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## **Does Familiarity Affect Gestural Rates?**

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## **Abstract**

Face-to-face dialogue can be regarded as a direct and visible way to establish a close connection, between two people facing each other communicate proactively and without barriers. It also plays a key role in the study of verbal and nonverbal communication. A number of studies provide an overview of how gesture rates in face-to-face conditions have registered different rates compared with other social settings. These settings included monologue conversation, using intercom devices or using partitioned walls to separate speakers from seeing each other (Alibali & Heath, 2001; Bavelas, 1992; Bavelas & Chovil, 2006; Hostetter & Potthoff 2012).

Although research on gesture rates is limited and restricted to aspects such as visibility and gesture functions, this study focuses on the effects of different degrees of familiarity (friend, acquaintance and stranger), in face-to-face interaction.

The results show that each level of familiarity has different gestural rates. For example, higher gestural rates were registered when the speaker talks with an acquaintance and lower gestural rates registered when the speaker interacts with a friend and with a stranger.

The study highlights the influence of the speaker's knowledge, the use of English as a second language and social behaviour which are also discussed.

**Keywords:** Speech, Gesture strokes, Gesture rates, Familiarity, Interaction.

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# 1 Introduction

Semiotic resources refer to the production of meaning in particular social and cultural conditions in different modes such as visual, verbal or aural that focuses on the interpretation of human communication. It could be argued that speech and gestures are indispensable modalities for studying human social interaction. These have been built up over time and have constituted a pivotal role in the origins of human language. The synergy between speech and gestures helps scientists to investigate human social interaction, particularly face-to-face conditions which have been documented in many studies. This relationship also involves a whole entity of bodily actions such as auditory, vocal, visual, kinetic and tactile elements. As observed by Bavelas and Chovil (2006:99), “face-to-face dialogue reveals the ubiquity and integral importance of specific nonverbal acts in the moment-by-moment interaction”.

Speech is part and parcel of our meta-communicating system which enables us to communicate with others and understand what has been said. We also perform gestures by carrying intelligible messages, sending information, processing turns, taking in conversations and by adding fundamental meanings to our verbal components.

There are many ways in which visible bodily actions are employed in accomplishment of expressions, which can be similar or even the same as expressions in spoken language. Sometimes they are used as a complement, supplement, substitute or alternative to them (Kendon, 2004: 1).

From a semiotic perspective, Kendon (2004), argues that gestures are visible bodily actions as utterance that can be conveyed with or without speech to deliver an intended message. He highlights human communicative moves which can hold different meanings with regards to discourse contexts. He also argues that gestures without speech can convey meanings on their own and gestures in conjunction with speech can be complementary. Speakers employ them in conversation to enhance what has been said. Therefore, to understand human interaction in face-to-face conditions we should take both speech and gestures into consideration.

This paper will investigate gestural rates during face-to-face interaction. It will examine whether the frequency of gestures is affected by the speaker’s familiarity with the interlocutor.

The purpose of this paper is to contribute to Bavelas's (2006) views which deal with gesture rates during face-to-face interaction. In principle the study aims to provide a better understanding of the speaker's gestural rate with the interlocutors in different levels of familiarity. Very little is known about the subject matter and there are almost no corpora or research.

The study adopts Kendon's (2004) definition of the three phases of gestures, preparation phase, stroke and retraction, which have been used in the coding process. Moreover, it adopts a multi-approach of qualitative and quantitative methods and specifically counts how many gestural strokes and words are executed by the speakers at each familiarity level. It also focuses on gestural strokes regardless of their types and functions.

## **2 Theoretical background**

For many years, gestures have acquired an academic attention in domains such as the origins of language, language acquisition, cognitive semiotics and communication studies. This section reviews aspects and theory of gestures and data collection in different social conditions which are relevant to this study.

### 2.1 Gestures (general observations on gesture theory)

Over many years, studies have been conducted into the way that speech and gestures communicate in various social conditions. Many scientists have contributed to the study of speech and gesture and some have focused on differences in gestural frequency, during face-to-face dialogues.

