Gestures and Lexical Access Problems in German as Second Language

ELENA ISAEVA

Master's Thesis

University of Barcelona

Applied Linguistics and Language Acquisition in Multilingual Contexts,
(LAALCM)

Supervisor: Dr. Marta Fernandez-Villanueva

22.06.2015

ABSTRACT:

Gestures receive growing attention in the field of Second Language Acquisition but still there is a scarcity of research that looks at them as a part of multimodal communication through the use of interactional approach.

The present study aims to explore the interplay of gestures in oral production in German as second language and the lexical access problems. It looks at the principal gesture functions in communication (referential, discursive, interactional, autostimulative) and adapts the NEUROGES typology by Lausberg and Sloetjes (2009) who distinguish gestures that depict image, conventional, emotional, pointing, emphatic, autostimulative gestures

The purpose of the study is to see what kind of gestures occurs with the lexical access problems in German SL oral communication and if any gestural types depend on L2 proficiency and fluency.

To answer these research questions the speech of 6 Spanish/Catalan (L1) students of German (L2) was analyzed. The participants varied in their proficiency (intermediate, upper-intermediate, advanced levels) and fluency. The data were taken from the VARCOM Corpus of the University of Barcelona. There were the videotaped dialogues between the students of German and German native speakers who participated in communication and were instructed to prompt the information from their interviewees during the argumentation task.

During the analysis the cases with lexical access problems in speech, the involved lexical items (abstract or concrete) and the hand gestures were identified and coded in the ELAN annotator device. The study reflects on the tendencies in the gestural trajectory and dynamics, the start-time of gestures regarding to the target word (before, together, after it) and the principal communicative functions of gestures at the moments of word-searches in speech.

The findings of this study give support to the Information Packaging Hypothesis and prompt us to rethink the traditional lexical compensatory function of gestures, because the emphatic and the pointing gestures are the most frequently occurring types during the lexical access problems in speech.

The results show that the gestures that depict image are scarcely presented and do not participate in word retrieval. The emphatic gestures represent the discursive function in communication. The pointing gestures in the majority of cases are used strategically to prompt reaction from the interviewer, and, thus, play an interactional function, not the referential one. The autostimulative

gestures that occur during the lexical access problems may participate in the retrieval but still their role should be investigated more.

In our study the higher proficiency is related to the decrease in lexical access problems and the decrease in searches for the abstract words. Its relation to the most frequently presented gestural types is, however, weak. The higher speech rate is related to the decrease in cases with lexical access problems that were produced without gestures, but does not affect gestural types. Frequency of silent pauses is not strongly related neither to the amount of lexical access problems, nor to the type of lexical items, nor to the most frequently presented gestural types.

TABLE of CONTENTS:

Index of Tables and Figures:.....	4
List of Appendices:	4
I. INTRODUCTION and LITERATURE REVIEW	5
1. 1. GESTURES in SLA	5
1.2. GESTURE TYPOLOGY.....	6
1.3. GESTURES and LEXICAL ACCESS	12
1.3.1. Gestures and Lexical access in L1	12
1.3.2. Gestures and Lexical Access in SLA	13
II. RESEARCH QUESTIONS and METHOD	14
III. ANALYSIS PROCEDURE	16
3.1.1 Segments with lexical access problems	16
3.1.2. Lexical items involved in word searches (abstract or concrete words)	17
3.1.3. Hand gestures during the lexical access problems	17
3. 2. Measures of Fluency	19
IV. RESULTS.....	20
RQ 1.....	20
RQ 2:.....	31
RQ 3:.....	32
V. DISCUSSION, CONCLUSION and LIMITATIONS.....	34
5.1. Discussion and Conclusion	34
5.2. Limitations:.....	35
ACKNOWLEDGEMENTS:	35
LIST OF REFERENCES:	36
LIST of TERMINOLOGY and ABBREVIATIONS:	40
APPENDICES:	41

Index of Tables and Figures:

Tables:

Table 1. Main Gesture Typologies and Their Function in Communication:.....	7
Table 2. General Information about Participants:	15
Table 3. Fluency of Participants:.....	19
Table 4. Number of Lexical Access Problems that occur with and without gestures for 6 participants:....	20
Table 5. Number of Concrete and Abstract Items during Lexical Access Problems for 6 Participants:.....	20
Table 6. Number of each gestural type and their function in communication.	21
Table 7. Trajectory and Dynamics of each Gesture Type for 6 participants.....	21
Table 8. Start time of Gestures with regards to Trajectory:	22
Table 9. Gestures and Lexical Access Problems with regards to L2 Proficiency:	31
Table 10. Gestures during Lexical Access Problems and Speech Rate:	32
Table 11. Gestures during Lexical Access Problems and Number of Silent Pauses /min:	33

Figures:

Figure 1. NEUROGES –Typology. Module III.	10
Figure 2. NEUROGES-typology. Module I.	18
Figure 3. NEUROGES-typology. Module II.	19

List of Appendices:

APPENDIX 1. <i>EXAMPLES OF PHRASES THAT CONTAIN PROBLEMS WITH LEXICAL ACCESS:</i> ..	41
APPENDIX 2. <i>TRANSCRIPTIONS OF THE ANALYZED SPEECH.</i>	46

I. INTRODUCTION and LITERATURE REVIEW

1. 1. GESTURES in SLA

Gesture studies is a relatively new field of research that nowadays receives growing attention in the cross-disciplinary studies, such as neuropsychology, culture, sociolinguistics and of course the area of second language acquisition as gestures are tightly interconnected with speech.

In SLA, Gullberg (2006) states the three main directions of gesture studies: the acquisition of gestures together with the second language, the possible effects of gestures on SLA and gestures as indicators of second language development. The last area is related to our current research, as we would observe the interplay of gestures with lexical access problems in communication in German as SL. However, interactional approaches, that observe multimodal and embodied communication, are still much more common in cognitive studies than in SLA research.

Rosch, Thompson, and Varela (1992) defend the importance of multimodal interaction approach in science and cognition. They state that our reactions and interpretations of the world depend on the experience of our body (embodied sensorimotor capacities), but this experience itself is influenced by biological, psychological and cultural contexts (Rosch et al., 1992, p.172-173).

Norris (2004) defines the embodied communication as a complex and multimodal process, where at least two interlocutors perceive, exchange and interpret information according to their feelings, thoughts and previous experiences. According to Poggi (2001), communication always consists of the information about the world (abstract and concrete events) and about the speaker's mind (goals, beliefs and emotions). From this perspective gestures are one of the communication modalities (together with bodily, facial, lexical, graphic, vocal modalities). Through them the speakers may indicate certainty or metacognitive information, communicative goals or focus of attention. Poggi (2001, p.2) calls them "mind-markers".

Norris (2004) in her study of multimodal interaction as well explores these modalities and discovers that they may vary in their "density" - the grade of importance and informativeness which depends on the situation and the personality of the participants

In relation to the SLA, it is important to explore if density of gestural modality depends on the proficiency and fluency levels of the SL, especially as not so much research is done in this direction. Graziano and Gullberg (2013) provided a study on gesture production in fluent and disfluent speech of 33 Italian (L1) children (4-5, 6-7, 8-10 years old), 11 Italian (L1) adults, 11 Dutch (L1) learners of French (L2) with low and intermediate levels. An adult instructor presented at each session providing feedback and asking questions during the narrative task. The results show that the majority of gestures occur with the fluent speech within all the tested

groups, the gestures are completed and stop when the speech stops. It shows that disfluencies in speech do not necessarily provoke an abundant gesticulation.

One of the principal findings of this study is also that the disfluent speech coincides not only with the referential gestures but also with the pragmatic ones (those that help to organize discourse). This discovery has opened the new horizons for investigations and set up a change in the traditional approaches that were mostly focused on the lexical compensatory functions of referential gestures (McNeill, 1992). There is a need to study gestural types more closely with regards to the SLA problematic.

1.2. GESTURE TYPOLOGY

However, gestures were traditionally defined as movement produced by hands, arms or shoulders (McNeill, 1992), some researchers (Seo & Koshik, 2010) widen the term and include the leg and foot movements, gaze, head movement. In our pilot-study we use the first definition and analyze only the hand movements. We find, however, extremely interesting to add more elements and modalities in the further, more large-scale research, which would give more fine-grained explanations to the questions raised in the discussion part of the present study.

In literature various gestural typologies are proposed. They are based on the form or function criteria. The first systematic linear typology of gestures may be found in Kendon (1980). Like speech, gestures may be divided into the minimal units - phases, each gesture has a stroke phase, which is the most significant and expressive one. It helps to distinguish one gesture from another.

The functional typologies depend on the role that gestures play in speech. McNeill (1992), Graziano and Gullberg (2013), Cienki and Müller (2008), Lausberg and Sloetjes (2009) distinguish and include various parameters, such as the referential, discursive, interactional and autostimulative ones. In the Table 1 we summarize the main functional typologies of gestures and show how the criteria expand to cover the gestural functions empirically.

McNeill (1992) in his work distinguishes only the referential and discursive functions of gestures, based on the four functional types. Three of them are related to the speech content (deictic, iconic and metaphorical) and the fourth one is related to discourse (beats). Iconic gestures represent concrete concepts, and metaphorical gestures represent the abstract ones. Deictic gestures indicate directions. Beats organize discourse and rhythmically coincide with the prosody in speech.

