Frequency and Type of Gesture in the Blind and the Sighted in L1 and L2

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1. Introduction

In interpersonal communication, speech is often accompanied by gestures, which help convey the intended message in visual terms. The sighted can see gestures which they produce, but the blind cannot. Such a discrepancy raises the question whether gesture plays the same role for the blind as they do for the sighted. Furthermore, we may ask ourselves whether the blind and the sighted gesticulate differently in different languages. In the case of L1 vs. L2, the issue becomes even more complex because L2 speakers use various communication strategies in order to compensate for possible lack of proficiency in a productive skill such as speaking. They tend to paraphrase, describe, use superordinate or subordinate concepts, borrow from other languages, create new words, and so on. In addition to these language-based strategies, they often resort to all sorts of nonverbal strategies that are likely to help them convey the intended message. It is not unusual for L2 speakers to point to themselves or objects and people around them, make facial expressions, change their body posture, and use gestures.

The aim of the study presented in this paper was to investigate frequency and types of gestures in blind and sighted speakers of Croatian as L1 and English as L2. We begin with a theoretical overview of gestures: we explain what gestures are and how they are classified. The outline is followed by a summary of previous research on gestures which served as a basis for our hypotheses. Next, we outline our aims and describe the methodology of the study. Finally, we present and discuss the results.

2. Gestures: definition and classification

McNeill (2006) defines the term 'gesture' as "a multiplicity of communicative movements, primarily but not always of the hands and arms" (p. 58). Speakers use their hands and arms to convey a certain message, e.g. where somebody went, or to illustrate what something looks like. It is not just concrete actions and items that are illustrated with gestures. Speakers even convey abstract concepts in gestures. For example, they show that they love somebody by shaping a heart with their hands. As Pavelin-Lešić (2010) notes, speakers materialize abstract concepts and handle them as concrete objects by using gestures. People are not aware of the fact that they gesticulate when they talk. Because speakers focus primarily on speech and the articulation of

their thoughts, gestures emerge subconsciously. As a consequence, gestures may not only transmit information that the speaker is articulating; they may also transmit information not conveyed in speech and may even give the listener insight into the speaker's mental state (Goldin-Meadow, 2000).

While people most often gesticulate in the presence of other individuals, it has been found that gestures emerge even when the speaker is alone, e.g. when talking on the telephone. This finding proves that a person need not see their listener in order to gesticulate. In other words, people do not gesticulate for the listener's sake, but rather their own sake. This largely explains why blind people gesticulate, even though they cannot see their listener and have never seen others produce a gesture (Iverson & Goldin-Meadow, 2001).

Although gestures co-occur with speech, they differ from speech in one important feature: speech is codified, meaning that words are combined into larger units (clauses and sentences) following rules from mental grammar and lexicon. If people wish to be understood, they must adhere to this set of rules. Unlike speech, however, gesture "is idiosyncratic and constructed at the moment of speaking – it does not belong to a conventional code" (Goldin-Meadow, 2000, p. 237). There are only a few conventionalized gestures, and no established rules for gesturing exist. Nevertheless, gestures which co-occur with speech can be classified according to their function in relation to speech. McNeill (1992) defines four primary types of co-speech gestures: iconic gestures, metaphoric gestures, deictic gestures and beats. An iconic gesture is a gesture which "bears a close formal relationship to the semantic content of speech" (McNeill, 1992, p. 78). For example, making a throwing movement with the hand to indicate that somebody throws something would classify as an iconic gesture. While iconic gestures are used to represent concrete entities, metaphoric gestures "present an image of an abstract concept" (McNeill, 1992, p. 80). For example, a speaker says "Next, we went…" and makes a swiping motion to the side while uttering the word 'next'. Of the four types of gestures, metaphoric gestures are the ones that are dependent on context the most (Pavelin-Lešić, 2010). What this suggests is that their meaning cannot be understood in isolation, but only in connection with speech and the overall context that it accompanies. Deictic gestures are gestures of pointing. While talking, speakers use these gestures to point at people or things. The referents of deictic gestures may, but need not be present for the speaker to point at them. Sometimes, a speaker may refer with a deictic gesture to something that was previously present in the room. In such a case, a speaker relies on the fact that the listener will remember who or what was in the place they are pointing at (Yule, 2006).The last primary co-speech gesture type is beats, "movements that do not present a discernible meaning, and they can be recognized positively in terms of their prototypical movement characteristics" (McNeill, 1992, p. 80). Beats serve to highlight words or phrases which are accentuated in speech. Speakers realize them as "small, low energy, rapid flicks of the finger or hand" and produce them repetitively when speaking (McNeill, 1992, p. 80).

