

## INFLECTIONAL MORPHOLOGICAL AWARENESS OF TURKISH DEAF STUDENTS

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### Abstract

This study attempted to determine how Turkish deaf students acquired inflectional morphological awareness and to investigate the possible effects on the development of morphological awareness. 100 hearing and 100 deaf participants attending elementary schools from grades 4 to 8 were tested via an online grammaticality judgment task on SuperLab 4.0 software. It was developed to evaluate participants' ability to use inflectional morphology knowledge. The findings showed that the inflectional morphological awareness of deaf students doesn't increase with grade. Generally, Turkish morphology awareness skills of hearing students from 4th to 8th grades were significantly better than deaf counterparts. We proposed that deaf students' difficulties in understanding the morpho-syntactic relationships in Turkish may be due to negative transfer of morpho-syntactic constraints of Turkish Sign Language (TİD).

**Keywords:** Deaf students, Morphological Awareness, Online Grammaticality Judgment Test, Turkish Sign Language

## İŞİTME ENGELLİ TÜRK ÖĞRENCİLERİN ÇEKİMSEL BİÇİMBİLİM FARKINDALIĞI

### Özet

Bu araştırmanın amacı, işitme engelli Türk öğrencilerin çekimsel biçimbilim farkındalığı edinimini incelemek ve bu gelişim sürecinde etkisi olabilecek nedenleri araştırmaktır. İlköğretim 4.-8. sınıflara devam eden 100 işitme engelli katılımcıya, çekimsel biçimbilim bilgisi ölçme amacıyla geliştirilmiş çevrimiçi dilbilgisi yargı testi, SuperLab 4.0 programı yardımıyla uygulanmıştır. Elde edilen bulgular, işitme engelli bireylerin çekimsel biçimbilim farkındalığının sınıf düzeyi ile birlikte gelişmediğini ve ilköğretim 4.-8. sınıflara giden tüm işitme engelli öğrencilerin Türkçe biçimbilim farkındalığının işitme engelli akranlarından gözle görülür derece daha iyi olduğunu göstermiştir. Bu çalışmada, Türk İşaret Dili'nin biçim-sözdizimsel yapısının olumsuz aktarımı nedeniyle işitme engelli öğrencilerin Türkçe'nin biçim-sözdizimsel ilişkilerini anlama sürecinde güçlükler yaşadığı öne sürülmektedir.

**Anahtar Sözcükler:** İşitme Engelli Öğrenci, Biçimbilimsel Farkındalık, Çevrimiçi Dilbilgisel Yargı Testi, Türk İşaret Dili

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## **1. Introduction**

Inflectional morphological awareness is a complex process. It refers to the ability to segment words into their smallest units of meaning, and plays an important role in morpho-syntactic relations. The problem that the knowledge in understanding of morpho-syntactic relations is one of the major challenges for deaf children in spoken language acquisition is generally shared by previous studies on deaf education. Carlisle (1995) and Carlisle & Stone (2003) state that morphological awareness refers to the learners' knowledge of morphemes and morphemic structure, allowing them to reflect and manipulate morphological structure of words. A small number of previous research has examined deaf children's morphology awareness of spoken language.

There is more evidence that hearing loss causes severe language delays in the development of spoken languages and creates gap between deaf children and hearing peers. This gap tends to widen with age (Marschark & Harris, 1996) and thus difficulties become more apparent as children progress through school. Kyle & Harris (2010) found a mean delay of 1 year in the reading scores of a group of 8-year-old deaf children. Researchers have also reported an average of 4-5 years delay in language development by the time deaf children enter high school (Blamey, Sarant, Paatsch, Barry, Wales, Wright, Psarros, Rattigan, & Tooher, 2001). Furthermore, it has been argued that deaf adolescents reach a plateau, rarely acquiring literacy beyond the equivalent of an 8 to 9-year-old hearing child (Musselman & Szanto, 1998).

Before discussing the development of inflectional morphology of the deaf students, it is necessary to document the pattern of morphological skills in hearing students to help to clarify how morphology awareness is similar or different compared to deaf students. Thus, it may enable us to monitor accurately their morphological development and to characterize the degree of overlap between morphological skills of deaf and hearing students. In order to understand why spoken language morphology is so challenging for many deaf students, it is also appropriate to consider the modality difference and grammatical differences between sign and spoken languages. These differences raise interesting questions about the morphological awareness of deaf students who are acquiring a spoken language as native or second language.

There seems to be a general consensus that deaf students have difficulties in understanding of syntactic relations when compared to hearing children (Quigley & King, 1980; Yoshinaga-Itano, Snyder, & Mayberry, 1996). For instance, in an extensive review of the English language syntactic skills of several hundred deaf children from America, Canada and Australia, Quigley and King (1980) concluded

that deaf children (10 to 18-years-old) performed poorly than younger hearing children (8 to 10-years-old) and the rate of syntactic development in deaf children was substantially delayed. However, the importance of inflectional morphology awareness in the literacy acquisition of deaf students has received very little interest so far, in spite of its role at the syntactic level. In this sense, the present study attempts to describe the steps of inflectional morphology awareness in deaf students' spoken language acquisition. In this respect, if deaf students make progress on the awareness of morphological relations, they should apply this knowledge to figure out syntactic structures.

