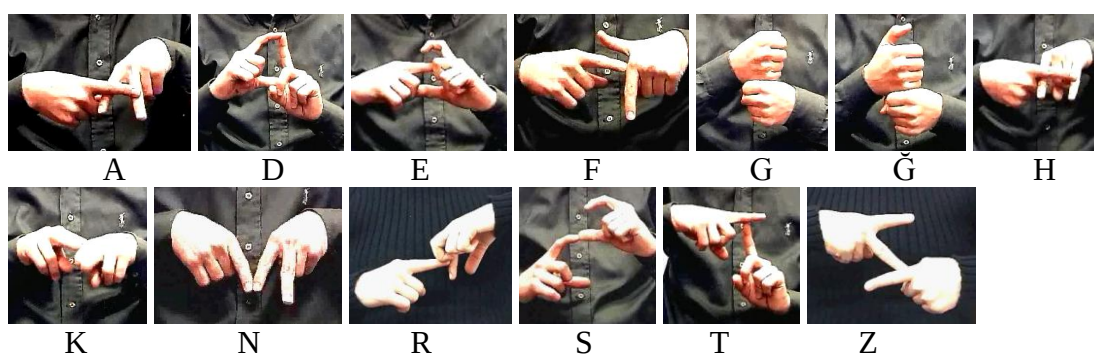


Fig. 21 Two-handed letters without movement (From Özyürek et al. 2004)

Table 2 illustrates the ratios of hand reversals among lexicalizations of two-handed letters without movement. We observe that two-handed letters without movement can undergo hand reversal, this is a new finding. The percentages of hand reversal range from 9% to 40%. The specific implications of the figures in Table 2 are discussed in the subsequent sections.

The letter ‘Ğ’ does not have movement in the dialect of these signers. The dominant hand has a thumb movement in some variants (See Section 3.3 for dialectal variations in the TİD manual alphabet).

³² The letter G is non-symmetrical like others. h2 would be over h1 if the letter is reversed.

Table 2. Ratio of Hand Reversal among Lexicalizations of Two-Handed Letters without Movement

	two-handed letters without movement
I Reversal in single letter lexicalizations	31% (4/13)
II Reversal in single letter and mono-morphemic sign combinations	23% (7/31)
III Reversal in single letter and poly-morphemic sign combinations	40% (6/15)
IV Reversal in multiple letter and mono-morphemic sign combinations	26% (51/194)
V Reversal in combinations of multiple letters and polymorphemic signs	9% (5/54)
VI Reversal in one by one fingerspelling	17% (76/446)

4.1.2.1 Susceptibility to Reversal

We see that in all kinds of signs two-handed letters without movement are more susceptible to hand reversal than two-handed letters with movement (cf. Table 2 and Table 3). The reason we propose for the absence of hand reversal in one-handed letters with movement is that the dominance condition does not allow a movement in the non-dominant hand while the dominant hand is passive. For example, fingersnapping of the letter Ī can not be signed with h2. But it is easier for the letter D to be reversed because it does not have any movement.

4.1.2.2. Multiple Hand Reversals

In some entries we observe a hand reversal which applies to all the letters of a word or some part of the word. The tendency of fingerspelling some part of a word in a reversed way seems to follow no conditions: For example, in three occurrences of K-

İ-L, two of them are fingerspelled normally, whereas in one entry, K and L are reversed.

4.1.2.3. Reversed Fingerspelling Mode

In contrast to the phenomenon in 4.1.2.2., in some cases we see that one group of adjacent letters in a word can be reversed. V-O-L-T-A-J has its first four letters reversed and the last two letters not reversed. All the letters of a word can be reversed as in P-R-O-T-O-N. We suggest that there might be a mode of ‘reversed fingerspelling’ which can apply to all the letters of a word, or alternatively to a left or right portion of a word.

4.1.2.4. Sporadic Reversal

In some entries, there is no definite break between the reversed letters and the non-reversed ones. For example, in R-İ-N-G-A^BALIK (‘clupea’= R-İ-N-G-A^fish) the letters R, N, and A are reversed. In these cases, the structural characteristics of individual letters might be playing a role. We identify and explain such structural effects in Section 4.1.3.2.

4.1.2.5 Hand Complexity As a Cause of Hand Reversal

There are four items where a single letter lexicalization has hand reversal and seven items where a single letter and a monomorphemic sign combination has hand reversal.

Except KÖKNAR ‘fir’, DOLMUŞ ‘shared taxi’, and DAMAT ‘groom’ all of these signs have letters (A, F, R) lexicalized and the letters A, F, R have a property in common. The letters A, F, and R have an I handshape in h1 and a more complex

handshape in h2 in their pre-lexicalized states. None of the complex h2 handshapes of the letters A, F, R is found among the most frequent handshapes in TİD (See Figure 17 for the most frequent and unmarked handshapes in TİD determined by Kubuş (2008)). This is very unusual when we think of other signs in TİD. When A, F, and R are reversed in lexicalization, the h1 has the more complex handshape instead of h2, which is more in line with the phonotactics of TİD. Thus, the reversal in these signs might be caused by the (c) part of the dominance condition which requires the h2 to have a restricted set of unmarked handshapes³³.

Thus we can conclude that relative hand complexity plays a role in hand reversal. Hand reversal aims to maximize the complexity of h1 whereas minimizing the complexity of h2.

4.1.3 Fingerspelled Signs Containing Two-Handed Letters with Movement

Up to now, we have discussed hand reversal in one-handed letters and two-handed letters without movement. In this subsection, we discuss lexicalized fingerspelling containing two-handed letters with movement in terms of hand reversal.

4.1.3.1 Why Do Two-Handed Letters with Movement Not Undergo Hand Reversal?

Seven letters in the TİD manual alphabet have fingersnapping or a small path movement: Ç, İ, J, Ö, Ş, Ü, Y. See Figure 22 for the pictures of two-handed letters with movement. Ç, İ, Ş, Ö, and Ü have fingersnapping. Ç and Ş have fingersnapping underneath the letter, using h2. İ, Ö, and Ü have have two fingersnappings side by

³³ Still we can not talk about a determining effect since, there are 20 items where the letters which have a more complex h2 handshape are lexicalized and there is no hand reversal.

side above h2. In J and Y, on the other hand, h1 has an I-handshape and moves along h2. We classify all these signs as two-handed letters with movement.

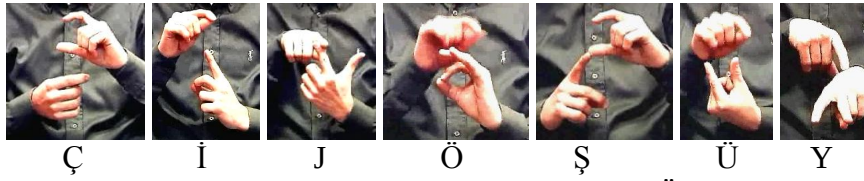


Fig. 22 Two-handed letters with movement (From Özyürek et al. 2004)

Table 3 below illustrates the ratios of hand reversals in the lexicalizations with two-handed letters with movement. As the figures indicate (zero to one percent) two-handed letters with movement do not undergo hand reversal, with three exceptions ('Ş' in BEKTAŞİ-ÜZÜMÜ=B-E-K-T-A-Ş-İ^ÜZÜM 'gooseberry'=B-E-K-T-A-Ş-İ^grape, 'Ç' in T-A-R-Ç-I-N 'cinnamon', 'Y' in Y-A-H-N-İ 'yahni'). These exceptions have either one-by-one fingerspelling (Ç and Y) or multiple letter and monomorphemic sign combinations (Ş).

Consider the Dominance Condition of Battison (1978 [1973]) paraphrased by Sandler and Lillo-Martin (2006) repeated below:

(a) if the hands of a two-handed sign do not share the same specification for handshape (i.e., they are different), then (b) one hand must be passive while the active hand articulates the movement and (c) the specification of the passive handshape is restricted to be one of a small set: (A, S, B, G, C, O) (p. 184)

If we look at the "if (a), then (b)" part of the condition, we can explain the fact that two handed letters with movement do not undergo hand reversal. Because if the hands were swapped, h2 would have had hand-internal movement (fingersnapping) which would violate part (b) of the dominance condition.

Table 3. Ratio of Hand Reversal among Lexicalizations of Two-Handed Letters with Movement

	two-handed letters with movement
I Reversal in single letter lexicalizations	none
II Reversal in single letter and mono-morphemic sign combinations	0% (0/8)
III Reversal in single letter and poly-morphemic sign combinations	0% (0/1)
IV Reversal in multiple letter and mono-morphemic sign combinations	0% (1/90)
V Reversal in combinations of multiple letters and polymorphemic signs	0/11
VI Reversal in one by one fingerspelling	2% (2/115)

We can not definitively identify the conditions which trigger hand reversal in the exceptions. In ten items from sources other than Spreadthesign (Boğaziçi University webpage and Dikyuva & Zeshan 2008), the two-handed letters with movement are lexicalized as single letters or combined with a monomorphemic sign and we do not observe any hand reversal there either.

4.1.3.2 Resistance of h1 Movement to Hand Reversal

If there is a kind of ‘reversed fingerspelling’ which is used occasionally, the two handed letters with movement might be effected by them in the three exceptions we have mentioned above.

We have found eleven items where there are more reversed letters than non-reversed ones. In these items, two-handed letters with movement do not undergo hand-reversal although the letters adjacent to them undergo hand reversal. Thus, two-handed letters with movement are not effected by reversed fingerspelling. The letters

in square brackets are two-handed letters with movement. The letters with an uppercase ‘r’ are reversed in the following entries:

- (6) E-N^r-G-[İ]-N^r-A^r-R^r
POWER^r-A^r-K^r-T^r-[Ö]-R^r-[Ü]
[J-Ö]-L^r-E^r
ROUND-OBJECT^r-E^r-R^r-E^r-V^r-[İ]-Z
R^r-[İ]-N^r-G-A^r-FISH
K^r-[İ]-L^r
L^r-A^r-D-[İ]-N^r-TREE
L^r-[İ]-F^r-PLATE
M-[İ]-N^r-E^r-R^r-A^r-L^r
N^r-[Ö]-T-R^r-O^r-N^r
V^r-O^r-L^r-T^r-A-J

As we see in these entries, one-handed letters or two-handed letters without movement can undergo hand reversal whereas two-handed letters with movement can not undergo hand reversal. This can be explained by the dominance condition (See Section 3.4.1). The number of cases (eleven against three) indicates that the pervasiveness and the power of the part (a) of the condition (h1 must be active) is more than the part (b) (h2 must be the same with h1 or it must be an unmarked handshape).

4.1.4 Summary of Findings and Suggestions on Hand Reversal

In the sections above, we have attempted to account for the observations of Kubuş (2008) that one-handed letters are reversed by positing two conditions. These are the

h1 insertion and the h1 assignment rules as phonological well-formedness conditions. In addition, we observed that two-handed letters without movement are relatively easier to undergo hand reversal than two-handed letters with movement because of the restrictions on the movement of h2.

4.2 Assimilation in Polymorphemic Signs with Fingerspelling

In this section, we discuss the various assimilation phenomena in TĪD polymorphemic forms involving fingerspelling. We characterise the phenomena in the Hand-Tier model as before and suggest improvements where problems arise.

In 4.2.1 we will discuss assimilation phenomena which occur in handshape or in a handshape feature such as orientation. In 4.2.2 we reconsider an assimilation which has been discussed in the literature as handshape assimilation and propose that it is place assimilation. In 4.2.3, we will touch on movement plane assimilation.

The types of assimilation we account for are the following:

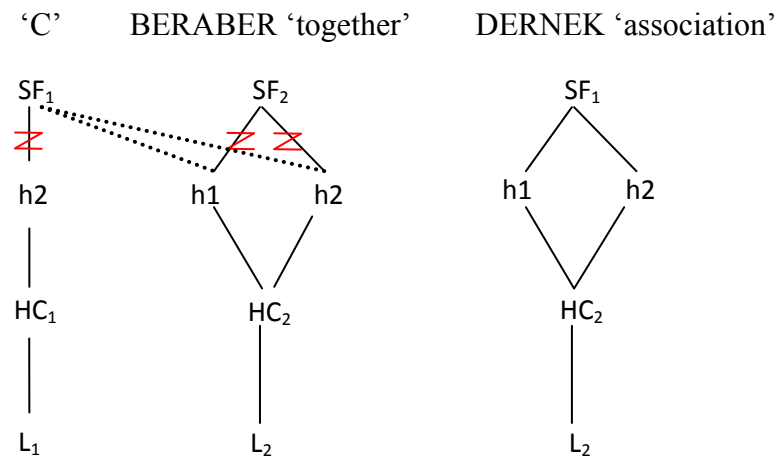
1. Assimilation in(side) handshape
2. Handshape or place assimilation
3. Place Assimilation
4. Movement Plane Assimilation

4.2.1 Assimilation in(side) Handshape

In this section, we account for handshape assimilation and orientation assimilation in TİD polymorphemic forms.

The sign CEMİYET ‘association’ is a simultaneously expressed polymorphemic sign (i.e. a simultaneous compound, see Section 5.1.3 for a detailed description) whose members are the letter C and the sign TOGETHER. Today, this sign is translated and mouthed as /dernek/ ‘association’ into Turkish., however, mouthings of elderly signers are /cemiyet/ ‘association’ (obsolescent form) while producing this sign, preserving the fingerspelling origin of the sign (See Section 5.1.2 for the discussion about the complexity in this sign).

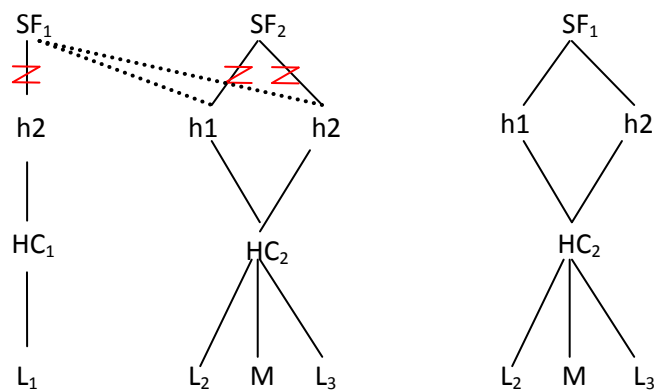
(7) DERNEK=C^BERABER /cemiyet/ (‘association’=C^together)



The handshape (SF) of the letter C spreads to h1 and h2.

In the simultaneous polymorphemic form CEKET = C^MONT (‘jacket’ = C^coat), there is forward assimilation of handshape (SF node) to the h1 and h2 nodes.