In addition to these four primary types of co-speech gestures, there are also several secondary gesture types: speech-framed gestures, emblems, pantomime and signs. We have included only speech-framed gestures into our analysis. These are gestures which, unlike the previously mentioned gesture types, do not occur simultaneously with speech, although they are preceded and followed by it. Instead, they occupy a slot in the sentence that the speaker does not verbalize. For example, a speaker says, "Sylvester went…", but instead of saying how or where Sylvester went, the speaker shows it in gestures (McNeill, 2006).

3. Previous research

The aim of this study was to investigate gesture in blind and sighted L2 learners. Unfortunately, few research studies on gestures in L2 speakers have been conducted so far. Nevertheless, there are some studies on gesture in foreign-language environment in general which help shed light on gestures in L2 speakers. For example, Guilberg (2010) reports the important role of gesture in L2 learners and teachers. Learners tend to learn more if their teacher gesticulates. Beats in particular are very useful; since they follow the rhythm of the speech, they help learners internalize prosodic and phonological properties of the target language. Gregersen, Olivares-Cuhat and Storm (2009) also emphasize the importance of gesture in the learning of an L2. In their study conducted on L2 learners, they found that gestures help overcome lexical gaps if they are employed in addition to or instead of speech in cases when a learner lacks the appropriate vocabulary for articulating their thoughts. Their study also showed that speakers gesticulate more often in their L1than in their L2. Further, the authors found the frequency of gestures in L2 to be reciprocal to competence: the most proficient learners gesticulated the most, whereas less proficient learners gesticulated less.

The two studies mentioned above involved sighted native speakers of English. There are only a few studies on gestures of blind native speakers of English and, to the authors' knowledge, none on gestures of blind L2 learners of English. Nevertheless, the existing studies and their findings will serve as important points of reference in this work.

One of the biggest myths about the blind is that they do not gesticulate. Iverson, Tencer, Lany and Goldin-Meadow (2000) debunked this myth when they found that blind infants produced gestures during the language acquisition process, albeit less frequently than sighted infants. The distribution of gesture types, however, was similar in both groups in their study. In another study, Iverson and Goldin-Meadow (1997) investigated gesture in older blind and sighted children in three tasks, one of which was a narrative task. All participants produced very few gestures, but the blind produced the fewest gestures. What is more, they produced exclusively iconic gestures. Although the blind produced only one gesture type, the authors were able to prove that the blind do gesticulate and that vision is not a prerequisite for producing gestures. In a later study, Iverson and Goldin-Meadow (2001) found that blind children gesticulated even when the addressee was blind. These findings suggest that the blind gesticulate because producing gestures is an intrinsic part of the speaking process, and it does not happen for the sake of others. Moreover, the authors observed that the blind frequently gesticulated while thinking out loud. They thus concluded that gestures also function as a channel through which the blind express thoughts which are difficult to articulate.