Morphological skills has been found to have a direct impact on the literacy development. Thus, to identify the obstacles for the deaf students to develop morphological awareness may enable them to progress through the same developmental stages as hearing students. The findings will contribute to our general understanding of spoken language acquisition of deaf children. The purpose of this research study is to determine how deaf students acquired inflectional morphological awareness with respect to the grade, acquisition age of TID and hearing loss type and also investigate the possible effects on the development of morphological awareness.

## **2. Morphological Awareness**

A morpheme is the smallest unit of grammatical meaning. For example, *arkadaşlarına* contains three bound morphemes, the plural suffix +[lar], the possessive morpheme +[-i] and the case morpheme +[(n)a]. Morphology awareness may enable the students to segment words into meaningful parts that are smaller than the whole word but larger than the grapheme. In this context, we can conclude that morphological awareness is an umbrella term referring to the conscious understanding of the meaning, boundary and structure of morphemes and the ability to manipulate them (Carlisle, 1995; McBride-Chang, Wagner, Muse, Chow, & Shu, 2005). Furthermore, it is important to note that morphological awareness relates to reading comprehension more than single-word reading (Deacon & Kirby, 2004).

The relationship between awareness of morphology and progress in reading acquisition can also be seen as reciprocal and mutually facilitative (Verhoeven and Perfetti, 2003). In four-year longitudinal study suggesting the importance of morphological awareness in reading, Deacon and Kirby's (2004) found that there is a positive relationship between morphological awareness and reading comprehension for the second, fourth and sixth graders.

### **2.1. Morphological Awareness in Deaf Students**

In order to establish the research questions for this study, this chapter highlights studies that have been conducted on the importance of morphological awareness for deaf students. Severely or profoundly

deaf children have very little access to auditory input and this provides insufficient linguistic input so they experience a delay in exposure to spoken language. For hearing children, morphological awareness develops through spoken communication prior to literacy acquisition (Gaustad, Kelly, Payne, & Lylak, 2002). However, for deaf children morphological awareness skills in spoken language usually develops from print exposure with literacy. Morphology awareness is the primary contributor of understanding of morpho-syntactic relationships, and it is widely recognized that there is a strong relationship between the morphological awareness and literacy achievement for both deaf (Gaustad & Kelly, 2004) and hearing readers (Carlisle, 1995, 2000; Deacon & Bryant, 2006; Mahony, Singson, & Mann, 2000; Singson, Mahony, & Mann, 2000). Although very little is known regarding morphological awareness skills in a group of deaf children. The previous studies showed that there is a significant difference in the morphological awareness skills between the deaf and hearing students. Bradmore (2007), for example, observed that many deaf students in secondary school had difficulty in using morphemes in reading comprehension. Besides Gaustad, Kelly, Payne, and Lylak (2002), documented that deaf college students and hearing middle school students appeared to have approximately the same morphological knowledge and word segmentation skills.

Fabbretti, Volterra, & Pontecorvo (1998) suggest that deaf Italian people may have a particular problem with inflectional rather than derivational morphology. However, according to Gaustad & Kelly, 2004, American deaf students know more about inflectional morphology than derivation. These differences might be due to grammatical differences between these languages. Turkish has complex inflectional system and often has strings of multiple affixes after the stem of the word.

Contra to hearing children, age of first exposure to an accessible L1 is highly variable for children born with severe or profound hearing impairments. Because their deafness is greater than the sound level of speech (Mayberry, 2007). The majority of hearing parents do not know Turkish Sign Language (TİD), This is why the deaf children of hearing parents is incompletely exposed to sign language input until they arrive at preschool or school for the deaf where they learn TİD from their peers having deaf parents. We ask the effects of TİD acquisition as a first-language (L1) in relation to Turkish as second-language (L2) outcome and whether language modality is a relevant factor in the transfer of morphological awareness skills from the L1 to the L2.

### **3. Method**

This research was based on an online grammaticality judgment task (GJT) consisting of cautiously designed true-false test items in a design aimed at investigating participants' ability to use inflectional morphology knowledge.

### 3.1. Participants

The participants for this study included twenty deaf and hearing students for each five grades attending elementary schools in Ankara. Deaf students were 45 boys and 55 girls. They attended Grade 4 (mean age = 11.05 years,  $SD = 1.31$ ), Grade 5 (mean age = 12.30,  $SD = 0.98$ ), Grade 6 (mean age = 13.00,  $SD = 1.34$ ), Grade 7 (mean age = 14.50,  $SD = 1.32$ ) and Grade 8 (mean age = 15.20,  $SD = 0.69$ ) classes in schools for the deaf. Hearing students were 48 boys and 52 girls. They attended Grade 4 (mean age = 9.65 years,  $SD = 0.49$ ), Grade 5 (mean age = 10.70,  $SD = 0.57$ ), Grade 6 (mean age = 12.10,  $SD = 0.64$ ), Grade 7 (mean age = 12.85,  $SD = 0.37$ ) and Grade 8 (mean age = 13.85,  $SD = 0.37$ ) classes in public schools. The distribution of participants in detail can be clearly seen in Table 1. The online GJT was administered during the spring semester of the year. All the basic information about the participants was obtained from their teachers and clinical reports available at the schools. Cognitive ability was also within normal limits for all participants and they didn't have additional known handicaps.