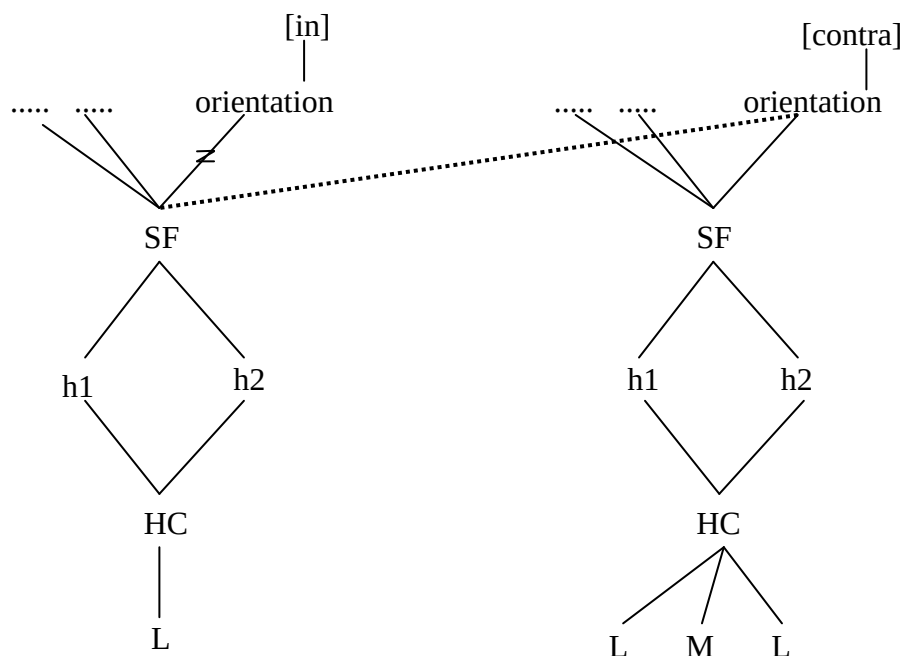
(8) 'C' MONT 'coat' CEKET 'jacket'



In the sequentially expressed polymorphic sign (i.e. sequential compound, see Section 5.1.2) MECLIS 'parliament', the orientation feature of SALON 'hall' spreads to the SF node of the letter M.

MECLIS=M^SALON ('parliament'=M^hall)

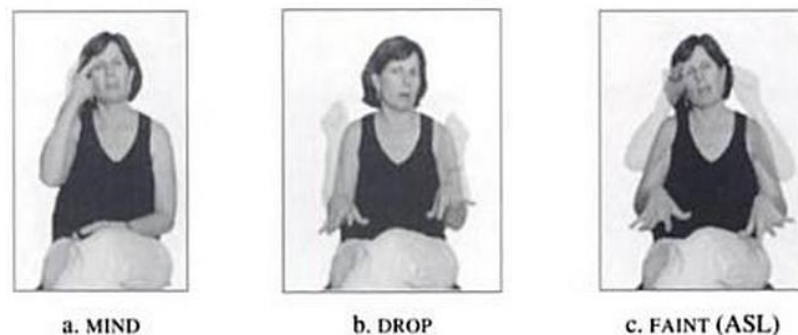
(9) M SALON 'hall'



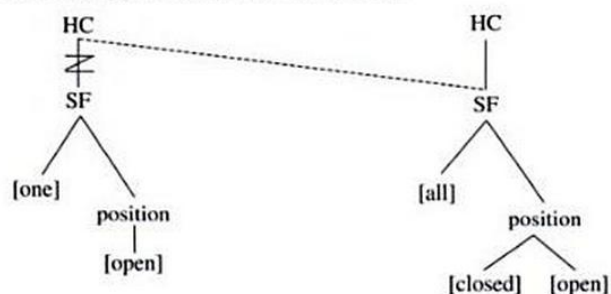
4.2.2 Handshape or Place Assimilation?

In this section, firstly we re-analyze a representation of a polymorphemic form by Sandler and Lillo-Martin (2006) in ASL. We will point an inconsistency of the analysis with the HC hierarchy of the Hand-Tier model and suggest a solution for this particular ASL form. We suggest that the so called ‘hand-configuration assimilation’ is better captured by the model if it is represented as ‘place assimilation’. Then, we present relevant examples of items which have similar assimilatory processes in TID and apply the same solution.

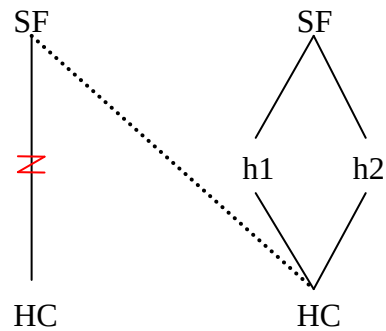
We show that what might appear as hand-configuration assimilation from a two-handed symmetrical sign (DROP) to a one-handed sign (MIND) in ASL (Sandler and Lillo-Martin (2006:155) can be alternatively conceived of as place assimilation.



Total hand configuration assimilation in FAINT

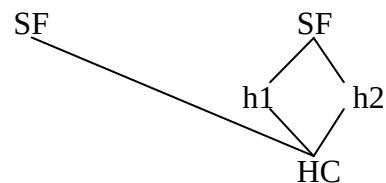


In the chapter about the role of the nondominant hand, Sandler and Lillo-Martin's representation for MIND^DROP shows h1-h2 nodes as well (p.187). In the previous representation, the SF node of DROP is linked with the HC node of MIND. In the latter representation, the HC node of DROP is linked to the SF node of MIND:



In other words, there is an inconsistency in the linking of the nodes.

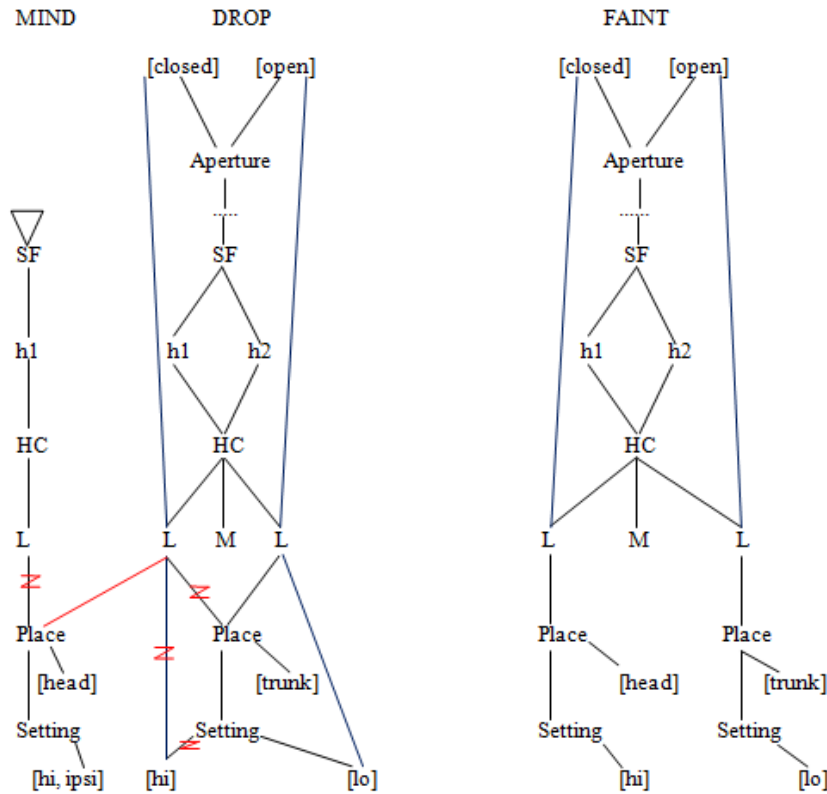
Besides this inconsistency, when we represent the output of this process, the result is incoherent with respect to the feature geometry proposed in the model:



This is because HC cannot be linked directly to the SF node, as h1-h2 is between HC and SF in the hierarchy. This should not be possible because HC can not have SF as its daughter since this would require crossing the h1-h2 (hand arrangement) tier. We can bypass this problem by delinking the Place node of MIND and associating it to the first timing slot of DROP.

FAINT=MIND^DROP in ASL can be represented as the following:

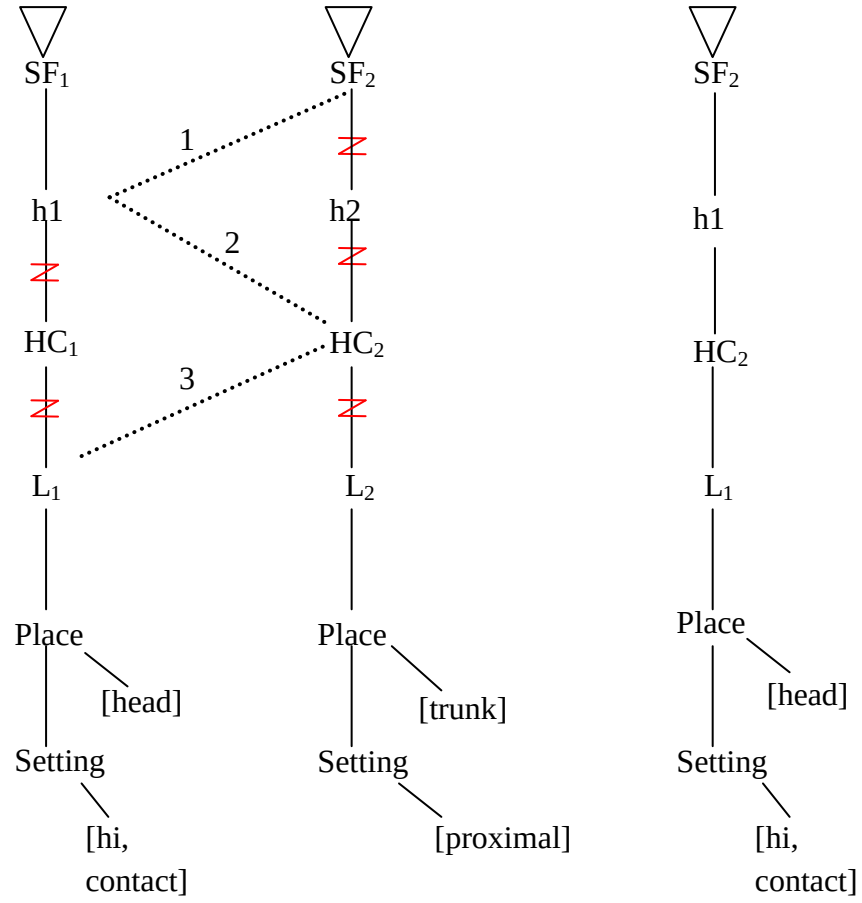
(10)



When we look at TİD, the simultaneous polymorphemic form PSİKOLOJİ ‘psychology’ in TİD consists of the sign BAŞ ‘head’ and the letter P.

In the representation of this compound (See below), the association line #1 and the association line #2 are required by the h1 assignment rule which was posited in Section 4.1.1. With the association line #3 the Location node of BAŞ ‘head’ links to the HC node of P representing the segmental loss. Remember that Location and Movement nodes also represent the skeleton, the timing slots. Since Place node is dominated by the Location, place assimilation is implicated and indicated by the model. If we adopted the strategy of Sandler and Lillo-Martin (2006) which is to connect the HC directly to SF, the representation of hand reversal (lines #1 and #2) would be missing from the representation.

(11) BAŞ ‘head’ ‘P’ PSİKOLOJİ ‘psikoloji’



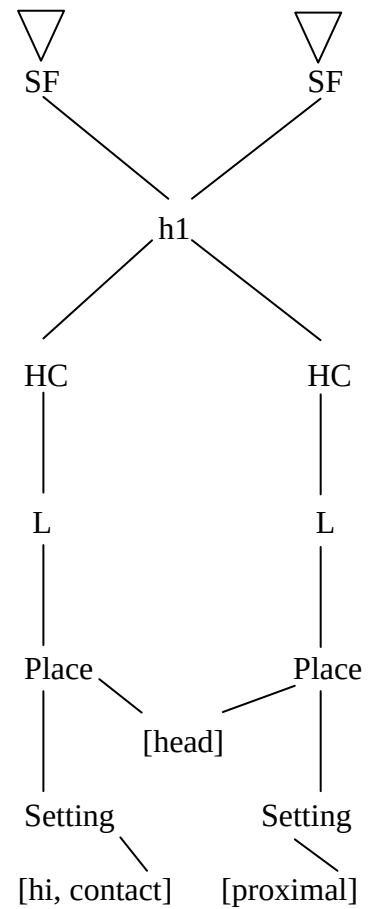
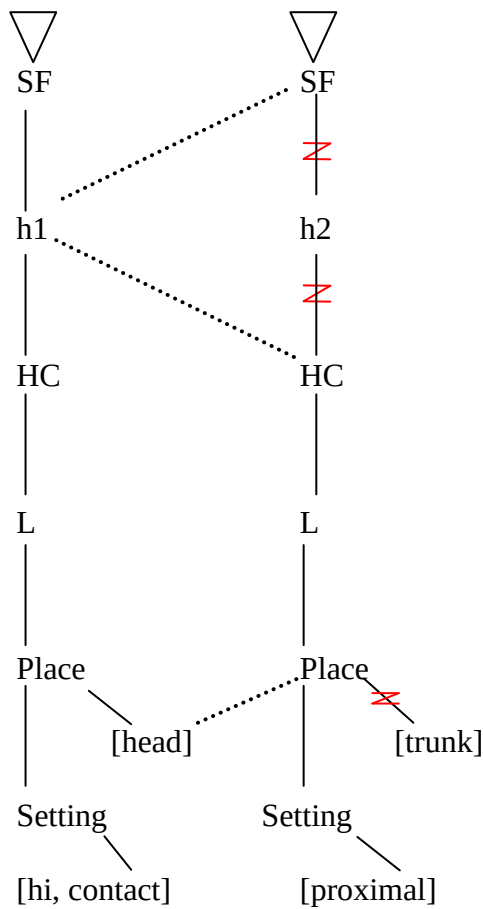
In TİD, DELİ=BAŞ^P ('mad'=head^P) as a sequential polymorphic form has place assimilation which is represented as the linking of the place feature of the first member [head] to the place node of the second member P. This sequential form is different from the simultaneous one at the level of hierarchy where assimilation occurs.

(12)

BAŞ ‘head’

‘P’

DELI ‘mad’



Note that setting features of both HEAD and P are preserved. The fact that place assimilation can take place without setting change supports the division of place and setting feature classes as separate nodes in the Hand-Tier model.

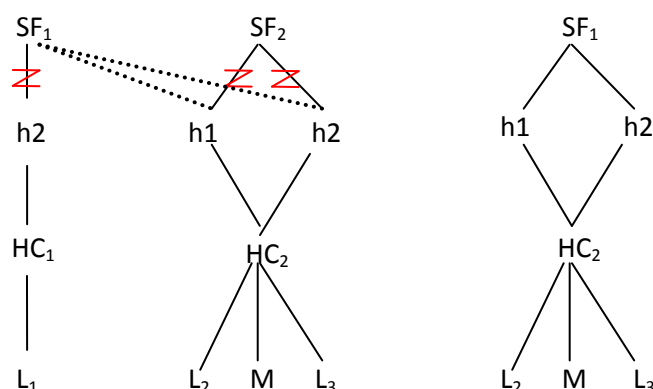
For the representation of the nondominant hand in two-handed signs, the h1-h2 node creates problems. For example, in the simultaneous polymorphic sign CEKET ‘jacket’ the SF node is linked to h1 and h2. The representation is repeated:

(13) Simultaneous CEKET

‘C’

MONT ‘coat’

CEKET ‘jacket’



This multiple linking is an ad-hoc solution. If h1 and h2 are present in a sign, by definition they are only present in symmetric signs (in non-symmetric signs h2 is a place of articulation) so they can never be separately linked to the SF and HC nodes. For example, it is not possible that an h1 is linked to SF₁ and h2 is linked to SF₂. If h1 and h2 always act together between SF and HC, there is no need to posit two different h1 and h2 nodes between SF and HC.