4. Study

4.1. Aims and research questions

The main aim of this study was to compare blind and sighted L2 learners' frequency of gesturing and the gesture types they produce. More specifically, we wished to determine the following:

a) Whether blind learners gesticulate more or less than sighted learners in their L1, i.e. Croatian. As a study by Iverson and Goldin-Meadow (1997) showed, blind native speakers of English tend to produce fewer gestures when narrating a story in their mother tongue than sighted speakers. Analogously, it was expected that Croatian speakers who are blind would produce fewer gestures when narrating a story in their first language than speakers who are sighted;
b) Whether blind learners gesticulate more or less than sighted learners in their L2, i.e. English. It was assumed that the findings pertaining to gesticulation in English would mirror those pertaining to gesticulation in Croatian, i.e. that blind learners would gesticulate less than sighted learners in L2, as well;
c) Whether there was a relationship between proficiency in L2 and the frequency of gesturing. Following Gregersen et al.'s (2009) findings, we expected that more proficient learners would gesticulate more in L2 than the less proficient learners;
d) Whether Croatian blind L2 learners gesticulate more in L1 or in L2. We assumed that Gregersen et al.'s (2009) finding about sighted speakers gesticulating less in a foreign language could also be applied to blind learners, meaning that the blind would gesticulate less in L2.

Finally, this study aimed to determine the types of gestures blind speakers produce in L1 and L2 as well as the purpose of their production. Although the blind produced only one gesture type during the narrative task in Iverson and Goldin-Meadow's (1997) study, the fact that the blind, much like the sighted, were found to produce a variety of gesture types during the speech acquisition process (Iverson & Goldin-Meadow, 2000) led us to presume that the gesture types employed by the blind in this study might be similar to those produced by the sighted.

4.2. Participants and methods

Fifteen L2 learners participated in the study. Five of them were blind learners of English, aged 16-18, attending a vocational program in a specialized school for the blind and visually impaired. According to their school achievement, their teacher's evaluation and their self-assessment of their competence, they were classified as intermediate learners. The rest of the learners were sighted and they formed two subsamples. Subsample #1 consisted of sighted grammar-school L2learners classified as advanced learners, whereas subsample #2 consisted of intermediate sighted vocational-school L2 learners. The students in the subsamples were 16 and 17 years old.

Prior to the study, all the participants gave their consent to participate in the study. They agreed to be video-recorded and allowed the use of the visual material in the publication of the results. The school principals also permitted the researchers to conduct the study on the premises of their schools. The study was conducted in two phases. In both phases, the participants received a story and were asked to retell it in front of a camera. The story was read to the blind participants, while the sighted participants read the story on their own. In the first phase, they were given a story in Croatian (their L1), while in the second phase, they received the same story in English (their L2).The story used was *The Killer in the Backseat*, chosen because it was expected that its dynamic and exciting character would elicit gestures from the participants. The retellings in L1 in all groups lasted between 90 and 120 seconds.

In L2, both subsamples needed 2 minutes on average to retell the story, whereas the average length of the retold story in L2 in the blind group was 3 minutes. The blind group's longer narratives in L2 were caused by long pauses in their retellings, during which they silently constructed their utterances.

After all the data had been collected, the participants' gestures were counted. In the analysis, Iverson and Goldin-Meadow's (1997) definition of a gesture served as a basis for recognition. Therefore, a hand movement counted as a gesture if it preceded, followed or co-occurred with speech and if it had a clear beginning and ending. The gestures were classified into types, following McNeill's (1992, 2006) classification of gestures. For each group, we also calculated the mean numbers of gestures as well as the mean number of each produced gesture type.

5. Results and Discussion

5.1. Frequency of gesturing in the blind and the sighted in L1

A comparison of the mean numbers of gestures (Figure 1) shows that the blind produced fewer gestures than both subsamples when narrating the story in Croatian. Therefore, our assumption that the blind would gesticulate less than the sighted in L1 was confirmed.

