Emblem use in parent-child interaction

A longitudinal study

Sofia Tahbaz

Abstract

This thesis investigates emblem use exploratory in parent-child interaction. Emblems are conventional gestures with a verbal equivalent. The aim of this study was to answer if emblem use facilitates language acquisition. Formulaic gestures – fixed gestures accompanying songs – were examined as a subgesture of emblems. 20 children and their parents’ emblem use were recorded when interacting freely at seven age points: 6, 9, 12, 15, 18, 21 and 24 months. Emblem use was correlated to the children’s productive vocabulary at 30 months. The results showed that parental emblem use at 24 months and child emblem use at 15 months predicted child productive vocabulary at 30 months. T-tests showed how emblem production of children in a lower productive vocabulary group differed from children in a higher productive vocabulary group. A difference between the children of the lower productive vocabulary group and the children of the higher productive vocabulary group emblem use was also found at 15 months, indicating emblem use being important in language acquisition. Formulaic gestures did not correlate to child productive vocabulary. Emblem use developed along with child age and probably inherently with word production. Parents adjust their emblem use to the child’s age and/or possibly language skills, suggesting that child-directed gesturing occurs in parent-child interaction.

Keywords

Emblem use, language acquisition, formulaic gestures, parent-child interaction, productive vocabulary
Emblemanvändning i förälder-barn interaktion

En longitudinell studie

Sofia Tahbaz

Sammanfattning


Nyckelord
Emblemanvändning, barns språkutveckling, fasta gester, förälder-barn interaktion, produktivt ordförråd
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1. Introduction

In child language acquisition research, different modalities have been examined to answer how children learn their first language(s). Exhaustive research has been conducted on the speech signal and its contents when directed to a child, as in child directed speech.

Recently, other modalities, like gestures, vision, and touch have been in focus when investigating child language acquisition. We still lack a detailed understanding of how children acquire language; but we know that typically developed children acquire a first language in a few years time.

Language is multimodal in nature and in language acquisition research there are attempts to understand which modalities that is of greatest importance and how they are combined. Is it one modality, for instance the speech signal, or multiple modalities in cooperation? This thesis focuses on hearing children with spoken languages, although multimodality applies to sign languages as well.

The comprehension that a language does not necessarily have to be spoken arose in the late twentieth century and studies on signed language became of great interest. At the same time, gesture studies were accepted as topic of research (Kendon, 2004: 73). This thesis does not include sign language but the shared history of them and gestures becoming accepted topics in research jointly are worth mentioning.

Previous research has found the vocal input to have great importance for language acquisition, what role do gestures have? In this thesis, I investigate if emblems are beneficial for language development; emblems produced by parents as well as children. The aim is to determine if emblems facilitate language acquisition.

Emblems are a subcategory to gestures and are defined as conventional gestures with a verbal equivalent (Ekman & Friesen, 1969). Emblems have different functions, some bear communicative meaning while others are used in a context of play. This thesis includes spontaneously produced emblems in parent-child interaction as well as emblems accompanying songs. I have developed the term formulaic gestures for the fixed gestures produced with songs. The role of emblems and formulaic gestures in parent-child interaction are examined.

Previous research has found that maternal verbal translation of gestures facilitates word learning (Goldin-Meadow, Goodrich, Sauer and Iverson, 2007). This thesis investigates what role emblems have in child language acquisition. Emblems have been examined in previous research together with other gestures (Capirici, Iversion, Pizzuto and Volterra, 1996), but not on their own. This study is exploratory since previous research on emblems is limited.
2. Background

Gesture studies have recently become of interest in child language research. Previous research on gestures and child directed speech is presented here as well as the definition of emblems. The last section contains information about a new term: formulaic gestures. Formulaic gestures are fixed gestures accompanying songs and chants and form a subcategory to emblems.

2.1 Gesture studies

Gestures are most commonly used by arms or hand movements (Kendon, 1980). Gestures are often seen as nonverbal communication and include any body movement or position in the face (Ekman and Friesen, 1969). A common way to limit gestures in research is to not include actions with objects or body adjustments, such as scratching oneself etc. (Mayberry and Nicoladis, 2000).

Gestures were seen as playing an important role when research was conducted on the origin of language, but did not form as an interesting topic in the field of linguistics until the 1970’s. Gestures were not acknowledged as a part of language. Therefore, early language studies did not include gestures (Kendon, 2004: 73).

In language acquisition research, different gestures have been examined in different studies. The gestures most studied are deictic gestures, iconic gestures and emblems. Deictic gestures are commonly used with the index finger extended from the fist, palm facing down or sideward (Butterworth, 2003). Deictic gestures can be divided in several subcategories. Iverson, Capirci, Longobardi and Caselli (1999) used the term deictic gestures for pointing, indicating and showing (1999: 61). Iconic gestures are gestures that describe an action or object (McNeill, 1992). An iconic gesture could be pinching the index finger, middle finger and the thumb and turning it, and saying “I locked the door”. Emblems are conventional gestures like waving the hand for “hello” and shaking the head for “no” (Ekman and Friesen, 1969).

Communication includes speaking as well as gesturing, among other non-verbal signals. Rauscher, Krauss and Chen (1996) found that a restriction to use hand movements in communication causes delay and more filled pauses than conversations without the restriction. They discussed whether gesturing hand movements while talking has a part in formulating the speech production process, lexical access, or if it rather affects the conceptualizing stage of speech production process (1996: 229).

2.2 Definition of emblems

The term emblem or emblematic/symbolic movements was initiated by Efron (1972) in his book “Gesture and Environment” (1941, re-issued in 1972 as Gesture, Race and Culture). He described emblems as “representing either a visual or a logical object by means of a pictorial or a non-pictorial form which has no morphological relationship to the thing represented” (Efron, 1972: 96). Emblems were considered as gestures with a linguistic aspect and Efron considered the referential meaning of the movement when studying them.

Ekman and Friesen (1969) gave a definition for emblems as being conventional gestures. The conventionality makes it possible for an emblem to be meaningful in one language or community and meaningless in another language or community. Emblems are gestures that are translatable to a dictionary translation, a word, two words or a sentence (Ekman and Friesen, 1969: 63).

An utterance can be accompanied by an emblem with parallel meaning (Kendon, 2004: 181). An equivalent verbal expression to an emblem would be: saying hello and waving your hand. Emblems can also be used to an utterance with a different meaning. The utterance does not match
the meaning of the emblem and can contribute to a more explicit meaning while the narrative is less explicit (2004: 177). An example of an emblem used to a non-matching verbal expression would be: saying “what are you doing?” and gesturing the “shame on you”-emblem; shaking the hand with the index finger extended from the fist. Here, the utterance does not fully match the gesture; however, the emblem specifies that the action is not appreciated.

2.2.1 The thesis definition of emblems

This thesis will use the definition of emblems being conventional gestures with a verbal equivalent, without a need to be accompanied by a verbalization (Ekman & Friesen, 1969: 71). Ergo, the definition of emblems is based on Ekman and Friesen (1969) as well as Kendon (2004), an emblem can be used in parallel to an utterance or it can add information to an utterance. Emblems concern hand movement as well as head movement, body movement and facial expressions given that the movements or expressions do have a verbal equivalent. From here on, when emblems are mentioned in the thesis, this is the definition provided.

2.2.2 Formulaic gestures

Earlier research has focused on gestures accompanying speech. This study will also include gestures accompanying songs and chants, where gestures are part of the song. These gestures will be termed formulaic gestures, a term invented for this study in order to keep them separate from spontaneously produced emblems in the data.