Kendon (2004) has contributed significantly to the study of speech and gestures in face-to-face social interaction. For him, speech and gestures are deployed in harmony to deliver the intended meaning: "The relationship between word and gesture is a reciprocal one - the gestural component and the spoken component interact with one another to create a precise and vivid understanding" Kendon (2004: 174).

He explained three phases of gestures which have been used in this study. The first is called the preparation phase, when hands move towards a place. The second is the stroke which is the maximum reaching point of the hand or the actual movement phase. The term “gestural strokes” refers to a hand movement or a finger trajectory which performs one or more complex movement patterns. The third is the retraction when the hand movement goes back to the resting position.

Kendon has also explained different positions of hand movements, fingers, thumb, open palm, arm and forearm orientation, which he calls the gesture component. This is contrasted with the meaning of words and speech, which he calls the “verbal component”. Kendon has further described different kinds of relationships between the speaker’s verbal component and gestures.

- Gestures which represent an object by depicting the shape, size and spatial orientation of an object or an action being referred to. This shows how words coordinate with gestures to assist the process of meaning. For example, when hands are opened together and pushed forward to depict the shape and the size of a ball.
- Gestures which create an object for deictic expressions. This is when hand movements of particular action are linked with a verbal component. This means that a hand gesture, that describes the shape and the size of an object, is related to the demonstrative pronoun ‘that’.

Kendon gives examples of how speech and gesture are employed together. An example of this is “*the cheese used to come in big crates about as long as that*” (Kendon, 2004: 164-165). By saying “that”, the speaker puts his two hands forward and both palms face each other in parallel distance. This observation shows how the participant’s gestural phrases contribute to reveal information about the size and space of an object being referred to without the use of words. It also shows how the use of gestures adds precision to the meaning of the verbal phrase, when executed by the hand movement.

Another example shows how gestural phrases emphasize the spoken words. For example, “*he used to go down there and throw ground rice over it*”. When the speaker says “throw”, the arm is outstretched before him, palm closed, the fingers folded inward. He then opens his palm just as if he was throwing a handful of rice over something (Kendon, 2004: 169).

Kendon (2004: 176) highlights that gestures can give semantic support to what a speaker is saying. This occurs when representational gestures, which depict semantic content, present an object with hand movements. This collaboration of hand movements with verbal components of an utterance helps the speaker with the process of its referential meaning.

Bavelas (1992, 1994, 1996, 2008) focuses on observing the distinctive features in face-to-face interaction, in particular, conversation, collaboration and the visible bodily actions in relation to speech. Bavelas refers to gestures in their synchrony, size, space and timing.

As stated by Bavelas and Chovil (2006: 104), “one of our defining criteria for nonverbal acts that are part of language use in face-to-face dialogue was that they must be tightly synchronized with words in both timing and meaning”.

With regards to gestural size, Bavelas has focused on gestures that depict the shape of an object as either picture-size or life-size. Picture-size gestures range from different scale of pictures up to the scale of the speaker’s own body, whereas life-size gestures require more effort and can assist well with the communication process. However, both picture-size gestures and life-size gestures need to use the speaker’s body. Therefore, they cannot be a source of help if they are used on the telephone or with a tape-recorded situation. Bavelas showed that life-size gestures, in face-to-face conversation, were the larger compared to those on the telephone and in recorded situations, which were picture-sized.

Bavelas adopted the term gesture functions and avoided using the term gesture classifications because gestures are not limited to a specific depiction of a tangible act, so they serve other functions in conversation.

## 2.2 Social effects on gesture rates

A number of studies have examined the effects of social settings on gestures often under the guise of studying speakers’ communicative intentions. Cohen and Harrison (1973) investigated gesture rates in different social interactions. Their results showed that gesture rates are greater in face-to-face interactions than on intercom speakers which mean non-visible interactions. They also suggested that speakers use their gestures, intentionally, in order to help the interlocutors.