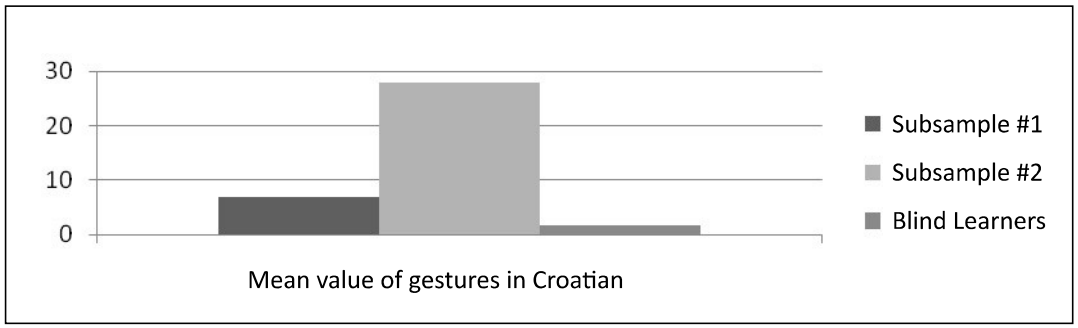

Figure 1.Mean numbers of gestures in both subsamples and the group of blind learners in L1

However, what is also noticeable from the table above is that subsample #2 produced a higher number of gestures than the other two groups. We believe that the discrepancy between the two subsamples may be explained by specific educational circumstances that produce an interplay between affective and cognitive factors. Grammar-school learners (subsample #1) are more skillful speakers; they often have discussions on different topics in their L1, and expressing their ideas and opinions has become a rather effortless task.Vocational-school learners (subsample #2) are not as eloquent as their grammar-school peers. Their discussion classes are less frequent. For that reason, they are often nervous when speaking in class and need to gesticulate more in order to convey a message. On the other hand, the fact that the blind produced so few gestures cannot be attributed to their level of proficiency. As already mentioned, our blind participants were at the lower-level proficiency; they were language learners with relatively weak narrative skills. The only reasonable conclusion is that the blind tend to rely mostly on speech when communicating in their mother tongue.

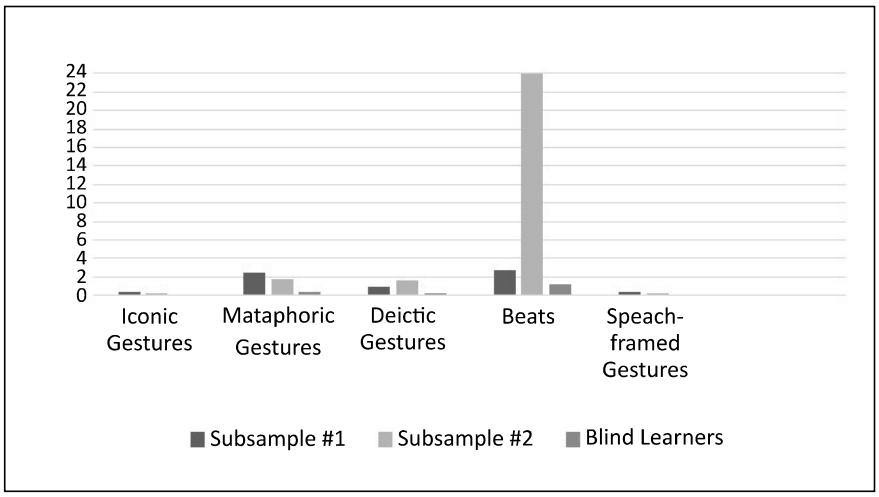

Figure 2. Mean numbers of occurrences of gesture types in both subsamples and the group of blind learners in L1

A further comparison of the mean numbers of occurrences of gestures types cross all groups (Figure 2) shows that all gesture types except beats were produced infrequently in L1. Beats were produced by subsample #2 much more often than any other gesture type. The forms of beats differed from one participant to another; they were formed by raising one hand and bringing it back to the initial position, moving one hand to the side and bringing it back to the resting position, opening and closing palms, etc. (Figure 3).