This problem can be solved in three steps:

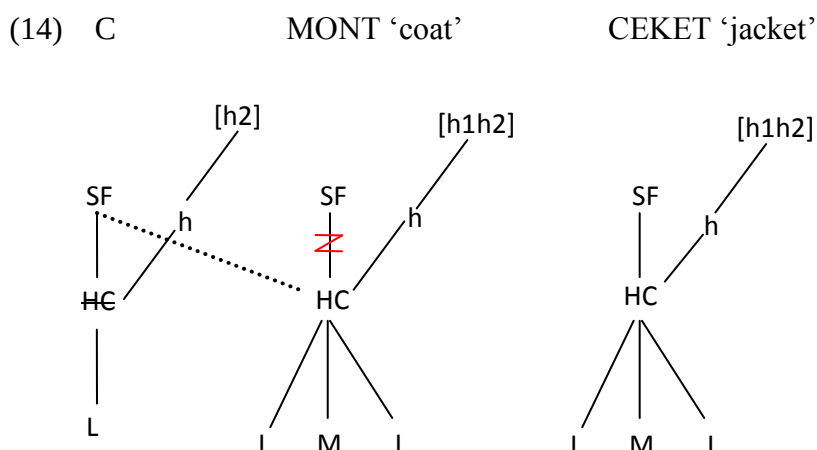
Step 1: The h1 and h2 nodes are merged into one ‘h’ node.

Step 2: ‘h’ node can have its own features: [h1] for one-handed signs or two-handed signs where h2 is place of articulation; [h2] for one-handed fingerspelled letters; and [h1h2] for symmetric signs.

Step 3: ‘h’ node becomes a daughter of HC without being connected to the SF. In other words, ‘h’ node is removed from its position between SF and HC³⁴.

³⁴ Thanks to Markus Pöchtrager for this suggestion.

Of course, one should investigate the further implications of this kind of a change. The following representation models the handshape assimilation in CEKET ‘jacket’ with the solution which we have proposed:



In this section we showed that some handshape assimilations can be reconsidered as place of articulation assimilation.

We next look at the assimilation of movement plane or movement direction in TĪD as a phonological process in compounds with fingerspelling.

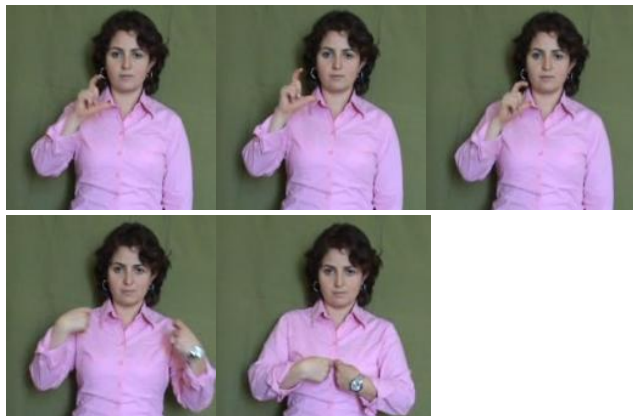
4.2.3 Assimilation of Movement Plane / Movement Direction

The third type of assimilation we will explain is the assimilation of movement plane or movement direction.

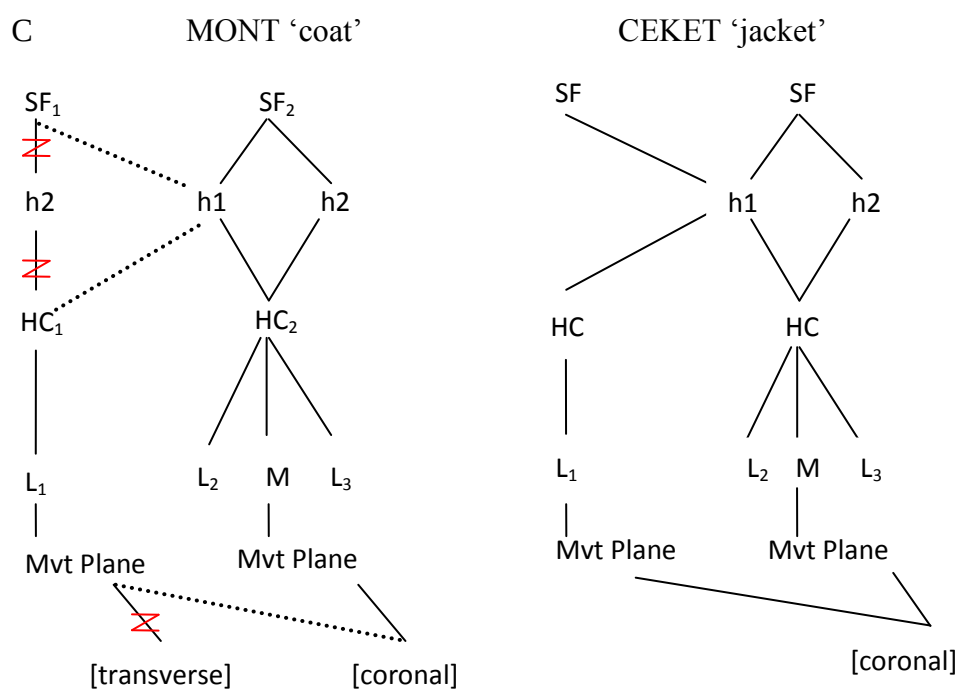
Direction of movement is distinctive in TĪD (e.g., GRAY - AUGUST, CAT - SLOW, ENGINEER vs PLAN).

The frames below show the sequential polymorphic sign CEKET ‘jacket’. The first three frames depict the movement of the C handshape sideways repeatedly, then the last two frames depict the sign COAT. The default movement direction is

forward-backward for one-handed fingerspelled letters if they are repeated or come in a sequence in one-by-one fingerspelling. In CEKET ‘jacket’, C is repeated sideways, copying the movement plane of MONT ‘coat’.



(15)



Movement plane is not included as a feature in the Hand-Tier model. This assimilation phenomenon that we have observed suggests that movement plane should be included as a feature in the model.

4.3 Conclusion

In this chapter, we have discussed two phonological phenomena in TİD fingerspelled signs: Hand reversal and assimilation.

The data about hand reversal revealed that one-handed letters undergo hand reversal when they are lexicalized. This finding is in line with Kubuş (2008). We have posited two rules, namely, h1 insertion and h1 assignment, to account for the hand reversal of one-handed letters. As for two-handed letters, we claimed that restrictions on h2 movement do not allow two-handed-letters with movement to undergo hand reversal. However, relative handshape complexity allows two-handed letters without movement to undergo hand reversal.

The assimilation phenomena in TİD polymorphemic forms with fingerspelling were scrutinized and modeled by the Hand-Tier model. We represented assimilation in handshape, orientation, place, and movement plane. We proposed a suggestion for changing the place of hand-arrangement node in the HC hierarchy. In addition, we suggested that the movement plane should be included in the Hand-Tier model as a feature class.

In the next chapter we look at these polymorphemic forms and investigate their morphological status.

CHAPTER 5

MORPHOLOGY OF LEXICALIZED FINGERSPELLING

In this chapter we investigate various morphological processes in TID lexicalized fingerspelling.

In Section 5.1, we propose repetition and length as a morpheme structure constraint on fingerspelled letters. We describe the word-formation processes through fingerspelled letters and touch on the issues of complexity, motivation and compositionality.

In Section 5.2, we analyze the internal structure of polymorphemic forms with fingerspelling and propose compounding as the morphological category for these forms.

Section 5.3 points to the constraints on the lexicalization of fingerspelling such as phonological, syntactic, and synonymy blocking.

Section 5.4 presents the listedness properties of lexicalized items with fingerspelling according to the number of phonological alterations in a fingerspelled letter.

5.1 Word Formation through Fingerspelling

In this section, the aim is to discuss the nature of word formation processes which apply to fingerspelling. Firstly, we suggest that a fingerspelled letter is subjected to

repetition when it is lexicalized. We introduce and describe lexicalized fingerspelling, the lexemes which are formed with fingerspelled letters.

Then, we consider the possibility that the movements might have morphemic status and indicate complexity in some seemingly simplex words which are derived from fingerspelling. Next, we discuss the possible constraints on the productivity of word-formation processes which apply to fingerspelling. Lastly, the listedness values of lexicalized fingerspelling items in our data are presented.

It is important to note that what we mean by lexicalization does not involve *local lexicalizations* (Brentari 1995b, in Johnston & Schembri 2007) where the fingerspelling acquires a stable meaning only within a particular conversation context. Our descriptions involve context-independent lexicalizations which are assumed to be listed in the lexicon of signers.

5.1.1 Constraints on Morpheme Structure:

Repetition and Length as Minimum Length Requirement

When a fingerspelled letter is lexicalized it necessarily has one of the two phonological processes: repetition or lengthening. We suggest that this happens because of a minimum length requirement on a morpheme.

An example for repetition is TEMMUZ ‘July’. This lexicalized letter has a repetitive movement of the letter ‘T’. The same kind of repetitive movements in lexicalized fingerspelling are also attested in one-by-one non-lexicalized fingerspelling if two of a same letter occur one after another. For example, there are two successive T’s in a word like *fettan* ‘coquettish’. When this word is fingerspelled one by one, the same fingerspelled letters (‘T’) follow each other and the repetitive

movements which is found in a lexicalized fingerspelling (like TEMMUZ) occur representing the repetition of the letter in the orthography of *fettan*.

Since the movements explained are present in the repetitions in one-by-one fingerspelling and local lexicalizations, we take these movements as the default repetitive movements of the TİD manual alphabet.

Lengthening is another process which happens to a fingerspelled letter when it is lexicalized. In VİRÜS ‘virus’ and YALOVA (a place name)³⁵ there is no movement but the durations of the sign (each of which is a single letter, ‘V’ and ‘Y’ respectively) are long, that is, the hands are held for a longer duration in the signing space. It is important to note that in a conversational setting, as an alternative to one-by-one fingerspelling, signers may use other means to sustain length. For example, they may fingerspell just the initial letter and mouth the spoken word (e.g., “Viyana” - Vienna) while the fingerspelled letter ‘V’ is suspended stationary in the signing space³⁶.

Following from the above, we propose the following as the default repetitive movements of the TİD manual alphabet:

- a) One-handed letters: Repeated forward-backward movement
- b) Symmetric two-handed letters: Repeated contact of the hands with each other in the coronal plane.
- c) Asymmetric two-handed letters without movement: h1 repeatedly contacts h2. the movement direction is forward-backward in two-handed letters where the dominant hand is in the supine position of the non-dominant hand (A, E,

³⁵ YALOVA is lexicalized from the former one-handed alphabet. See Section 2.1.2.

³⁶ We can hypothesize that mouthing and repetition do not co-occur, but we leave this point for future research. See also Section 2.2.4.

H), whereas the movement direction is ipsilateral-contralateral in the other stationary two-handed letters.

d) Two-handed letters with movement: Fingersnapping in Ç, Ş, and İ is repeated. In the letter Y, path movement of h1 is repeated. The letters Ö, Ü, and J are not repeated when they are lexicalized.

e) Lengthening is the alternative to repetition. The letters which can not be repeated (Ö, Ü, J) can not be lengthened either.

When the fingerspelling becomes a compound member (see Section 5.2), then the repetition can be avoided, but the letter can also have extra repetition. For example, ‘M’ in the compound MECLİS = M[^]SALON ‘parliament = m[^]hall’, has repetition. Likewise, for length, the length of a letter can increase or decrease in a compound as in the letter ‘E’ in the compound TÜRK-EDEBİYATI = TÜRK[^]E ‘Turkish-literature = Turkish[^]E.

There are a few signs in TİD without any movement, or sometimes produced without movement (e.g., TURKEY, BALL). We regard repetition of fingerspelling not as a morphological word formation process, but as a natural outcome of the phonological/prosodic requirements to be found in a sign.

The evidence for a minimum length requirement comes from the letters which can not be repeated. The letter J has a longer path movement than Y. That is why, we assume, the letter J can not have repetition whereas the letter Y can. Ö and Ü are not repeated since there are already two fingersnappings. The minimum length requirement is satisfied by these letters, and therefore there is no need for them to be repeated.

The repetitions of a letter do not necessarily indicate that the sign is lexicalized and listed unless the repetition is achieved in a different way than the

default repetition patterns. When we see a default kind of a repetition, we do not have any evidence for the sign's lexicalization status other than frequency of usage. In other words, when we see a repeated letter, it is either a nonce form which acquires a meaning specific to a context, or it is a lexicalized and listed word of the language. LAZIM 'necessary' has repeated forward-backward movement only but we are quite sure that it is listed in the lexicon because of its high frequency of usage among signers.

Thus, in this section, we described how repetition occurs in fingerspelled letters. We argued that repetition and its alternative lengthening take place due to a minimum length requirement on morpheme structure. The repeated letters can be either nonce forms or lexicalized forms.

We next look at the ways of modifying fingerspelling for word-formation purposes.

5.1.2 Ways of Modifying Fingerspelling to Create Lexemes

As stated earlier in Section 1.2, words of sign languages consist of phonological units such as handshape, movement, orientation, and place of articulation. The letters of the TID manual alphabet can be lexicalized along these parameters. That is, these phonological features are either (i) modified or (ii) added to form new lexemes. Now we point out certain examples for major feature nodes (handshape, movement, place). The inventory of our data demonstrating which change occurs in which sign can be seen in Appendix D (Lexicalized Fingerspelled Items).

As explained in Chapter 3, the letters of the TID Manual Alphabet are signed in neutral space and do not have any movement except in the case of seven letters.

Lexicalization of fingerspelling can happen in a number of ways:

1. path movement,
2. hand-internal movement,
3. hand drop,
4. altered orientation,
5. altered location,
6. non-manual features,
7. abbreviations, creative handshapes, and simultaneous fingerspelling.

Each of these ways of modification will be described and exemplified below.

We also provide examples of signs which are not related to fingerspelling in order to show that most of the modifications on fingerspelling take place within the phonological parameters and material of TID.

5.1.2.1 Fingerspelling with Path Movement

Path movements require the specification of two settings inside one major place area in the Hand-Tier model (See Section 1.2). When lexicalized, some letters of the TID manual alphabet are moved along a path. TID fingerspelling has examples of lexicalizations from all three subtypes of path movement: straight, arc, and circular. These are the same movements occurring in TID signs which are not related to fingerspelling. See Table 4 for some of the lexicalizations with one-handed letters and their non-fingerspelled counterparts with a similar phonological material:

Table 4. Examples of Lexicalized Fingerspelling with One-Handed Letters and Signs Unrelated to Fingerspelling Which Share The Same Path Movement

Path movement type	Lexicalization from fingerspelling	Sign unrelated to fingerspelling
Straight	<u>L</u> OKAL ‘clubhouse’	DUR ‘stop’
Arc	<u>C</u> EVAP ‘answer’	VER ‘give’
Circular	<u>L</u> İSE ‘high school’	EYLÜL ‘september’

Table 5. Examples of Lexicalized Fingerspelling with Two-Handed Letters and Signs Unrelated to Fingerspelling Which Share The Same Path Movement

Balanced/Unbalanced		Lexicalization from Fingerspelling	Sign unrelated to fingerspelling
Symmetric Two-handed	Straight	T <u>A</u> XI ‘taxi’	BERABER-GİTMEK ‘go together’
	Circular	<u>M</u> OR ‘purple’	SALATA ‘salad’
Asymmetric Two-handed	Straight	<u>D</u> OLMUŞ ‘shared-taxi’ T <u>A</u> KSI ‘taxi’	
	Arc	<u>S</u> ORU ‘question’	SÜPÜR ‘sweep’

Similarly, two-handed letters can have path movement as well, where both hands move. MOR ‘purple’ has symmetric circular movements, TAXI³⁸ ‘taxi’ and DOLMUŞ ‘shared-taxi’ have forward-backward movements. SORU ‘question’ has an arc movement. See Table 5 above for TİD signs having similar kinds of movement.