Gerwing and Allison (2011) investigated the gestural rates in face-to-face conditions. During their experiment they recruited speakers to describe a dress using two different settings. The first was face-to-face and the other was on the telephone. The results showed that the description of the dress in the face-to-face situation was clearer and depicted the correct size and the shape of the dress. In contrast, the gestures used to describe the dress on the telephone were small and ambiguous. The authors highlighted, in their paper, other related studies showing that the gesture rates are unaffected by visibility (Bavelas, Chovil, Lawrie, & Wade, 1992; Bavelas, Gerwing, Sutton & Prevost, 2008). They concluded that in most cases the speakers continued to contribute illustrative gestures when they were speaking to interlocutors who could not see those gestures. It seems that the focus on gesture rates alone did not provide clear evidence as to whether the speakers deployed their gestures to serve a communicative function (Gerwing & Allison, 2011: 312).

Alibali and Heath (2001) examined the communicative role of gestures in two different conditions. The first was when a speaker explained a narrative cartoon to a listener during face-to-face dialogue. The second was when the speaker could not see the listener and was blocked by a screen. In the experiment two different functions of gestures were analyzed. The first was representational gestures which depict semantic content, present an object with hand movements. The second was beat gestures which means rhythmic gestures that do not depict semantic content. The result showed that the highest gesture rates were in representational gesture when performed by speakers who could see their listeners during their face-to-face dialogue. However, speakers also used some representational gestures when separated by a screen. This resulted in reduced gestural rates when their listener could not see the representational gestures in non-visible conditions. As regards beat gestures their gesture rates were equal in both conditions. They also concluded that visibility status of the listeners affects the level of frequency of gestural production.

Hostetter and Potthoff (2012) also analyzed the frequency of gestures in social settings. They examined five different types of speakers and their personality traits in conjunction with their representational gestures. Their aim was to explore whether there was a relation between the speakers' personality traits and their use of representational gestures in a social situation. Another part of the study showed a comparison in the relationship between gesture and personality. It

looked at two different social settings, face-to-face dialogue and non-visible conditions. They found that the speaker's personality, in conjunction with their social situation, was an important contributor to how frequently they gestured. They concluded that there were links between extroversion and visibility. In face-to-face situations speakers with extroverted personalities produced higher representational gesture rates compared to lower gesture rates in non-visible situations.

Bavelas and Chovil (2006) argued that the gestural rates decrease when the speakers and the interlocutors are not visible during their conversation. This meant that the participants were not using their gestures when they could not see each other.

Bavelas and Chovil concluded that gesture rate in face-to-face dialogue is higher compared to telephone dialogue and conversations with participants separated by wall.

The results show that in tape recorded monologues, which considered a non-visible setting. The speaker could not see the addressee's gestures. This affected the speaker's communication who relied upon speech more than gestures. The frequencies of gestures were lowest in both partitioned and monologue conditions. Telephone and partitioned dialogue differed from face-to-face dialogue in familiarity and visibility. In other words, the lack of visibility significantly lowered the frequency of gestures in all dialogues.

They stated that the rate of topic gestures that depict semantic information related to the topic of the discourse in face-to-face dialogue, was higher compared to telephone and tape-recorded conditions (Bavelas & Chovil, 2006: 511).

Bavelas (1992) focuses on interactive gestures which refer directly to the addressee in a dialogue instead of the topic of conversation. This means that a dialogue requires at least two people facing each other, in a conversation, to receive these gestures. She also highlights how interactive gestures specify a word in a sentence by projecting the word by hand movements. This can be done by the use of open palm, curly fingers, index or other use of the body to emphasize meaning. The result shows that interactive gestures are significantly influenced by the requirements of dialogue.

The studies mentioned above, address many variables affecting the frequency of gestures in different social conditions. However, the results are inconsistent, since studies were conducted

in different social settings such as visible or non-visible conditions, monologue, on the phone, intercom and partition wall. Also, we do not know whether gestural rates vary depending on different levels of familiarity between the speakers and their interlocutors in a given social setting. The social effects on gesture rate described above suggested that speakers may gesture more in social situations, perhaps where speakers feel more comfortable or confident. It therefore seems plausible that familiarity with interlocutors may also influence gesture rates. This study will investigate whether the speakers' behavior changes when they are talking about the same topic with different interlocutors.

### 2.3 Research question

How do different degrees of familiarity with a person affect the speaker's gestural rate during face to face interaction?

### 2.4 Hypothesis

The study formulates the following hypothesis. The speakers will gesture more with a friend and less with an acquaintance and a stranger. This amounts to the suggestion that the speaker's social behaviour is affected by a certain level of familiarity.