Table 1. Main Gesture Typologies and Their Function in Communication:

Author	Term	Definition	Function				
			Referential		Dis-cursive	Inter-actional	Auto-stimulative
			Con-crete	Abs-tract			
McNeill (1992)	iconic	gestures that present images of concrete actions or entitles	+				
	metaphoric	gestures that depict abstract content		+			
	deictic	gestures that indicate directions	+	+			
	beats	gestures that are related to discourse			+		
Graziano and Gullberg (2013)	referential	gestures that depict reference (size, shape, function)	+	+			
	pragmatic	gestures that do not depict reference, but indicate speech acts, comment on speaking production, parse speech.			+	+	
Cienki and Müller (2008)	referential	gestures that depict objects, attributes of objects or people, actions, behaviors and can refer to abstract and concrete entities	+	+			
	performative	gestures that enact speech acts (e.g. requesting for information, forcing to do something)				+	
	discourse	gestures that structure an utterance (e.g. beats, counting)			+		
Lausberg and Sloetjes (2009)	pointing	gestures that indicate a specific visible or non-visible location direction in space	+	+		+	
	depict motion	gestures that depict IMAGE (motion; forms, objects; position with focus of reference)					
	depict object						
	depict space		+	+			
	emphasis	gestures that help to make emphasis in discourse			+		
	emotional	gestures that show intrinsic emotional expressions	+	+			
	conventional	conventionalized gestures	+	+		+	
	autostimulative	gestures that indicate internal regulation					+

McNeill's typology was used as a basis and elaborated by Poggi (2008). She stated that "iconicity" may differ in its amount and exist in various gestures (creative and codified). "The grade of iconicity" can be measured by "means of how many parameters feature their meaning or how many steps are passed through from meaning to signal" (Poggi, 2008, p.56). So, this means that some gestures may have blended functions.

Casasanto (2008) also elaborates McNeill's typology and proposes the new hybrid type - "metaphorical beats". Such conclusion was made after a set of his specially created experiments where a group of 24 participants had to move marbles up and down while recounting and retrieving autobiographical memoirs. The results showed that the retrieval of negative-valence memoirs coincided with downward movements, and the retrieval of positive-valence memoirs coincided with upward movements. In these situations gestures carried a metaphorical representation of a reference but at the same time were related to discourse (rhythmical movements coincided with prosody while speaking). We admit that still, however, a more observational approach is needed to understand the possible blend of gestural functions in communication.

As we may see in the Table 1, **Graziano and Gullberg (2013)** distinguish only representational (oriented to reference) and pragmatic gestures. They define the pragmatic gestures as those that help to organize speech or indicate speech acts. It means that the authors expand discursive function and speak about the pragmatic role as well within one type. The authors do not focus their attention on the gestures that indicate time, person or location (deictic), but within this typology, then, they may be related both to the reference and to speech acts depending on the situation.

The similar idea was expressed earlier by **Fricke (2007)** who concentrated on deictic gestures in multimodal communication. Following Bühler, she widens the term and modifies the concept of **origo** (reference point for deixis) proving that deictic gestures may be oriented to the speaker or to the interlocutor. The notion of interlocutor and an interactional function of gestures is a new principal criterion for the distinction of gesture functions in communication (apart of referential and discursive functions).

Cienki and Müller (2008) already take into consideration all these three criteria. They offer the referential type of gestures which represent either abstract or concrete content (the authors consider that McNeill's iconic and metaphorical gestures are in fact the same type). They also distinguish performative gestures (represent speech acts and have interactional function in speech) and discursive gestures (help to structure utterances).

Cienki and Müller (2008) reflect a lot on the function of metaphor in communication and state that it is a cognitive procedure “of understanding one thing in terms of another” (p.10).

Metaphorical gestures may illustrate the whole phrase or just its elements, the representations may be expected or not, and are directly connected with thinking, context and discourse. These notions were principal for our study where we as well aimed to use an interactional approach.

Lausberg and Sloetjes (2009) developed another functional typology (NEUROGES) for empirical studies of gestural behavior. It consists of 3 modules, modules I and II describe the gestural form. Module III is devoted to the gesture function in communication. Below we quote the proposed algorithm for the functional coding.

Figure 1. NEUROGES –Typology. Module III.

(Images retrieved from Lausberg and Sloetjes (2009), pp.844-845).

The gestures that depict image, space, motion all play referential function in speech, so that can be grouped as one type that depicts image (see table 1). The emotional gestures play referential function as well, as they express the feelings about the speech content. The pointing gestures could be reference-oriented and as well play interactional function (indicate a speech act, as in the typology by Graziano and Gullberg, 2013). The conventional gestures also can be related to reference or to interlocutor in various situations. The emphatic gestures play discursive function. The authors distinguish also an autostimulative type (e.g. touching gestures) and underline that they are usually produced on body or any other surface and differ from the rhythmical beats in McNeill's typology. They are related neither to discourse, nor to the interlocutor, nor to the reference. Such gestures indicate the "internal regulation" (Lausberg & Sloetjes, 2009, p.844) of the speaker and help to concentrate and to calm down. The relation of gestures to cognitive dimension seems to be neglected in the previous studies on SLA. Still there is a need to explore

more in detail when exactly the autostimulative gestures occur in speech, if they are related more to the lexical access or to the planning process and if they could help in word retrieval. The classification by Lausberg and Sloetjes (2009) is chosen as a basis for the current study, as it is the most precise and includes the four gestural functions together with the autostimulative one. Moreover, this typology was previously used by Lausberg and Sloetjes (2009) with ELAN annotation device which we apply in our analysis too.

1.3. GESTURES and LEXICAL ACCESS

1.3.1. Gestures and Lexical access in L1

There are two main hypothesis (Alibali, Kita & Young, 2000; Wagner, Malisz, & Kopp, 2014) related to the process of speech production. The Lexical Retrieval Hypothesis, on the one side, states that gestures help to form the utterances and directly participate in speech process (Krauss, Chen & Gottesman, 2008). This was a fundamental concept for McNeill (1992) who focused on iconic gestures and underlined their ability to substitute the lexical item and thus potentially help in word retrieval.

The second concept, the Information Packaging Hypothesis, states that gestures participate also in problem solving and play a significant role in thinking and conceptualization of the ideas.

Many contemporary studies prove the last hypothesis.

For example, Alibali et al. (2000) performed an experiment with two different tasks (explanation and description) to elicit the similar utterances. They tested 18 children in their English L1 and asked them to use sand or play dough while speaking. They found out that the amount of gestures during the problems with lexical access was higher in the explanation task – the one that requires more retrieval load and analytical thinking. The results showed also that during the explanation tasks the gestures were more spontaneous and complex, and they were mostly related to conceptual planning, not to the shape representation of words. This proves that the lexical retrieval is not the single process in speaking when gestures are involved (Alibali et al., p. 16).

Another experiment was provided by Beattie and Coughlan (1999): they compared the production of 60 native speakers at the tip-of-the-tongue (TOT) state to investigate which gesture type helps in word retrieval. They created an experiment where the first group was allowed to gesticulate, and the second one was totally immobile. The results show actually that gestures do not always help us to access the necessary word. Iconic gestures in the majority of cases did not help to resolve the TOT state and actually occurred less frequently than beats and self-adaptors (self-touching gestures that coincide with autostimulative gestures in typology by Lausberg and

Sloetjes, 2009). Such findings raised our interest for the autostimulative and discursive role of gestures during word retrieval.

The experiment by Beattie and Coughlan (1999) also shows that the immobile group in some situations had more successful access to the target words. Ravizza (2003) explains it by noting that gestures may help only in the automatic spread activation but not during the strategic word search. The second process is exactly what we deal with in our current study as we analyze communication in the foreign language.

The question if any of gesture types help during lexical access in SL is still open. There is a need to use less experimental but more observational approach.

The recent neurological studies prove the differences in brain processes during retrieval of the abstract and concrete words. According to Meteyard, Cuadrado, Bahrami, and Vigliocco (2012), concrete words have more “imageability” and are much more dependent on the context. Abstract words are significantly more related to some emotional, “affective information”, and these affective components first helps us to memorize such words and later to retrieve them much faster than the concrete ones (Kousta, Vigliocco, Vinson, Andrews, & Del Campo, 2011; Vigliocco et al., 2014). These findings seem to be interesting to check with regard to the communication in SL and gestural modality.

1.3.2. Gestures and Lexical Access in SLA

In the area of SLA, Graziano and Gullberg (2013) also underline that not only referential but pragmatic gestures may be related to word retrieval. Recently Lucero, Zaharchuk, and Casasanto (2014) proved that beats (discursive function) indeed help in retrieval, and the role of iconic gestures (referential function) is insignificant. These crucial results, however, again were obtained during the specially created experiment and from the NS English participants: the authors used a word-naming task and instructed all the participants to produce either iconic (group 1) or beat gestures (group 2) during the word searches. Such findings still need to be checked with L2 speakers and in the situations that are closer to realistic multimodal communication.

While analyzing the lexical access problem, it is important to distinguish this process from the planning and formulation. Still, the previous studies on oral production in SLA do not have enough descriptions on how lexical access was recognized.

Following Murphy and Roca de Larios (2010), Tullock and Fernandez-Villanueva (2013) lexical-access problems may be identified through linguistic and extralinguistic indicators, such as meta-comments, problem-indication, self-questioning and problem-solving, self-evaluation,

paraphrasing. Long pauses and rising intonation as well may signal that we deal with lexical access difficulties. Both studies analyzed written production through think-aloud protocols that helped to register difficulties in retrieval. Prompting is one of the key elements of this technique, and it is used often in real multimodal communication, so that we find the results of these two studies extremely useful and applicable for our analysis.