³⁸ The Turkish gloss for ‘taxi’ is ‘taksi’. However this sign lexicalizes the letter X from the English orthography. Because in the past, taxis had plates on top of them on which it was written ‘TAXI’.

5.1.2.2 Fingerspelling with Hand-Internal Movement

When fingerspelled letters are lexicalized, the following hand-internal movements are observed in TİD: Orientation movement, wiggling, and aperture (curved-to-open) movement. The signs with wiggling have wiggling in the hand, not in the fingers. Aperture movement is seen in the polymorphemic signs ORTAOKUL ‘secondary school’ and QHMMETRE ‘ohmmeter’. See Table 6 for examples items which have hand-internal movement with and without fingerspelling.

Table 6. Examples of Lexicalized Fingerspelling and Signs Unrelated To Fingerspelling Which Have Hand-Internal Movement

Hand-Internal Movement Type	Lexicalization from Fingerspelling	Sign unrelated to fingerspelling
Orientation Movement	AVRO/ <u>e</u> uro	RÜZGAR ‘wind’
Wiggle	<u>ORTA</u> ‘middle’ <u>QCAK</u> ‘january’ <u>MATEMATİK</u> ‘mathematics’ OTO <u>CAM</u> ‘car-window’ ÖN <u>CAM</u> ‘front-window’	ŞAKA ‘joke’
Aperture	<u>ORTA</u> OKUL ‘secondary-school’ <u>QH</u> MMETRE ‘ohmmeter’	ELEKTRONİK ‘electronic’

In 5.1.2.1 and 5.1.2.2 we demonstrated that fingerspelling can be lexicalized by path movement and hand-internal movement. In the next section, we look at hand drop in lexicalized fingerspelled items.

5.1.2.3 Hand Drop in Lexicalized Fingerspelling

The hand arrangement of a fingerspelled letter can change when it is lexicalized. For example, the two-handed letter ‘H’ becomes one-handed in HAZİRAN ‘June’ and in a proper name. The two-handed ‘R’ becomes one-handed in RAPOR ‘report’.

However, for asymmetric two-handed letters, we observe in general that the two hands do not separate from each other in signing space, or two hands are obligatory. In this respect, the view that the manual alphabet letters are non-analyzable icons is supported (Kubuş 2008).

In addition, separating the hands in asymmetric two-handed letters renders the letter unrecognizable, decreasing its predictability. Breaking up the two-handed letters is unproductive because it decreases the predictability of the meaning of the sign.

5.1.2.4 Fingerspelling with Altered Orientation

Orientation of fingerspelling can be altered when it is lexicalized. For example in UŞAK (a place name), the ulnar border of the hand faces the contralateral side instead of the body. In MEVŞİM ‘season’, the palms are in contra-lateral position, they face the opposite side of the body. Orientation is distinctive in TİD in a minimal pair like ART ‘increase’ vs. AZAL ‘decrease’. So the orientation-wise modification of fingerspelling occurs within the phonological mechanisms of TİD.

5.1.2.5 Fingerspelling with Altered Location

We can see that fingerspelling can be articulated in alternative locations when it is lexicalized. For example, the letter ‘P’ in PSİKOLOJİ ‘psychology’ is signed near the head. This alteration is within the remits of TİD phonology because location is

distinctive in TİD as in the minimal pair YANLIŞ ‘wrong’ - BEŞİKTAŞ (a place name).

5.1.2.6 Fingerspelling with Non-Manual Features

Non-manual features can be distinctive at the lexical level in TİD. For example, the signs for DOCTOR and PATIENT are distinguished by different non-manual features. Two lexicalizations of the letter ‘İ’ in our data, İĞRENÇ ‘disgusting’ and İLGİNÇ ‘interesting’ are also differentiated on the basis of different nonmanual features.

5.1.2.7 Lexicalization of Fingerspelling by Abbreviations, Creative Handshapes, and Simultaneous Fingerspelling

There are some word-formations with fingerspelling which are unique to fingerspelling and we can not easily put them under the phonology of TİD.

One of these has to do with abbreviations. Abbreviations can be already present in the source language (Turkish). Alternatively, forms can get abbreviated in the target language, for example, TİD. TL ‘Turkish Lira’ is already an abbreviation in Turkish and gets lexicalized as T-L. Alternatively, a spoken word can become abbreviated in TİD. C-C in TİD stands for Coca-Cola.

One item in our data (PAKİSTAN ‘Pakistan’) involves the expression of a one-handed letter ‘P’ articulated with two hands having the I and C handshapes. This can also be seen as a neologism and this change is hard to classify under a phonological process, such as path movement or hand drop.

Simultaneous fingerspelling of two letters is another creative word-formation process. For example ‘V’ and ‘A’ are simultaneously fingerspelled in VAN (a place

name), so that the signing takes two hold positions. WC has a creative handshape where ‘C’ is expressed with the index and the thumb while ‘W’ is expressed with the middle, ring, and the little fingers. This sign exists also in the sign languages of Estonia, France, Germany, Japan, and The Czech Republic (Spreadthesign.com).

In this section, we have seen various ways of modifying fingerspelling for creating new lexemes. We have argued that most of these modifications are constrained by the phonological structure of TİD.

In the next section, we discuss the complex lexemes in terms of motivation and compositionality.

5.1.3 Complex Lexemes: Motivation and Compositionality

In this section, we identify the phonological indicators of morphological complexity for the TİD manual alphabet. We discuss morphological complexity together with the concepts of motivatedness and compositionality in some of the lexicalized fingerspelled items in our data.

A fingerspelled letter and a sign can be composed sequentially or simultaneously to form a new lexeme. For example, the letter C and a sign MONT ‘coat’ are signed one after another psychology’ to refer to CEKET ‘jacket’. This is an example of sequential expression, because the members are separated in time. First, ‘C’ is signed, then the sign for MONT ‘coat’ is signed. Conversely, in the simultaneous variant of CEKET ‘jacket’, the handshape of the sign for MONT ‘coat’ is replaced with a C-handshape, i.e. the handshape of the letter C. We can not separate the two members of the item in time because they occur at the same time. This is an example of simultaneous expression. Other items of this type are

LACİVERT ‘dark blue’, CEMİYET ‘association’, PSİKOLOJİ ‘. We will categorize these forms as compounds in Section 5.2.

It is relatively easy to identify sequential kind of complexity, because it is straightforward to see which part of the sign is the letter and which part is something different than the letter. However, the simultaneous complexity can be hard to identify because the motivation of one of the morphemes might have ceased in time.

The type of movement in a fingerspelled letter can signal complexity. Previously in Section 5.1.1, we argued that the first thing that happens to a fingerspelled letter through lexicalization is repetition or lengthening. We propose that any movement other than the default repetitive movements which have been previously described, indicate complexity in a lexicalized fingerspelled item, at least, it has done so at some point in the history of the word.

For example the sign for DERNEK ‘association’ is the same as the sign for BERABER ‘together’ except that the hands have a C handshape in DERNEK, like the letter C. For this particular sign, the signers from the younger generation mouth the word /dernek/ for this sign, whereas the elder signers mouth /cemiyet/. *Dernek* is the more recent word for ‘association’ in Turkish and *cemiyet* is rarely used for this meaning in present time. Thus, the letter C in DERNEK ‘association’ has no motivation any more. We can analyze this word as being simplex and non-compositional.

Another example for lack of motivatedness comes from the signs LACİVERT ‘dark blue’, LİSE ‘high school’, OCAK ‘january’ which have circular movement but no direct semantic relation between them. It might also be the case that, the letter was compounded with another sign and only the handshape of the letter remained

because of a handshape assimilation. Thus, it might be the case that these words were formerly complex, but became simplex in time.

Some path movements might be regarded as motivated. For example, DOLMUŞ ‘shared taxi’, TAKSİ ‘taxi’, ACİL^SERVİS ‘emergency service’ have a going-coming relation and SORU ‘question’ and CEVAP ‘answer’ have a giving-taking relationship.

With respect to motivatedness, compositionality and complexity, we can analyze the signs mentioned above as follows:

Not motivated, non-compositional, simplex:

DERNEK (cemiyet) ‘association’, OCAK ‘january’, LİSE ‘high school’

Partially motivated and non-compositional, simplex:

DOLMUŞ ‘shared taxi’, TAKSİ ‘taxi’

Motivated and compositional, complex:

SORU ‘question’, CEVAP ‘answer’ LACİVERT ‘dark blue’.

Considering these meaning relationships, we suggest that initially, a letter either acquires repetition and/or it forms a compound with another sign. Then at a later time (or at the time of word-formation), with the effect of phonological processes such as assimilation, the compounded sign loses some of its phonological specifications and the remainder is established as the lexicalized form. If this is true, then all the lexicalized fingerspelling having a movement other than repetition should have an origin as a compound (which is not always possible to trace back).

The movements other than repetition are indicators of listedness. Listedness of lexicalized fingerspelling will be discussed in Section 5.4.

5.2 The Internal Structure of Compounds with Fingerspelling

In the literature, the sequentiality or simultaneity of merging forms seem to have an affect on the descriptions in terms of their morphological category . Simultaneous sign+sign forms have been referred to as ‘portmanteau’ (Liddell 1984), ‘blend’ (Uyechi 1996, Meir 2011) or ‘compound with assimilation’ (Liddell & Johnson 1986, Sandler & Lillo-Martin 2006). These categorizations are applicable to lexicalizations which have simultaneous expression of sign and letter. For similar simultaneous forms, affixation has been proposed by Brentari (2010). According to Brentari, the fingerspelled letters in these forms have certain meanings like affixes where the meaning is the printed letter of the Roman alphabet. Another possibility not mentioned in the literature would be cliticization, that is, the fingerspelling which attaches to a sign might be a clitic.

In order to distinguish compounds, phrases, affixation, and cliticization Sandler and Lillo-Martin (2006) presents a table of criteria (p.67, See Table 7 below).

Table 7. Characteristics of Phrases and Complex Words (From Sandler & Lillo-Martin 2006, p.67)

	Phrase (word+word)	host+clitic	lexicalized compound	word+ derivational affix
Interruptible by other words	+	+	-	-
Word-level phonological properties	N/A	+	+	+
Idiosyncratic semantics	-	-	+	+
Arbitrary lexical gaps	N/A	-	-	+
Productivity of morphological element	N/A	+	generally not productive	generally productive

We review possible categories³⁹ (cliticization, affixation, compounding, blending, clipping) and discuss their appropriateness for the TID FS+sign forms, whether they are sequential or simultaneous. First, we will reject cliticization and affixation. Then, we will test these forms with respect to eight formal criteria and argue that polymorphemic forms with fingerspelling are compounds. The criteria and the morphological category they support are shown in Table 8 below.

Table 8. Morphological Category of FS+Sign Forms with Respect to Formal Criteria

	Word Stress	Shared Segment	Stems Retaining Form	Output Category	Headedness	Ellipsis	Transparency	Productivity
Blend			+	+	+			
Clipping	+	+		+				
Compound	+	+	+			+	+	+

We now turn to assessing the morphological category of polymorphemic forms with fingerspelling. We start with entertaining the idea that fingerspelling in polymorphemic forms is cliticization or affixation.

5.2.1 Evaluating Possible Categories for Polymorphemic Forms with Fingerspelling

The categories cliticization and affixation will be discussed in terms of whether they can be considered as parts of complex lexicalized fingerspelled items. After rejecting these two categories, we will evaluate the categories compounding, blending, and

³⁹ When fingerspelling is produced in classifier constructions in a simultaneous way, it is considered to be at the phrasal level by Johnston and Schembri (1999, cited in Meir 2011). In the TID data there are five forms with classifiers but they are not simultaneous. Regardless of fingerspelling, sign languages do have lexicalizations from classifiers. Though Meir claims these are lexemes in many respects, fingerspelling at the phrasal level needs further examination.

clipping in terms of their similarity to polymorphemic lexicalized fingerspelled words.

5.2.1.1 Cliticization

For fingerspelled letters which attach to signs, there are two reasons to reject that they are clitics (i) Clitics do not bear stress whereas lexicalized letters can.

(ii) Clitics are function words whereas lexicalized letters are content words.

First, clitics are particles which can attach to words or phrases regardless of word category, headedness, or inflection and they can not be stressed (Caink 2006). We have observed that manual alphabet letters can be stressed by repetition, eyebrow raising and forward head movement in letter+sign forms. For example, MECLİS = M[^]SALON ('parliament=M[^]hall').

Secondly, in TİD, when lexicalized, fingerspelled letters become content words. Clitics, however, are function words. Each manual alphabet letter represents a Roman alphabet letter, but when it is lexicalized, its ultimate meaning changes in accordance with the represented spoken word. See Section 6.2 for the discussion of the semantic representation of fingerspelling in lexicalized forms.

Another evidence against manual alphabet letters being function words is that TİD signers can invent and lexicalize new letters such as X, W, and Q which do not exist in the Turkish writing system. For example, fingerspelled W is lexicalized and stands for 'wireless'. The fingerspelled letter X is lexicalized, meaning 'taxi'. These do not require the historical process which is required for function words.

Therefore, fingerspelling which attaches to signs can not be considered clitics.

5.2.1.2 Affixation

Affixation is another category which has been mentioned for FS+sign forms (Brentari 2010). Affixes: (i) have a specific meaning, (ii) select the word class they attach to, and (iii) they are dependent on heads of compounds. We will see below that fingerspelling in FS+sign forms is different from affixation in all of these three respects.

Firstly, lexicalized fingerspelling can have any meaning depending on the spoken word which is represented, as pointed above. This is not a property of affixation in which a particular affix has a meaning. Secondly, lexicalized fingerspelled letters in TİD mostly attach to nouns but occasionally can attach to other word categories. This is not a property of affixation; affixes choose the category type they attach to (Haspelmath 2002). Thirdly, lexicalized fingerspelled letters are not dependent on stems, they can stand alone. They can be the modifying element, or be the head themselves. In JANDARMA = ASKER^J ('gendarme' = soldier^J), the letter J is the modifier, it indicates a subcategory of soldier, i.e. J. None of these are properties of affixes.

In TÜRK-EDEBİYATI = TÜR^K^E ('Turkish literature' = Turkish^E), the letter E is the head which is modified by the non-fingerspelled element. A similar example is BEYAZ-PEYİNİR = BEYAZ^P ('white cheese' = white^P).

We can conclude that the FS in FS+sign forms are not affixes.

5.2.1.3 Compounding vs. Blending or Clipping

Formal criteria, especially the phonological shape of simultaneous FS+sign or sign+sign forms might suggest that they are a category like blends or clippings. However, when we analyze the forms according to phonological, morphological,

syntactic, and semantic criteria, the picture is not straightforward. I argue that the prosodic structure of sign language promotes this kind of condensation and renders it productive. By definition, blends and clippings are not productive, thus in this section I argue that signs whose one of the components is fingerspelled are compounds, not blends or clippings.

We begin with the definition of a compound. A compound is defined to be a lexeme formed by two or more lexemes where the result is not a phrasal structure (Bauer 2006). Blends and clippings are also formed by two or more lexemes, but in this case the stems are cut. The main difference between compounds on the one hand, and blends and clippings on the other is that blends are cut from the inner edge(s) whereas clippings are cut from right edge(s) (Bat-El 2006). For example, the word *jazzercise* (*jazz+exercise*) is a blend whereas *sitcom* (*situation+comedy*) is a clipping or clipped compound. In Table 9 below we illustrate the general tendencies in English and Turkish compounds, blends, and clippings.