## **3 Methods**

This study examines the changes in frequency that occur in a speaker's speech and gestural strokes executed during face-to-face interaction with interlocutors under different degrees of familiarity. Specifically, it builds on Bavelas's work relating to social interaction and on Kendon's (2004) definition of gestural phases.

### 3.1 Participants

A total of 16 participants, all Swedish, were recruited to undertake the study on face-to-face interaction with different levels of familiarity. The participants recruited for this study were

university students. They were asked to participate in this experiment by attending a video recording session, in person, at Lund University Humanities Lab's Larm-studio.

Participants were recruited based on their familiarity levels with each other. Each speaker was asked about their relationship with their fellow interlocutors. As an example of this, the speaker was asked to bring two people. First, someone they knew as friend and secondly, someone they knew less as an acquaintance. The strangers, whom the speakers never met before, were selected and introduced to the speakers just before the recording sessions.

Participants consisted of four bilingual female speakers and twelve bilingual female interlocutors. They are characterised as bilingual because everybody spoke Swedish and English as a second language. English was chosen as the language of communication for convenience since the author does not speak Swedish. It is known that speakers are likely to gesture more when they speak their second than their first language (Gullberg, 1998). However, with everyone speaking a second language, this factor was controlled for. The reason for selecting one gender was for the sake of consistency and to keep the variables under control as much as possible. This ensured that the study was not impacted by gender. Their ages were between 19 and 28 years and English was the language used in all conversations. The participants were divided into four groups each group was set up in a different role for the study.

There were four speakers; each conversed with three different interlocutors. Every speaker had a conversation with their three interlocutors on the same topic. Each speaker had three minutes to talk with each of their three interlocutors.

The three levels of familiarity were set out as follows.

Level One. The interlocutor and the speaker knew each other very well.

Level Two. The speaker was conversing with an acquaintance.

Level Three. The speaker communicated with someone they had never met before.

In each recording group the order of familiarity (friend, acquaintance, and stranger) was different. This means that every speaker was presented with a different order of familiarity to interlocutors. The reason for this variation was to see whether changing the interlocutors order could have an impact on the gestural rates during the study.

### 3.2 Materials

The topic of conversation was “Talk about the pros and cons of a healthy eating diet”. The reason this topic was chosen was because it can be seen as a controversial topic. People have different views and different reactions to this topic. The topic is reasonably easy for people to talk about and many people follow different diets and have very different ideas and views about what is healthy and unhealthy. An example of this is looking at people who are vegans, vegetarians or meat eaters; they all have compelling views on the topic. Therefore, it was a question of debate that raises individual ideas about various eating preferences and eating habits.

### 3.3 Procedure

The study took place at the Lund University Humanities Lab’s Larm-studio. The participants were asked to give their consent at the beginning of the experiment to participate in this study. Approval was obtained in a written consent form signed by each of the participants. (See appendix I). The studio was set up with high quality audio and video recording equipment and controlled by the studio engineer.

In the recording room the speaker and the interlocutor sat face-to-face. There were two large cameras focused on and recording the participants. The first camera was recording the speaker and the second recording the interlocutor. The room was also equipped with two microphone devices that were set up to provide good recording quality.

A visual timer was placed next to the participants not only to give them a reminder of the time limit but also to understand if time was adding pressure to them. The participants were told that each person had three minutes to talk about the subject without interruption. The speakers were selected to start the discussion. When the speakers had finished it was then the interlocutors’ turn to deliver their point of view on the topic.

Before the recording time started two copies of written instructions were placed on the table. (See appendix II). The participants were asked to listen to the reader instructions and to follow them as they were being read out by the studio administrator. The speaker and the interlocutor had no previous awareness about the topic they would be talking about, before the recording started.

During each session the speaker was given three minutes to deliver their viewpoint relating to the topic of discussion before the roles were reversed. The participants were told, before recording started, to listen to their fellow participant and not to interrupt each other during the dialogue. This made it easier to observe the speakers gestural flow without disruption.