To conclude our literature review, we note that research focused on the multimodal communication in the field of SLA is still scarce. Some recent findings from the cognitive studies may be adapted and checked. Still there is a discussion how gestures are related to speech and what kind of gestures occur and may help in word retrieval. There is still not so much known about the possible interdependence of fluency and proficiency with the gestural mode. Communication in German as a SL as well deserves more attention and seems for us a prospective source for new investigations.

II. RESEARCH QUESTIONS and METHOD

2.1. Research Questions

For our current study we set up the following research questions:

What kind of gestures occurs with the Lexical Access Problems in German SL Oral Communication? Do certain gesture types decrease with proficiency? Do any gesture types correlate with fluency?

2.2. Data

The present study aims to explore the use of gestures in SL oral production during lexical access problems. To answer the research questions we analyzed 6 videotaped interviews from the VARCOM corpus, created at the University of Barcelona in 2001-2005 to investigate the Variation and Communication in the Multimodal Speech (Fernandez-Villanueva & Strunk, 2009). The participants provided a set of oral tasks and were interviewed in their L1 and their L2 (German, Spanish, Catalan).

For the current study we chose the materials with an “argumentation task”, which allows us to observe semi-spontaneous speech and the interaction between students and native speakers.

After a preliminary 15-20 minutes interview the participants received some pictures with older men and children as stimuli and were asked to defend one of the two statements “older men are better fathers than the younger ones” or “younger men are better fathers than the older ones”.

The interviewer was instructed to represent the opposite point of view to prompt actively a counterargument.

The transcribed interviews were segmented in ELAN annotator device following its official manual (edited by Geerts, 2014), and the articles by Bickford (2005); Ladewig and Bressem (2014) for the technical issues.

2.3. Participants

For our exploratory purposes we analyzed the speech of 6 participants (3 male, 3 female), who were grown-up native speakers of Spanish/Catalan and students at the University of Barcelona. The students had intermediate, upper-intermediate and advanced levels of German and varied in fluency (See Table 2 and Table 3). The level of proficiency was checked with Vocabulary-test and C-test. The interviewers were German native speakers of the same age as the participants. For this study, fluency was calculated later using PRAAT Program. This procedure is described in the Analysis Part.

Table 2. General Information about Participants:

Participants	1	2	3	4	5	6
Number of Video	26	19	25	22	17	24
Gender	female	male	female	male	female	male
Proficiency	Interm.	Interm.	Up-interm.	Up-interm.	Adv.	Adv.
Total Time of Interview	231 sec	300 sec	295 sec	145 sec	186 sec	348 sec
Time Spoken be Each Participant	176 sec	189 sec	265 sec	108 sec	124 sec	325 sec
Number of Words Uttered	353	375	453	194	296	841

2.4. Coding Stages

While coding in ELAN we performed the following steps and identified:

- 1. Segments with lexical access problems and lexical items involved** (abstract or concrete words). Cases with non-identifiable items were excluded.
- 2. Hand gestures** that coincided with the lexical access problems. We used the NEUROGES typology by Lausberg and Sloetjes (2009) as a basis (I, II, III modules), see Chapter 1.2.
- 3. Type of Interaction between the gestures and speech:** referential, discursive, interactional, autostimulative functions (see Table 1).

III. ANALYSIS PROCEDURE

3.1.1 Segments with lexical access problems

To identify lexical access problems we based on the criteria described by Tullock and Fernandez-Villanueva (2013). See Appendix I that gives some examples of how we classified lexical access problems.

It was important as well to distinguish lexical access from the planning process, which sometimes provoked similar disfluencies in speech (pauses, rising intonation and repetitions). Still there is a lack of methodology on this issue in previous literature. We share some of our observations below.

It was noted that the disfluencies that **coincided** with discourse markers (connectors such as “und, weil”[and, because] or meta-comments like “ich meine“ [I think], “das stimmt“ [of course], “ich glaube”[it seems]) were related to the planning process. When there were disfluencies related to the planning process, the pauses and repetitions typically were followed not by the single word but by the whole argumentation mode. For example:

- **Speaker 2 [time: 00.00-00.03.51]: “ich entscheide mich mal für für für [PAUSE] die jüngere Vaeter” [I think of of the young fathers].** After the repetition of functional word “für” the speaker produces the adjective and noun together as a coherent mode..

In our data sometimes the rising intonations and pauses were used as rhetorical figure of speech. It was used for emphasis, but not to indicate the word search. For example”

- **Speaker 6 [time:00.53-00.57]: “Stell dir vor, man hat den ganzen Leben gespart, Geld gespart. [Imagine, they wasted all their life, they wasted all their money].** All the utterances sound smoothly and without any long pauses between the words. The phrases are repeated theatrically just for the emphasis purpose. No word is searched here.

- **Speaker 5 [time: 01.41-01.43]: “das ist Alles so wie Oh, unendlich” [it is all like oh, interminable].** An interjection “Oh” emphasizes the speaker’s emotion and helps to formulate the next idea. There are no pauses before the word “unendlich” and no rising intonation when the word “unendlich” is produce. The speaker is sure in her word choice.

It was important to distinguish lexical access from formulation. The examples related to formulation process in our data indicate some insecurity of the speakers in the grammatical forms of German words:

- **Speaker 1 [time: 01.21-01.23]: “ich glaube de...den Beruf” [I think about the..profession].** The speaker was not sure in the right inflection of the article but knew the word she wanted to use. Rising intonation marks the problem with the formulation, not with the lexical access.

In our data there are some ambiguous cases which can be interpreted both as lexical access and planning process problems. For example:

- **Speaker 4 [time: 02.14-02.18]: “und gehen sehr viel [PAUSE] aus” [and going out a lot].** The speaker might reflect and plan his speech but also might forget the verb „ausgehen“.
- **Speaker 6 [time: 04.02-04.07]: „die bezahlen dir dein Essen, die bezahlen dir dein dein [pause]Alles” [they pay for your food, they pay for your, your everything].** The speaker might have forgotten the target word and then use a more general word “Alles” as a solution (paraphrase). However, a pause might refer also to a planning process.

All such ambiguous examples were excluded from our data (6 out of 60). For the further analysis only 54 cases were left.

3.1.2. Lexical items involved in word searches (abstract or concrete words)

All our cases were later grouped by the type of the searched lexical item. Cases with non-identifiable items were excluded. They usually contained long pauses and were unfinished. (e.g. “Es ist **eine**...” [it is a...], “Ich denke sie sie haben auch ein bisschen...” [I think they they have also a bit of...]).

On this stage the 3 cases out of 54 were excluded. As a result, only 51 segments were left for the final analysis (see Table 5).

3.1.3. Hand gestures during the lexical access problems

As already indicated, we classified the occurring hand gestures following the NEUROGES typology by Lausberg and Sloetjes (2009).

In Module I we identified **kinetic characteristics of gestures**: the start and end of the movement, trajectory and dynamics (repetitive, phasic, continuous, shift, stopped), position of the hand (distant or on body).

Figure 2. NEUROGES-typology. Module I.

(Image retrieved from Lausberg and Sloetjes (2009), p.842).

We noticed that apart of being distant or in contact with the body, many of our gestures were produced on some other surfaces (table, armchair etc.). This instigated us to modify the initial terminology by Lausberg and Sloetjes (2009). We divide our gestures on “distant” and those being produced “in contact with a surface” (it includes contact with the body and any other object). It helps us later to reflect on the autostimulative gestures which are not expected to be distant.

As all our identified gestures had phasic or repetitive trajectory, we decided to look at this parameter more in-detail and check its possible interdependence with the start time and functional types.

In Module II we coded the relation between the two hands (separate or in touch, symmetrical or complementary, right or left hand dominance).

Figure 3. NEUROGES-typology. Module II.

(Image retrieved from Lausberg and Sloetjes (2009), p. 843).

In Module III we identified the gestural functions (see Table 1 and Figure 1).

3. 2. Measures of Fluency

In our third research question we were interested to look if any gesture types correlate with fluency. We calculate the speech rate and frequency of silent pauses per minute as the criteria for utterance and breakdown fluency.

The speech rate was calculated by dividing the number of syllables by total time. It was unpruned. False starts and filled pauses were included in the analysis. Frequency of the silent pauses per minute was calculated by dividing the number of silent pauses by total time. We identified the number of pauses in PRAAT. A minimum threshold for the silent pauses was 250 msec. following De Jong, Steinel, Florijn, Schoonen, and Hulstijn (2013). The results on fluency for each participant are presented in Table 3.

Table 3. Fluency of Participants:

Participants	1	2	3	4	5	6
Gender	female	male	female	male	female	male
Time spoken (sec.)	176	189	265	108	124	325
Number of Syllables	500	594	660	289	405	1245
Number of Silent Pauses	60	55	99	28	37	113
Speech Rate (syll./sec.)	2,84	3,14	2,49	2,675	3,26	3,83
Number of Silent Pauses per min.	0,34	0,291	0,373	0,259	0,298	0,347

IV. RESULTS

RQ 1

In our first research question we aimed to understand what kind of gestures occurs with the Lexical Access Problems in German Oral Communication. To answer it, first of all, we compared how many cases were produced with gestures and without them. We discovered that lexical access problems in speech tend to be accompanied by gestures (41 cases, see table 4).