Figure 3. "ustrašila se" (*she got scared*) –Participant opens and closes his palms, an example of a beat gesture produced in subsample #2.

As Gregersen et al. (2009) suggest, beats help learners organize their thoughts into verbal language and articulate them. This is likely to be the case with subsample #2. In personal communication, several participants from this subsample admitted that they were not sure if they were up to the task as they did not think that they had good speaking skills in either L1 or L2. As already stressed, their school is vocational and its curriculum does not include debates or longer discussions. We may conclude that the high occurrence of beats is probably due to their role in helping our participants narrate the story and complete the task.

5.2. Frequency of gesturing in the blind and the sighted in L2

Figure 4 shows that blind L2 learners produced more gestures in L2 than subsample#1, but fewer than subsample#2. The mean number of gestures produced by the blind in English is numerically halfway between the mean values of both subsamples.Whether the blind gesticulate more or less in L2 than their sighted peers is yet to be determined through future research.

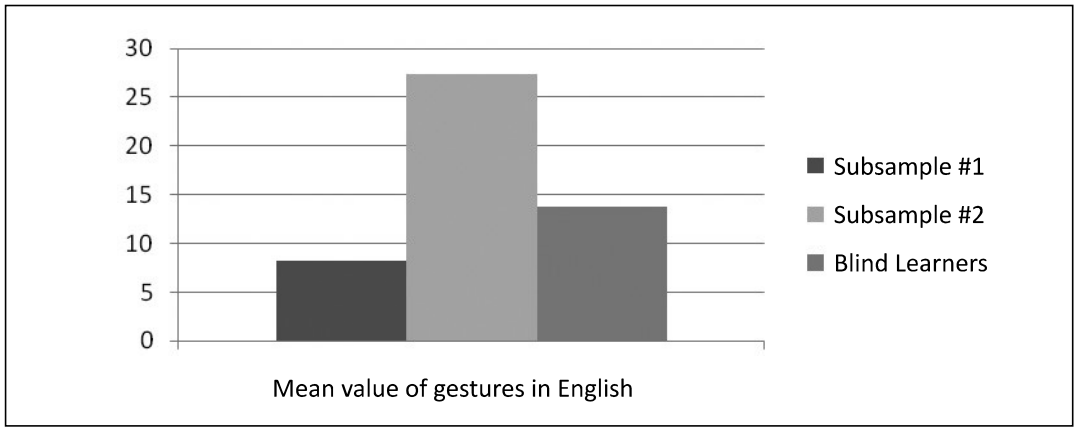

Figure 4.Mean numbers of gestures in both subsamples and the group of blind learners in L2

Following Gregersen et al.'s (2009) findings, it was expected that all groups would gesticulate less in L2. However, the mean number of gestures in L2 in the group of blind participants was higher than their mean number of gestures in L1, whereas the mean numbers of gestures in L1 and L2 for both subsamples of sighted learners were almost equal.