All recording sessions were observed on a digital monitor from the control room to make sure that everything was running properly. For example, the speaker in Group Three was seen placing her hands under her hips, sitting on them, most of the time. During the following recording the same speaker was told to be more herself, not to worry and to be calm and comfortable. She was also told not to sit on her hands, which was difficult without giving a hint of the reason of this entire study relating to hand movements.

### 3.4 Gesture coding

Each recording session was labelled and saved as a file for analytical purposes. The data was analysed using the ELAN software (Wittenburg, Brugman, Russel, Klassmann, & Sloetjes, 2006). ELAN is a program that enables annotation of audio and video recordings and to analyse speech accompanying gestures in different segments. Therefore, ELAN helped to provide the study with the necessary coding options to analyse the speaker's speech and gesture production.

There were four groups of participants in each group which had three recording sessions. Every session had one speaker and one interlocutor. The main focus was on the speakers and their gestural strokes.

A three-minute time limit was given to each participant as a countdown. The recording time varied from two minutes to three minutes per session. The official coding time, for every session, started at the last two minutes. It was decided to dismiss the first minute at the beginning of each conversation. The first minute was considered a starting point for the speaker to warm up their ideas, conversations and gestures. The time was sufficient to count the strokes from each of the two participants, in each group, during their interaction.

Gestural strokes were selected (see the definition in section 2.1; Kendon 2004) and counted based on form (movement patterns), not on gestural functions. All gesture strokes, that delivered

meanings or synchronized with words were analysed. Other hand movements such as touching the nose, scratching, twisting hair, tugging on ears or rubbing the legs etc. were adaptors with no meaning. Therefore, they were not considered.

Gesture strokes were analysed based on hand movement patterns. As Kendon's definition, strokes constitute the peak of movement, often with a clear handshape, aligned with speech. They are set apart from preparations, holds and retractions, when the hand goes back to a resting position. Sometimes repeated identical movements with no holds in between were counted as one stroke.

### 3.5 Speech transcription

All conversations were transcribed and saved in a text file. The author transcribed speech according to the criteria of standard orthography conventions. Words which were spoken in abbreviated form were considered as one word as well as standard contractions according to the Oxford English Dictionary. In the transcription, some words were spoken twice, in a phrase, thus each repeated word was counted as one word and marked with three full stops. This was to highlight the repetition in the text. Apostrophes and punctuation marks were used in their possessives and contractions grammatical form.

### 3.6 Further data treatment

In each recording session the number of strokes was divided by the number of words per two minutes. The outcome was the gestural rates in each familiarity group. Only descriptive statistics are presented.

## 4 The results

Table 1 shows the gestural rates in the different levels of familiarity of speaker 1. The results were surprising since the gestural rates were different from what was predicted in the hypothesis.

The results showed that the “Speaker to Friend” had the lowest gestural rate and the “Speaker to Acquaintance” was higher than predicted. Both of these results were unexpected.

**Table 1. Gesture Rate for Speaker 1**

<b>Order</b> <small>The Order the Interlocutor talks to the speaker.</small>	<b>Familiarity</b>	<b>Recording time</b>	<b>Total Words</b>	<b>Strokes Per Total Time</b>	<b>Selected Time</b>	<b>Strokes Per 2 min</b>	<b>Total Words Per 2 min</b>	<b>Gesture Rate</b> <small>[Strokes / Total Words]</small>
<b>First</b>	Speaker to stranger	3:14 min	413	62	2 min	40	258	0.16
<b>Second</b>	Speaker to friend	2:13 min	293	42	2 min	38	282	0.13
<b>Third</b>	Speaker to acquaintance	2:44 min	376	76	2 min	58	279	0.21

Table 2 shows the gestural rates at different levels of familiarity of speaker 2. The results were similar to speaker 1, even though the orders of the interlocutor were different. The result shows that the “Speaker to friend” and “speaker to Stranger” scored low and comparable gestural rates, whereas the gesture rates of “speaker to Acquaintance” was higher than expected.