**Table 1.** *Distribution of Participants, by Hearing Condition and Grade*

	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>Total</b>
Deaf	20	20	20	20	20	100
Hearing	20	20	20	20	20	100
Total	40	40	40	40	40	200

It is known that speech perception is highly reliant on lip-reading, even with hearing aids for deaf children with severe (70-94 dB) hearing loss (RNID, 2007). Thus, deaf students with hearing loss of more than 70 dB on the best ear were selected for this study as seen in Table 2.

**Table 2.** *Distribution of Deaf Participants, by Degree of Hearing Loss and Grade (Better ear average)*

<b>Degree of Hearing Loss</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>Total</b>
Severe (71-95 dB)	8	6	9	8	8	39
Profound (96+ dB)	12	14	11	12	12	61

This study was also designed to answer a basic question about the critical period for language acquisition and its possible effect on inflectional morphological awareness with respect to acquisition age of TİD. Table 3 indicates that the students learned little or no language during early childhood before the age of 5 years. At school, they learned both TİD and Turkish at the same time, TİD from their deaf peers and Turkish in the classroom. The other students learned TİD from their deaf parents during early childhood. All participants used TİD on a daily basis as their primary and preferred means of communication.

**Table 3.** *Distribution of Deaf Participants, by Acquisition Age of TİD and Grade*

<i>Age</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>Total</i>
0-5	7	7	5	4	0	23
5-10	13	13	15	16	20	77
Total	20	20	20	20	20	100

All deaf subjects were born deaf or became deaf before the age of 3 years (see Table 4). The only eight participants became deaf due to meningitis vs. Because of the extremely small sample size for participants who acquired deafness, no inferential statistics were calculated.

**Table 4.** *Distribution of Deaf Participants, by Hearing Loss Type*

	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>Total</i>
Congenital	20	19	20	19	14	92
Acquired	0	1	0	1	6	8
Total	20	20	20	20	20	100

The majority of participants had hearing aid and only six participants had cochlear implant. The only one participant had no hearing device experience (see Table 5). Because of the extremely small sample size for participants with cochlear implants and no hearing devices, no inferential statistics were also calculated.

**Table 5.** *Distribution of Deaf Participants, by Device and Grade*

<i>Device</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>Total</i>
None	0	1	0	0	0	1
Hearing aid	19	17	18	20	19	93
Cochlear implant	1	2	2	0	1	6
Total	20	20	20	20	20	100

### **3.2. Online Grammaticality Judgment Task**

An online grammaticality judgment task (GJT) using a rapid serial test item presentation paradigm which was administered to investigate the deaf students' inflectional case morphology accuracy during processing. Schütze (1996) suggested that the frequency of lexical items should be controlled to avoid the possibility that informants reject sentences because of a word that are is not frequent in the language. Another factor which has been found to influence the informants' judgments is the number of grammatical items. As this can lead informants to expect the test items to be grammatical and influence

their judgments in general. Thus following Schütze (1996), high frequency Turkish words were selected for test items and correct and incorrect test items controlled for number.

The online GJT including grammatical and ungrammatical case morphemes, presented in the full-sentence. The experimental items are simple sentence in which the case of the noun phrases matches or does not match the verb. The online GJT has three general sentence types (1-3), which are broken down into three sentence subtypes (a-c). In order to maintain the linguistic complexity of the online GJT, the length of each sentence was controlled for length (three words).

**1. One morpheme in noun phrases of test items: root + case morpheme**

- a. Ali Ankara-DAT go-PAST.
- b. \*Ali Ankara-ACC go-PAST (error type: substitution)
- c. \* Ali Ankara-Ø go-PAST (error type: deletion)  
Ali Ankara-ya git-ti.

**2. Two morphemes in noun phrases of test items: root + possessive morpheme + case morpheme**

- a. Child father-POSS1-ACC see-PAST
- b. \*Child father-POSS1-DAT see-PAST (error type: substitution)
- c. \*Child father-POSS3 see-PAST (error type: deletion)  
Çocuk baba-sı-nı gör-dü.

**3. Three morphemes in noun phrases of test items: root + plural morpheme + possessive morpheme + case morpheme**

- a. Boss worker-PL-POSS3-DAT trust-PRES
- b. \* Boss worker-PL-POSS3-ABL trust-PRES (error type: substitution)
- c. \* Boss worker-PL-POSS3 trust-PRES (error type: deletion)  
Patron işçi-ler-i-ne güven-iyor

According to Schütze (1996), participants shouldn't become aware of the purpose of the experiment, it is crucial to use at least as many distractors as experimental items. Hence, 48 out of the 96 test items in the online GJT were the targeted sentences with the targeted feature and the remaining 48 non-targeted sentences were distractors which used in this task serve as experimental items for subject-verb agreement. Among the 48 targeted test items, 24 were grammatical sentences and the other 24 were ungrammatical ones. Only the results of the 48 targeted test items were computed for further statistical analysis (see Table 6).