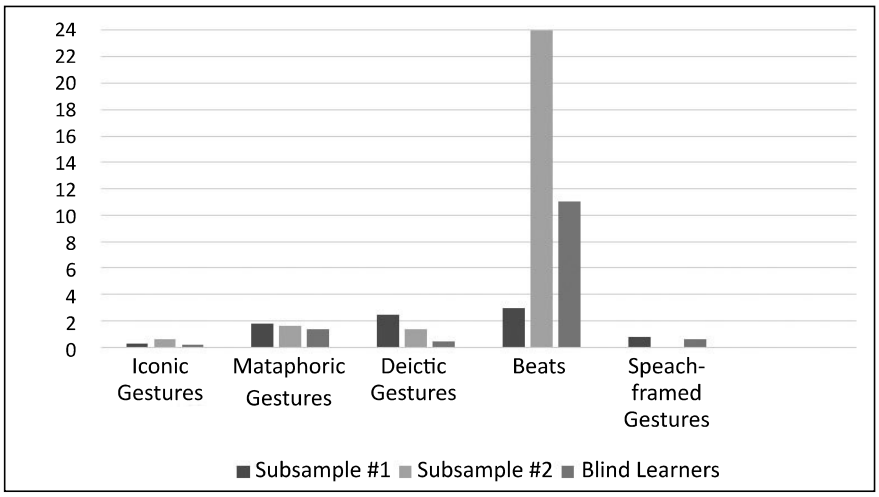

Figure 5. Mean numbers of occurrences of gesture types in both subsamples and the group of blind learners in L2

Subsample #1 produced the fewest gestures of all three groups. It is reasonable to attribute this result to their higher proficiency in English. As grammar-school learners, they have more L2 classes per week than the other two groups, and, as already mentioned, a lot of their classes, irrespective of the school subject, include a lot

of discussion. They are more advanced in the use of vocabulary and grammar and they are less likely to miss "the right words". Therefore, they do not need to compensate by using gestures.

The comparison of the mean numbers of occurrences of gestures types in all groups (Figure 5) shows that the previously established high number of gestures in subsample #2 is mostly due to a high occurrence of beats. As was the case in L1, this finding in L2 may be again explained by the educational circumstances - fewer Croatian and English language classes and, consequently, less advanced language proficiency and fewer chances to practice speaking skills.The use of gestures compensates for their poorer speaking skills and helps them overcome the anxiety they are likely to experience when speaking in L2.

When compared to both subsamples, the group of blind L2 learners demonstrated more similarities to subsample #2. In addition to the fact that both groups consisted of intermediate-level L2 learners, a very significant commonality between them is the tendency towards beats. The possible explanation for why blind learners employed beats so frequently, and why they produced much more gestures in L2 than in L1, is offered in later sections.

5.3. Relationship between proficiency in L2 and the frequency of gesturing

Although it was expected that the more proficient participants in this study (subsample#1) would gesticulate more frequently in L2, our findings show that less proficient participants (subsample#2) gesticulated three times more often in English than their more proficient peers. A tentative conclusion which can be drawn from this data (see Figure 4) is that proficiency and the number of gestures produced in L2 seem to be inversely proportional to one another: the more proficient learners are in L2, the fewer gestures they produce.

This result contradicts the finding from Gregersen et al.'s (2009) study. However, when the participants' educational context and mental disposition are taken into account, it can be explained why more proficient L2 learners would employ gestures less frequently than their less proficient peers. As already suggested, they are simply more used to situations in which they are asked to talk for a length of time, and they either learn how to control their hand movements or they simply do not feel the need to gesticulate. In addition, as proficient speakers, they rarely experience communication breakdowns, so that they need not employ gestures in order to compensate for them.

Less proficient sighted L2 learners in our study (subsample#2) go to a vocational school with a lot of specialist subjects where languages and social sciences are not priority. They are not frequently encouraged to debate, defend their views or speak extensively in any language class. So, when faced with a task to orally produce a story in L2, they experience anxiety and communication breakdowns. Just like in L1, they resort to gestures to compensate for their lack of knowledge.

Our blind participants, who were also classified as intermediate-level L2 learners, were found to gesticulate more frequently in L2. What reasons may lie behind this result is explained in the sections that follow.

5.4. Frequency of gesturing in the blind in L1 and L2

As seen in Figure 6, the mean number of gestures produced in English (L2) by the blind was much higher than in Croatian (L1). Therefore, the hypothesis that the blind would gesticulate less in L2 was not confirmed.