**Table 2. Gesture Rate for Speaker 2**

<b>Order</b> <small>The Order the Interlocutor talks to the speaker.</small>	<b>Familiarity</b>	<b>Recording time</b>	<b>Total Words</b>	<b>Strokes Per Total Time</b>	<b>Selected Time</b>	<b>Strokes Per 2 min</b>	<b>Total Words Per 2 min</b>	<b>Gesture Rate</b> <small>[Strokes / Total Words]</small>
<b>First</b>	Speaker to friend	3:20 min	327	47	2 min	36	220	0.16
<b>Second</b>	Speaker to stranger	2:21 min	328	56	2 min	46	288	0.16
<b>Third</b>	Speaker to acquaintance	2:40 min	368	71	2 min	56	280	0.20



Table 3 shows the gesture rates at different levels of familiarity of speaker 3. It shows different results from speakers 1 and 2. It appeared that gestural rates were relatively higher with “Speaker to Friend”. The results also show that “Speaker to stranger” and “Speaker to Acquaintance” were lower in gestural rates.

**Table 3. Gesture Rate for Speaker 3**

<b>Order</b> <small>The Order the Interlocutor talks to the speaker.</small>	<b>Familiarity</b>	<b>Recording time</b>	<b>Total Words</b>	<b>Strokes Per Total Time</b>	<b>Selected Time</b>	<b>Strokes Per 2 min</b>	<b>Total Words Per 2 min</b>	<b>Gesture Rate</b> <small>[Strokes / Total Words]</small>
<b>First</b>	Speaker to stranger	2:31 min	270	9	2 min	7	213	0.03
<b>Second</b>	Speaker to friend	2:18 min	261	19	2 min	19	241	0.08
<b>Third</b>	Speaker to acquaintance	2:45 min	331	15	2 min	10	232	0.04

Table 4 shows the gesture rates at different levels of familiarity of speaker 4. It indicates low gestural rates between “Speaker to friend” and Speaker to Stranger”. It is interesting to see that the “Speaker to Acquaintance” showed higher gestural rates.

**Table 4. Gesture Rate for Speaker 4**

<b>Order</b> <small>The Order the Interlocutor talks to the speaker.</small>	<b>Familiarity</b>	<b>Recording time</b>	<b>Total Words</b>	<b>Strokes Per Total Time</b>	<b>Selected Time</b>	<b>Strokes Per 2 min</b>	<b>Total Words Per 2 min</b>	<b>Gesture Rate</b> <small>[Strokes / Total Words]</small>
<b>First</b>	Speaker to friend	2:34 min	224	32	2 min	15	165	0.09
<b>Second</b>	Speaker to stranger	2:06 min	230	15	2 min	15	227	0.07
<b>Third</b>	Speaker to acquaintance	2:33 min	263	32	2 min	28	212	0.13

Table 5 shows the average gesture rate per familiarity level.

**Table 5. Average Gesture Rate of Familiarity**

<b>Familiarity</b>	<b>Average Gesture Rate</b>
<b>Stranger</b>	0.11
<b>Acquaintance</b>	0.15
<b>Friend</b>	0.12

Table 6 shows the average gestural rates in terms of order of familiarity level. Two orders were only possible to compare out of the entire four groups. The first order, “Speaker to Stranger” was compared to Group 1 and 2. The second order, “Speaker to Friend” compared to Group 2 and 4. Order seems to have no effect on gesture rate.

**Table 6. Average Gesture Rate of Order**

<b>Group</b>	<b>Order</b>	<b>Average Gesture Rate</b>
<b>One</b>	<b>Speaker to Stranger First</b>	0.10
<b>Three</b>	<b>Speaker to Stranger Second</b>	0.12
<b>Two</b>	<b>Speaker to Friend First</b>	0.13
<b>Four</b>	<b>Speaker to Friend Second</b>	0.11

## 5 Discussion

The study addressed the following research question: how do different levels of familiarity with an interlocutor affect the speaker's gestural rate during face to face interaction?

The results show that the average gesture rate of familiarity in Table 5, was 0.11 with "Stranger", 0.15 with "Acquaintance" and 0.12 with "Friend".

The hypothesis in this study was that the gesture rate of the speaker increases with growing levels of familiarity. This means that the lowest gesture rate was expected to be with "Stranger" and the highest gesture rate with "Friend". However, the current results highlighted different gesture rates between "Acquaintance" and "Friend". Somehow the two levels, "Acquaintance" and "Friend", have swapped the expected outcome showing that "Acquaintance" had the highest gesture rate and "Friend" came in second place. The reason for the difference could be influenced by the effect that the highest gesture rate always occurred in the last conversation except in Group 3. It is possible that the speaker became more confident, therefore deploying more gestures and already knew what to say regardless of the level of familiarity.