There is a disagreement in the literature about the category of FS+sign forms, especially for simultaneous items. Interestingly, a similar confusion exists in the spoken language literature as well about compounds and blends as Bauer (2006, p. 721) points out:

There is also the problem that in individual languages, things may be called compounds that would not normally be so termed in other languages. For example, Glinert (1989) describes as compounds of Hebrew, things that sound like blends (q.v.) to the reader more used to languages such as English.

(16) *rakével* ‘cablecar’ *rakévet +kével* ‘train+cable’

madHan ‘parking meter’ *madad+Hanaya* ‘measure+parking’

(examples from Glinert 1989)

Table 9. General Properties of Compounds, Blends, and Clippings in English and Turkish (drawn from Aronoff & Fudeman 2005, Bauer 1983, 2006, Bat-El 2006, Göksel 2009)

	Morphological	Phonological
Compound	1. Stems retain form 2. Some contain special markers like linking elements 3. Made up from two or more stems 4. Inflection should apply on the whole word or the	1) Special stress (Compound stress) 2) A phonological process which applies to first unit, second unit, or boundaries 3) Phonology determines order in appositional compounds
Blend	1. At least one of the stems are reduced segmentally at the conjuncture of two stems 2. Made up from two or more stems 3. Cut element can not function as a word 4. No special marker like linking element	1. Word stress 2. Exocentric blends are ordered by phonology 3. Shared segment 4. Generally syllable number equals the syllable number of the longer base word 5. If there is not a shared segment: a) for monosyllabic blends formed from monosyllabic bases, first word contributes only its onset and the second contributes its nucleus and coda. b) for polysyllabic blends, switch point is at the syllable boundary
Clipping	1. At least one of the stems are reduced segmentally at the outer edge(s) of the stem 2. Made up of one, two or more stems 3. Cut element can function as a word if the input and the output is a single stem 4. No special marker like linking element	1. Special stress (Compound stress if it is composed of more than one stems)

Table 9. continued. General Properties of Compounds, Blends, and Clippings in English and Turkish (drawn from Aronoff & Fudeman 2005, Bauer 1983, 2006, Bat-El 2006, Göksel 2009)

	Productivity	Semantic	Syntactic
Compound	Productive, rarely salient	1) More likely to be transparent 2) Specialized meaning	1. Output category: noun, verb, adj, adv Three types: modifier-head, complement-head, dvandva 2. Head-directionality, usually follows head-parameter (except co-compounds) 3. Ellipsis is possible
Blend	Not productive, generally salient	1) More meaning possibilities, but can be more obscure than compounds because of segmental reduction 2) Specialized meaning	1. Output category: predominantly nouns, also adjectives and verbs Generally dvandva, but also has modifier-head, complement-head 2. If endocentric, modifier+head order in English. If exocentric, order is determined by the phonology 3. Ellipsis is not possible
Clipping	Not productive, generally salient	1) More likely to be transparent, but can be more obscure than compounds because of segmental reduction 2) Synonymy in stems made up of one stem. Specialized meaning in forms made up of two or more stems	1. Output category: predominantly nouns Three types: modifier-head, complement-head, dvandva 2. Head-directionality, usually follows head-parameter (except co-compounds) 3. Ellipsis is not possible

Traditionally, blends and clippings were accepted to be totally unpredictable in terms of their formal properties since they are neologisms and all of them were considered to be created by stylistic motivations. However, there is some work on blends which shows that there are certain formal tendencies in terms of phonological structure and semantic headedness (Bat-El 2006).

5.2.1.3.1 Distinguishing Compounding vs Blending or Clipping with Formal Criteria

We have selected eight formal criteria from Table 8 that distinguish compounds, blends and clippings in spoken languages:

1. Word stress
2. Shared segment
3. Stems retaining form
4. Output category
5. Ellipsis
6. Transparency
7. Productivity
8. Headedness

We examine the polymorphemic forms with fingerspelling with respect to these criteria in order to understand whether these forms are similar to compounds, blends or clippings. In order to do this, we will examine each criterion by exemplifying from spoken languages. We adopt Liddell and Johnson's model (1989, 2011) in analysing whether the forms have a shared segment. In this model, signs are defined in sequential segments. There are basically two types of segments: (i) Hold (Location, or Position) segments where features are aligned and not changing), (ii) Movement (Transition) segments where one or more features are changing. With this

model, the features of individual segments are seen more clearly which eases the comparison.

5.2.1.3.1.1 Word Stress

One of the salient differences between words and compounds is that compounds have different stress patterns than words. For example in Turkish, the final syllable is stressed in words, whereas in compounds the leftmost stem is stressed:

- (17)a. *elmá+ağac-ı* apple+tree-POSS ‘apple tree’
b. *kurú+kayısı* dry+apricot ‘dried apricots’ (Göksel 2009)

In clippings, the stress pattern of the underlying compound is inherited. The remainder syllable (or) of the first stem carries the stress in the clipped form:

- (18) before clipping: *ordú+general-i* army+general-POSS ‘full general’
clipped: *órgeneral*

In blends, word level stress (word-final stress) is observed:

- (19)a. *kahve+alt-ı=kahvaltí* coffee+before-POSS ‘coffee+before=breakfast’
(Özsoy, Kocaman, İmer 2011)
b. *Eti+ekmek=Etimék* ‘Eti (brand name)+bread=Etimek (A product of toasted bread)’
c. *tako+kokoreç=takoréç* taco+kokoreç ‘taco bread filled with kokoreç meat’
d. *bira+sürahi=birahí* beer+jug ‘jug filled with beer’

How can we apply this information to sign languages? The equivalent to stress in sign languages has been proposed to be repetition, length and forward body movement, although these can work differently at the lexical and phrasal level

(Wilbur 1999). If we take repetition and lengthening as indicators of stress in sign languages, then we can say that the prosodic pattern of some monomorphemic words is not observed in FS+sign and sign+sign forms in TİD. We observed that some monomorphemic words can have equal length of hold segments, which is a pattern not found in polymorphemic forms. We now present these observations.

The duration of *hold (position)* segments is indicated in square brackets. For example, [40] indicates a hold segment which lasts for 40 milliseconds. Blanks between holds indicate transitory movements. Movement segments are indicated by the letters M. Some possible duration patterns in TİD are illustrated in (20) below. The examples in (20)c are repetitions of the same segment, the others (20d,e,f,g) have changing hold segments at least in one feature.

- | | |
|------------------------|---|
| (20)a. [240] | TOP ‘ball’ |
| b. [680] | TÜRKÇE ‘Turkish’ |
| c. [40] [40] [40] [40] | ADAM ‘man’, KADIN ‘woman’, KURS ‘course’ |
| d. [80] [160] | ÇİLEK ‘strawberry’, KOLAY ‘easy’ |
| e. [120] [120] [120] | ANNE ‘mother’, COĞRAFYA ‘geography’,
ABLA ‘elder sister’, GÖMLEK ‘shirt’ |
| f. [40] M [160] | UYU ‘sleep’ |
| g. [40] M [80] | UÇAK ‘airplane’ |

The equal length pattern seen in (20)e is not observed in sign+sign and FS+sign forms. Although at this point we can not determine a special ‘word stress’ or ‘compound stress’ in TİD, sign+sign and FS+sign forms are less permissive in their prosodic structure. This property brings them closer to the category of compounds and clippings.

5.2.1.3.1.2 Shared Segment

A property which can be observed in some blends is that the base forms have a shared segment (Bat-El 2006):

(21)a. Chicag**o**+gorilla=Chicagorilla

b. diab**e**tes+ob**e**sity=diabesity

The segment is defined as “any discrete unit that can be identified, either physically or auditorily, in the stream of speech” (Crystal 2008, p.426) or “the minimum concatenative unit referred to by the grammar” (Brentari 1998, p.177). Although there is assimilation in simultaneous FS+sign forms, it is hard to find perfect shared segments. Consider the ASL example from Liddell (1984, p. 389):

(22)

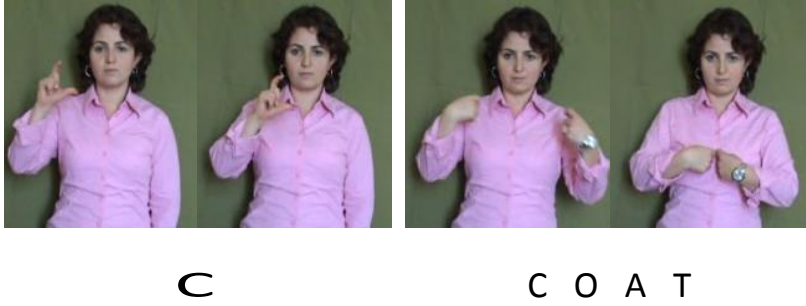
	THINK		MARRY		
Seg.	AP	H	H	AP	H
HS	I	I	C	C	C
Or.	TI	TI	PA	PA	PA
Loc.	FH	FH	C	C	C
Con.	-	+	-	-	+
NMS	-	-	-	-	+

	BELIEVE		
Seg.	H	AP	H
HS	I	C	C
Or.	TI.PAC	PA	PA
Loc.	FH	C	C
Con.	+	-	+
NMS	-	-	-

Note that in THINK and MARRY, there is no time unit in which all the phonological features are the same.

As a TID example, see the sequential alternant of CEKET ‘jacket’ below.

(23)



In the simultaneous alternant of CEKET ‘jacket’, the sign COAT is produced with a



handshape. Similar to BELIEVE in ASL, there is no shared segment between C and COAT. In this respect, FS+sign forms appear not to be blends because having a shared segment is one of the most important characteristics of blends.

5.2.1.3.1.3 Stems Retaining Form

In spoken languages, compounds generally retain their segmental units, though assimilations and additional linking elements can occur (Bauer 2006, Göksel 2009).

In TİD, when two signs form a new sign, the first element is reduced either in terms of having less or no repetition or in its length (Kubuş 2008). These properties also occur in BSL and ASL (Brennan 1990, Sandler & Lillo-Martin 2006). For example in TİD, words such as TÜRKÇE ‘Turkish’, SICAK ‘hot’, and MÜDÜR ‘principal’ in (24), reduce half of their duration when they become the first constituent in a new lexeme.

(24)a. TÜRK-KAHVESİ = TÜRK^KAHVE (‘Turkish coffee = Turkish^coffee)

b. GÜNEŞ = SICAK^GÜNEŞ (‘sun’=hot^sun)

c. MÜDÜR-YARDIMCISI = MÜDÜR^YARDIM

(‘vice-principal = principal^help)

There can be phonological processes applying to the first element of compounds in spoken languages. For example, in Danish there is glottalization, use of tones in Scandinavian varieties, and stress in English (Bauer 2006). The shortening duration of first elements in FS+sign forms could attest compoundhood in TİD.

We see the same reduction in nonfingerspelled elements of FS+sign forms if a sign precedes the fingerspelled letter, except one form JANDARMA = ASKER^J ('gendarme' = soldier^J).

We found that fingerspelled letters are generally longer than their non-lexicalized carefully fingerspelled counterparts regardless of their occurrence in the first or the second element. However, the mean FS letter duration in the first element is 325msecs (N=8), whereas it is 432msecs in the second element (N=5). Although the data at hand do not allow inferential statistics, by this picture we may speculate that fingerspelling gets closer to regular signs in form. In other words, there is a shorter length slot for the first element than the slot for the second element. The duration of fingerspelling is adjusted to these slots.

On the other hand, we can interpret the situation as being similar to blends. Bat-El (2006) shows that in blends, generally the syllable number of the blend equals the syllable number of the longer base word. Another property proposed by Bat-El is that, if there is no shared segment, a) for monosyllabic blends formed from monosyllabic bases, only the onset of the first word remains [that would be one hold segment in TİD] and the nucleus and the coda of the second word remain b) for polysyllabic blends, the switch point is at the syllable boundary.

5.2.1.3.1.4 Output Category

Blends and clippings are predominantly nouns in spoken languages. In TİD, the output of FS+sign forms are mostly nouns. Sign+sign forms have more variety in their output category and they appear to be nouns, adjectives, and verbs.

Adj: GENÇ = YÜZ^KÜÇÜK ('young' = face^small)

Adj: GÜZEL = YÜZ^İYİ ('beautiful' = face^good)

Verb: HATIRLA = BAŞ^ANI ('remember' = head^memory)

(examples from Kubuş 2008). In this respect, FS+signs are similar to blends and clippings, whereas sign+sign forms are like compounds in TİD.

5.2.1.3.1.5 Ellipsis

Ellipsis is possible in FS+sign forms which renders them similar to compounds.

Some compounds have fingerspelling as subcategorizing a prototypical member of a semantic category such as DİZEL=BENZİN^D ('diesel'=gas^D) and

KİMYON=K^TUZ ('cumin'=K^salt). If two members of a category are present in the context, the FS letter can be used alone, leaving out the head of the compound.

The following is a possible conversation in a gas station as told by one informant (subscripts indicate different locations in signing space):

- GAS_i , D_{ii} ? "Regular gas or diesel?"

- D "Diesel"

However, if there is only one member of a semantic category, the head remains and the modifying element is left out. For example, the citation form of CD is C-D+CL-ROUND-OBJECT. One can only sign the classifier for round object meaning CD, if there are no DVDs or other round objects in the immediate context.

In spoken languages English and Turkish, these sort of ellipsis operations are impossible on blends and clippings. In other words, cut elements can not function as words in blends and clippings (except clippings formed from one stem). Therefore, the possibility of ellipsis is a piece of evidence supporting the compoundhood of FS+sign forms.

5.2.1.3.1.6 Transparency

Transparency is generally applicable to new lexemes based on existing lexemes. Compounds have greater transparency in spoken languages than blends and clippings because the stems retain their form.

Chinese compounding is interesting in this sense. Ceccagno (2009; see also Ceccagno & Basciano 2011) claims that, in Chinese *metacompounds* in which one or two input elements are compounds themselves, the input compounds are cut because of the allowed maximum syllable number in a word. The elements of cut compounds which remain in the output metacompound are selected on the basis of maximizing semantic transparency. Bat-El (2006) suggests a similar relationship in English blends where phonotactics compete with transparency motivation. In sign language sign+sign or FS+sign forms, although words are reduced in segmental structure, stems are not cut (unlike blends, as also noticed by Liddell 1984), morphemes preserve their meaning in a compact duration. Therefore, our data weighs towards compounds in this respect.

5.2.1.3.1.7 Productivity

Regardless of any formal differences or similarities between compounds and blends, the most important defining property of blends is that they are neologisms with salience and they are not as productive as compounding.

Chinese compounding is a very relevant case for sign language compounding because sign languages are found to be prosodically akin to Chinese in terms of the number of syllables allowed in a word (Brentari 2002). Likewise, some structures in Chinese look like clippings in English but they are treated as compounds (Ceccagno 2009). Blend- and clipping-like structures in Chinese are treated as compounds because of their non-salience and high productivity (Ceccagno 2009). Another reason is that in the compounds which are formed by cutting words, the lexemes which are cut are compounds themselves. Thus, a compound is cut at the morpheme boundary and then can become an input for another compound which is called a *metacompound*.

Blends and clippings are neologisms and neologisms are not productive. For neologisms we can not be sure how much they are the result of productive rules of language and how much the result of stylistic creativity (Hohenhaus 2005). Another related property of blends is that they have salience (Aronoff & Fudeman 2005). That is, they sound interesting or unexpected, because their creation reason is to attract attention (on an advertising board for example or news headlines).

In sign languages, the simultaneous forms which are generally called compounds in the current literature are referred to as portmanteau words in Liddell (1984), blends in Uyechi (1996) and Meir (2011). Possibly, the categorization was made disregarding the properties of blends as neologisms, their unproductivity and their having salience, all of which are rarely found in compounds.