To understand the term, formulaic gestures can be compared to certain rituals in the context of singing. The term is based on Wray’s (1999) term fixed formulae: memorized sequences as fixed utterances that are used in certain contexts as a sort of ritual (Wray, 1999: 220). Wray’s (1999) description for fixed formulae is of course about speech and a subcategory of formulaic language, but the description fits the description of formulaic gestures as it is used here.

2.3 Child language acquisition

Research on how children acquire language has been conducted for a long time with different approaches. Research has focused on different modalities, either isolated or in interface. Here, research on the speech and gesture modalities is presented.

2.3.1 Language is multimodal

Language does not only consist of a speech signal or a sign. Multiple channels of expressions as gestures, prosody, facial expression and body movements are included in the production and interpretation of language (Vigliocco, Perniss and Vinson, 2014: 4). Levinson and Holler (2014) suggest language to be a “system of systems” with speech as one system, gesture as another. Levinson and Holler explains humans’ multimodal communicative ability with the upright posture, which makes it possible to use gaze, facial expressions and gestures simultaneously (Levinson and Holler, 2014: 2). When acquiring a language, the child does not only learn how to speak but also how to use his/her hands while speaking (Goldin-Meadow, 2014: 1).

2.3.2 Child-directed speech and vocabulary spurt

How children manage to learn a language has fascinated researchers for a long time and one of the areas of interest has been the speech signal used towards children, infant directed speech (IDS) or child directed speech (CDS). The main difference between CDS and adult directed speech (ADS) lies in the melodic patterns. In CDS there is a higher pitch, a larger variation in pitch, longer pauses and the utterances are shorter than in ADS (Grieser and Kuhl, 1988). CDS has been observed in many different languages suggesting that this feature is a universal behavior towards children (Fernald, 1992: 391). In contrast to ADS, Fernald (1989) showed the intonation in CDS is providing the child with cues of the speaker’s feelings (Fernald, 1989: 1508). Rask
(2015) showed how different aspects of CDS, such as a decreased pitch, changes along with child age.

Theissen, Hill and Saffran (2005) showed that IDS facilitates the children’s ability to find word segments in fluent speech. Moreover, several studies have shown that the children prefer CDS over ADS (Fernald 1985, McRoberts, McDonough and Lakusta, 2009).

Language is acquired in stages. The first word is usually pronounced at 12 months of age (Kuhl, 2004). From approximately 12 months, children can produce single words in isolation (i.e. the one-word stage), and from around 18 months, children start combining words and produce two-word sentences (i.e. the two-word stage) (Goldin-Meadow and Butcher, 2003). But language acquisition does not start at the first pronounced word. Håkansson (2014: 41) claims that when a child can produce 10 words s/he understands about 100 words, meaning that language understanding comes before language production.

Goldfield and Reznick (1990) found that the children they were examining learned their first 30 words over a few months. But after learning another 10 words, the children more than doubled their vocabulary size in just three months (Goldfield and Reznick, 1990: 179). This is what is known as a vocabulary spurt.

The vocabulary spurt comes at different times for different children, Goldfield and Reznick (1990: 176) found evidence for a vocabulary spurt for between 17-19 months. Benedict (1977) reported how the children that had reached 50 words in production were the ones that accelerated their vocabularies.

However, Goldfield and Reznick (1990: 179) did also notice that some of the children did not experience a vocabulary spurt. This was challenged by Mervis and Bertrand (1995) who, after following children who had not experienced a vocabulary spurt, found that all children indeed go through vocabulary spurts, although some later than others (Mervis and Bertrand, 1995: 466).

2.3.3 Gesture studies in child language research

As stated in the section above, language is acquired in stages. Before the child starts producing words she starts producing gestures. Children start to communicate to their parents by producing deictic gestures at objects or people some time before they produce words (Bates, 1976: 61).

Schnur and Shatz (1984) concluded that gestures had the function of capturing the child’s attention. They addressed the need for further research to examine if gestures work as help to language learning (Schnur and Shatz, 1984: 40-41). Almost 25 years later, Goldin-Meadow, Goodrich, Sauer and Iverson (2007) found that maternal verbal translation of child gestures facilitates the child’s language learning. They suggested that there is a causal relationship between gestures produced by the child and new words or sentences learnt (Goldin-Meadow et al., 2007: 784). Similar results came from Dimatrova, Özçalşkan and Adamsson (2016). They followed typically developed children as well as children with autism and Down syndrome and their results reinforce Goldin-Meadow’s et al. (2007) results.

Capirici, Iverson, Pizzuto and Volterra (1996) studied conventional gestures (i.e. emblems) and iconic gestures combined with deictic gestures. They studied children’s one-word utterances at 16 months and 20 months. Capirici et al. (1996) found that gestures produced together with words by 16 months old children worked as a good predictor on language output at 20 months. They suggested that gesture-word combinations are a transitional phase before the two-word stage (Capirici et al., 1996: 670-671).

Gesture reflects knowledge in language learners; it reflects a role in changing thought (Goldin-Meadow, 2009). Goldin-Meadow (2014) finds it necessary to include the manual modality in research on language learning, since children have an ability to express notions before they are able to speak (Goldin-Meadow, 2014: 9). Goldin-Meadow (2009) discusses how gestures in early child development can help to identify the children who need more help in language learning (Goldin-Meadow, 2009: 109). Sauer, Levin and Goldin-Meadow (2010) examined eleven
children between the ages of 18-30 months with pre- or perinatal unilateral brain lesion. They found that early gesture production delay at 18 months is a good measure to predict language delay at 30 months (Sauer et al., 2010: 535).

Andrén (2010) investigated gestures performed by five Swedish children between the ages of 18 and 30 months. He found that deictic gestures are the most common gestures. Deictic gestures are also the most common gesture to be produced together with speech. Andrén found gestures to be more used between the ages of 18-24 months than between 24-30 months (Andrén, 2010: 336).

2.3.4 Studies of emblems in child language research

Headshakes and nods are two commonly used emblems by the child in the child’s early development. Nodding meaning “yes” is a typical way of using the nods by children, while headshakes have a broader usage. Shaking the head is often used in a way that does not always mean “no” by children. Research on 11 Swedish children found that nodding for “yes” is a gesture produced first during the third year of life, while shaking the head for “no” was started to be used during the second year of life. It was also found that nods are more stable in use in the child’s development than headshakes (Gerholm 2015).

The headshake has been investigated and found to bear eight different sorts of functions where only two functions are equivalent to the verbal expression “no” and one with the function of negation (Kendon, 2002: 151-152).

The two most frequently used gestures in mother-child interaction are deictic and conventional gestures (i.e. emblems) (Iverson, Capirci, Longobardi and Caselli, 1999). They found that the gestures reinforced the message provided by speech and that frequency of maternal gestures influence development of the communicative repertoires. Besides that, maternal gesture has a positive effect on children’s use of gestures as well as speech (Iverson et al., 1999: 72-73).

Child emblem production is found to increase slightly in production as the child grow older, as opposite to gestures in general (Andrén, 2010: 336). Previous research has found maternal gesture to possibly help their children to acquire their first language (Iverson et al. 1999). Therefore, emblem use by children as well as their parents is examined.

At this point, research has not found which role emblems have in parent-child interaction. Emblems are defined as conventional gestures, and children learn to use them. Research has found parental speech input to have an influence on child’s first language acquisition, and this study aims to investigate if the same applies for parental emblem input.
3. Aim and Research Questions

The research questions are the following:
1. Does parental emblem use predict child emblem use?
2a. Does parental emblem use predict child productive vocabulary?
2b. Does parental formulaic gesture use predict child productive vocabulary?
3a. Does child emblem use predict child productive vocabulary?
3b. Does child formulaic gesture use predict child productive vocabulary?
4a. Is there a difference in parent or child emblem use between children with a smaller/larger vocabulary?
4b. Is there a difference in parent or child formulaic gesture use between children with a smaller/larger vocabulary?