The results are in line with findings demonstrating an increase in gesture rates in the presence of an audience who can see the gestures (Alibali & Heath, 2001; Bavelas et al., 2008; Bavelas & Chovil, 2006; Hostetter & Potthoff, 2012). We can also refer to the semantic and social aspects not only affecting the gesture production but also the interaction which helps to increase the speaker's gestural rates. This demonstrates that when speakers interact with interlocutors, three times in a row they become confident and deploy more gestures.

According to Hostetter (2014), when speakers interact, they simulate the motor and spatial events or topic they are talking about. As the process of motor activity becomes more involved, in these simulations, they may become explicitly expressed and result in an increased gesture rate. The influence of bilingual or second language is discussed by Gulberg (1998). She stated that second language speakers tend to produce more gestures when they speak their second language than their first.

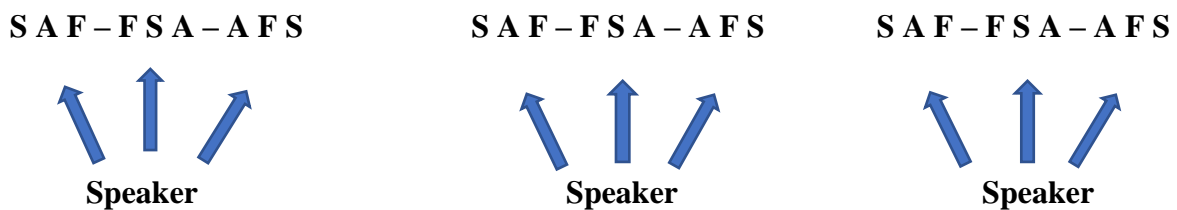
Most importantly, speakers do not seem to produce gestures mainly to solve lexical problems. Instead they produce a lot of gestures to indicate ongoing trouble, so-called pragmatic gestures (e.g., Gullberg, 2011).

The study did not consider different functions since the speakers were using their second language in all three settings Any change across the settings was due to order or familiarity not to second language status.

### 5.1 Limitations and weaknesses

According to the given data it can be noted that the “Acquaintance” was placed in the third order throughout the entire study. This was due to uncertainty or a source error in the experimental design. Therefore, order can be seen as a confounding variable. It is only really possible to compare “Speaker to Stranger” and “Speaker to Friend”.

The results showed no further effect of familiarity order. To remove the confound and to have good statistics, on a large scale, in the future more cycles should be added to compare the three linear orders. The following cycles are set up as three variables in different order. These will eliminate any chance for any interlocutors to occur in the last recording session. It will also be possible to compare the interlocutors in pairs. In other words, the order of interlocutors must be counterbalanced across the familiarity conditions. Below you will see abbreviations S stands for stranger, A stands for acquaintance and F stands for friend.



### 5.2 Evaluation

In total, eighteen minutes was the duration of the time used for all participants in all sessions. The speakers and the interlocutors had a specific time to deliver their views on the topic. Each group had three recording sessions.

It was surprising to observe that during the video recording session, the speaker regularly looked at the time, the digital sign that was placed nearby and in the vision of the participant. It could be suggested that observing the time occurred too frequently for the participants to enable them to deliver their intended message within the required time limits.

During the recording session it was found that the presence of the written instructions on the table also had a negative influence on the speaker. The speaker in Group Two, during the recording time, was consistently looking at the instructions, on the table in front of her, instead of interacting with the interlocutor spontaneously. This meant that the speaker did not have total eye contact with the interlocutor until the end of the recording session. It appeared that the lack of eye contact, during the recording session, limited and reduced the social connection between the two participants. However, the speaker managed to deploy her gestural strokes even though eye contact was averted. Therefore, it was possible to read the speaker's strokes even though her eye contact was limited. To keep the study more robust and without any unexpected effect of stimulus it was decided to disregard the written instructions from the table, once it was read, at the beginning of the session. It could be suggested that this may allow the participants to interact freely without distraction.