5.2.1.3.1.8 Headedness

The head order in compounds and clippings usually follow the head-directionality of the language. The headedness in blends follows the head-directionality of the language if they are endocentric. Bat-El (2006) argues that exocentric blends are ordered by phonological conditions. Thus, we should examine the exocentric polymorphemic forms with fingerspelling in TİD. If they are ordered by phonology, then we can say they are similar to blends. If they follow a basic head order, then they behave like compounds and clippings.

We firstly ask whether there is a position for the head in the polymorphemic forms of TİD. Then, we test whether there is a head order in endocentric polymorphemic lexicalizations of fingerspelling. Finally, by taking Bat-El's argument, we examine the exocentric FS+sign forms in terms of headedness.

We aim to understand whether polymorphemic forms at hand have a basic head order. The internal constituent order of Turkish compounds may have an effect on the constituent order of polymorphemic forms in TİD since they may be direct translations. To eliminate this confounding variable, we exclude the signs which have polymorphemic Turkish translations such as TÜRK-EDEBİYATI = TÜRK^E ('Turkish literature' = Turkish^E).

In certain compounds, if the meaning of the compound is a hyponym or semantically modified version of one of the compound members, this member is called the *head* of the compound and this kind of compound is an *endocentric compound* (Haspelmath 2002). The head order can differ among languages. See for example English and Spanish:

(25)	<u>Spanish</u>	<u>English</u>	
	<i>hombre-rana</i>	'man+frog'	frog-man
	<i>año lux</i>	'year+light'	light year
	<i>pez espada</i>	'fish+sword'	sword-fish
			(Haspelmath 2002)

English compounds have their heads in the second members whereas the heads in Spanish compounds are the first members.

Differing from endocentric compounds, the head of an *exocentric compound* is outside the compound. For example, English *redhead* means 'someone who has red hair'. It does not refer to a kind of red or head (ibid).

We will now examine the sequential compounds which have monomorphemic Turkish translations, based on my data and the data drawn from Kubuş (2008, p.80). This way, we can eliminate the confounding effects which may be imposed by the order of Turkish compounds.

Endocentric compounds without fingerspelling:

'elder brother' = man[^]tall

'elder sister' = woman[^]tall

'sea' = water[^]wave

'chick' = chicken[^]small⁴⁰

'cut potato' = potato[^]cut

'tomato' = red[^]round-object_{CL}

'sausage' = red[^]thin-object_{CL}

'sun' = hot[^]sun

⁴⁰ There is a variant of CHICK without the second constituent: CHICKEN_{HEAD-FORWARD, SLENTED EYES}

We have found that there is no considerable difference between the number of head-initial compounds and head-final compounds in TİD. Considering the pairs of compounds below which have members very close in meaning, it is hard to claim a basic head order in TİD compounds. Because a head sign can be either the first or the second constituent.

- (26)
- a. ‘football field’ = match[^]place
 - b. ‘swimming pool’ = place[^]swim
 - c. ‘astro-pitch’ = place[^]match
 - d. ‘onion’ = round-object_{CL}[^]laminar
 - e. ‘potato’ = Cheeck-Contact[^]round-object_{CL})
 - f. ‘tomato’ = red[^]round-object_{CL}
 - g. ‘pepper’ = long-thin-object[^]fan
 - h. ‘sausage’ = red[^]long-thin-object_{CL}

With respect to the variable position of the head in compounds, some scholars argued that phonological factors have a role in the ordering of compound members in sign languages (Brennan 1990, Kan & Gökgöz 2009). First Contact Rule (cited in Brennan 1990) requires that if the hand contacts the body in one of the compound members, this member having the contact must be the first member. In our data this rule applies for most of the compounds where there is a contact (except for ‘doctor’ = h2-Contact[^]Trunk-Contact). In the following list of compounds, the first member is body contact: ‘pijama’, ‘blanket’, ‘cut potato’, ‘tomato’, ‘sausage’, ‘principal’, ‘sun’, ‘potato’, ‘leek’, ‘minced meat’, ‘loudspeaker’, ‘petrol’, ‘notary’, ‘control’, ‘natural gas’.

Exocentric compounds without fingerspelling have their syntactic head as the first member. Therefore, it might be the case that the basic syntactic head order in TİD compounds is head-initial. This is illustrated in the list below:

Exocentric compounds without fingerspelling:

- ‘remember’ = head^memory
- ‘stubborn’ = head^strong
- ‘agreement’ = head^match
- ‘ugly’ = face^bad
- ‘beautiful’ = face^good
- ‘young’ = face^small
- ‘health’ = body^strong
- ‘eggplant’ = purple^cut-sth-in-the-middle
- ‘kitchen’ = food^family
- ‘chicken’⁴² = Nose-Contact^h2-Contact

To make a comparison to FS+sign forms, first see the examples below:

Endocentric polymorphemic forms with fingerspelling:

- ‘parliament’ = M^hall
- ‘party’ = P^party
- ‘staff’ = P^plural-person_{CL}⁴⁴
- ‘dvd’ = D-V-D^round-object_{CL}
- ‘Renault’ = car^R

⁴² Most of the polymorphemic forms are taken from Kubuş’s (2008) compound list. Some polymorphemic forms are based on our own data collection from two deaf informants.

⁴⁴ Pluralized non-honorific person classifier (Zeshan 2002, Kubuş 2008) with hand facing down and forward movement.

‘Honda’ = H^{car}

‘jacket’ = C^{coat}

‘whiskey’ = V^{drink}

‘adventure movie’ = film^M

‘conference’ = K^{meeting}

In all of the compounds above, the fingerspelled letters are the modifiers. However, the letters can occur as the first element or the second element. For example, the head ‘car’ is modified by R in ‘Renault’. The same word ‘car’ is modified by H in ‘Honda’. The letter is the second element in ‘Renault’ whereas it is the first element in ‘Honda’. Thus, we do not observe a headedness pattern in endocentric polymorphemic forms with fingerspelling. This renders them different from exocentric compounds in that they are not comparable with respect to head order.

The exocentric polymorphemic forms with fingerspelling below are head-final unlike the exocentric compounds without fingerspelling which are head-initial.

Exocentric polymorphemic forms with fingerspelling:

‘sock’ = Ç^{wear-on-foot}

‘staff’ = P^{work}

‘vodka’ = V^{rakı}

In English, Bat-El (2006) claims that most endocentric blends have the same head order with compounds, however, exocentric blends are ordered based on phonology.

In short, we do not observe a headedness pattern in exocentric polymorphemic forms with fingerspelling. Without a syntactic headedness pattern, phonology might have an effect on the order of FS+sign forms. This property makes FS+sign forms seem similar to blends.

5.2.2 Summary and Conclusion of Section 5.2:

Compounding as the Proposed Morphological Category

When we look at the formal properties of compounds, blends, and clippings in English and Turkish, there are certain important differences between these three categories. In sign languages, for some of the polymorphemic forms with or without fingerspelling, the fact that these forms tend to be cut and become simultaneous have made some authors call these structures blends or affixes.

The preliminary analysis we have conducted for the categorization of polymorphemic forms with fingerspelling favors compounding. The behavior of fingerspelled polymorphemic forms is similar to compounds in word stress, shared segment, stems retaining form, ellipsis, transparency and productivity.

A comparison with Chinese as discussed above is relevant here because like sign languages, Chinese has disyllabic word forms and the prosodic structure of the language requires cutting and condensing forms. ‘Metacompounding’ is a productive morphological process in Chinese (Ceccagno and Basciano 2009b). This is the reason why Ceccagno and Basciano do not refer to these abbreviated forms in Chinese as blending or clipping.

Sign languages are similar to Chinese in terms of the typical syllable number of the word (Brentari 2002). Putting together these facts about sign and spoken

languages, expansion or condensation tendencies in compounding seem to be affected by the prosodic requirements on words. This is illustrated below in Table 10.

Table 10. Canonical Wordshape According to The Number of Syllables and Morphemes per Word (Brentari, 2002, p.57)

Word Shape	Monosyllabic	Polysyllabic
Mono-morphemic	Chinese	English
Poly-morphemic	Sign Languages	West Greenlandic

In addition to productivity, five other criteria that we have discussed support compoundhood: Word stress, shared segment, stems retaining form, ellipsis, transparency. Three criteria support categorization on behalf of blending and three criteria on behalf of clipping. A summary of our category inferences based on formal criteria is illustrated in Table 8 which is repeated as Table 11 below. For the reasons discussed above the heaviest determining criterion is productivity. But still just looking at the number of criteria for compounds, we see a tendency towards compounding. We conclude that FS+Sign forms are compounds.

Table 11. Morphological Category of FS+Sign Forms with Respect to Formal Criteria

	Word Stress	Shared Segment	Stems Retaining Form	Output Category	Headedness	Ellipsis	Transparency	Productivity
Blend			+	+	+			
Clipping	+	+		+				
Compound	+	+	+			+	+	+

5.3 Constraints on the Lexicalization of Fingerspelling

As Aronoff & Fudeman (2005) point out, there can be constraints on the productivity of a certain word formation process. These can be phonological, morphological, semantics, syntax, blocking, pragmatics). In what follows we focus on three of them: phonological constraints, syntactic constraints, and blocking constraints.

5.3.1 Phonological Constraints on the Productivity of Word Formation through Fingerspelling

The variety in the phonological make-up of the TID manual alphabet letters lead to different degrees of productivity for their lexicalization and different phonological processes are allowed if they are lexicalized. The movement type or the kind of phonological alteration is also another variable effecting the possibility of lexicalization. In order to understand the effects of the phonological makeup of fingerspelled signs, firstly we will group the fingerspelled letters according to their phonological structure and discuss the possible effects of their structure on the productivity of their lexicalization. Then, we give the frequency of different phonological alterations to show their varying degrees of productivity.

5.3.1.1 The Effect of Phonological Structure of Fingerspelling on the Productivity of Lexicalization

Below we investigate the productivity of adding path movement to a TID fingerspelled letter. We group the letters into three:

1. One-handed letters,

2. Symmetric two-handed letters, and
3. Asymmetric two-handed letters.

There is no phonological constraint on one-handed letters to have path movement. By this fact we can explain the relative abundance of lexicalizations with one-handed letters.

As for asymmetric two-handed letters, the ones with an h1 movement (Ç, İ, J, Ö, Ş, Ü, Y) do not have any additional path movement in their lexicalizations. This would violate the symmetry condition as h2 would then have a movement other than the movement of h1, which is fingersnapping. In other words, as a word formation way, path movement is blocked by the symmetry condition

The limited productivity of adding path movement to asymmetric two-handed letters without movement can be explained by phonological blocking (by the dominance condition, see section 4.1.3.1).

Two-handed letters can not have path movement according to the (b) section of the *dominance condition* (See Section 3.4).

In Battison's (1977, p. 51) words "the overall complexity of the sign must be reduced by prohibiting the movement of one hand (usually the non-dominant)". We see that this condition is violated by signs such as DOLMUŞ 'shared taxi', TAXI 'taxi', where two hands have different handshapes and both move. It is surprising that we do not see much fewer numbers of lexicalizations with asymmetric two-handed letters, considering their eccentric phonological make-up.

5.3.1.2 Frequency of Phonological Alteration Types in Lexicalized Fingerspelling

Internal movements are much less common than path movements. Predominantly one handed letters, especially the letter O is seen as having internal movement.

Aronoff & Fudeman (2005) point out that productivity for a morphological process is the possibility of being applied in the words of the language. Among fifty six signs from Boğaziçi University webpage and the TİD course material (Dikyuva & Zeshan 2008), the frequency of each fingerspelling process will be presented. In other words, we present the *type frequency* (Haspelmath, 2002) of each word formation way through fingerspelling (See Table 12 below).

As seen in Table 12, compounding, repetitive movement addition, and path movement addition are among the most productive ways of forming new signs with fingerspelling.

Predictability, or semantic compositionality is another criterion for productive processes. For sign language, we should regard iconicity as an additional factor increasing the predictability of a sign. For example, simultaneous fingerspelling is

Table 12 - Type Frequencies Of Word Formation Ways With Fingerspelling

repetitive movement 23
path movement 14
altered orientation 11
altered location 8
altered number of hands 6
orientation movement 5
initialism 4
modified handshape 3
facial expression 2
simultaneous fingerspelling 2
handshape change 1
abbreviated fingerspelling 1

less productive than repetitive movement addition concerning their type frequencies. However, WC, a sign with simultaneous fingerspelling is more iconic, and therefore more predictable than İLKOKUL ‘primary school’ which is produced by repetitive

movement addition. So, type frequency should not be regarded as the sole criterion for productivity.

5.3.2 Syntactic Constraints on the Productivity of Word Formation through Fingerspelling

Fingerspelling heavily applies to nouns. The only verbs are SORU ‘question’ and CEVAP ‘answer’. We regard these words verbs because they can be inflected for person. American Sign Language has a similar tendency as observed by Padden & Gunsauls (2003) as indicated in Table 13.

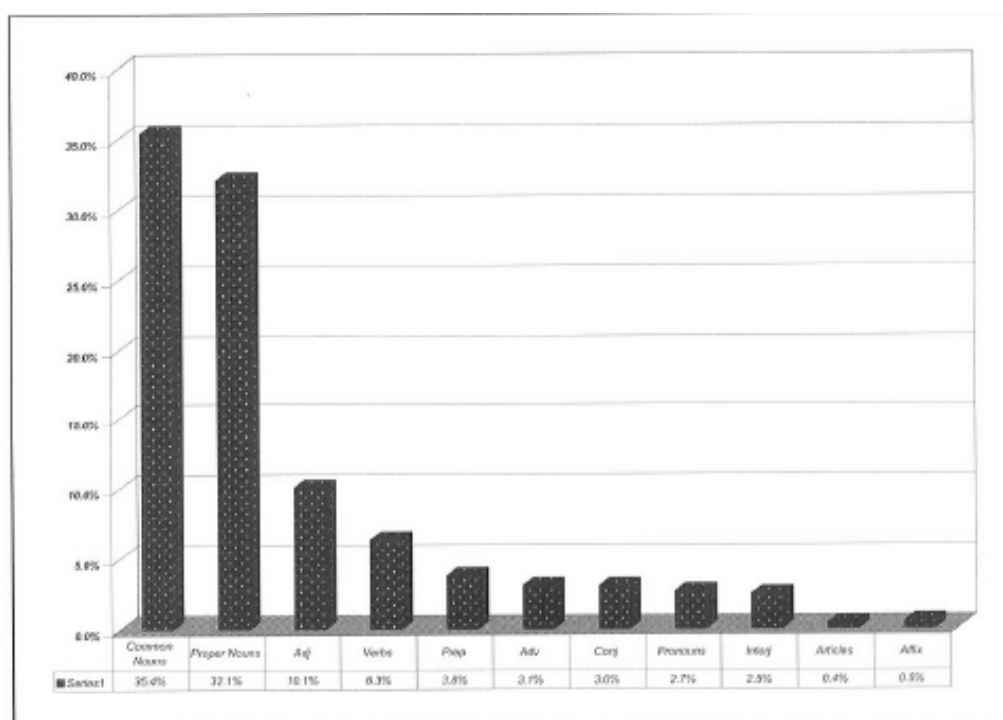


Table 13. Frequency of Fingerspelling According to Syntactic Category in ASL (From Padden & Gunsauls 2003. Columns from left to right: Common Nouns, Proper Nouns, Adj, Verbs, Prep, Adv, Conj, Pronouns, Interjections, Articles, Affix)

5.3.3 Synonymy Blocking on Word Formation through Fingerspelling

Following Aronoff & Fudeman (2005), blocking happens when a derivation fails to apply if another word has the same intended meaning. For example, *steal-er is out since the word *thief* already exists. Similarly, the counter-intuitive fact that TİD does not include a fingerspelled sign for TV might be because of blocking. Because there is another sign for TV in TİD which does not involve fingerspelling.