Table 4. Number of Lexical Access Problems that occur with and without gestures for 6 participants:

Cases without Gestures	N=10	2 concrete, 8 abstract items
Cases with Gestures	N=41	12 concrete, 29 abstract items

We also count the amount of abstract and concrete items, and see that the abstract words prevail in word searches (37 cases, see table 5). Such result coincides with the neurolinguistic findings by Meteyard et al. (2012).

Table 5. Number of Concrete and Abstract Items during Lexical Access Problems for 6 Participants:

Number of Lexical Access Problems for all participants	51
No of Abstract Items	37
No of Concrete Items	14

We also calculated if the type of lexical item predicts the gesticulation. We see that the most typical case with lexical access involves a search of abstract word and coincides with gesticulation (29 cases out of 51, see table 4).

In the Table 6 we calculate the amount of each functional type of gesture. As we may see, the emphatic gestures prevail, than go the pointing type. No emotional gestures were registered in our data. The presence of conventional and iconic gestures is very scarce. The amount of autostimulative gestures is also scarce: we need to provide experiments with wider range of

participants to make a final conclusion on their relation to lexical access. However such gestures may participate in retrieval, and we explain this hypothesis a bit further.

In the Table 6 we also indicate the relation of gestural types to one of the four functions (referential, discursive, interactional, autostimulative). We see that during the lexical access problems gestures mostly play discursive or interactional functions. The pointing gestures in the majority of cases are related to the interlocutor, not to reference. Referential function is presented very scarcely, that coincides with the results by Lucero et al (2014).

To make our findings more visible, we also present a diagram that shows the general percentage of each gestural type out of all cases that were produced with gestures (n=41).

Table 6. Number of each gestural type and their function in communication.

Percentage of each gestural type for 6 participants.

TYPE	Number of Cases	Ref.	Disc.	Inter.	Aut.
1. Depict Image	N=2	2			
2. Emotional	N=0				
3. Conventional	N=2	2			
4. Autostimulative	N=3				3
5. Pointing	N=6	1		5	
6. Emphatic	N=28		28

In our data all the identified gestures had either phasic or repetitive trajectory. We analyzed how this parameter may be related to the gestural type. In our data we see that the pointing gestures are mostly phasic and the emphatic gestures are mostly repetitive. However, some variation exists (table 7).

Table 7. Trajectory and Dynamics of each Gesture Type for 6 participants.

	Image (n=2)	Emot.	Convent. (n=2)	Aut.(n=3)	Point. (n=6)	Emph. (n=28)
phasic (n=20)	2	-	2	3	5	9
repetitive (n=21)					1	19

Later on we found some relation between the trajectory and the start time of the gesture (see Table 8). The majority of repetitive gestures started before the target word. And the majority of phasic words coincided in time with the target word.

Table 8. Start time of Gestures with regards to Trajectory:

	phasic (n=20)	repetitive (n=21)
BEFORE (n=24)	5	19
WITH (n=15)	14	1
AFTER (n=2)	1	1

Taking into consideration our findings on the trajectory and start time, we later on speculate how it could be related with gestural function during lexical access.

1. As we already said, **gestures that depict image** were used scarcely. In our data they never started before the target item and, thus, did not help in retrieval.

Below we would like to comment one interesting example below:

Example: Speaker 1 [Time: 02.33-02.34]. The speaker cannot retrieve a word and uses a hyperonym “Zeugnis um die Kinder zu tragen” [things to carry the children]. German word “Zeugnis” is incorrect from “Zeug” {engl. =Stuff, things}. The gesture is used together with the substitute here, and illustrates a “backpack”, but still does not help to utter this word in speech.

ELAN - Dt Fs EM 26 _Itere V_ter 20 marzo.eaf

File Edit Annotation Tier Type Search View Options Window Help

Grid Text Subtitles Lexicon Comments Audio Recognizer Video Recognizer Metadata Controls

< select a tier >

Nr Annotation Begin Time End Time Duration

00:02:34.962 Selection: 00:02:29.800 - 00:02:34.962 5162

KS [GAT] (TIE1) | (0.37) AH-ha, | o KAY, |

EM [GAT] (TIE3) | .36) Komische Zeuge, | () ZEUGin? | () <<FS | () ZEUGnis? | (0.52) um die Kinder zu TRAGEN, | egal | WI | (0.87) | ja, | (0.89) sie machen (sie) sind GAN

EM [M] (TIE2) | mische Zeuge, Zeugin? (FS spanisch/katalanisch) No, Zeugnis? Um die Kinder zu tragen. | Egal | wie. | Ja. | Sie machen (sie) sind ganz (...) pf

Phrases with Le | | komische Zeuge | Zeugnis? | No | Zeugnis? | | um die Kinder | zu tragen | | | | | | |

found words (44) | | Zeuge | Zeugnis | Zeugnis | | zu tragen | | | | | | |

function of found | | concrete no concrete noun | concrete noun | | concrete verb | | | | | | |

INTERACTION G | | interviewer | discourse | reference | | | | |

MOVEMENTS LE | | | | | | | | |

trajectory left h | | repetitive | phasic | repetitive | phasic | | | | |

contact with bod | | distant | distant | distant | distant | | | | |

FUNCTION LEF | | Emphasis | Pointing | distant phasic | Depict Objects | | | | |

MOVEMENT RIG | | | | | | | | |

trajectory right h | | repetitive | phasic | repetitive | phasic | | | | |

contact with bod | | distant | distant | distant | distant | | | | |

FUNCTION RIG | | Emphasis | Pointing | Emphasis | Depict Objects | | | | |

MOVEMENT BOT | | | | | | | | |

space between t | | separate | separate | separate | separate | | | | |

priority in the m | | symmetrical | symmetrical | symmetrical | symmetrical | | | | |

FUNCTION BOT | | Emphasis | Pointing | Emphasis | Depict Objects | | | | |

2. Conventional gestures occurred in our data already after the target word and coincided with self-evaluation comments. They showed the feelings of the speaker about the choice made but did not help to access the forgotten word.

Speaker 1 [Time: 00.30-00.31]: “weil Kinder haben mehr Energie, mehr Zeit. No, nicht mehr Zeit, ja, mehr Zeit” [because children have more energy, more time, no, not more time, yes, more time]. Meta-comment and rising intonation indicate the lexical access problem. The speaker touches her temple and then straightens her arm towards the interviewer, expressing her surprise (possible meaning: „how could I forget it!“).

Speaker 2 [Time:04:02-04:13]: “Ah ist auf eben auf der anderen Seite die die die ah mh die Zuneig, ah nein, Zuneigung wahrscheinlich nicht” [Ah on the other side, the the the ah mh the affect, oh no, affection perhaps no]. Self-evaluative comments signal about the lexical access problem. The speaker waves his hand rapidly up and down showing that his previous words should not be taken into consideration.

3.The autostimulative gestures coincide with the silent pauses, have phasic trajectory and occur **before the target word**. They help to concentrate and thus probably may aid in retrieval of the necessary word. This hypothesis, however, needs to be checked in further research. While working with our data we found that the autostimulative gestures also coincided with the planning process, and such cases were far more frequent (out of 33 cases with the autostimulative gestures in total, only 3 were related to lexical access, and 30 -to planning). Perhaps this gesture is a better indicator of a planning process and perhaps, our 3 cases combine the two processes (lexical access + planning as well).

4.Pointing gestures are the second frequently used type after the emphatic gestures. In the majority of cases pointing gestures coincide with the target word in time and have phasic trajectory and dynamics.

In our data we have several pointing gestures with repetitive trajectory: and in this case they all combine several functions and are hybrids. For example:

Speaker 1 [Time: 00.52-00.55]: “weil die Kinder viel ausbrennen” [because the children are very burnt out]. Rising intonation indicates on the lexical access problem. We would say it is a hybrid of pointing and conventional gesture. We see a typical arm movement towards interviewer (pointing). The gesture coincides in time with the target word. It is related to the interlocutor and aims to activate the feedback channel and prompt ratification.

A photograph of two women sitting in chairs facing each other across a small round table. The woman on the left is wearing a light-colored sweater and glasses, and the woman on the right is wearing a red shirt. A microphone is on the table between them.

Speaker 2: [Time:00.16-00.19] “nach dem...dies Bildmaterial” [according to...this picture].

Here the gesture was produced before the target word, which means it could prompt word retrieval:

5.Finally, we see that the emphatic gestures are the most frequent type during the lexical access problems in speech. Their trajectory could be both phasic and repetitive.

a) The majority of **phasic emphatic** gestures coincided in time with the target words. They do not aid in word retrieval, but parse the speech and emphasize the final solution made.

In the few cases (see Table 7), however, when they occur before a target word, they coincide with discourse marker or false start of a target words, and may aid in retrieval.

b) The majority of **repetitive emphatic gestures** started before the target words and thus participate in word retrieval. Emphatic repetitive gestures are equal to the “beats” in McNeill’s typology. They play discursive function in communication.

Below we comment on the single case when the repetitive emphatic gesture started together with the target word. Still, it is related to word search and helps in retrieval.

Speaker 1 [Time: 00.28-00.31]: mehr Zeit no nicht mehr Zeit [more time, no, not more time]). Here the speaker utters the word “Zeit” first time but does not consider it as a good solution, she makes no pauses and continues her word searches. Despite the fact that the gesture was started not before but together with the word “Zeit”, this gesture seems to participate in retrieval. It indicates that the speaker does not want to give up her turn and thus show the word-search is in process.