**Table 6.** *Distribution of test items in online grammaticality judgment test*

		<i>True (n)</i>	<i>False (n)</i>	<i>Total (n)</i>
Target sentences	Noun phrases with one morpheme	8	8	16
	Noun phrases with two morphemes	8	8	16
	Noun phrases with three morphemes	8	8	16
Distractors	Subject-verb agreement	24	24	48
Total		48	48	96

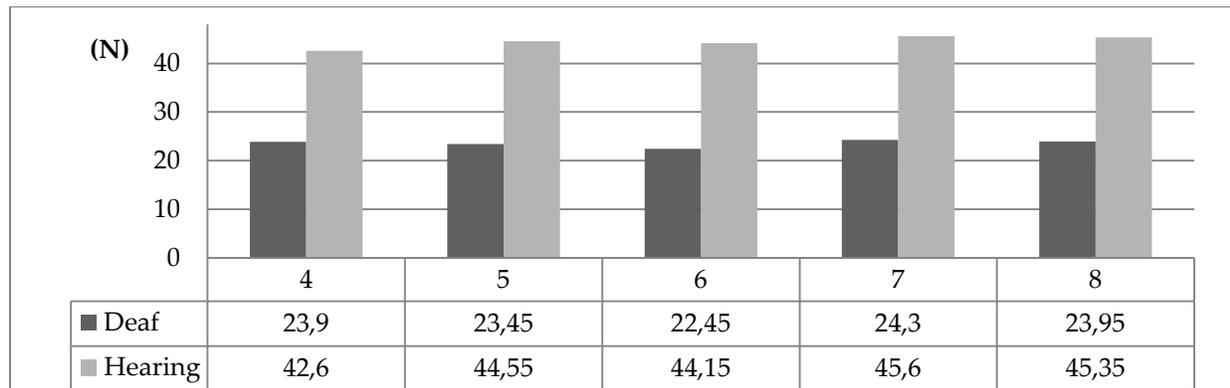
The purpose and the procedure for conducting this test were explained to the participants in TİD, and the need for them to respond to the test items as quickly as they could. The stimuli were presented to students on a laptop computer screen one by one. All data were recorded and analyzed using SuperLab software package, version 4.0. Background color was white with text presented in black 48pt Tahoma font. All the sentences were presented randomly to avoid the serial effect. The participants responded by pressing the appropriate button marked “true” (green) or “false” (red) on the button box which measured the response time (RT) and logged the response. A practice session of 10 trials was given to each participant. Data was collected away from any visual and auditory distractions.

For each trial, participants saw the following sequence: The instructions in written format appeared. The screen was then clear for 1000ms before the test items appeared. The test item remained on the screen until the participant responded or until it timed out after 15000ms. The screen was clear for 1000ms before the next trial began. Given this mode of presentation, the participants were not able to go back and change their judgments on previous sentences.

#### 4. Results

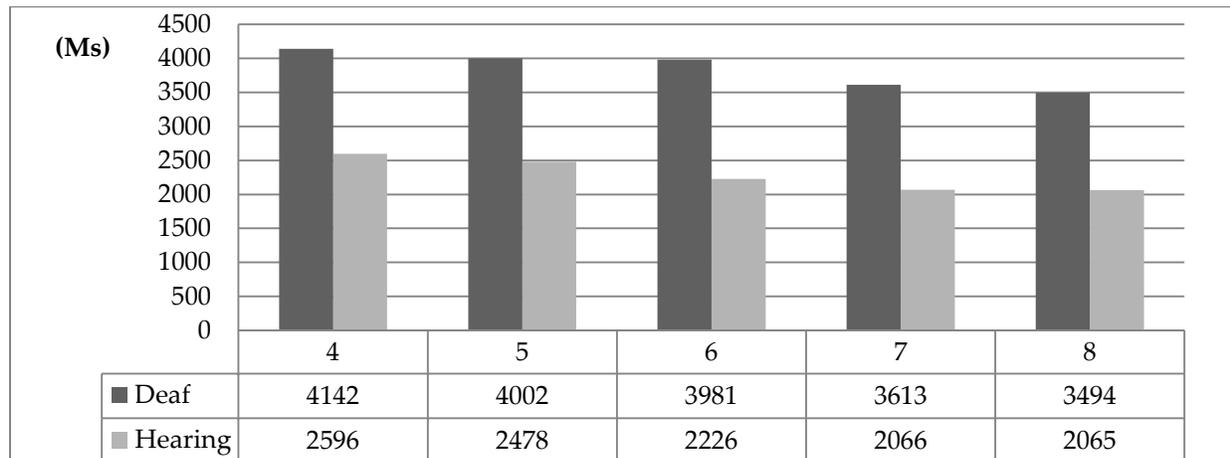
Descriptive and comparative statistical analyses were conducted on the results using the program SPSS (v.15) Response and response times of distractors were excluded from the analyses. One-way ANOVAs were used to compare the performance of the hearing and deaf students.