5.4 Listedness of Lexicalized Fingerspelling

Idiosyncratic sound changes in spoken languages are indications of listedness. Haspelmath (2002, among others), points out that idiosyncratic words are listed in the lexicon. Following this assumption, it is likely that the more phonological changes (repetitive movement, path movement, handshape change, etc...) a fingerspelled sign has, it is more probable that this fingerspelled sign is listed in the lexicon.

The following examples have 4, 3, 2, 1 and 0 number of phonological alterations respectively: ORTAOKUL ‘secondary school’, PSİKOLOJİ ‘psychology’, DOLMUŞ ‘shared taxi’, ŞUBAT ‘February’, and ÖDEV ‘homework’.

In ORTAOKUL ‘secondary school’, the O handshape has an additional middle finger, there is aperture movement, hand reversal, and repetition. In PSİKOLOJİ ‘psychology’, the phonological changes are place of articulation, repetition, and hand reversal. In DOLMUŞ ‘shared taxi’, there is path movement and repetition. ŞUBAT ‘February’ only has repetition. ÖDEV ‘homework’ remains unchanged because the letter Ö has two fingersnappings. Thus the letter Ö fulfills the

prosodic requirements to be a word by itself (See Section 5.1.1). We can claim that the listedness of ORTAOKUL ‘secondary school’ is the greatest and the listedness decreases respectively in the order of examples given.

For a list of lexicalized fingerspelled items and their corresponding listedness values as indicated by the number of phonological alterations they have, see Appendix D.

We only presented the phonological evidence for listedness. The widespread usage of a word among speakers also shows that the word is listed in the lexicon. An example is LAZIM ‘necessary’ which has repetition only. Data about the frequency of usage of lexicalized fingerspelled items require field and corpus studies and this kind of research is beyond the scope of this thesis.

In this chapter, we have shown the word formation ways with fingerspelling, proposed repetition and length as morpheme structure constraints. We have given a sketch about the motivation and compositionality of complex lexemes. In addition, we have claimed that polymorphemic signs with fingerspelling are compounds.

We have discussed the phonological, syntactic, and, the semantic constraints on the lexicalization of fingerspelling. Lastly, we have touched on the listedness features of fingerspelled signs.

In the next chapter, we discuss the design features of fingerspelling as a non-linguistic system and position it with respect to grammar and other symbolic systems.

CHAPTER 6

LINGUISTICITY OF FINGERSPELLING

6.1 Is Fingerspelling a Part of Grammar?

It has been suggested by Kubuş (2008) that fingerspelling may not be a ‘proper part’ of sign language phonology. To cover the problem more broadly, this doubt can be reformulated by asking: Is fingerspelling a part of the grammar? In other words, should we regard it as a part of *competence* or *performance*? This question has also been asked for acronymization and initialism in spoken languages which can be seen, in some way, as analogues of fingerspelling in spoken language (see e.g., Haspelmath 2002; Aronoff & Fudeman 2005). Some authors think that since acronymization is an intentional process, it is not part of the unconscious linguistic knowledge (Beard, 2001), so they call these word-formations *word creations* or *word manufacturing* (Booij 2005). Acronymization can indeed be a part of performance. It is very unlikely that in a society with no writing system, people would abbreviate words by acronymization or initialism. In this sense, literacy is not a part of language competence but it is part of other cognitive abilities.

Below we compare the alphabet and fingerspelling discussing the alphabet is relevant for this investigation because it is an intermediary and extralinguistic system just like fingerspelling.

6.2 Alphabet vs. Fingerspelling

It is known that the manual alphabets have been created for educational purposes and they are artificial, they do not emerge naturally and gradually in a deaf community (Sutton-Spence 2006). Rather, they are created by one person or a group of people. However, if we look at alphabets for spoken languages, they are also artificial and constructed. The alphabet is a naive, and traditional model of phonetic, phonological, and lexical output. It does not represent all the information in a speech signal, and moreover, it has diversions from it historically. Acquiring literacy not only involves forming sound-graphic symbol correspondences, but also learning the irregular sound-graphic correspondences. In advanced levels of literacy, reading becomes more automatic and the words are perceived as wholes.

At this point, one can ask, despite being extraneous to language, does the print form of words have a place in our lexicon. Some connectionist accounts claim that word recognition involves orthographic and phonological layers (Seidenberg & McClelland 1989, Plaut et al. 1996; cited in Balota and Yap 2006).

Although not productive, initialisms and acronyms show that immense amount of reading practice allows an alphabet to permeate into language to some extent. We can not attest this kind of word formation in illiterate societies.

Analogously, competence in fingerspelling is an integral part of literacy for signers. Patrie and Johnson claim that signers do not have to form [(i) FS - (ii) print letters - (iii) meaning] chain during the perception of fingerspelling. The authors claim that signers can skip the second level and form a FS-meaning relationship by *direct lexical access*.

context-independent meaning in compounds after a time. See Table 14 below for a comparison of the representation of lexicalized alphabet forms in spoken and signed modalities.

Table 14. Comparison of The Representations of Alphabet and Fingerspelling

Modality	Written Symbol	Name of the written symbol	Meaning
Spoken	A B C	[ej] [bi:] [si:] alpha, bravo, charlie	“a type of mail” in C -mail
Signed			“a member of a clothing category” in #JACKET= C +COAT

It is obvious that we have to take into account the bilingual situation of signers. Two lexicons work together and fingerspelling is one of the several ways to represent and to make a connection with the spoken lexicon.

6.3 Fingerspelling as a Linguistic vs. Non-Linguistic System

As discussed by some authors (Brentari & Padden 2001, Patrie & Johnson 2010), fingerspelling was seen as something alien to sign language by some people. Indeed, fingerspelling can have handshapes and composition of two hands in ways violating

the phonological structure. However, linguistic analyses of lexicalized fingerspelling show that manual alphabet letters are not non-analyzable icons phonologically, they are subject to phonological processes, obey well-formedness conditions and gradually nativize when lexicalized (Battison 1978, Brentari & Padden 2001 *inter alia*). Our analyses in Chapter 4 also show that fingerspelled letters in lexicalized items are involved in phonological processes like hand reversal and assimilation. This shows that they are not completely extraneous to the language system.

On the other hand, we do not fully agree with Patrie and Johnson (2010) who say that fingerspelling is totally a part of sign language. Fingerspelling has different properties than a linguistic system. In order to understand the differences, we can look at Daniels (2001) who compares writing systems and language. He has two remarks:

- 1) Language changes, writings follows tradition.
- 2) Language does not change by commandment, writing can.

We can compare fingerspelling and language on the axes of these two remarks. Starting with the first remark, we can say that fingerspelling is like language. There is variation among signers for the letters E, K, G, Ĝ in TİD. The letter K has two forms, one of which is less iconic⁴⁵ (See Figure 23 below).

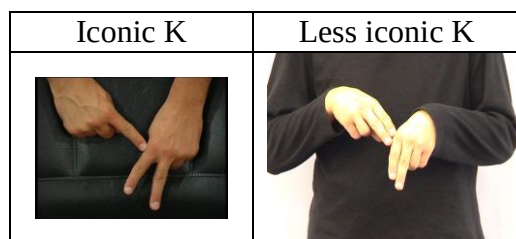


Fig. 23 Iconicity in the letter K (From Dikyuva & Zeshan 2008)

⁴⁵ Pictures from Dikyuva & Zeshan (2008).

We can suggest that the less iconic alternant has arisen diachronically. In addition, when lexicalized, the phonological changes in FS are dependent on the phonological system of the sign language.

As for the second remark, fingerspelling is like writing. In Turkey, as Daniels exemplifies, Kemal Atatürk changed the Arabic alphabet in 1928. Later, as we know from our interviews, Süleyman Gök replaced the one-handed manual alphabet with a two-handed one in the 1940s, see above Section 2.1). The change in fingerspelling (and writing) habits is just a matter of schooling. It took one generation for writing and fingerspelling systems to change in Turkey. To apply this kind of rapid replacement for a language change is harder than changing a writing system (Daniels 2001).

Therefore, we can suggest that fingerspelling is integrated into the linguistic system and it is an integral part of it in the current social circumstances; however, FS still preserves some properties of secondary sign systems (see Kendon 2004).

In sum, in this chapter, we have discussed the involvement of fingerspelling in grammatical processes and positioned fingerspelling closer to *performance* rather than *competence*.

Then we compared fingerspelling with its neighbor system, the alphabet. We suggested that fingerspelling can form connections with the spoken lexicon. We suggested that a fingerspelled letter in lexicalized compound has a similar meaning representation with initialized compounds in spoken languages.

Finally, we enquired into the linguisticity of fingerspelling. In other words, we asked what linguistic and non-linguistic properties fingerspelling has and compared fingerspelling with writing systems. We proposed that fingerspelling has more linguisticity than writing systems.

CHAPTER 7

CONCLUSION

In this work, we have investigated the lexicalization of fingerspelling in TID in terms of the phonological and morphological structure of the language. As a non-linguistic system, when lexicalized, fingerspelling conforms to the structure of sign language, which is a full-fledged grammatical system. The main suggestions we have made are the following:

1. Fingerspelling is not a part of the grammar, but lexicalized fingerspelling is.
It is possible for the grammar to make use of fingerspelling. Fingerspelling is a non-linguistic system which works with the linguistic system.
2. Fingerspelling can be a bridge between spoken and signed lexicons.
3. There are constraints on the lexicalization of fingerspelling such as phonological blocking, syntactic blocking, and synonymy blocking.
4. The composition of fingerspelled letters and other signs are categorized as compounds.
5. The type of movement in a fingerspelled sign can give us cues about its complexity, motivatedness and compositionality.
6. Repetition, or otherwise, lengthening is a morpheme structure constraint on fingerspelled letters.
7. We have proposed a revision of the dominance condition in order to account for the deviant behavior of the fingerspelled letter Ğ.

8. We have posited <h1 insertion> and <h1 assignment> rules in order to account for the hand reversal in one-handed letters when they are lexicalized.
9. The hand arrangement tier should be separated from its place between SF and HC. It should be a daughter of HC as a terminal node.
10. Movement plane should be regarded as a phonological feature.

In this study, although we have shed light on many aspects of TİD lexicalized fingerspelling, still many issues remain unresolved, with many directions for future research. We came up with many hypotheses from this descriptive study which we will test in our future studies.

In Section 3.4, in terms of the deviance of lexicalized fingerspelling from TİD phonology, we have mainly considered the dominance condition as a criterion. Kubuş and Hohenberger (2011) also tested the fingerspelled letters and some lexicalized finerspelled items against other phonological conditions such as ‘the selected finger constraint’ (Mandel 1981), ‘prosodic constituency/monosyllabicity’ (Coulter 1982), and ‘contact’ specifications (Brentari 1998). However, we can learn more about TİD phonology if these conditions themselves are investigated. A complementary phonological system, co-phonology, or loan-word phonology might be built based on the structure of lexicalized fingerspelling.

One drawback of our research is that the bulk of our data is based on existing sign language dictionaries and corpora. In order to capture the linguistic knowledge of signers, more detailed field work and data collection is needed in further studies. By this way, we can be sure about which fingerspelled signs are listed in the lexicon.

In Section 5.2, we have categorized compositions of fingerspelled letters and other signs as compounds. Among the eight criteria we used, especially stress, ellipsis and headedness properties of polymorphemic forms with fingerspelling need a more rigorous investigation in further studies because we base our conclusions on a small amount of data which are citation forms. Especially for headedness, sentences with different information structure may yield certain headedness patterns. Moreover, there is still the possibility that some of these forms are phrases rather than compounds. One has to look at the behavior of these forms with respect to lexical integrity with different methodologies.

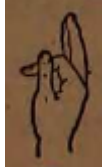
Our final suggestion for future research is a psycholinguistic study with respect to the recognition of lexicalized fingerspelled items versus the recognition of print forms. This is important, as it will illuminate the nature of the representation of lexicalized fingerspelling in the minds of signers.

APPENDICES

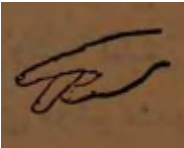
Appendix A

TİD One-Handed Manual Alphabets

	French SL (LSF) Manual Alphabet (Haydar 1925)	Grati's Ottoman Manual Alphabet (Haydar 1925)	Süleyman Gök's manual alphabet (1940)	Ministry of Education (MEB) (1995)
A				
		 Elif		
		 Ayın		
B		 Be		
C		 Cim		
Ç		 Çim		

	French SL (LSF) Manual Alphabet (Haydar 1925)	Grati's Ottoman Manual Alphabet (Haydar 1925)	Süleyman Gök's manual alphabet (1940)	Ministry of Education (MEB) (1995)
D		 Dal		
		 Dad		
E				
F		 Fe		
G		 Gayın		
		 Kef		
		 Gef		
Ğ				

	French SL (LSF) Manual Alphabet (Haydar 1925)	Grati's Ottoman Manual Alphabet (Haydar 1925)	Süleyman Gök's manual alphabet (1940)	Ministry of Education (MEB) (1995)
H		 Ha		
		 Hi		
		 He		
I				
İ				
J		 Je		
K		 Kaf		

	French SL (LSF) Manual Alphabet (Haydar 1925)	Grati's Ottoman Manual Alphabet (Haydar 1925)	Süleyman Gök's manual alphabet (1940)	Ministry of Education (MEB) (1995)
L		 Lam		
M		 Mim		
N		 Nun		
		 Sağır Kef		
O				
Ö				
P		 Pe		
Q				

	French SL (LSF) Manual Alphabet (Haydar 1925)	Grati's Ottoman Manual Alphabet (Haydar 1925)	Süleyman Gök's manual alphabet (1940)	Ministry of Education (MEB) (1995)
R		 Re		
S		 Se		
		 Sin		
		 Sad		
Ş		 Şin		
T		 Te		
		 Tı		
U				

	French SL (LSF) Manual Alphabet (Haydar 1925)	Grati's Ottoman Manual Alphabet (Haydar 1925)	Süleyman Gök's manual alphabet (1940)	Ministry of Education (MEB) (1995)
Ü				
V		 Vav		
X				
Y		 Ye		
Z		 Zel		
		 Ze		
		 Zi		

Appendix B

The Manual Alphabet of Zevki İshak

i. Front page



TÜRKÇE EL ALFABESİ



Türkçe El Alfabesini hazırlayan Ceyhanlı Zevki bîhak 1333 doğumlu. Yanda Zevki bîhak'ın 1332 yılında Paris Şehir ve Dil Bilimleri Enstitüsünde ilim öğrenmiş resmini görüyorsunuz.



Yabancı El Alfabesi



FRANSIZCA

Amerika Almanca İngilizce

BEŞERİ ALEME İHTAF

Gündiye kadar Türkiyede hiç yayınlanmamış olan El İhtaf'ın Alfabe eserini siz sayın normal vatandaşlarımıza takdim etmekle şeref duyuyorum.

Malûl vatandaşlarımızla anlaşmayı kolaylaştıran bu alfabe'yi kendi kendinize öğrenilirsiniz. Bu sayede, müesseselere mürşesat edecek dip-lomalı malûl vatandaşlarımızla kolaylıkla aileler ilgilen-den çok memnun olup aynı zamanda çok büyük sevep kazanmış olacaksınız.