To sum up, we see that lexical access problems in L2 speech mostly coincide with emphatic and pointing gesture types. Pointing gestures were related to reference in only 1 case out of 5. According to our results, they play not the referential but the interactional function during the lexical access problems in speech. The pointing gestures were used to attract attention of the interviewer and ask for his ratification of the elicited word. It is a strategy to get information about the searched item.

The emphatic gestures in all our cases are related to discourse. It is important to distinguish between the emphatic phasic and emphatic repetitive gestures. Phasic emphatic gestures

underline the target words and do not aid in retrieval. Repetitive gestures tend to start before the target word and help the speaker to keep turn and may aid in retrieval.

There are few cases of autostimulative gestures, they are phasic and always start before the TW in our data. They provide inner concentration, and thus may help to retrieve forgotten words. But still it should be investigated more with wider range of participants.

RQ 2:

In our second research questions we were interested to see if any gesture types decrease with proficiency of SL. We calculated the total number of lexical access problems, the type of items involved and each gestural function for each proficiency level. In the Table 9 we sum up the results and indicate the Pearson's linear correlation between proficiency and each of the mentioned parameters:

Table 9. Gestures and Lexical Access Problems with regards to L2 Proficiency:

Distribution of TW	Interm.	Upper-Interm.	Adv.	Pearson's Correlation (r)
TOTAL Number of Items (Concrete and Abstract)	24	15	12	-0,96
No of Abstract Items	18	13	6	-0,99
No of Concrete Items	6	2	6	0
Cases with and without Gestures within Each Proficiency Group:				
Cases with Gestures	22	7	12	-0,65
Cases without Gestures	2	8	0	-0,24
Distribution of gestures by their function within Each Proficiency Group				
Image	2	0	0	-0,86
Conventional	2	0	0	-0,86
Autostimulative	1	1	1	0
Pointing	3	1	2	-0,5
Emphatic	14	5	9	-0,55

We see that the total number of word searches decrease with the higher level of proficiency. Correlation is very strong and negative ($r = -0,96$). The number of searches for the abstract words also decrease significantly with the development in proficiency ($r = -0,99$). However, there is no correlation between the concrete items and proficiency.

We did not find strong dependency between proficiency and gesticulation during word searches. The emphatic and the pointing gestures are the most frequent types for all levels of proficiency, but they do not strongly correlate with proficiency. In our data the correlation is quite strong between proficiency and gestures that depict image and conventional gesture ($r = -0,86$). Indeed, such gestures occur only with intermediate participants and do not appear in the more advanced students. Still, as we have the very scarce representation of such cases (2 conventional and 2 image gestures only), we need to provide the further research with wider data to check this possible dependency.

RQ 3:

In our third research question we checked if gestural functional types correlate with fluency.

We looked separately at two fluency measures (speech rate and number of silent pauses per minute) and present our results in tables 10 and 11.

Table 10. Gestures during Lexical Access Problems and Speech Rate:

	Sp 1	Sp 2	Sp 3	Sp 4	Sp 5	Sp 6	Pearson's Correlation
Speech Rate (syll/total time)	2,84	3,14	2,49	2,675	3,26	3,83	
<i>TOTAL No of searched Items</i>	17	7	9	6	4	8	-0,23
<i>Abstr. Items</i>	13	5	9	4	3	3	-0,56
<i>Concr. Items</i>	4	2	0	2	1	5	0,63
<i>No of cases with and without Gestures with regards to Speech Rate.</i>							
<i>with gest.</i>	15	7	6	1	4	8	0,11
<i>wihout gest.</i>	2	0	3	5	0	0	-0,78
<i>Types of Gestures Used with regards to Speech Rate</i>							
<i>Image</i>	2	0	0	0	0	0	-0,2
<i>Convent.</i>	1	1	0	0	0	0	-0,07
<i>Aut.</i>	1	0	1	0	0	1	0,03
<i>Point.</i>	2	1	1	0	1	1	0,1
<i>Emph.</i>	9	5	4	1	3	6	0,23

There is quite a strong negative correlation between the speech rate and lexical access cases without gestures ($r = -0,78$). As we can see, indeed, the speakers 2, 5, 6 (with the higher speech

rate) in our data always use gestures during lexical access problems (0 cases with no gestures). Participants with lower speech rate do have the cases without gestures.

We see, however, that speech rate is not strongly related to the types of lexical items. The direction is negative with regards to the abstract items and positive with regards to the concrete items. Speech rate is not related to any of functional gestural types, as the Pearson's correlations are very weak. It is negative with respect to the image and conventional gestures and positive with regards to autostimulative, pointing and emphatic ones.

Table 11. Gestures during Lexical Access Problems and Number of Silent Pauses /min:

	Sp 1	Sp 2	Sp 3	Sp 4	Sp 5	Sp 6	Pearson's Correlation
<i>No of silent pauses per minute</i>	0,34	0,291	0,373	0,259	0,298	0,347	
<i>TOTAL No of Items</i>	17	7	9	6	4	8	0,5
<i>Abstr. items</i>	13	5	9	4	3	3	0,51
<i>Concr. Items</i>	4	2	0	2	1	5	0,1
<i>No of cases with and without Gestures with regards to Number of silent Pauses/min</i>							
<i>with gest.</i>	15	7	6	1	4	8	0,56
<i>without gest.</i>	2		3	5	0	0	-0,19
<i>Types of Gestures Used with regards to Number of Silent Pauses/min</i>							
<i>Image</i>	2	0	0	0	0	0	0,25
<i>Convent.</i>	1	1	0	0	0	0	-0,04
<i>Aut.</i>	1	0	1	0	0	1	0,91
<i>Point.</i>	2	1	1	0	1	1	0,6
<i>Emph.</i>	9	5	4	1	3	6	0,58

As we may see, the speakers 1, 3 and 6 gain in frequency of silent pauses. However, such parameter does not strongly correlate with number of lexical access problems, neither to the type of lexical items. It seems to be unrelated to the majority of the functional gestural types as well. In our data Pearson's correlation is positive and very strong only with regards to the autostimulative gestural type, but as we had only 3 examples in our data, we would need to provide a wider experiment to check this dependency.

V. DISCUSSION, CONCLUSION and LIMITATIONS

5.1. Discussion and Conclusion

To answer our first research question, we state that lexical access problems are accompanied mostly by emphatic gestures. They are related to discourse.

The second frequent type is the pointing gestures. In 5 cases out of 6 they perform an interactional function and are used strategically to elicit information from the interlocutor or to underline the final solution.

Trajectory of gestures and its starting point is crucial to identify if gestures help in word retrieval or not. In our data we have found that the emphatic gestures that aid in word retrieval tend to have repetitive trajectory and start before the target word.

As for the pointing gestures, those produced before the target words, seem to have more potential to elicit necessary information from the interlocutor and help in word retrieval. Gestures that coincide with the target word may not participate in word retrieval-they may just help to emphasize an item and provoke the interlocutor for further debates.

Image-gestures, conventional and pointing gestures with referential function were presented scarcely in our data and do not play the main role in word retrieval.

Gestures with autostimulative function signal about inner concentration of the speakers. In our data they are phasic and start before the target word and thus may aid in word retrieval too. However, their nature should be investigated more with wider range of data. This gesture probably may be a good indicator of planning process rather than the lexical access.

To answer our second research question, we state that the higher proficiency level predicts the decrease of lexical access problems in speech ($r=-0,96$) and the decrease in searches for the abstract items ($r=-0,99$). Conventional gestures and gestures that depict image decrease with the development in proficiency, and correlation is strong, but still, we need to do further research with wider data to prove this relation. No strong correlation is found between the other, more widely presented gestural types and proficiency.

Answering our third research question, we state that in our data the higher speech rate negatively correlates with the cases of lexical access problems that were produced without gestures ($r = -0,78$). We hypothesize that when the speaker has enough fluency in the L2, he uses the gesture modality more expressively. It coincides with the findings by Graziano and Gullberg (2013) who as well stated that gestures stop when the speech stops and mostly occur with the

fluent speech. However, speech rate is unrelated to the general amount of lexical problems, to the type of lexical items and to any functional gestural type. Analyzing frequency of silent pauses we found strong correlation with the autostimulative gestures. But as we have a very small amount of data we would still need the new research with more data to prove this possible dependency. There is no correlations between frequency of silent pauses and any other , more frequently presented gestural types.

5.2. Limitations:

One of our principal limitations was a small range of participants. The investigation should be repeated with wider data to check the identified tendencies and explore individual differences. Gestures as a part of embodied experience are very individual and depend on many factors that cannot be controlled. Temperament, individual communicative style, state of mood, gender, relation to the interlocutor, lack of personal interest in the discussed topic may affect the production and in our data the fluency rate. Gestures are related to embodied communication and are part of cognition, so that some questions can be observed and explained only intuitively in this kind of data. Experimental approaches should be carried out to confirm some of the findings. The present study is very exploratory: we wanted to perform a microanalysis of gesture functions with the small range of participants. After doing this we now can continue investigating the identified factors in a more controlled design..

ACKNOWLEDGEMENTS:

To my supervisor, Dr. Marta Fernandez-Villanueva, for teaching and guidance of the project, for inspiratory ideas and access to the data from the VARCOM Corpus, for all her support and encouragement. To Dr. Juan Carlos Mora for his advice on the technical issues about PRAAT-program. I would like to give special thanks to Douglas Cary-Brown for correcting my paper.