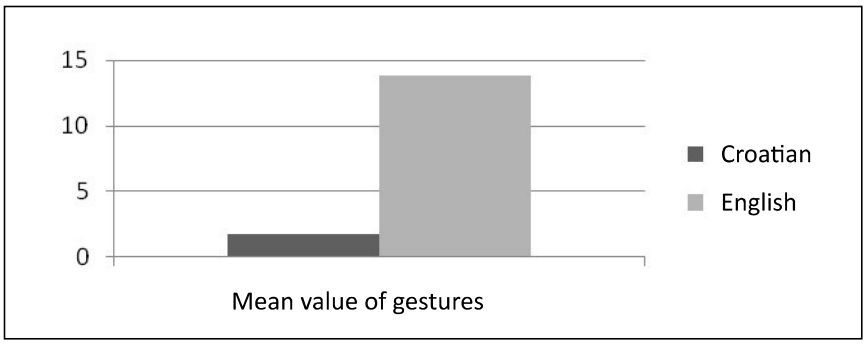

Figure 6. Mean numbers of gestures in blind L2 learners in English and Croatian

As a group, the blind participants in this study were classified to be of intermediate proficiency. While narrating in English, they made a number of grammatical mistakes. They were aware of the fact that their speaking skills were not good and they expressed their concern about it openly. Gestures helped them organize their thoughts, articulate them and explain them in visual terms. Once the blind successfully articulated their thoughts with the assistance of gestures, they were more motivated to continue and complete the task at hand. The conclusion is that gestures seemed to compensate for our blind L2 learners' lacking knowledge, motivate them when speaking and clarify the information they wish to convey to the listener.

5.5. Gesture types in blind participants' narratives

Mean numbers of occurrences for each gesture type produced by blind L2 learners in Croatian (L1) are distinctly low (Figure 7), which is in line with the previous finding that the blind do not gesticulate much in L1. Some gesture types (iconic gestures and speech-framed gestures) were not produced at all by the blind participants in Croatian.

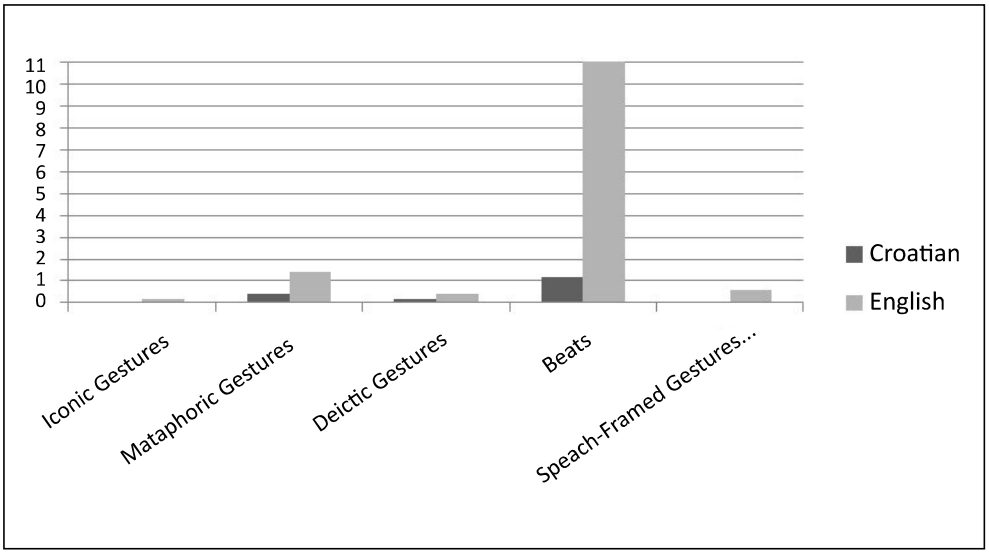

Figure 7.Mean numbers of occurrences of gesture types produced by blind L2 learners in English and Croatian

In the second phase of the study, while narrating in English (L2), blind L2 learners produced all gestures types. Metaphoric and deictic gestures were produced

almost equally in both languages, while the number of beats was significantly more frequent in L2. An example of a blind student producing a beat can be seen in Figure 8.