The aim of this thesis is to investigate emblems and their occurrences in parent-child interaction during the child’s first two years and to test if emblem use facilitates first language acquisition in children. The thesis is exploratory since previous research on emblems is limited.
4. Method

The material in this study comes from an ongoing research project at Stockholm University. 20 children and their parents were recorded at seven different age points, playing freely in a lab environment. The seven age points are connected to the child’s productive vocabulary at 30 months. Emblems are conventional gestures and the use of emblems by children and by parents are examined.

4.1 Material

4.1.1 The MINT-project and SECDI

The MINT-project\(^1\) is an ongoing research project at the Department of Linguistics at Stockholm University. The project focuses on interaction between care-takers and their children, recording the child and his/her parent every three months from the age of three months until the child is four years. The project invited 2000 families living in Stockholm to participate in the study (Appendix A), all were randomly selected by the Swedish tax authorities. 85 children started the study, 72 children participated until the children were three years old and 70 children still participate in the study at four years. The project’s aim is to capture the interaction between parents and their children and to annotate the material to build a multimodal parent-child interactional corpus.

The Swedish Early Communicative Developmental Inventories, henceforth SECDI (Berglund and Eriksson, 2000a; 2000b), is a Swedish version of the MacArtur-Bates Communicative Developmental Inventories (Fenson, Reznick, Thal, Bates, Hartung, Pethick and Reilly, 1993). SECDI is a form in which the parents tick different words that their child produces. SECDI contains three parts, SECDI I words and gestures, SECDI II words and sentences and a third part that is called SCDI – containing grammatical information of the child’s language development. This thesis correlates the emblems to SECDI II-scores, words and sentences, at 30 months of age.

4.1.2 Sample subjects

This study included 20 children (10 girls, 10 boys) and their parents from the MINT-project. Emblem use by parents\(^2\) and children was examined during the sessions when the children were 6, 9, 12, 15, 18, 21 and, 24 months old. The children participating in the MINT-project were all born in August or September of 2013. The 20 children were chosen partly random and partly based on which children had already been annotated. Two of the children were fully annotated, while 12 of the children had one to five sessions fully annotated. These children were chosen for practical reasons. Six children were chosen randomly with two criteria: SECDI-scores had been reported at 30 months and, the sample should have balance between the two groups (high (n=10) and low (n =10) SECDI-score). Five of the sample children are bilingual, three in the high score group and two in the low score groups. None of the children in the sample has any reported developmental issues. All children are in preschool: three entered at the age of 12 months, 12 at the age of 18 months and five at the age of 24 months.

The families in this study were all living in the Stockholm area when invited to the project. The majority of the parents have a post-secondary education. All families but one have an annual income of at least 400.000 Swedish Kronas.

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\(^{1}\) Modelling child language acquisition from parent-child interaction, funded by Marcus and Amelia Wallenberg Foundation, MAW: 2011.007.

\(^{2}\) In one of the sessions a grandmother steps in for the parent.
4.1.3 Studio
The recording studio was a small room with three adjustable cameras set at the walls (Canon HDMI model X A10). The cameras were adjusted for every session so that the parent and the child were fitted in the picture. A go-pro camera (Go-Pro Hero 3) was placed on the parent’s chest to provide the annotators with an ideal angle of the child. The cameras have a condenser microphone (AKG SE 300 B), as a measure to link all video files together. Additionally, both the parent and the child were provided with a microphone (Sennheiser model eW 100 G2) each placed on their chest.

4.1.4 Data coding
Annotating the sessions is a big part of the MINT-project. The annotations are made in the software ELAN (Sloetjes and Wittenburg: 2008). This thesis includes 20 children at 7 different age points, a total of 140 sessions. Annotation takes time and is somewhat subjective. The annotators are not just transcribing speech, but facial expressions, touch, gestures and gaze as well. They follow a transcription key and when that does not cover a question raised by the material; they can discuss it at weekly meetings. The transcription key is regularly updated and fitted to all the ages of the children.

Parental gesture was annotated in one tier separately. Child gesture was annotated in one tier with a controlled vocabulary until the age of 6 months. From 9 months, child gesture was annotated manually in two tiers. This is because of small children’s tendency to do different things at the same time. The annotators consider primary and secondary gestures; primary gestures are tagged in the first tier and secondary in the second. Primary gestures are considered of higher rank than secondary. A primary gesture can be an emblem while a secondary gesture can be holding a toy without paying attention to it or actively doing something with the toy. If there were no hierarchy in the gestures, the tiers represent the right and the left hand or leg.

Deictic gestures (e.g. pointing with the hand, index finger, or by the use of the eyes) are not included in the data of this study, although they often do bear meaning translatable to a word or a phrase (e.g. over there, that one, you, I). This is due to previous research where deictic gestures often are categorized as a gesture-group standing alone from emblems (Capirici et al., 1996, Iverson et al., 1999, Andrén, 2010). Gestures that are made using toys or other objects are not included in this following (e.g. waving a doll’s hand is not tagged as an emblem. These restrictions were made to be able to compare the results to previous research.

The annotation of the 140 sessions was divided between 6 different annotators. 53 sessions had been fully annotated at the time of the present study and 87 sessions had not been transcribed beforehand and were annotated by the author. The annotators meet once a week to discuss unique or difficult situations in the material, to make sure that the annotators handle the material alike. Moreover, all sessions were manually double-checked; to make sure that the annotators had annotated emblems in the same manner. Lastly, emblems of the formulaic kind were investigated in the data, e.g. rolling the arms, with clenched fists for the song “the wheels on the bus”.

4.1.5 Definition of emblems in the transcription key
The definition in the transcription key for the annotators is: “conventional gestures such as waving, applauding, putting the index finger in front of the lips for hyssch etc.”. A gesture can also be described by usage of more than one subcategory: “A gesture can have several functions as ACTION and an EMBLEM for “peek-a-boo””.

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1 A controlled vocabulary in ELAN is a list with a set of different pre-determined alternatives (i.e. “wiggle with legs” or “grab left hand” etc.).
4.1.6 Coding issues

Emblems, as all language aspects, are context based and a movement in one context can be understood as an emblem while the same movement in another context is not. It is not only one body part or movement that decides what meaning the emblem has. Different facial expressions accompanying the same hand movement changes the interpretation of the emblem. For example, an emblem with both hands extended from the body with elbows down, palms facing up becomes different emblems depending on the facial expression used. If the eyebrows are raised, eyes wide open it means “all gone” while if the eyebrows are lowered possibly combined with a slight headshake it means “what happened?”. Differences between the emblems are presented in the figure below (figure 1).

![Figure 1. Differences in facial expression decides the emblem. The figure shows the “all gone” emblem to the left, with eyebrows raised, and the “what happened?” emblem, with eyebrows lowered. The difference of the translations is based on the facial expression. The hand movements are identical, elbows lowered and placed close to the body and hands up with palms facing up.](image)

4.2 Procedure

The parent-child dyads are recorded every three months, from the age of three months. The ambition is to capture the interaction that the children participate in during the child’s first years of development. All sessions are suited to the age of the children with different toys available. The sessions differ in the experimental part as well. Thus, from the age of three months until the age of nine months, the parent and the child interacts freely for 15-20 minutes. Approximately 10 minutes is without instruction, except for the instruction to interact as they normally do. After the free interaction time a researcher provides the parent with two books, one containing pictures of objects such as a lamp and a plane, the other containing familiar words and gestures used in parent-child interaction, e.g. “peek-a-boo” and clapping the hands. The parents are asked to use the books as an inspiration.