LIST OF REFERENCES:

- Alibali, M., Kita, S., Young, A. J. (2000). Gesture and the Process of Speech Production: We Think, therefore we Gesture. *Language and Cognitive Processes*, 15 (6), 593-613.
- Bickford, A. (2005). Using ELAN: A Getting-Started Guide For Use With Sign Languages. Paper presented at the Summer Institute of Linguistics, University of North Dakota, Grand Forks. October 19, 2005.
- Retrieved from:
<http://arts-sciences.und.edu/summer-institute-of-linguistics/teachinglinguistics/files/docs/using-elan.pdf>
- Casasanto, D. (2008). Conceptual affiliates of metaphorical gestures. *Paper presented at the International Conference on Language, Communication, & Cognition*. Brighton, UK, 1-9.
- Retrieved from
http://www.casasanto.com/papers/Casasanto_ConceptualAffiliatesGestures.pdf
- Cienki, A. & Müller, C. (Eds.) (2008). *Metaphor and Gesture*. Amsterdam / Philadelphia: John Benjamins Publishing Company.
- De Jong, N.H., Steinel M., Florijn, A., Schoonen, R., & Hulstijn, J.H (2013). Linguistic Skills and Speaking Fluency in a Second language. *Applied Psycholinguistics*, 34 (2013) ,893-916. doi: 10.1017/S0142716412000069
- Fernandez-Villanueva, M. & Strunk, O. (2009). Das Korpus VARCOM-Variation und Kommunikation in der gesprochenen Sprache. [The Varcom Corpus- Variation and Communication in the Oral Speech]. In: *Deutsch als Fremdsprache. Zeitschrift zur Theorie und Praxis des Deutschunterrichts fuer Auslaender*. Leipzig, ISSN0011-9741, 46,2, 67-73.
- Fricke, E. (2007). *Linguistik Impulse & Tendenzen: Origo, Geste und Raum. Lokaldeixis im Deutschen* [Linguistic Impulse & Tendencies: Origo, Gesture and Space. Space Deixis in German]. Berlin: Walter de Gruyter GmbH & Co.
- Graziano, M. & Gullberg, M. (2013, June). Gesture Production and Speech Fluency in Competent Speakers and Language Learners. Paper presented at Tilburg Gesture Research Meeting (TiGeR), Netherlands. Retrieved from <http://tiger.uvt.nl/pdf/papers/graziano.pdf>

- Gullberg, M. (2006). Some Reasons for Studying Gesture and Second Language Acquisition (Hommage à Adam Kendon). *IRAL - International Review of Applied Linguistics in Language Teaching*, 44(2), 103–124.
doi:10.1515/IRAL.2006.004
- Gullberg, M. (2010). Methodological Reflections on Gesture Analysis in Second Language Acquisition and Bilingualism Research. *Second language Research*, 26 (1), 75–102.
- Geerts, G. (2014). ELAN-Linguistic Annotator Version 4.8.0.
Retrieved from
<http://www.mpi.nl/corpus/manuals/manual-elan.pdf>
- Kendon, Adam. (1980). Gesture and speech: Two aspects of the process of utterance. In Mary R. Key (ed.), *Nonverbal communication and language*, 207–227. The Hague: Mouton.
- Kousta, S.-T., Vigliocco, G., Vinson, D. P., Andrews, M., & Del Campo, E. (2011). The Representation of Abstract Words: Why Emotion Matters. *Journal of Experimental Psychology. General*, 140(1), 14–34.
doi:10.1037/a0021446
- Krauss, R. M., Chen, Y., & Gottesman, R. F. (2000). Lexical Gestures and Lexical Access : A Process Model. In D. McNeill (Ed.), *Language and gesture* (pp. 261-283). New York: Cambridge University Press.
- Ladewig, S.H. & Bressemer, J. (2014). A Linguistic Perspective on the Notation of Gesture Phases, In C. Müller, A. Cienki, E. Fricke, S. H. Ladewig, D. McNeill, S. Teßendorf (Eds). *Body – Language – Communication: An International Handbook on Multimodality in Human Interaction. (Handbooks of Linguistics and Communication Science)* , 38(1), (pp.1060-1079), Berlin/Boston: De Gruyter Mouton.
- Lausberg, H. & Sloetjes, H. (2009). Coding Gestural Behavior with the NEUROGES--ELAN System. *Behavior Research Methods*, 41(3), 841–9.
doi:10.3758/BRM.41.3.841
- Lausberg, H. (2014). NEUROGES-A Coding System for the Empirical Analysis of Hand Movement Behaviour as a Reflection of Cognitive, Emotional and Interactive Processes. In

- C. Müller, A. Cienki, E. Fricke, S. H. Ladewig, D. McNeill, S. Teßendorf (Eds). *Body – Language – Communication: An International Handbook on Multimodality in Human Interaction. (Handbooks of Linguistics and Communication Science)* , 38(1), (pp.1022-1037), Berlin/Boston: De Gruyter Mouton.
- Lucero, C., Zaharchuk, H., & Casasanto, D. (2014). Beat Gestures Facilitate Speech Production. In P. Bello, M. Guarini, M. McShane, & B. Scassellati (Eds.), *Proceedings of the 36th Annual Conference of the Cognitive Science Society* (pp.898-903). Austin, TX: Cognitive Science Society.
- McNeill, D. (1992). Gesture: a Psycholinguistic Approach *The Encyclopedia of Language and Linguistics*, 1–15.
Retrieved from http://mcneilllab.uchicago.edu/pdfs/gesture.a_psycholinguistic_approach.cambridge.encyclop.pdf
- Meteyard, L., Cuadrado, S. R., Bahrami, B., & Vigliocco, G. (2012). Coming of Age: A Review of Embodiment and the Neuroscience of Semantics. *Cortex*, 48(7), 788–804.
doi:10.1016/j.cortex.2010.11.002
- Murphy, L. & Roca de Larios, J. (2010). Searching for Words: One Strategic Use of the Mother Tongue by Advanced Spanish EFL Writers. *Journal of Second Language Writing*, 19(2), 61–81.
doi:10.1016/j.jslw.2010.02.001
- Norris, S. (2004). *Analyzing Multimodal Interaction: A Methodological Framework*. NY: Routledge.
- Poggi, I. (2001). Mind Markers. *The Semantics and Pragmatics of Everyday Gestures*.
Retrieved from <http://host.uniroma3.it/docenti/poggi/cursitopdf/MIMPORTODEF.pdf>
- Poggi, I. (2008). Iconicity in Different Types of Gestures. *Gesture*, 8, 45–61.
doi:10.1075/gest.8.1.05pog
- Ravizza, S. (2003). Movement and Lexical Access: Do Noniconic Gestures Aid in Retrieval? *Psychonomic Bulletin & Review*, 10(3), 610–615.
doi:10.3758/BF03196522

- Rosch, E, Thompson, E., & Varela, F. J. (1992). *The Embodied Mind: Cognitive Science and Human Experience*. Cambridge: MIT Press.
- Seo, M.-S. & Koshik, I. (2010). A Conversation Analytic Study of Gestures that Engender Repair in ESL Conversational Tutoring. *Journal of Pragmatics*, 42(8), 2219–2239.
doi:10.1016/j.pragma.2010.01.021
- Tullock, B. D., & Fernández-Villanueva, M. (2013). The Role of Previously Learned Languages in the Thought Processes of Multilingual Writers at the Deutsche Schule Barcelona. *Research in the Teaching of English*, 47(4), 420–441.
- Vigliocco, G., Kousta, S. T., Della Rosa, P. A., Vinson, D. P., Tettamanti, M., Devlin, J. T., & Cappa, S. F. (2014). The Neural Representation of Abstract Words: The Role of Emotion. *Cerebral Cortex*, 24(July), 1767–1777.
doi:10.1093/cercor/bht025
- Wagner P, Malisz Z, & Kopp S (2014) Gesture and Speech in Interaction :An Overview. *Speech Communication*, 57(Special Iss.): 209–232.
doi: 10.1016/j.specom.2013.09.008

LIST of TERMINOLOGY and ABBREVIATIONS:

Abstract item – abstr, item

Advanced level - adv.

Autostimulative function - aut.

Concrete item – concr. item

Conventional gesture - convent.

Discursive function - disc.

Emphatic gesture - emph.

Emotional gesture - emot.

Gesture – gest.

Interactional function - inter.

Intermediate level- interm.

L1 – first language

L2 – second language

Pointing gesture - point.

Referential function – ref.

Second Language - SL

Second Language Acquisition - SLA

Speaker – Sp.

TOT state - tip-of-the-tongue state

Upper-Intermediate level - up-interm.

APPENDICES:

APPENDIX 1. EXAMPLES OF PHRASES THAT CONTAIN PROBLEMS WITH LEXICAL ACCESS:

A) META-COMMENTS and PROBLEM-INDICATION:

Sp. 1: “Und sie sind noch nicht ähm gebrannt. **Sagt man auf Deutsch?**“ [And they are still aehm not outburnt yet. **Do you say it in German?**“

B) SELF-EVALUATION

Sp. 1: “...weil Kinder haben mehr Energie, mehr mehr Zeit. **No, nicht mehr Zeit. Ja, mehr Zeit.**“ [...because children have more energy, more more time. **No, not more time. Yes, more time**“]

C) SELF-QUESTIONING and PROBLEM SOLVING:

Sp.1: “Ja, ich habe es gesehen in Geschäfte ganz viele komische Zeuge,* **Zeugnis?**

No.Zeugnis?”[Yes, in the shops I saw a lot of comic *thi, ***thinks?** No. Thinks?]