Figure 8. "in *the* *him *office*" - Learner repeatedly taps his right knee as he speaks the italicized words

For the blind, beats were the most frequently employed gesture type in both L1 and especially L2. When observing the circumstances in which beats occurred, it becomes evident that they had an important role in the blind learners' communication. In many cases, beats tended to occur after long pauses, during which the learners seemed to think about how they would articulate their thoughts. Once they thought of a way to express them, they accompanied their spoken words with a beat gesture. In some participants, this pattern was highly repetitive. The conclusion which can be drawn from this observation is that beats assist the blind in putting their thoughts into utterances, i.e. in organizing them into syntactic units (phrases, clauses and sentences) and articulating them. As a matter of fact, they are likely to be the main facilitator in the process of completing the task, in spite of possible problems in oral communication.

An important finding in this study is that the blind produce metaphoric and deictic gestures, even though the opposite was reported in Iverson and Goldin-Meadow's (1997) study of blind children narrating a story. Figure 9 shows a blind L2 learner producing a metaphoric gesture by sweeping with his hand through the air. Through this gesture, he signalized the transition to the next stage of the story.

Figure 9. "she *go next" - Learner motions with the hand from one side to the other to indicate the transition to the next stage in the narrative

In spite of being visually impaired, the blind also successfully produced deictic gestures. They proved to be capable of organizing objects and people from the story into space and pointing at them as if they were actually in the room. Figure 10 shows an interesting example of a deictic gesture made by a blind L2 learner. Whenever he referenced the main character in the story, he pointed at himself, showing that he identified with her. Even though his oral narrative was produced from a third-person point of view, his gestures indicated a first-person point of view.

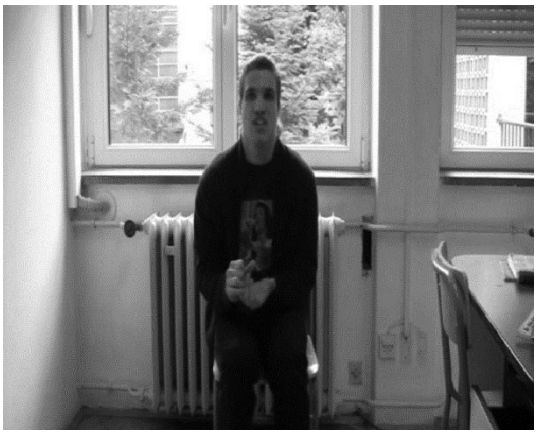

Figure 10 “to her” - Learner points to himself when referencing the main character of the narrative (deictic gesture)

6. Conclusion

The aim of this study was to examine blind and sighted L2 learners’ gestures. The findings suggest that blind L2 learners gesticulate less in L1 (Croatian) than their sighted peers.While inconclusive findings make it difficult to state whether the blind gesticulate more or less than the sighted in their L2 (English), it is significant that, as a group, they employ gestures more frequently in L2. Also, our findings show that the blind produce all gesture types.

A further conclusion from this studyis that proficiency in L2 and the frequency of gesturing appear to be inversely proportional. When narrating a story in English, less proficient L2 learners in this study gesticulated more frequently than more proficient learners.Both blind and sighted less proficient L2 learners seemed to employ gestures as assistance in speech production; with the help of gestures, they successfully overcame potential communication breakdowns that might have occurred due to their lack of proficiency. Because of this, their motivation to continue with the task increased. Of all gesture types, beats in particular were greatly employed by the less proficient learners when they were trying to communicate a message across. They assisted these learners in organizing their thoughts into speech and articulating them.

This study was qualitative in nature and it was conducted on a small sample of blind L2 learners whose proficiency was at an intermediate level. In the future, it would be desirable to conduct a similar study with a larger sample of blind learners of varied proficiency levels so as to confirm or refute the tendencies observed in this small-scale study, especially those results pertaining to the relationship between proficiency and the frequency of gesturing.

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