From the age of 12 months, a semi-structured experiment is included in the sessions. The parents play freely with their children for approximately 10 minutes, as before, but after the free interaction part a researcher joins the interaction with different games to test the children. At the ages of 9 and 12 months the book containing inspirational gestures is placed in the studio. The experiments have been the “going to bed-ritual”, “going to the doctor-ritual”, “tea party-ritual” and testing if the children understand prepositions (using a toy and instructing the child to put it behind, on, and, in front of something). In connection to the recordings the parents fill out a form online, SECDI, reporting on new produced words.
4.3 Ethical aspects

The MINT-project has provided the families with a confirmation form saying that they can stop their participation in the project at any time. All annotators have signed a contract restricting them to talk about the material in the project with people not included in the project. All children participating in the project are anonymized, identified with codes. The ethical aspects of the MINT-project are in accordance to The Swedish Data Protection Authority, The Ethical Review Board at Karolinska Institutet, The Personal Data Act, and The Act concerning the Ethical Review of Research Involving Humans.

4.4 Data processing

All the gesture tiers of the ELAN-files were exported to Microsoft Excel (2010). All emblems were counted. The thesis only considers the parents’ and the children’s frequency of emblems. The emblems and formulaic gestures were processed separately. Therefore, one excel file extracted the emblems as defined in this thesis from ELAN, another extracted the formulaic gestures from ELAN. The emblem mean per minute produced by the children as well as the parents was calculated in every file.

The analysis examined emblem use during free parent-child interaction, when the researcher had left the studio. All 72 children participating in the MINT-project were divided into two groups, one with high and one with low SECDI-score at 30 months. The division was made to answer if emblem use in parent-child interaction is related to child language acquisition, measured with productive vocabulary. The division was made arbitrary; based solely on the fact that the two groups would contain the same number of children on the high-side as the low-side. Ten of the children are assigned to in the high, and ten children are in the low SECDI-score group.

4.5 Data analysis

Table 1. Research questions and statistical tests conducted in the study. The table presents the research questions and what tests that were conducted to answer the research questions.

<table>
<thead>
<tr>
<th>Research question</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Does the parental emblem use predict child emblem use?</td>
<td>Linear regression on group level with mean emblem use for all children/parents. Group and individual linear regression analysis on child produced emblem percentage of parental emblems production.</td>
</tr>
<tr>
<td>2a/b. Does the parental emblem use/formulaic gesture use predict the child’s productive vocabulary?</td>
<td>Linear regression on each separate age point: 6, 9, 12, 15, 18, 21 and 24 months to productive vocabulary at 30 months.</td>
</tr>
<tr>
<td>3a/b. Does the child emblem use/formulaic gesture use predict the child’s productive vocabulary?</td>
<td>Linear regression on each separate age point: 6, 9, 12, 15, 18, 21 and 24 months to productive vocabulary at 30 months.</td>
</tr>
<tr>
<td>4a/b. Is there a difference between the parental/child emblem use by children with a smaller/larger productive vocabulary?</td>
<td>Two independent sample t-tests separately at each age point 6, 9, 12, 15, 18, 21 and 24 months.</td>
</tr>
</tbody>
</table>

http://www.epn.se/en/start/regulations/
The data analysis was handled in several different steps; question 1-3 was answered by linear regressions, while the fourth question was answered by independent sample t-tests.

The first research question, if parents emblem use predict child emblem use, was answered on group level: a mean value for the children at each age point correlated to a mean value for the parents at each age point. Another linear regression was conducted on group level: the mean of the children’s percentage performed emblems of the parents’ emblem use. On individual level, a linear regression was conducted on the child’s individual percentage performed emblems of his/her own parent’s performed emblems.

The second and third question, correlation between productive vocabulary and emblem/formulaic gesture use by parents and children, were all conducted by separate linear regressions for each age point.

The fourth question, if there are any differences in emblem/formulaic gesture use by parents or children between children with small/large productive vocabulary, was answered with independent sample t-tests for each age point separately.

The a-questions and the b-questions differ in what kind of emblems that were considered. A-questions consider emblems (2.2.1). These questions do not account for the formulaic gestures described in (2.2.2). B-questions only consider the formulaic gestures that are used to different songs or chants. The two different emblems examined forms are not summarized into a total in any of the research questions.
5. Results

The results of this study are presented in the same order as the research questions are formulated in section 3, with the linear regressions followed by t-tests.

5.1 Parental emblem use predicting child emblem use

Does parental emblem use predict child emblem use? This was answered by a linear regression analysis. The child mean are presented in Appendix B, where a table shows the emblem per minute for all children separately at every age point while Appendix C has a table showing the emblem per minute for every parent at each age point.

The regression analysis showed a significant correlation between the child mean and parent mean, the mean of the produced emblems by the children are correlated to the mean of the produced emblems by the parents, showing a strong correlation ($F(1,5) = 8.070; p < .05, R^2 = .617$).

![Figure 2](image.jpg)

*Figure 2. The figure shows a significant strong correlation ($F(1,5) = 8.070; p < .05, R^2 = .617$) between the child’s emblem use per minute at every age point and the parents’ emblem use per minute at the same age point.*
In figure 3, the mean emblem use by the parents and the children is presented. The visual inspection of the figure shows how emblem use by the children is increasing until the age of 21 months, but a plateau is shown at 18 months. The visual inspection of the figure also shows how the parents increase their emblem use with child age and a plateau at 18 months.

**Emblems during the child’s first two years**

![Graph showing emblem use by parents and children](image)

*Figure 3. The figure shows the mean of the parents’ emblem use per minute and the mean of the children’s emblem use per minute at all seven age points, 6, 9, 12, 15, 18, 21 and 24 months. The percentage presented is the child produced emblems percentage of the parental produced emblems.*

Another linear regression analysis was conducted on the percentage of how many emblems the children produced at every age point compared to parents. The percentages are presented in figure 3. The regression analyzed child emblem use percentage to parental mean emblem use and showed another significant value ($F(1,5) = 19.095; p < .05$) with a strong correlation ($R^2 = .792$).

Another regression analysis was conducted for the parental mean emblem correlated to child age. This test showed a strong correlation ($F(1,5) = 31.149; p = .01$, $R^2 = .862$) between parental emblems and child age, with a significant value. This linear regression is presented in figure 4.

The presented linear regressions above were conducted on a group mean, all the children and all the parents. A linear regression was also conducted on individual level: all children’s percentage of produced emblems of their parents’ emblem use, correlated to their parents’ emblem use in each session.
Figure 4. Linear regression analysis with parental emblem use and child age (F(1,5) = 31.149; p = .01, $R^2 = .862$). The figure shows that the mean of the parental emblem use correlates to child age, the emblem use is fitted to the age of the child.

The children’s increased percentage of their parents’ emblem production was tested. The linear regression showed that only four children had a significant prediction to produced emblems by their own parents emblem use; three parents’ emblem use predicted their own child emblem use and was found significant at a five percent significance level ((F(1,5) = 7.308; $R^2 = .594$), (F(1,5) = 8.000; $R^2 = .615$), (F(1,5) = 15.349), $R^2 = .754$); $p < .05$), while one child’s approach was significant at a 1 percent significance level (F(1,5) = 19.807; $p < .01$, $R^2 = .798$). All four of the children who correlated their percentage to parental emblems were children from the low vocabulary score group.