**Table 7.** Deaf and hearing participants' correct responses



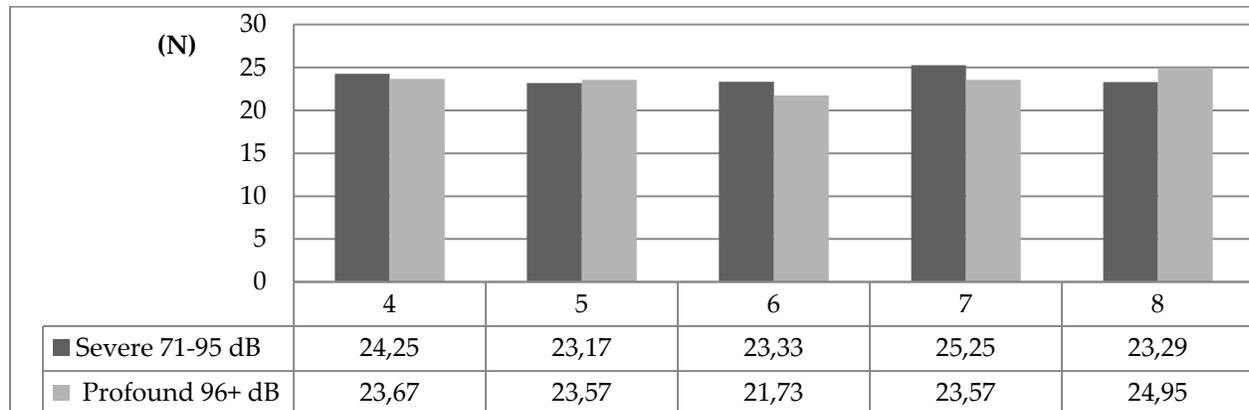
The first statistical analysis showed that hearing students produced significantly more correct responses than deaf students for all grades with a statistically significant difference of ( $F_{1-38}= 807,30$ )  $p = ,00$  for 4<sup>th</sup> grade; ( $F_{1-38}= 1485,34$ )  $p = ,00$  for 5<sup>th</sup> grade; ( $F_{1-38}= 759,82$ )  $p = ,00$  for 6<sup>th</sup> grade; ( $F_{1-38}= 866,34$ )  $p = ,00$  for 7<sup>th</sup> grade; ( $F_{1-38}= 581,05$ )  $p = ,00$  for 8<sup>th</sup> grade (see Table 7) .

**Table 8.** Deaf and hearing participants' response time ratio



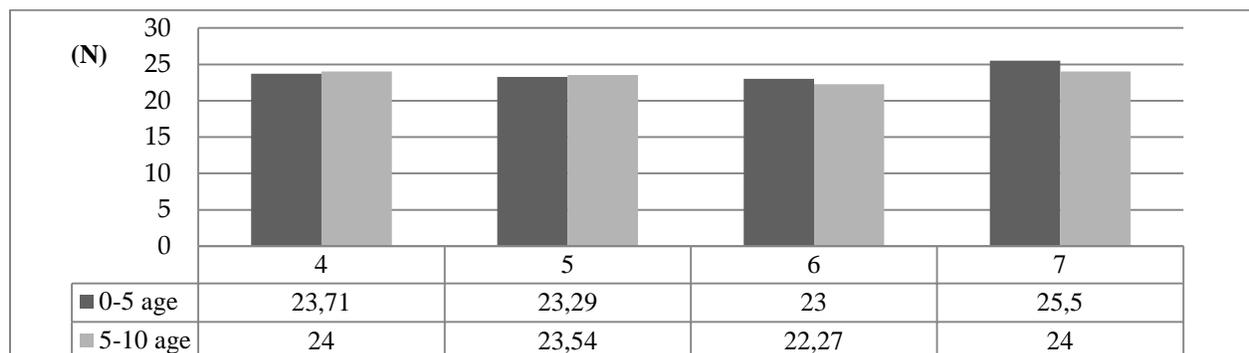
The second analysis examined whether hearing condition of participants influenced response times and it was revealed that hearing students responded more quickly than deaf students for all grades with a statistically significant difference of ( $F_{1-38}= 33,90$ )  $p = ,00$  for 4<sup>th</sup> grade; ( $F_{1-38}= 23,57$ )  $p = ,00$  for 5<sup>th</sup> grade; ( $F_{1-38}= 27,88$ )  $p = ,00$  for 6<sup>th</sup> grade; ( $F_{1-38}= 52,33$ )  $p = ,00$  for 7<sup>th</sup> grade; ( $F_{1-38}= 22,03$ )  $p = ,00$  for 8<sup>th</sup> grade (see Table 8).