### 5.3 General evaluation of the speakers

It is possible that the speakers were not as confident and were less informative during the first session of each group, due to the lack of information relating to the subject they were talking about. This made the speakers more hesitant in delivering their point of view concerning the topic. As they progressed to the next group their confidence in the subject matter increased and they appeared to become more informed about the subject. From their own knowledge they delivered better quantity information to the interlocutor.

In Session Two the speakers started to access more information which enhanced the process of executing more words and gestures. This continued in the final session, Session Three, and the confidence and familiarity with the topic increased. The speakers started to repeat some sentences talking faster and adding information. The speakers' confidence increased during their discussions

regardless of their level of familiarity. This can be seen through the increasing numbers of words and gestures. It was observed that the speakers in Tables 1, 2 and 4 showed higher gestural rates compared to Table 3. For example, in Table 1, the speaker in the last order registered 279 words and 58 strokes more compared to the previous recording session. Table 2, the speaker in the last order registered 280 words and 56 strokes more compared to the last two recording sessions. Table 4, the speaker in the last order registered 212 words and 28 strokes more compared to the first recording sessions. It seems therefore that the level of knowledge a speaker has, relating to the subject, affects their gestural production. The more intermittent the speech, the fewer gestures there were.

The effect of the speaker's confidence also suggests that other factors may influence gesture rates such as social behavior, when the speaker used English as their second language.

Moreover, the research was conducted in a studio setting, with two large cameras, which could have affected the results. One of the participants commented that she found the cameras off-putting, so she felt less comfortable in this setting compared to being in a relaxed situation.

## **6 Conclusions**

This study focused on the speakers and their gestural rates at three levels of familiarity, friend, acquaintance and stranger. It examined four Swedish speakers interacting with twelve Swedish interlocutors in four groups. English was a second language, used by all participants within the groups. These groups were studied during face-to-face interaction. The study looked specifically at whether the gestural rate was affected by variations of familiarity between the speakers and the interlocutors.

It shows that the speakers who gestured less with "Friend" also gestured less with someone they had never met before.

Surprisingly, the study refuted the hypothesis which was that the highest gesture rate would be with "Friend". It can be said that these data interestingly show different results to what was expected. The data showed that the highest gesture rate was with "Acquaintance". However, this

may be because it was always the last interlocutor, and the speaker's confidence increased with the repeated topic. The speaker's confidence seemed to grow regardless of the order of familiarity.

Based on these findings, it can be suggested that speaker's confidence in conjunction with their knowledge, social situations and the use of English as a second language can affect how frequently they gesture. It seems that neither order nor the level of familiarity showed an effect on gesture rates. We can keep in mind that the topic that the participants shared was neutral. Therefore, it would be interesting to share an intimate or emotional subject such as relationships or life changing topics which are considered private and deeply personal which might have a gesture effect on familiarity level.

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## Appendix I

The consent form which was given to all participants after finishing the recording.

### Consent Form

I hereby give my permission to Firas Alrawas, Centre for Languages and Literature, Lund University, Sweden, to use today's recordings (audio and video) for the following purposes:

(Please tick the appropriate box, "☐", if you give your permission.)

1. analyses for scientific research;

2. as illustrations of the above scientific research in professional seminars, lectures, conferences, and in scientific publications;

as still photographs;

as video clips.

My anonymity is guaranteed. Under no circumstances will my personal identity be revealed to anybody other than the above mentioned scientific researchers (e.g. no names will be used in presentations of the recording).

Name

Signature

Date

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Participant number: \_\_\_\_\_

## Appendix II

The written instructions which were given to the participants beforehand the recording time.

### INSTRUCTIONS

Thank you so much for your participation and interest in taking part in this study.

In the video recording sessions two participants are going to deliver their view on the topic for 3 minutes.

As a participant in this study you will be asked to do the following:

- Firstly, read and understand the topic that you are going to be discussing.

The topic is

**Talk about the pros and cons of a healthy eating diet.**

- Secondly, give your own opinion about the topic.
- Finally, each participant will be given their opportunity to deliver their point of view.

Thank You