5.2 Parental emblem use predicting child productive vocabulary

Parental emblem use towards children corat 24 months was correlated to productive vocabulary at 30 months. The linear regression showed a correlation (F(1,18) = 5.740; $p < .05$, $R^2 = .242$) see figure 5.
Figure 5. Statistical significant linear regression analysis ($F(1,18) = 5.740; p < .05, R^2 = .242$). The figure shows that parental emblem use per minute at 24 months correlated to their child’s SECDI-score at 30 months.

5.3 Parental formulaic gestures predicting child productive vocabulary

There was no correlation between parental formulaic gestures and the children’s productive vocabulary at 30 months. Appendix D contains a table with the values of produced formulaic gestures per minute by the parents.

5.4 Child emblem use predicting child productive vocabulary

A correlation was found between the children’s number of emblems per minute at 15 months with their productive vocabulary at 30 months. The correlation was significant ($F(1,18) = 9.073; p < .01, R^2 = .335$). A correlation scatterplot is shown in figure 6.
Figure 6. The figure shows a correlation between child emblem use (emblem per minute) at 15 months and his/her productive vocabulary 30 months ($F(1,18) = 9.073; p < .01, R^2 = .335$).

5.5 Child formulaic gesture predicting productive vocabulary

There was no correlation found between produced formulaic gestures by the children and SECDI score at 30 months. Appendix E contains a table with the values of produced formulaic gestures per minute by each separate child. Formulaic gestures are not frequently used by children at these age points, only three children produced formulaic gestures.
5.6 Difference between lower/higher-score groups in emblem use

Figure 7. Productive vocabulary in the lower and higher SECDI-score groups. The figure shows the SECDI-score at 30 months for all 20 children in the study. The y-axes show the amount of produced words and the x-axes shows each individual child. The line divides the two groups, left of the line are the children with lower productive vocabulary and right of the line are the children with higher productive vocabulary.

Figure 7 shows the SECDI-score at 30 months for each child in this study. The graph is divided in the two groups by a line, with children with low scores to the left of the line and children with high scores to the right of the line. The figure shows how the child with the lowest score produced less than 50 words when s/he was 30 months old and the child with the highest score produced almost 700 words when s/he was 30 months old. Besides that, the figure shows a continuous scale. The child with the highest score in the low-score group has produced 20 words less than the child with the lowest score in the high-score group.

5.6.1 Parental difference in emblem use

No statistical significant difference was found between the parents’ emblem use in the high- and low SECDI-score groups. However, at 24 months a marginal tendency to difference was found ($t$ (18) = 2.065, $p$ = .054).

5.6.2 Child difference in emblem use

A difference was found between the children’s emblem use at 15 months ($t$ (18) = 3.052, $p$ < .05), showing a significant difference between the high and low-score SECDI-groups in production of emblems.

SECDI-scores for the two groups at 18, 21, 24, 27 and 30 months are presented in figure 8. The individual scores are not of interest, it is rather the group differences that are of interest at the different age points.
5.7 Difference between lower/higher-score groups in formulaic gestures

5.7.1 Parental difference in formulaic gestures

No significant differences were found between the parents’ formulaic gestures in the high- and low SECDI-score groups. Appendix D contains a table with all the individual parents’ use of formulaic gestures in the sessions.
5.7.2 Child difference in formulaic gestures

No differences in formulaic gesture use by the children in the high- and low SECDI-score groups were found. Only one child performed formulaic gestures at several age points, the child belonged to the high SECDI-score group. Appendix E contains a table with all the individual children’s formulaic gesture use.
6. Discussion

The discussion is divided into subsections. There is a method discussion and a result discussion. The method discussion concerns some problems with the categorization of gestures and the division of the sample into two groups. The result discussion provides the implication of the results and why emblems seem important to child language acquisition. A third subsection contains a more general discussion about emblems in parent-child interaction.

6.1 Method discussion

6.1.1 Motivation

The aim of this study was to examine emblem use and see if emblem use facilitates language acquisition. The study was conducted by examining frequency of emblem use in children and their parents at seven different age points, three during the child’s first year and four during the second year. Emblem frequency was further correlated with the child’s productive vocabulary at 30 months. The study examined 20 children.

The extensive use of data points combined with 20 children makes the data exhaustive when compared to previous research on gestures. Previous research has been made on what role gestures might have in language acquisition, but none of the studies were dedicated to emblems in comparison to productive vocabulary. Since previous research is sparse and based on yet smaller samples this thesis is explorative in nature.

Previous research has found maternal gestures to have a positive effect on language development (Iverson et al. 1999). It has also been found that maternal verbal translation of child gestures can affect the child’s word learning (Goldin-Meadow et al. 2007, Dimatrova et al. 2016). Therefore, this study examined emblem use by children as well as parents.

The sample of children was chosen partly random and partly based on finished annotated sessions from the MINT-project. Six children were chosen to be included in this study randomly. Though, there was a restriction saying that the parents had to have filled out the SECDI-form for the children at 30 months. Another restriction was that the children would have to fulfill the balance between the two groups of children, so that each group contained ten children each. Ideally, the sample children would have a more equal score in the groups. One of the children in the low SECDI-score group scored 100 words less than the next child. However, since the sample was randomized and the child did not have any reported developmental issues a substitution was not made.

Emblems are defined in this study as conventional gestures with a verbal equivalent. The emblem use in this study is translated into numbers. The investigation does not differentiate between different kinds of emblems, with one exception, formulaic gestures. All emblems as well as formulaic gestures in the study are presented as a mean emblem per minute, a measure that Andrén (2010) used when examining child emblems.

It is addressed by previous research that nods and headshakes can be used without having a communicative function (Gerholm, 2015), headshakes have sub-categorical meaning (Kendon, 2002). This is not considered a problem since the data is annotated by people with communicative skills and at least two years of linguistic education, all able to distinguish between the different uses of body movements and to determine whether a movement is an emblem or not.

Although, it is stated that all emblems are taken into account when analyzing the results, there was one exception which differentiated the emblems, formulaic gestures. Formulaic gestures have not, to my knowledge, been investigated before and there was an interest in exploring what role
they might have in language acquisition. The formulaic gestures differ from emblems in several ways: they are accompanying songs or chants, and are used in a predetermined manner. This, and the comparability to previous research, is why the analysis separated emblems from formulaic gestures, since formulaic gestures are a special case of emblems. However, formulaic gestures and emblems do have the conventionality in common.

6.1.2 The division of the groups

To be able to compare children with higher productive vocabulary to children with a lower productive vocabulary this study divided all 72 children that had participated in the MINT-project until the age of 30 months into two groups. This division was based on an even division of the groups, making sure that it was 36 children in each group. Therefore, the division is not based on a measure of how small or large a productive vocabulary should be for a typically developed child. The division makes it possible for the highest ranked child in the low-score group and the lowest ranked child in the high-score group to differ in a few words. This is the case in the sample where only 16 words differed between them. However, both the groups of the children include the extremes with very high and very low scores, as well as children who were within the average score in productive vocabulary.

6.1.3 Emblems depending on facial expression and context

A conventional gesture with a verbal equivalent accompanied or not accompanied by a verbalization, is the definition for emblems in this study. When annotating the data, it is evident that some of the emblems are identical in form but the facial expression is what determines the verbal equivalent. Emotions appear to play a particular role when interpreting the emblem.

Language is multimodal (Vigliocco et al. 2014) and so are emblems since emblems is decided not solely on the hand movement, or head movement but the movements and facial expressions combined. Levinson and Holler (2014) describes language as a “system of systems”, which seems to be a good description even when looking at emblems alone.

Shaking the head or nodding does not always bear negative or affirmative meaning; the head movement is not always an emblem (Gerholm, 2015; Kendon, 2002). A movement can in one context be an emblem and the same movement in another context could be meaningless, or have another meaning. The annotators of the material can see the difference between the emblems but how and when children manage to differentiate between the emblems and movements are yet to be discovered.