Görünmeyen gözlerimle eğleniyor uykular, Duymayın kulaklarınızla eğleniyor müzikler, Söylemeyen dillerimle eğleniyor nağmeler.

Bin nimetler karşısında derümlü bağışayın.

Hiç görmeyen mahzun yüzlüm Hiç dinmeyen gözyağım Bu solmetin ülkesinde, Ne feci bir hayattır.

İstemiyorum saadet, İstemiyorum teselli.

En kararlık zindanlarda İhtırapla bağışayın.

Bu aslim tabiatın ellerile, ister misin mezarımı, Ne istersen hazırım, Bu azaptan kurtar beni.

Vereyim mi altından kazım vereyim mi altından kılrek Ne istersen vereyim, Bu azaptan kurtar beni.

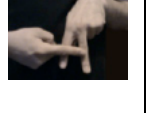
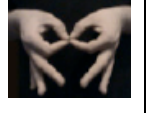
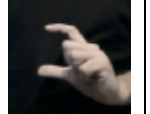
Toprağın bir sandettir, Mezarın bir mekânâdır, Yer yüzüne doymasdan, Bu azaptan kurtar beni.

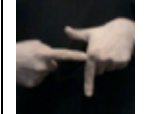
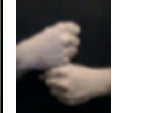
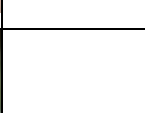
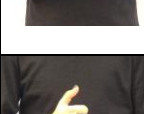
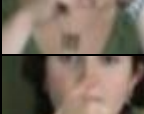
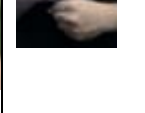
Biz Dünya üzerinde binlerce ağır ve dilale Hazretî Allahın emriyle doğuştan malûl olarak yaratıldık. Çay-rek asardan beri okulsuzluk ve lig-lizlikten cahil bırakıldık.

Tabiatın gödrüne uğramış ağır ve dilisiz malûller bundan yirmi asır öv-veline kadar insanlar hattâ ans ve babaları tarafından türlü eziyetlere maruz bırakıldılar. Sokağa atılan ve ans baba seftatından mahrum bırakılan bu gûl çocuklar avarele-jerek ormanlara, mağaralara yerle-şirlerdi. Burada hayvan vururuk ve yabanî meyve toplayarak karnularını boyurur, hayatlarının sonuna kadar sefult çökerlerdi. Bazı kimseler ma-lûl çocuklarını koruyup onların güçlerinden, kuvvetlerinden istifade ederlerdi. Değirmende at yerine tar-sada öküz yerine kullandılar.

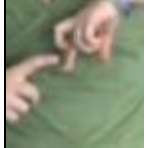
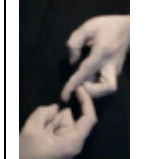
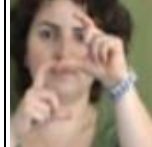
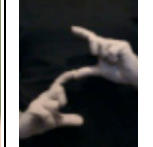
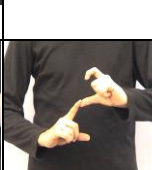
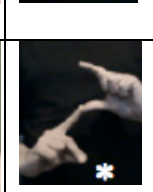
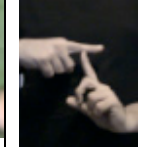
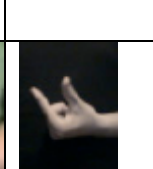
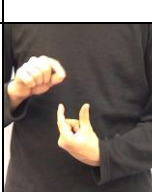
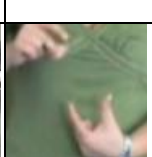
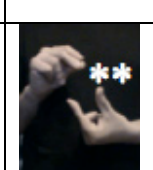
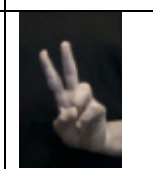
Appendix C

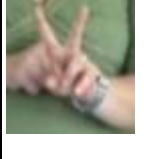
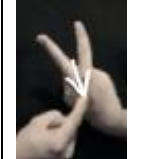
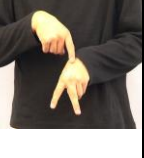
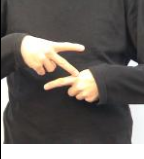
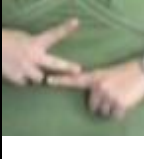
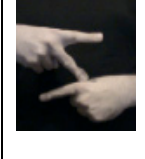
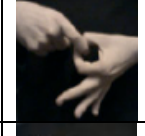
Today's Two-Handed Manual Alphabets in TİD

Letter	MEB (Ministry of Education) 1995	Zeshan 2003	Dikyuva & Zeshan 2008	Özyürek, İlkbaşaran, Arık 2004	Boğaziçi University Website 2008-2010	Kubuş & Hohenberger 2011
A						
B						
C						
						
Ç						
						
D						
E						
						

Letter	MEB (Ministry of Education) 1995	Zeshan 2003	Dikyuva & Zeshan 2008	Özyürek, İlkbaşaran, Arık 2004	Boğaziçi University Website 2008-2010	Kuş & Hohenberger 2011
F						
G						
Ğ						
H						
I						
İ						

Letter	MEB (Ministry of Education) 1995	Zeshan 2003	Dikyuva & Zeshan 2008	Özyürek, İlkbaşaran, Arık 2004	Boğaziçi University Website 2008-2010	Kubuş & Hohenberger 2011
J						
K						
L						
M						
N						
O						
Ö						
P						

Letter	MEB (Ministry of Education) 1995	Zeshan 2003	Dikyuva & Zeshan 2008	Özyürek, İlkbaşaran, Arık 2004	Boğaziçi University Website 2008-2010	Kuş & Hohenberger 2011
R						
S						
Ş						
T						
U						
Ü						
V						

Letter	MEB (Ministry of Education) 1995	Zeshan 2003	Dikyuva & Zeshan 2008	Özyürek, İlkbaşaran, Arık 2004	Boğaziçi University Website 2008-2010	Kuş & Hohenberger 2011
Y						
						
Z						
Q						
W						
X						

Appendix D

Lexicalized Fingerspelled Items

i. Items from Boğaziçi University Website

Turkish Gloss	Turkish Translation	English Gloss	English Translation
BEYAZ^P	BEYAZ PEYNİR	white^P	white cheese
C-D^YUVARLAK-NESNE	CD	C-D^round-object	CD
C-D^SÜRÜCÜ	CD SÜRÜCÜ	C-D^driver	CD driver
C^MONT	CEKET	C^coat	jacket
C-C	COCACOLA	C-C	COCACOLA
Ç^AYAĞA-GİY	ÇORAP	Ç^wear-on-foot	sock
Ç^KUTU	ÇÖP KUTUSU	Ç^bin	waste bin
MİNİBÜS^D	DOLMUŞ	minibus^D	shared taxi
D-V-D^YUVARLAK-NESNE	DVD	D-V-D^round-object	DVD
D-V-D^SÜRÜCÜ	DVD SÜRÜCÜ	D-V-D^driver	DVD driver
E	EURO	E	euro
F	FİZİK	F	physics
İ	İĞRENME	İ	disgust
İ	İLGİNÇ	İ	interesting
İ^OKUL	İLKOKUL	İ^school	primary school
ASKER^J	JANDARMA	soldier^J	gendarme
W^AL	KABLOSUZ AĞ	W^receive	wireless
K-E-K^YUVARLAK-NESNE	KEK	K-E-K^round-object	cake
K^TUZ	KİMYON	K^salt	cumin
L^MAVİ	LACİVERT	L^blue	dark blue
L^YUVARLAK-NESNE	LAHANA	L^round-object	cabbage
L	LAZIM	L	necessary
L	LİSE	L	high school
M^SALON	MECLİS	M^hall	parliament
M	MEVSİM	M	season
M	MOR	M	purple
O	OCAK	O	january
Ö	ÖDEV	Ö	homework
BAŞ^P	PSİKOLOJİ	head^P	psychology
R^ÖĞRETMEN	REHBER ÖĞRETMEN	R^teacher	guidance counselor
S	SORU	S	question
T	TEKNOLOJİ	T	technology
TÜRK^E	TÜRK EDEBİYATI	Turkish^E	Turkish literature
U-N^YOĞUR	UN	U-N^knead	flour
V	VİRÜS	V	virus
WC	WC	WC	WC

ii. Items from Dikyuva & Zeshan (2008)

Turkish Gloss	Turkish Translation	English Gloss	English Translation
C	CEVAP	C	answer
D	DOLMUŞ	D	shared taxi
D-V-D^YUVARLAK-NESNE	DVD MAKİNESİ	dvd^round-object	DVD driver
F^KİMYA	FİZİK	F^chemistry	physics
İ	İLKOKUL	İ^school	primary school
J^ASKER	JANDARMA	J^soldier	gendarme
K^KİMYA	KİMYA	K^chemistry	chemistry
KÜÇÜK^Y	KÜÇÜKYALI	SMALL^Y	Küçükalyalı (place name) 'small residence'
L	LİSE	L	high school
L	LOKAL	L	clubhouse
M	MOR	M	purple
O	OCAK	O	january
O^OKUL	ORTAOKUL	O^school	secondary school
P	PAKİSTAN	P	Pakistan
BAŞ^P	PSİKOLOJİ	head^P	psychology
S	SORU	S	question
Ş	ŞUBAT	Ş	february
U	UŞAK	U	Uşak (place name)
V-A-N	VAN	V-A-N	Van (place name)
Z	ZABITA	Z	constabulary

iii. Items from Koç University Website

Turkish Gloss	Turkish Translation	English Gloss	English Translation
O	OCAK	O	january
T	TEMMUZ	T	july
MAVİ-L	LACİVERT	blue^L	dark blue
M	MOR	M	purple
Ç^KİŞİ	ÇÖPÇÜ	Ç^person	garbage man
Ç^KAMYON	ÇÖP KAMYONU	Ç^truck	garbage truck
SPOR^L	SPOR LOKALİ	sports^L	sports clubhouse

iv. Items from Spreadthesign.com

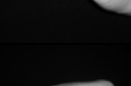
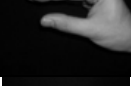
Turkish Gloss	Turkish Translation	English Gloss	English Translation
HEYECAN^H	ADRENALİN	excitement^H	adrenalin
A^KUTU	AKÜ	A^box	accumulator
A^ŞARJ	AKÜ ŞARJİ	A^charge	battery charge
A^İLAÇ	ANTİBİYOTİK	A^drug	antibiotic

Turkish Gloss	Turkish Translation	English Gloss	English Translation
SORU-CEVAP^DEĞİL	ANTİSOSYAL	conversation^not	antisocial
KADIN^WC	BAYAN TUVALETİ	woman^WC	ladies' room
C	CEVAPLAMAK	C	answer
Ç^AYAĞA-GİY	ÇORAP	Ç^wear-on-foot	sock
D	DAMAT	D	groom
D^BOZUK	DAVRANIŞ BOZUKLUĞU	D^disorder	behavior disorder
D^METRE	DESİMETRE	D^meter	decimeter
D^BENZİN	DİZEL	D^gas	diesel
D^YÖN	DOĞU	D^direction	east
D	DOLMUŞ	D	shared taxi
D^DİZ	DOMİNO	D^arrange	domino
E^HASTA	ENFEKSİYON	E^illness	infection
ERKEK^WC	ERKEK TUVALETİ	man^WC	gents toilet
ERKEK^Y	ERKEK YEĞEN	boy^Y	nephew
ET^J	ETLİ JÖLE	meat^J	aspic
F^DALGA	FREKANS	F^wave	frequency
F^DUR	FREN	F^stop	brake
F^PEDAL	FREN PEDALI	F^pedal	brake pedal
L^DEĞİL	GEREKSİZ	L^not	not necessary
G^KEMER	GÜVENLİK	G^belt	security
YÜZ^H	HAVUZ	swim^H	swimming pool
H	HAZİRAN	H	june
H^İYİ	HOŞ	H^good	nice
İHTİYAÇ^L	İHTİYAÇ DUYMAK	need^L	need
J^KAPLA	JÖLE İLE KAPLAMAK	J^cover	glaze
K^MOTOR	KARBÜRATÖR	K^engine	carburetor
K^AĞIR	KİLOGRAM	K^heavy	kilogram
K-W	KİLOVAT	K-W	kilowatt
K^HASTA	KLİNİK	K^ill	clinic
WC^KAPAK	KLOZET	WC^cover	toilet seat
K	KUZEN	K	cousin
K^YUKARI	KUZEY	K^up	north
KIZ^Y	KIZ YEĞEN	girl^Y	niece
L^BALIK	LEVREK	L^fish	perch
L^AYIR	LEVYE	L^force-apart	jimmy
İÇKİ^L	LİKÖR	drink^L	liqueur
L^UZUN-ARAÇ	LİMUZİN	L^long-vehicle	limousine
M	MATEMATİK	M	mathematics
M^METRE	MİLİMETRE	M	millimeter
O	OCAK	O	january
ARABA^C	OTO CAM	car^C	car window
ÖN^C	ÖN CAM	front^C	front window

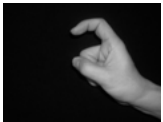
Turkish Gloss	Turkish Translation	English Gloss	English Translation
P^RESİM	PALET	P^painting	pallette
KİMYA^O	PEROKSİT	chemistry^O	peroxide
P^BENZİN	PETROL	P^gas	petrol
P^TOPLAM	POTANSİYEL	P^total	potential
BAŞ^P	PSİKOLOJİ	head^P	psychology
R^AL	REZERVASYON	R^take	reservation
C^METRE	SANTİMETRE	C^meter	centimeter
S	SORU	S	ask
ŞİŞME^H	ŞİŞME HAVUZ	inflatable^H	inflatable pool
T	TAKSİ	T	taxi
T^SİZE	TEŞEKKÜRLER	T^to-you	thanks
WC	TUVALET	WC	toilet
T^SİZE	TÜNAYDIN	T^to-you	good afternoon
U^DÖN	U DÖNÜŞÜ YAPMAK	U^turn	U turn
V^KAYIŞ	V KAYIŞI	V^belt	V belt
V^SÜR	VERNİK	V^brush	varnish
Y^BAĞLANTI	Y BAĞLANTI	Y^connection	Y connection
Y^KAHVE	YEMEN KAHVESİ	Y^coffee	Yemen coffee
YÜZ^H	YÜZME HAVUZU	swim^H	swimming pool
ÇİÇEK^Z	ZAMBAK	flower^Z	lily

Appendix E

TİD Handshape Inventory (From Kubuş 2008)

Name of the Handshape	Photograph of the handshape
C-handshape	
L-handshape	
O-handshape	
P-handshape	
U-handshape	
ASL A-handshape	
ASL A-bar	
ASL B-handshape	
Flat Hand	
Hooked Flat Extended	
Bent Flat	
Bent Flat Bar	
ASL C-handshape	
ASL Q-handshape	

Name of the Handshape	Photograph of the handshape		
Middle selected ASL (open 8)			
ASL O-handshape			
Narrowed O			
Baby-O handshape			
ASL 8-handshape			
12-handshape/ ASL R-handshape			
Covered T			
Horn/ Combined ASL I and H			
Little finger/ ASL I handshape			
Little+Thumb/ ASL Y- handshape			
ASL 3-handshape			
4-flexed			
I/1-handshape			

Name of the Handshape	Photograph of the handshape
V/2-handshape	
5-handshape	
8-handshape	
9-handshape/ ASL X-handshape	
Finger Snapping	

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