**Table 9.** Hearing participants' correct responses by hearing loss types



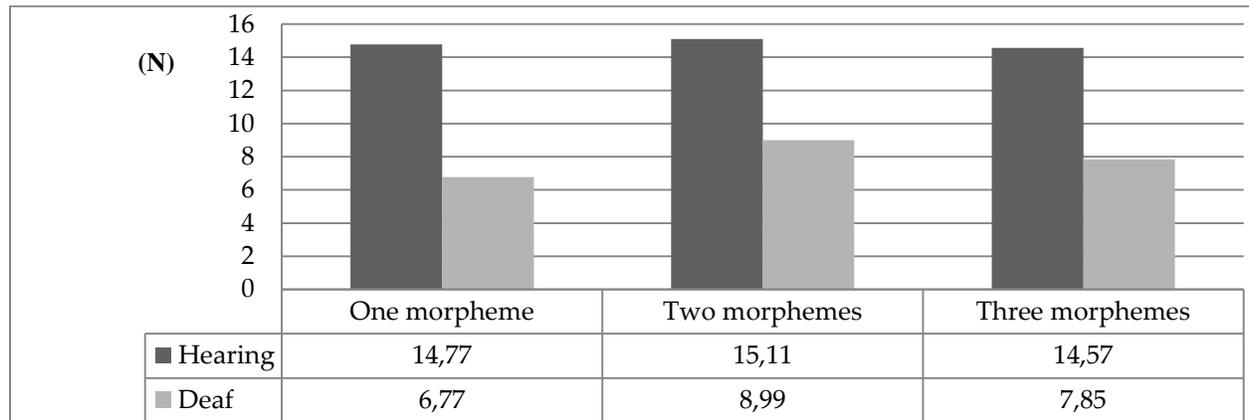
One-way ANOVAs were performed to investigate the impact of grade on accuracy and response times of the deaf students. It was revealed that there were no significant differences among grades for response accuracy ( $F_{4-95}= 1,54$ )  $p = ,197$ ) and response times ( $F_{4-95}= 1,03$ )  $p = ,396$ ). Follow-up analyses were conducted to compare accuracy between severely and profoundly deaf students. These analyses revealed that there weren't any significant differences between these groups for all grades with a statistically difference of ( $F_{1-18}= ,44$ )  $p = ,513$  for 4<sup>th</sup> grade; ( $F_{1-18}= ,31$ )  $p = ,568$  for 5<sup>th</sup> grade; ( $F_{1-18}= 1,69$ )  $p = ,210$  for 6<sup>th</sup> grade; ( $F_{1-18}= 1,72$ )  $p = ,207$  for 7<sup>th</sup> grade; ( $F_{1-18}= ,372$ )  $p = ,550$  for 8<sup>th</sup> grade (see Table 9) .

**Table 10.** Deaf participants' correct responses by acquisition age of TID and grade (max. 48 correct responses)



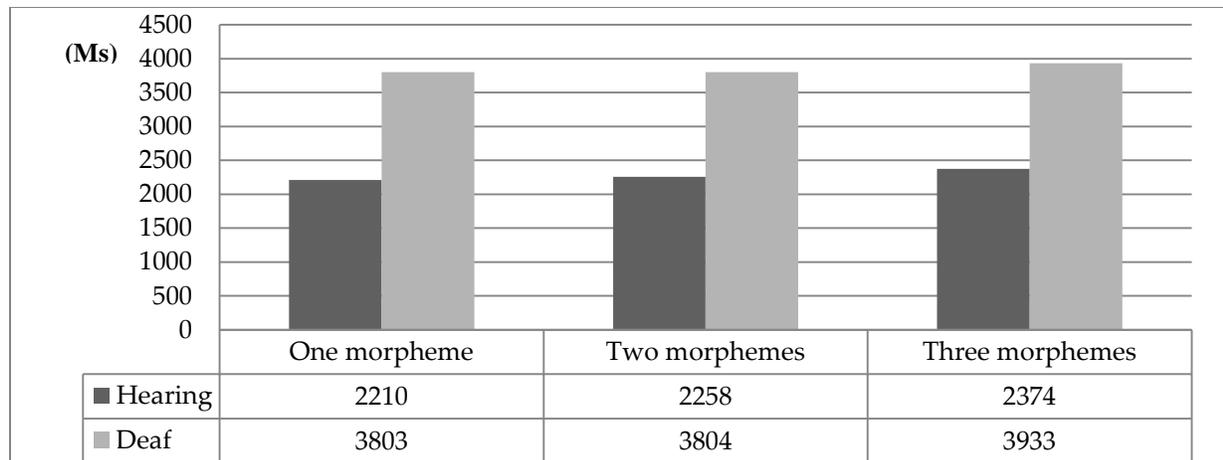
Then, from deaf participants who acquired TİD between the age of 5-10, 7 for 4<sup>th</sup> grade; 7 for 5<sup>th</sup> grade; 5 for 6<sup>th</sup> grade; 4 for 8<sup>th</sup> grade randomly selected to match participants' numbers of groups. We were also investigated the relationship between deaf students' response time ratios and acquisition age of TİD for grade. It was revealed that there weren't any significant differences between these groups for all grades with a statistically difference of ( $F_{1-12} = ,14$   $p = ,713$  for 4<sup>th</sup> grade; ( $F_{1-12} = ,10$ )  $p = ,761$  for 5<sup>th</sup> grade; ( $F_{1-8} = ,00$ )  $p = 1,00$  for 6<sup>th</sup> grade; ( $F_{1-6} = ,46$ )  $p = ,522$  for 7<sup>th</sup> grade (see Table 10).