6.1.4 Reliability

The annotators follow a transcription key when transcribing sessions in the MINT-project. Although the MINT-project defines emblems as conventional gestures there was a decision made to double-check these 53 files to make sure that all files were comparable.

There were a few cases where an emblem had not been annotated as an emblem. The faulty annotations were removed from the material. The errors were present because of the definition of an emblem in this study of having a verbal translation and not to be performed with objects, something that is not specified in the transcription key, but a common restriction in research on gestures (Mayberry and Nicoladis, 2000). The beforehand transcribed data differed in a few cases, all because of this studies limitation, meaning that the transcribers agreement was very high.

The material for this study is 140 files. 53 files were fully annotated there were 87 files which had not been transcribed beforehand. These files were annotated by the author. Additionally, a meeting was set with the annotators in the project where random files were examined. If any uncertainty appeared, the gesture was performed to one or two of the annotators, or at the weekly meeting, along with a task for the others to transcribe the gesture. This was considered a test to see if a gesture would be classified as an emblem or not.
The formulaic gestures are defined as fixed gestures that accompany songs or chants. If any uncertainty appeared, a test for a fixed formulaic was asking the other transcribers to perform the formulaic gestures to the song. Or, the transcribers were asked to translate what song was being gesticulated, without singing, to see if the song had fixed gestures to it.

Productive vocabulary is represented with scores from SECDI II, words and sentences. SECDI has been proven a good measure of language development (Berglund and Eriksson, 2000b). Although, one should consider a possible difference between the parents’ interpretation of the produced words, some could be more generous while other parents are stricter in interpretation.

The MINT-project includes monolingual and bilingual children and the parents are asked to tick produced words in the SECDI-form regardless of what language the child has produced the word in. The productive vocabulary is not, in that way, based solely on word production in Swedish and the child’s true productive vocabulary is presented.

6.1.5 Validity

The intention with the MINT-projects is to capture what input the child is given during interaction in a representational way. The free interaction part is what this study has examined. This study has not differed between mothers and fathers and, in one case a grandmother. This is not considered to be a problem, since the MINT-project aims to capture the child’s input and both the parents stand for that in the child’s daily life. And in the case of the grandmother interacting with the child instead of a parent it is considered that the grandmother is being a regular part of the child’s daily life and interaction.

This study has examined the emblem use by 20 children and their parents. The children were, partly, randomly selected. The two extremes, the highest and lowest score, in the groups of children and their productive vocabulary size differed to a great degree: the child with the highest SECDI-score had a productive vocabulary of about 700 words while the child with the lowest SECDI-score had a productive vocabulary of about 30 words. However, most of the children were in the middle of each group. The groups do represent the differences in language skills between children when they are 30 months.

The difference in session time resulted in a mean-emblem per minute instead of a number per session. One number per session would make it easier to visualize the alternation of the emblem use. Ideally, all files would have been the same length. Most of the files were approximately 10 minutes, but some were not. This is the reason why an emblem mean per minute was used.

The first research question, if the parental emblem use predicts the child’s emblem use, is tested with a regression analysis. The analysis is not used as a measure of implication or causality but the correlation shows if the parental output and the child output correlates and, in that way, if they have a connection to each other. The linear regression is partly based on a mean for all the parents and all the children and partly based on an individual level, one child’s percentage of produced emblems correlated to his/her parent’s emblem use.

6.1.6 Generalizability

It is common that the subjects used in research are highly educated. This study is not an exception as the majority of the parents included in this sample had a university degree. Although this is the case, the sample does include families with lower education. The majority of the sample families have an annual income of at least 400.000 Swedish Kronas. The sample consists of middle class families.

Although all sample children had started preschool, they entered at three different ages. Additionally, the children in the sample had a great variation in productive vocabulary at 30 months; some with a low score others with a high score. Moreover, the MINT-project did not ask for only Swedish speaking families. Therefore, some of the children in this study are monolingual and others bilingual.
6.2 Result discussion

6.2.1 Parental emblem use predicting child emblem use

To answer it parental emblem use predicts child emblem use several regressions were conducted, one with a mean emblem use for all the children and a mean emblem use for all the parents. Another regression analysis was set for the mean percentage of emblem use correlated to a mean parental production of emblems for each child’s percentage of produced emblems correlated to its own parent’s emblem use per minute. There was an increase of performed percentage-of-parental-emblems over age, significantly. The mean emblem use by the children correlated with the mean emblem use by the parents.

Emblem use increased until the age of 21 months, with one exception at 18 months. Andrén (2010) followed five Swedish children once a month between 18 and 24 months and found that emblems had an increase between the ages of 18 and 21 months. This study’s results show how there is an increase of emblems between the same ages. The result of this study showed that the percentage of emblem use compared to parental emblem use increased with age. Though, a visual inspection of figure 3 (p. 13) shows an evidential plateau at 18 and decrease at 24 months. At 18 months, the parents also decreased their use of emblems. At 24 months, parents increase their use of emblems dramatically while the children decrease their use.

There were a few parents whose emblem use predicted their child’s emblem use significantly. This raised the question if the parental emblem use is modified to their child’s age, with a smaller degree of using emblems at the age of 6 months and a higher degree of use them at 24 months. It was evident that the mean parent emblem use increased when their children were 24 months (see figure 3, p. 13). Therefore, a test was conducted on parent emblem use correlated to child age. A significant result showed that parents match their use of emblems to the children’s age.

The results of the linear regressions on each individual parent-child dyad showed how the majority of the children did not match their parents’ emblem production significantly. A correlation was only found between four children and their parents. Is it not good for parental emblem use to predict child emblem use? The question arose by the fact that the four children who matched their parents’ production of emblems were all in the low SECDI-score group. The reason for the significant correlation can be that while most parents increased their emblem production in pace with their children’s age and/or with their children’s development of language skills, some of the parents did not increase the production as much.

It is known from previous research that children prefer CDS over ADS (Fernald et al. 1985) and all of the special features that the modified speech includes (Grieser and Kuhl: 1988, Fernald: 1989, Fernald: 1992). The modified speech is good for children and provides them with cues for segmentation (Theissen et al. 2005). The results of this study seem to add up one feature that adults modify when interacting with children, their gesture pattern of emblems. CDS has been shown to change along with child age (Rask, 2015) and parental emblem use was at its minimum at the first data point and increased along with the age of the children, although with one exception.

6.2.2 Parental emblems predicting child productive vocabulary

Some children from the low SECDI-score group showed a significant correlation between their increasing percentages emblem use of their parents’ emblem use. In the previous section, it was discussed if it was because of these parents not increasing their emblem use along with child age. A linear regression showed a prediction at 24 months between parental emblems and child productive vocabulary, meaning that fewer emblems predicted smaller productive vocabulary and more emblems predicted larger productive vocabulary. Giving the impression that parents match their use of emblems to something else than just child age, possibly the communication partners’ language skills.
When the children were 24 months they decreased their use of emblems (see figure 3, p. 13) while the parents increased their use. The linear regression analysis between parental emblem use at 24 months and child productive vocabulary at 30 months had a moderate correlation value, although significant.

6.2.3 Parental formulaic gestures predicting child productive vocabulary

This thesis has included fixed gestures that are accompanying songs or chants. I have chosen to call them formulaic gestures, because of their similarity to Wray’s (1999) description of fixed formulaic, a subcategory to formulaic language. The formulaic gestures are gestures that are a necessary part of the song or chant. The data in this study showed that most of the parents did use these gestures in at least one session. However, the data did not contain much formulaic gestures and no correlation between formulaic gestures and productive vocabulary was found. This could depend on the small dataset.