Comment:here the speaker) retrieves an incorrect «Zeugnis» [certificate/reference] instead of «Zeug» [things, stuff] due same sound in initial position. In our English translation we use the word “thinks” to represent the erroneous choice.

D) PARAPHRASIS:

Sp.4: “Sogar wenn es gibt viele Generations...Meinungsunterschiede gibt”. [even if there are *generations...**mindset differences**“].

Sp.6: ” Sie haben normal auch mehr Geld und mehr **mehr ...weniger finanzielle Probleme**”. [They usually have also more money and more **more...less financial problems**].

E) EXTRALINGUISTIC INDICATORS (repetitions and rising intonation):

Sp.6: „Die Eltern sind sind dann ein wichtiger echt so ein Unterstütz ein wichtiges ein wichtiger Unterstützungspu Unterstützungspunkt“. [The Parents are then an important real so to say *suppor an important *supportpo supportpoint].

Sp.5: ” also diesen ähm die hab die haben mehr Geduld” [so these these ähm have more patience“(rising intonation).

APPENDIX 2. TRANSCRIPTIONS OF THE ANALYZED SPEECH.

Speaker 1 (Video 26):

Mh ich glaube (ju) junge Männer sind besser Väter. Nt weil die sie die alte Männer sollten gute gute äh Opas sein. So. das ist seine Funktion im Leben. Und dann die junge Männer sollten (die Wahl), weil Kinder haben mehr Energie, mehr mehr Zeit no, nicht mehr Zeit. Ja, mehr Zeit. Einige Sie haben mehr Energie, weil sie pff nt jünger sind eigentlich und und sie sind noch nicht ähm gebrannt Sagt man auf Deutsch? Ausgebrannt. Weil die Kinder viel ausbrennen Ich weiß nicht, ob man das sagen kann. Und und deshalb also pff. Ich glaube, de den Beruf, w wenn man es gut organisiert, dann es dauert nur acht Stunde pro Tag. Und dann kann man den ganzen Zeit zur Kinder nehmen, an anwenden? Oder. (No). Widmen? Sagt man?Ja. Und und ich glaube, das ist genug Zeit. So acht Stunde Arbeit, in einige Länder sieben Stunde und dann... Das kann auch mit Kindern machen.No. Ich weiß nicht, wie, weil ich Kinder habe Es muss kompliziert sein aber Nee, das das kann man auch mit Kindern machen. Es ist es ist alle. Was? Ja, es gibt sie machen vom alles für die Kinder. Ja, ich habe es gesehen in Geschäfte ganz viele komische Zeuge. Zeugin? No, Zeugnis? Um die Kinder zu tragen. Egal wie. Ja. Sie machen (sie) sind ganz pff So die haben viele viele Sachen, die Kinder zu tragen, in Reise, um es leicht zu machen für die Eltern. Aber was für ein Kind (dann) will diese, ne? So ruhig so (you know) es ist wie (you know, what)? (It's). Er wird nicht vorbereitet für die moderne Welt. Er muss ein bisschen so ja, Energie haben, schon seit Anfang. Um so pff. Ich weiß nicht, wie die junge Eltern sind sind mehr mh nt ja. In Beziehung mit der mit der Welt, (mir) der Heutzutage-Welt. Sie geben ihre Kinder alle neue Sachen. Lernen, (alle) neue Sachen (an)zeigen. Und die alte Männer denken normalerweise, dass äh alles äh alter äh besser war. Und dann die neue Technologien, Internet und so, das werden sie nicht mit einem alten Mann lernen

Speaker 2 (Video 19):

Also ich entscheide mich mal für für die jüngeren Väter.Obwohl ich da selber schon zu alt f dafür bin. Warum die jüngeren Väter? Na ja, nach dem nach dem mh das Bildmaterial, mh das waren alles äh etwas ältere Männer, über fünfzig vielleicht. Und natürlich hat man gesehen, dass sie einen liebevollen Umgang haben mit den Kindern. Aber gleichzeitig äh, das was natürlich ein bisschen fehlt, ist das Junge, Belebte, was ein ein Vater unter fünfundzwanzig den Kindern bringen kann. Gleichzeitig mh. Gleichzeitig. Boah, gute Frage, warum mit fünfundzwanzig? Wahrscheinlich sind auch äh Männer unter fünfundzwanzig noch flexibler in ihrer Lebensart und können sich wahrscheinlich auch besser mit den auf den Umgang mit dem Kind einstellen.Weiters weiters nt nt besitzen sie die Leidenschaft.Für ihre Kinder, die vielleicht im Alter und mit Altsein ein bisschen verloren geht. Nt ja, ich glaube, dass man dass dass man d dieses Argument nicht hernehmen kann, weil weil wahrscheinlich weil wahrscheinlich die t genauso viel Baustellen für die Älteren ab fünfzig existieren, allein wenn man denkt, wie viele in die Midlifecrisis kommen mit fünfzig. Und und vielleicht auch mit mit mit der Beziehung schon, es kriselt nachdem schon na einige Jahre zusammen sind. Und und auch wenn man sich die ganzen Scheidungsraten anschaut.

Also, d ich denke, Baustellen gibt's auch genug für Fünfzigjährige. Na ja. Mhm. Hm. N eh, aber natürlich auch nicht alle. Alle älteren Personen. Äh äh. Statistisch gesehen. Aber dafür ich habe leider die Statistik momentan nicht im Kopf. Äh ist auf eben auf der anderen Seite die die die ähm mh die Zuneil äh nein, Zuneigung wahrscheinlich nicht, aber die Freude auf ein Kind und, genauso groß bei einem Fünfundzwanzigjährigen, und und die Flexibilität, die, glaube ich, da wirklich sehr wichtig ist, auch weil ein Kind zu bekommen ist ja, das bedeutet ja wirklich eine große Umstellung im Leben. Und jemand, der fünfzig Jahre lang kein Kind gehabt hat, niemals Vater war und dann auf einmal Vater wird, das könnte ich mir schon sehr sehr schwer vorstellen. Wobei mit fünfundzwanzig ist alles noch beweglich, bis fünfundzwanzig, gleichzeitig äh kann man da auch also kann man da, ja, kann man sich auch gut anpassen und und ein Leben gemeinsam mit seinem Kind zu probieren.

Speaker 3 (Video 25):

Dann ich nehme, dass da ältere Väter viel besser sind als jüngere. Weil das Pro das große Problem, den das ich finde, wenn wenn man als als ganz jung äh Kinder bekommt, ist, dass man nt man hat irgendwie äh wenig Erfahrung im Leben und es kann ganz gut möglich sein, dass ähm die Väter, ähm die wollen immer noch ausgehen, die wollen immer noch ähm irgendwie eine jugendliche äh Leben, sozusagen, und mit viel sozialen Kontakten und Freunden und so. Und dann die haben wenig Zeit für die Kinder. Und das finde ich schon schlimm. Außerdem die ähm jüngere Eltern, ähm die haben irgendwie nicht genug gelebt und (oder) (...). (Und) ähm (ja und) ich denke, sie sind nicht vorbereitet, um ähm um ein Kind großzuziehen, weil ähm man braucht viel Verbotung und und Geduld. Und wenn man jung ist, man hat beide ähm keine von denen. Und ältere Väter haben diesen diesen nt Verbotungsgefühl, also diesen ähm. Die haben (die/ja) haben mehr Geduld. Und ähm sie haben normal auch mehr Geld und mehr mehr ähm weniger finanzielle Probleme (als) als jüngere Eltern. Nicht? Und dann die die Kinder können mehr mehr Chancen auch im Leben bekommen. Obwohl das ganz ökonomisch klingt, aber auch in Bezug auf ähm mehr Zeit für ihnen sozusagen. Das (auch/noch). Ja, aber wenn i ich meine wenn ähm. Jüngere Väter äh vielleicht sind doch äh besser zum Spielen für die Kinder. Aber die sind, also diese Väter sind immer noch Kinder, sozusagen. Oder nicht genug reif geworden. Und dadurch die haben ein die haben nicht ein richtige(r) Eltern, sondern Freunde. Und meiner Meinung nach ist, dass V Va äh die die Väter müssen keine Freunde im (im im) engen Sinne sein. Sie müssen Va sie müssen Vater sein erst mal. Und ganz genau Grenze ähm ähm nt einstellen. Und wenn die Väter viel zu jung sind, die können die Grenze auch nicht selbst sehen. Und dann ist ga das ganz schlecht für die Kinder, weil die gehen verloren, sozusagen. Aber ich bin ich bin damit nicht einverstanden. Weil äh ähm nt also wie gesagt wie gesagt, also die die Eltern sollten meiner Meinung nach nicht äh Freunde werden. Also es ist doch klar. Egal ob ich äh dreißig bin oder ob ich äh fünfzig bin. Also meine Hobbys werden nicht meines Kindes Hobbys, nicht? Und mei meinem, was ich mir gefällt, wird mein Kind nicht gefallen. Es ist doch klar. Und es ist es ist ähm für für mich blöd, äh das zu denken, dass dein dein Kind muss Ähnlich ähm Ähnlichkeiten, also solche Geschmackähnlichkeiten haben. Weil es ist doch gar nicht wahr. Also es es ist immer ein ein Generationsproblem und.