**Table 11.** Deaf and hearing participants' correct responses by morpheme number in noun phrases of test items (max. 16 correct responses)



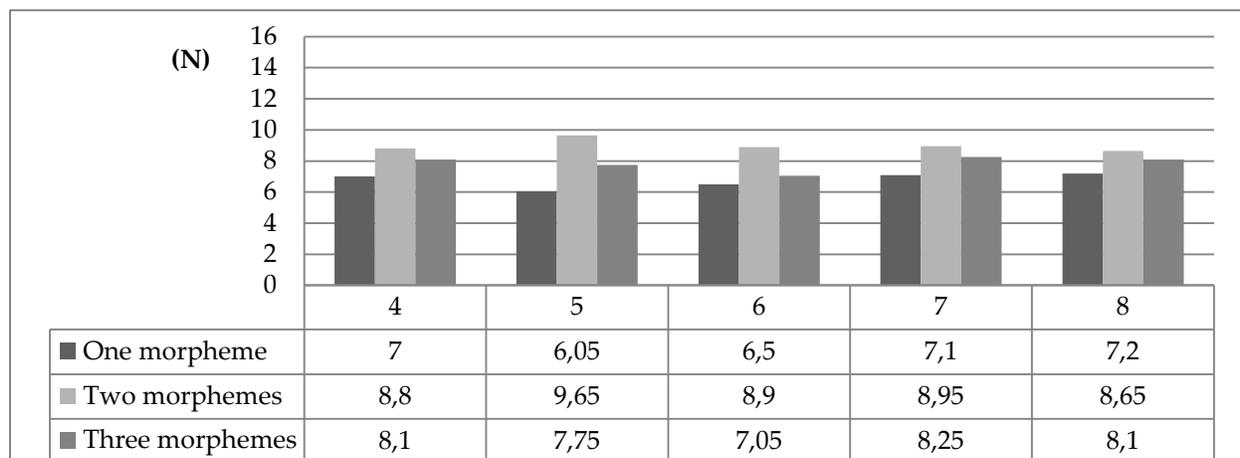
We also investigated the relationship between correct responses and participant type for morpheme number in noun phrases of test items. It was revealed that there were significant differences between hearing and deaf students for all noun phrase types in target sentences with a statistically difference of ( $F_{1-198} = 1578,40$ )  $p = ,00$  for noun phrases with one morpheme; ( $F_{1-198} = 1134,70$ )  $p = ,00$  for noun phrases with two morphemes; ( $F_{1-198} = 1244,41$ )  $p = ,00$  for noun phrases with three morphemes (see Table 11).

**Table 12.** Deaf and hearing participants' response time ratio by morpheme number in noun phrases of test items.



One-way ANOVAs were performed to investigate the relationship between response time ratio and participant type for morpheme number in noun phrases of test items. The data revealed a significant interaction between hearing and deaf students for all noun phrase types in target sentences with a statistically difference of ( $F_{1-198}= 148,52$ )  $p = ,00$  for noun phrases with one morpheme; ( $F_{1-198}= 144,95$ )  $p = ,00$  for noun phrases with two morphemes; ( $F_{1-198}= 114,56$ )  $p = ,00$  for noun phrases with three morphemes (see Table 12).

**Table 13.** Deaf participants' correct responses by morpheme number in noun phrases of test items (max. 16 correct responses)



According to the findings of the research, for all grades the deaf students have similar accuracy rates without noticing morphological complexity of test items. Furthermore, the deaf students had much more errors in the test items even with noun phrases having only one morpheme. It is therefore possible to hypothesize that they didn't achieve even the first level of morphological awareness (see Table 13).

**Table 14.** Deaf participants' correct responses by error type in test items and grade

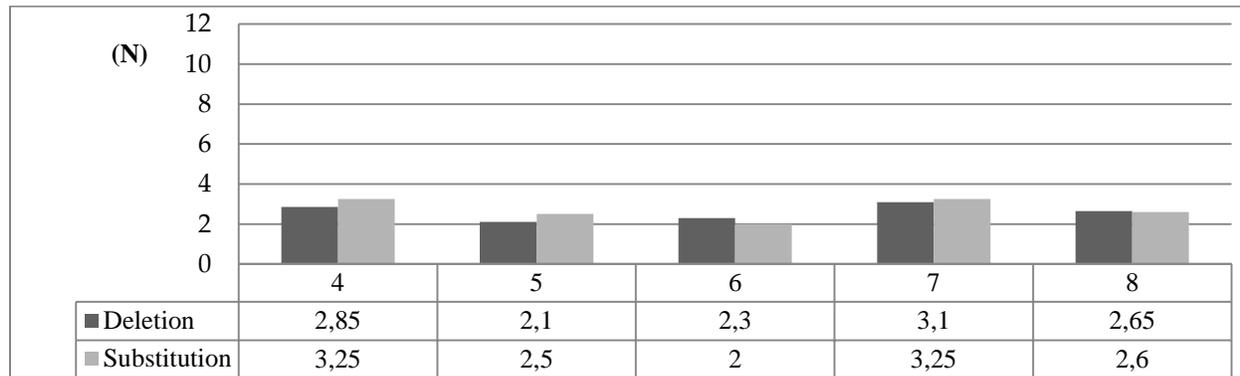


Table 14 indicates that deaf students performed similarly on morphological awareness tasks (morpheme deletion and substitution). That is way we can't say that deaf students predominately are more prone to use deletion strategy or substitution strategy and this strategy changes with grade.