6.2.4 Child emblem use predicting productive vocabulary

It is shown that the children who produced more emblems at 15 months also had a greater productive vocabulary at 30 months; the linear regression analysis showed that child emblem use at 15 months predicts child productive vocabulary. The results of 15-month old’s gestures predicting the child’s productive vocabulary 15 months later is similar to the results that Capirici et al. (1996) found, when produced gestures combined with words performed by 16-month olds predicted their language skills at 20 months.

Gestures do not merely have the purpose of gaining attention in parent-child interaction as Schnur and Shartz’s (1984) results showed. Rauscher et al. (1996) found that restricting people from using hand movements during conversation caused the conversation to contain more interruptions than conversations without this restriction. The correlation that this study found between bigger productive vocabulary and more produced emblems does indicate that gestures could have a possible connection to lexical access. Rauscher’s et al. (1996) results indicate gesture working as a help while communicating. It is suggested by Goldin-Meadow (2009) that gestures reflect language knowledge; the result of this study reinforces the suggestion.

6.2.5 Child formulaic gestures predicting productive vocabulary

Formulaic gestures produced by children did not predict the productive vocabulary at any of the age points. Only three children performed formulaic gestures, at four different age points. Because of this, it is taken as the data being too small for any correlation tests to be significant.

6.2.6 Differences between the groups in emblem use

A prediction of child productive vocabulary and parental emblem use was only found at 24 months. But, no difference between the high- and low SECDI-score groups were found. The t-test does not show how the groups differ, it shows if they differ (Appendix C contains the values for all ages for the reader who wants to examine in a stricter sense). At 24 months there was a marginal tendency of significant difference between groups of parents. A larger sample is needed to conclude differences between groups of parents at this age point.

Goldin-Meadow et al. (2007) and Dimatrova et al. (2016) found parental translation of child gestures to play a role in word learning. One suggestion is that the parents provided the children with the high SECDI-score provided their children with more input, i.e. produced more emblems, than the parents to the children in the low SECDI-score group. It could be the case that they did produce more emblems and that parental emblem input plays a role in child language acquisition. However, since a difference was not found between the groups, further research is needed. Iverson et al. (1999) found maternal gesture to have a positive effect on the children’s communicative repertoires. Although a linear regression analysis for parental emblem use at 24
months showed a correlation with more emblems and larger productive vocabulary, no significant difference were found. Therefore, further research is needed to conclude that a high quantity of emblems by parents facilitates child language acquisition.

Child emblem use at 15 months correlated to child productive vocabulary which is just a few months before the vocabulary spurt is documented as normally occurring (Goldfield and Reznick 1990). It could be the case that the difference between the children in the groups could be an indication of the high score group soon experiencing a vocabulary spurt. Mervis and Bertrand (1995) found that all children do experience the vocabulary spurt but some children could experience it later than others. This is strengthened by this study’s result (see figure 8, p. 18).

It could also be the case that emblems have a strong connection to the productive vocabulary at the same point and since this study only compares emblem use to one age point later in time this cannot be answered here. The children in the low score group had not developed in language production as much as the high score group and were not close to the 50-word level, which Benedict (1977) described as the point where the children’s vocabulary spurt begins. The vocabulary curves for the high- and low SECDI-score groups show how the children in the low score group had not reached 50 words, while most of the children in the high score group had (see figure 8, p. 18). The result indicates that emblem use at 15 months not only predicts productive vocabulary at 30 months but it is also a hint whether a vocabulary spurt will occur within a short period of time or not.

Language delay can be predicted by analyzing gesture production between 18-30 months (Sauer et al. 2010). The results of this study showed a difference in the emblem use between high- and low SECDI-score groups at 15 months, and a statistically significant correlation to productive vocabulary at 30 months, suggesting that language delay can be predicted earlier than Sauer et al. (2010) found. However, one should take into consideration that this study has not divided the children in a typically-developed group and a language-delay group and is not based on how many words a typically developed child should be able to produce.

6.2.7 Differences between the groups in formulaic gesture use

A t-test was conducted on the parents’ formulaic gestures, the parents of the children on the high- and low SECDI-score groups. No differences were found between the groups of parents emblem use (Appendix D contains the values for each parent).

No differences between the two groups of children’s formulaic gesture use were found. Only three children did use formulaic gestures at four age points. At three age points, only one child performed formulaic gestures. The child that produced formulaic gestures at several age points is also the child with the highest score on SECDI. Therefore, it is interpreted as if the usage of formulaic gestures in some way could be connected to a larger vocabulary (Appendix E). More research on formulaic gestures is needed to conclude if they are beneficial to language development.

Formulaic gestures are not used to a large extent by the children in the sample. It could depend on that formulaic gestures are bound to context and if the parent is not singing a song or chant it is not likely that the child will produce the formulaic gestures. Very few formulaic gestures occur in the sample. Probably because of the sample size used in this study is too small. Appendices D and E contain the values of produced formulaic gestures in the sessions, D for each parent and E for each child. The tables show that there is less as well as smaller values than the appendices for emblem use (B and C).

6.3 Emblems in parent-child interaction

What is it about emblems that are special? The gesture having a verbal equivalent and being conventional makes it different from other gestures (Ekman and Friesen, 1969, Kendon, 2004). What do we need classifications for? Can emblems be considered a subcategory to speech instead
of a subcategory to gesture, or, are the function of emblems closer to speech than gestures? Emblems are expressions that are between speech and gesture. To use an emblem with communicative meaning one must understand the meaning of the emblem. Emblems were most commonly used from the age of 12 months where the first word is usually produced (Kuhl, 2004). When studying emblems', the distinction between emblems and speech becomes vague. The distinction between emblems and other gestures also becomes imprecise. Like all language and gestures, emblems are depending on context for interpretation. Somehow, this is acquired by the children.

While examining emblems it becomes evident that emblems do have different functions in parent-child interaction. Sometimes it bears communicative meaning, as nodding, and sometimes it is used as part of play, as the “peek-a-boo”-emblem. Some emblems are iconic, actions or emotive emblems, as described in the transcription key for the MINT-project (see section 4.1.5) and can therefore be categorized as multiple gesture types in one. Deictic gestures can also be an emblem, although excluded in this material due to comparison to previous research. These characteristics of an emblem make one doubt the way to investigate gestures with several subcategories. It seems as if the categorization of gestures is inappropriate. Emblems could qualify in many, if not all, subcategories. It may be that emblems are special because of their ability to qualify in several subcategories. In this sense they resemble words, as words often change meaning depending on context yet they remain in the same form.

Some gestures are produced by children before they are able to talk (Bates, 1976) but emblem use is shown to increase as the children get older, starting for most children at 12 months. In the sample, two children produced emblems at 9 months, most used emblems from 12 months but there are children in the sample that did not use emblems until later than 12 months (Appendix B). This, together with the fact that children learn to differentiate between the same emblems in different contexts speaks for the claim that language learning is not only learning how to speak but also how to gesture while speaking (Goldin-Meadow, 2014).

This study has shown the importance of emblems in parent-child interaction. Parents adjust their use of emblems to their child's age and, potentially, language skills. Parental emblem use when the child is 24 months predicts child productive vocabulary at 30 months. The child’s emblem use at 15 months predicts his/her language skills at 30 months. No differences of the groups of parents or children were found in the use of formulaic gestures, and there was no correlation found to productive vocabulary. The t-tests that were conducted did not show a difference and no correlation was found to productive vocabulary. This result is taken as a fault of a too small sample rather than a non-existing relationship, considering that the formulaic gestures were not being used in as large an extent as emblems.