Speaker 4 (Video 22):

Ältere Männer ältere no, ältere Eltern sind besser als jüngere. Weil sie haben mehr erlebt und haben mehr Erfahrungen in im Leben. Und jüngere Männern äh beschäftigen sich mit viele andere Sachen als mit Kindern. Also sie müssen arbeiten und reisen und so weit und sie haben kein Zeit für das Kind. Und das Kind äh leidet das. Das ist ein gute Frage, aber das die die Eltern können das Kind in zu einem Fußballmannschaft schicken. Und dann gibt es auch andere Kinder und junge Trainer. Trainer? Dann brauchen brauchen sie (mit/nicht) mit mh ihres eigenes Kind zu spielen. Es kann sein, aber nicht unbedingt. Also wenn ein V Vater oder eine Mutter sehr viel geleben haben, dann sind sie sehr meinungsoffen und können das Kind sehr gut verstehen. Sogar wenn es gibt viele mh Generations-Meinungsunterschiede gibt. Oder oder so. Gegen? Ja. Mh sie haben kein(e) Zeit. Kann man sagen. Und und außerdem gehen sie (lacht leicht) sehr viel aus, in die Nacht und trunken sehr viel. Und nehmen viele Drogen und so weit. Und das ist nicht gesund für das Kind.

Speaker 5 (Video 17):

Ja, ältere Leute sind bessere Väter. Sicher
Ja, sie haben, ja, mehr Zeit. Das ist alles, ja? Und das bedeutet, dass sie leben ohne Stress. Ämh sie haben mehr Zeit für ihren Kinder. Sie sie können in den Zoo gehen, (sie können) spazieren gehen. Sie können mehrere Aktivitäten vorbereiten und ja, sie haben mehr Erfahrungen im Leben und ja sie sind keine zusätzliche Belastung, ja? Nach der Arbeit, und man kommt und, ja, noch Kinder, und ja, also. was meinst du? Ja, arbeiten noch zehn Jahren, Ja, aber vielleicht sie haben eine andere Perspektive vom Leben. Ja, das ist das kommt alles Ja, nur in sieben Jahren oder in fünf Jahren, dann habe ich nt ja viel viel Zeit und das das macht das Leben ganz anders als wenn man zum Beispiel zwanzig ist, und das ist alles so wie oh unendlich und (sieht) und. Ich denke sie sie haben auch ein bisschen. Ja, sie sind vielleicht müde, nt ja? Von das Leben. Das kann auch sein. Aber, nt sie können auch diese positive mh, ja Perspektive haben. Und ja und viel mehr Erfahrungen und ja. Kann sein, klar. Kann sein. Ja. Mhm. Mh ja, aber nt. Ja, es ist das. Ich denke schon, dass es (die/sie) haben diese nt positive Perspektive vom Leben und wenn sie sind alt, und wenn sie sehen, dass das Leben noch einmal fängt an und. Ich denke, dass sie haben ja zum Beispiel Großmutter, sind immer so zärtlich mit mits mit kleine Kinder und. Und vielleicht für für jüngere Leute, es ist so wie, bah jetzt nach Hause jetzt. So es ist es ist immer ein Problem. Und ich denke, dass mit mit große Leu, mit mit ältere Leute, es, ja, kann positiver sein, kann äh ja.

Speaker 6 (Video 24):

Ich bin der Meinung, ja? Äh jüngere Väter sind bessere Väter als ältere Väter. Ich meine aus einer mh aus einer praktischen Perspektive, praktischen beziehungsweise pragmatischen Perspektive, sind dann jüngere Väter, so Zwanzigjährige wenn du willst, äh dann die besseren Väter. Warum? Äh ja, also aus dem einen

Grund, dass äh mh also wenn man wenn man sechzig ist, beziehungsweise fünfundfünfzig ist, ist man nicht Papa, ist man Opa, was was Anderes ist, ne? Also ich meine, ist etwas Anderes angesagt irgendwie. Weißt du? So mh das ist nicht ich finde es nicht, man man ist müde, man äh man hat. Stell dir vor, man hat das ganze Leben gespart. Ja? Geld gespart. Um um weißt du? Rente. Weißt du? Äh ein bisschen verreisen. Stell dir vor, ich habe ich habe das ganze Leben mich tot gearbeitet. Ne? Und jetzt? Jetzt? Ne? Jetzt muss ich mich um um ein kleines mh Kind. (Nee). Wollte ich was sagen, was Anderes sagen, aber. Äh mu muss ich mich äh ähm m muss ich mich um um um dieses Kind jetzt kümmern. (Mit) jetzt, wo ich eigentlich so Arthrose habe, jetzt wo ich so

anfange, irgendwie so zu. Es geht nicht. Also man man hat keine Geduld mehr, man man hat schon alles im Leben gesehen. Man muss einf eigentlich genießen. Weißt du? (I) in dem Alter. Und wenn man jung ist, ok, Problemen. Nt ja, aber m man ist nicht erfahren. Das stimmt. Das stimmt. Man ist nicht erfahren und man man pff man hat das ganze Leben vor sich. Und klar, das stimmt. Das alles stimmt, aber. Ich spreche (jetzt) zum Beispiel von Barcelona, ne? Und das ist dasselbe, was ich im im vorigen Interview gesagt habe. Äh mh wie die Lage jetzt aussieht. Hier in diese Stadt. Man kann man kann nicht ausziehen. Wegen der Preise, Wohnungspreise und so. Miete überhaupt, ne? Und äh man wohnt bei den Eltern. Und die Eltern sind hier, nicht in Deutschland, aber hier. Ich meine, wie die Lage jetzt aussieht, ne? In den letzten ich würde sagen in den letzten zehn Jahren so geworden. Dann alles alle wie alles geworden ist. Ähm nt äh die Eltern sind sind dann ein (echt) so ein Unterstüt eine wichtiges ein wichtiger Unterstützungspun Unterstützungspunkt. Weißt du? Und mh es gleicht sich aus alles. Weißt du wenn wenn wenn wenn dieser Zwanzigjährige äh kein guter Papa ist, ne? Da hat er auch einen Papa, da hat er auch eine Mama. Und die helfen dabei. Hier. Ich spreche ich ich wiederhole, ne? Hier noch mal, Barcelona, ne? Und diese(n) dieses diese diese Zwanzigjährige der hat sein ganzes Leben um zu lernen. (Äh) und der wird wahrscheinlich ein ein ein anderes Kind bekommen. Ne? Aber der hat ja die Möglichkeit. Weißt du? Ein ein ein Opa, ein Sechzigjähriger, der hat keine zweite keinen zweite keine zweite Chance. Weißt du? Keine zweite Möglichkeit. Ok. Ruhe, (lacht leicht) ob er nicht tot ist. Nee, aber hör zu (lacht). Klar, ein Zwanzigjährige, (lacht) ein Zwanzigjährige, das stimmt, der hat die äh diese diese finanzielle Absicherung nicht. Dasch da das, das stimmt. Er hat äh diese diese Absicherung zwar nicht, aber der hat die Eltern. Und die Eltern, die zahlen alles hier. Man wundert sich, ich weiß schon. Ne? Also wenn man das von außen das betrachts (da), aber es objektiv betrachtet ist halt so. Tendenziell. Nicht bei allen Fällen. Aber tendenziell schon. Die bezahlen alles, die Eltern. Die bezahlen dir dein Essen, die bezahlen dir dein dein alles. Du wohnst bei den Eltern. Und bei den Eltern wohnen heißt, die zahlen alles. Die die Eltern die helfen. Also die die Eltern, normalerwei ich würde sagen, tendenziell die Eltern hier, die. Ich hätte kein kein Kind bekommen. (lacht) Weißt du? (lacht) Ja, ja. Ja, ja. Nak na ja, aber weißt du, meine meine meine Mutter oder mein Papa, die hätten mir geholfen. Die hätten mir, weißt du? I Ich ich hätte mir jetzt zum Beispiel äh jetzt diese Wohnung. Äh die ich jetzt äh also diese Miete, die Ich gefunden habe und so. Das hätte ich mir nichts nicht leisten können. Zum Beispiel, ne? Aber dafür hätte äh i i ich ich könnte ich könnte nicht ausziehen. Ich müsste daheim bleiben, bei meinen Eltern. Und meine Eltern, natürlich, meine ich, in meinem Fall hätten sie das geduldet. Klar. Aber ich ich denke tendenziell ist das

so. Bei allen Fällen wäre es so. Von daher. Wie? Dann lieber kein Kind (lacht leicht). Lass uns das Leben genießen. (lacht) (lacht) Klar und stell dir ste klar. Stell dir vor, und du musst auch noch studieren und so. Es ist sehr ungünstig. Wirklich? Es ist auch sehr ungünstig. Aber ungünstiger ungünstiger ist ist ist Opa. Also für das Kind auch. Finde ich wirklich sehr, sehr, sehr scheiße. Ne? So ein Sechzigjähriger äh als einen s einen Sechzigjährigen als Papa zu haben. (Äh äh) Entschuldigung. Aber das heißt, wenn ich wenn ich fünfzehn bin, wenn ich zwanzig bin, dann ist mei mein Papa wahrscheinlich tot. Aber dann ist mein Papa achtzig. Weißt du? Wenn nicht tot, dann ist er achtzig.