### 5. Conclusion and Discussion

This section discusses factors that may play a role in the inflectional morphology awareness of deaf students. The outcomes of this study make a significant contribution to research in this area. It is important to bear in mind that discussion below focuses on findings that emerge from the case morpheme data. In the literature, there were numerous studies that highlighting the importance of including morphographic analysis in deaf education (Gaustad, 2000; Gaustad et al., 2002, Gaustad & Kelly, 2004; Kelly & Gaustad, 2007). The present study has attempted to address is how deaf students acquired inflectional morphological awareness with respect to the grade, acquisition age of TİD and hearing loss type and investigate the possible effects on the development of morphological awareness. The online GJT was used to assess students' awareness of the inflectional structure of Turkish words. Results show that the inflectional morphological awareness of deaf students doesn't increase with grade. As it is expected that across Grade 4 to 8 hearing student's Turkish morphology awareness skills were significantly better than deaf students. The deaf students had much more errors in the test items even with noun phrases having one morpheme demonstrated that they didn't achieve even the first level of morphological awareness. Besides the findings support that the response times of hearing students were significantly smaller than those of deaf students. Therefore, hearing students read all words significantly faster than deaf students. It is also found that there weren't any significant differences between severely and profoundly deaf students' accuracy rates. The data we have reported support and expand the significant point is the quality of the auditory input received by the deaf students. It is known that speech perception is highly reliant on lip-reading, even with hearing aids for deaf children with severe (70-94 dB) hearing loss (RNID, 2007). These findings have led to the conclusion that deaf students have difficulty in

understanding of morpho-syntactic relationships of Turkish from the evidence provided in the present study.

We do not know how much attention the deaf students having not deaf parents pay to acquire TİD before the literacy development. This choice is not an issue for deaf students having deaf parents. However, we observed that all deaf students used TİD on a daily basis as their primary and preferred means of communication even those educated primarily in auditory-oral programs. TİD should be considered the primary and dominant language even though the hearing parents' primary or dominant language is Turkish. Defining dominant language may provide important new insight into how deaf students use spoken language. Dominant language is generally used to account for the lack of balance between two or more languages. Note that the dominant languages influence is an important aspect to keep in mind in its process for the development of non-dominant language. Due to lack of auditory input, it is also clear that Turkish may become entirely inaccessible to the deaf students and also requires special intervention, including training in speech articulation, speech perception, and lip reading, unlike hearing children acquiring a spoken language (see Blamey, 2003). Deaf students, therefore, have only limited knowledge of the Turkish that print represents. We propose that TİD becomes dominant language without noticing acquisition age from the evidence provided in the present study that all deaf students used TİD on a daily basis as their primary and preferred means of communication. In terms of the TİD input we have described the particular differences between early before the age of 5 years and late childhood acquisition. However, one surprising finding from this study that whether deaf students acquired TİD during early childhood or late childhood didn't affect accuracy rates in online GJT assessing awareness of the inflectional case morphology of Turkish.

To highlight the impact of dominant language, we have to find out if transferability exists between TİD and Turkish, and also if there was a relationship between the processes of inflectional morphology, especially case morpheme between them. Firstly we illustrated that a more crucial difference between Turkish and TİD with respect to how inflectional case morphology is expressed (4-5).

#### **4. Turkish**

- a. Student school-DAT go-PRES
- b. Child door-ACC open-PAST

#### **5. TİD<sup>1</sup>**

- a. STUDENT SCHOOL GO-PRES

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<sup>1</sup> TİD is not written language. So it was instead glossed with English words written in all capital letters.

b. CHILD DOOR OPEN-PAST

As can be clearly seen, the inflectional case morpheme is not overtly present in the TİD. In light of these structures, we proposed that deaf students' failure is to negative transfer morpho-syntactic constraints from TİD to Turkish. In short, negative transfer occurs when speakers transfer items and structures that are not the same in both languages. For the case marking in TİD, there is no overt case morpheme that gets affixed to the phrase. Rather, the context of SCHOOL GO brings out more clearly the case marking of the sentence. It is therefore possible to conclude that marking case in clause in Turkish may seem redundant to deaf students. The results showed that sign language explanation of deaf students' morphological awareness skills was important when acquiring the spoken language.

Before concluding the present study it may be useful to summarize the main issues raised so far. In light of our data and observations, we proposed that due to lack of abundant and variable auditory linguistic input and opportunities for Turkish use, TİD becomes dominant language for deaf students even though those educated primarily in auditory-oral programs and hearing parents' primary or dominant language is Turkish. In our view of deaf student's inflectional morphological awareness in spoken language we have also proposed that deaf students' difficulties in understanding of morpho-syntactic relationships of Turkish may be due to negative transfer of morpho-syntactic constraints from TİD. However, it does not mean that TİD hinders the acquisition of Turkish. Furthermore, deaf children having deaf parents (who use a Sign Language) typically attain higher levels of literacy and academic achievement than their peers having hearing parents, although the causes of this relationship remain unclear (Chamberlain & Mayberry, 2000). We suggest that studies on deaf students' spoken language acquisition should focus on differences and similarities between sign and spoken language. To sum up, these findings reinforce the importance of attention to morphemic awareness. These and other issues have to be left open for future, fruitful research.

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