6.4 Ideas for future research

Future research needs to address whether emblems with and without verbalization differ in some ways, for example in relation to productive vocabulary. There is also a need for further research to conclude that a high quantity of emblems by parents facilitates child language acquisition.

Additionally, a similar study is needed focusing on formulaic gestures. This study could not find any correlation between formulaic gestures and productive vocabulary at 30 months, and no differences were found between the parental groups or between the child groups with smaller/larger productive vocabulary. However, the child with the highest productive vocabulary used these and therefore, a similar study with a larger sample and a somewhat later time-span is needed, for instance, between the ages of 2 and 4 years.

Furthermore, future studies need to explore the different kinds of emblems used in parent-child interaction, to find out which are the most frequently used and/or the ones that facilitates language acquisition. This study is limited to frequency and has not categorized the emblem-kinds of gestures used in parent-child interaction.
7. Conclusion

The aim of this thesis was to investigate emblem use in parent-child interaction during the child’s first two years and to investigate if emblem use facilitates child language acquisition. The research questions and the answers follow:

Does the parental emblem use predict child emblem use?

This was answered by several linear regressions on group level as well as individual level. The children did approach their parent’s use of emblems when it was measured at group level. On individual level only four children approached their parents, all four in the low SECDI-score group. It is discussed how this could depend on the fact that the parents in the low SECDI-score group did not increase their emblem use dramatically along with the child’s age.

Does the parental emblem use predict child productive vocabulary?

A regression analysis showed how parental emblem use at 24 months correlated to child productive vocabulary. It was discussed if parents match their use of emblems to something other than just child age, possibly the communication partners’ language skills.

Does the parental/child formulaic gesture use predict child productive vocabulary?

No correlation was found between formulaic gestures and productive vocabulary, either produced by the parents or the children. It was discussed if this depends on the data of formulaic gestures being too small or if formulaic gestures do not have an important role in language acquisition.

Does the child emblem use predict child productive vocabulary?

A linear regression showed that the children’s emblem use at 15 months correlated to their productive vocabulary at 30 months. The result is in line with previous research where gesture use at 16 months predicted language skills at 20 months. It was also discussed how emblem use at 15 months could predict if a vocabulary spurt will occur within a short period of time.

Is there a difference in parental or the children’s emblem use between children with smaller/larger productive vocabulary?

Differences were found between the groups of high and low SECDI-score. The groups of parents had no significant difference at any age point. The groups of children differed significantly at 15 months, where a correlation was found between emblem use and productive vocabulary.

Is there a difference in parental or the children’s formulaic gesture use between the children with smaller/larger productive vocabulary?

No differences between the groups of parents were found at any age points. No differences were found between the groups of children at any age points. Formulaic gestures were not used to as large extent as emblems, therefore it is considered that the data was too small to find differences between the groups as well as correlations to productive vocabulary.

Results indicated that parents adjust their emblem use towards their children depending on child age and potentially language skills and a discussion on if child directed gesturing is present in parent-child interaction was conducted. Emblem use by the children was shown to develop as the children grew older. Zero emblems were produced at 6 months and as the child got older, with two exceptions, 18 and 24 months, emblem use increased. Emblem use started most commonly around 12 months, where the first word usually is pronounced.
References

Andrén, Mats. 2010. Children’s Gestures from 18 to 30 Months. Centre for Languages and Literature, Lund University


McRoberts, Gerald, W., McDonough, Colleen and Lakusta, Laura. 2009. The role of verbal repetition in the development of infant speech preferences from 4 to 14 months of age. Infancy 14(2), 162-194.


Bästa föräldrar!

Vill ni delta med ert barn i ett forskningsprojekt om barns språkutveckling? Med detta brev vill vi presentera vårt forskningsprojekt ”MINT - Modellering av interaktion” vid Institutionen för lingvistik, Stockholms universitet (Frescati).


Trots att resultaten är av stort vetenskapligt intresse kan vi inte ersätta er ekonomiskt för deltagandet. Däremot kan vi erbjuda kopior av alla ordlistor som ni fyller i som en dokumentation av ert barns ordförråd. Vi hoppas att dessa, och även våra kontinuerliga kontakter, ska kunna ge värdefull insikt i ert barns språkutveckling.

Nedan följer mer omfattande information om projektet, metoden och informationsbehandlingen, samt detaljerad information om hur ni hittar till oss på Stockholms universitet. Om ni är
intresserade av att delta i vårt projekt anmäler ni ert intresse genom att fylla i och skicka den medföljande **anmälningsblanketten**. När vi fått blanketten, kontaktar vi er för tidsbokning och eventuellt ytterligare information per telefon. Vill ni komma i kontakt med oss går det bra att lämna ett meddelande på vår telefonsvarare, tel. nr 08-16 19 32, så ringer vi upp, alternativt via e-post: eevak@ling.su.se.

**Information om forskningsprojektet MINT**

I forskningsprojektet undersöks olika aspekter av barns tidiga utveckling av språk. Undersökningarna utförs av personal och studenter under handledning vid institutionen för lingvistik, Stockholms universitet. Ansvariga för projektet är Tove Gerholm och Eeva Klintfors.

**Studiens syfte**

Under de första levnadsåren börjar barnet förstå att ord refererar till olika föremål eller situationer i omgivningen. Föräldrar och andra vuxna i barnets omgivning är delaktiga i denna process genom att interagera och samtala med barnet. Projektets syfte är att studera barnets inlärning av ord, joller- och språkutveckling, samt samspelet mellan förälder och barn.

**Etiska aspekter och sekretess**

Följande personuppgifter ingår i undersökningen: barnets namn och kön, beräknat och faktiskt födelsedatum, födelsevikt, föräldrars namn, adress och telefonnummer, språk som talas hemma hos barnet, antal äldre och yngre syskon samt eventuell förekomst av öroninflammation. Ni har rätt att när som helst och utan vidare förklaringar ta del av informationen eller begära att era personuppgifter tas bort. Vid bearbetning och presentation av resultaten i vetenskapliga sammanhang kommer materialet att vara avidentifierat och sammanställt per åldersgrupp.

**Hur visar jag mitt intresse?**

Är ni intresserade av att delta med ert barn i denna undersökning anmäler ni er genom att fylla i medföljande blankett och skicka den till oss i det bifogade förfrankerade kuvertet. Vi kommer att kontakta er så fort som möjligt för att boka in tid och kan då svara på eventuella frågor. Om ni kommer med bil får ni ett särskilt tillstånd för fri parkering av oss.

Välkomna till vårt fonetiklaboratorium och ett stort tack för att ni hjälper oss inom forskningen om tidig språkutveckling!

![signature]

Tove Gerholm  
FD

Eeva Klintfors  
FD

---

http://www.epn.se/start/bakgrundbestamnelser/lagar-och-foerordningar.aspx
Appendix B – Mean emblem per child

Table 2. Mean amount of emblems per minute produced by every separate child in every session at the different age points. The table shows the separate mean emblem per minute for each child, the sum is presented in Figure 2 (p. 13).

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Appendix C – Mean emblem per parent

Table 3. Mean amount of emblems per minute produced by the parents, separately, in every session at the different age points. The table shows the separate mean emblem per minute for each parent, the sum is presented in Figure 2 (p. 13).

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Appendix D – Parent mean formulaic gesture

Table 4. Mean amount of formulaic gestures per minute produced by every separate parent in every session at the different age points. The table shows the separate mean formulaic gesture per minute for each parent.

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### Appendix E – Child mean formulaic gesture

Table 5. Mean amount of formulaic gestures per minute produced by every separate child in every session at the different age points. The table shows the separate mean formulaic gesture per minute for each child.

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