

Progress report: From Babbling to Speech
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The project "From Babbling to Speech" constitutes the Swedish part of a larger international project. The study is pursued in collaboration with the linguistic departments in Stanford, Paris and Padua. The aim of this work is to determine how and when the young child first acquires language specific phonetic and phonological characteristics from the ambient language. By observing children acquiring different mother tongues - American English, French, Japanese, Italian and Swedish - we hope to be able to define at what point and by what means this acquisition takes place.

Method

Six children, three girls and three boys are audio- and video-recorded on a bi-weekly basis, in their homes from the age of nine months until they spontaneously use 25 words in a recording session, the so called 25-word point. Each session lasts 30 minutes and consists of 20 minutes of mother-child interaction followed alternatively by 10 minutes of child playing alone with private toys or 10 minutes of child playing with a group of standardised toys brought by the assistant. One session per month is transcribed in order to determine the lexical stage of the child. At the 4- and 15-word point an extra recording is made to ensure sufficient data from these points. Six sessions, one each from the 0- and 25-word point and two each from the 4- and 15-word point are chosen for analysis. These word-points are chosen since they represent stable levels in the lexical development (Vihman and Ferguson 1986). It is expected that the child has at least twice the number of words in his/her total lexicon than that which occurs in a session. This means that the 4-word point is equivalent to a lexicon of at least 8 words and the 25-word point to at least 50. The word-point sessions are transcribed by two independent transcribers. For a transcription to be accepted as the basis for statistical analyses, agreement of at least 80 percent between the transcribers on place and manner for consonants and on number of syllables in the utterance is required. When the child is 13 and 16 months, an imitation test is made. This test is repeated if the child is older than 17 months when the 25-word point is reached. The aim of these tests and of the group of standardised toys mentioned earlier, is to allow for an evaluation of the cognitive development of the child. Once a month the assistant and the mother go through a questionnaire concerning the child's general communicative development. In connection with the imitation test mentioned above, they also go through a more detailed questionnaire of the same type. The mother is asked to keep a diary on the child's lexical and general communicative development.

What constitutes a "word" ?

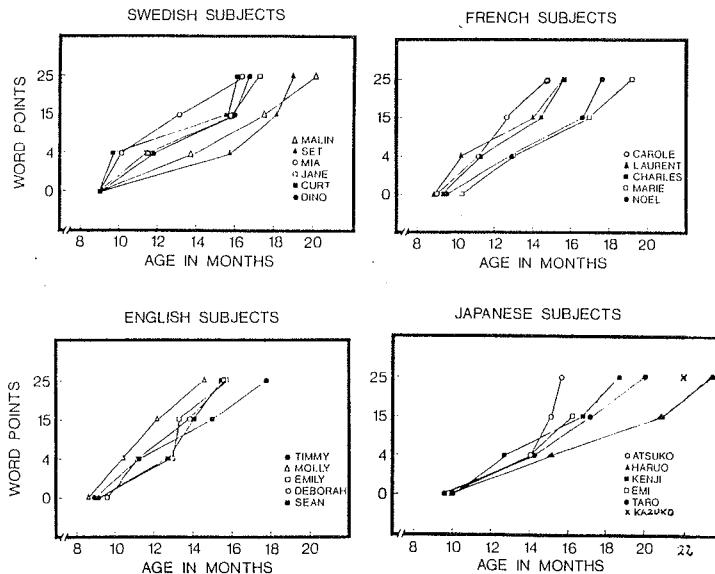
In order to determine the lexical stage of a child, it is necessary to identify the words that the child is using. A method of distinguishing early words from babbling has been developed at Stanford by Lorraine McCune and Marilyn Vihman (1988). My colleague Ingrid Landberg will describe this method in greater detail in the following presentation. Here it is sufficient to say that there are a number of criteria which a

vocalization suspected of being a word must meet in order to achieve "word-status". First of all, the vocalization must meet the criteria of plausible form and plausible context, whereby it achieves the status of "word-candidate" and is awarded two points, one for form and one for context. Each word-candidate must thereafter meet a number of additional criteria in order to be accepted as a word. Each criteria met is rewarded by a point. A word-candidate must achieve at least five points in order to be accepted as a word.

Analysis

The groups are analysed with respect to certain phonetic and phonological characteristics. These are tentatively divided into universal and language specific. The universal features are those that can be expected to occur in all children, irrespective of language background, these are: reduplicated babbling by ten months of age, preference for open syllables, single consonants and front vowels. Further, it is expected that the amount of "true" consonants (not glottals and glides) will increase during the period studied and that stops will constitute at least 50 percent of these. The universal features can be said to be a result of the child being exposed to a human language in general.

Figure I



These Figures show the age of the individual children in the four language groups at the four word-points.

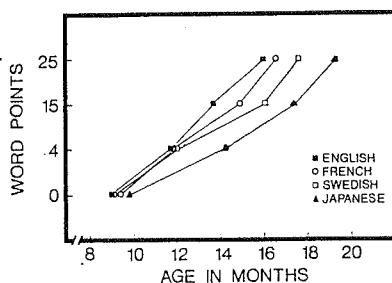
The language specific effects on the other hand, are those that can be said to result from the child being exposed to a specific language. These effects are divided into prosodic and segmental characteristics. The prosodic characteristics are: degree of reduction, length of vocalization, fundamental

frequency variation within words and vocalization closure. The segmental characteristics are: geminated (long) consonants, diphthongs, nasal vowels, front rounded vowels and liquids. The language groups are expected to differ in frequency of occurrence of these features. As mentioned earlier, six recording sessions will be analysed. The analysis consists of frequency counts of phonetic symbols and additional acoustic analysis. Further, certain parts of the mother's speech to the child will be analysed. This procedure is the same in the five research groups and constitutes the basis for comparison between them.

Preliminary results

The recordings have been completed in the English, French, Japanese and Swedish groups. In the Italian group the recordings have just begun. In Figure I we see the age of the individual children at the four word-points for the four language groups. From this Figure we conclude that the individual variation within each group is quite large. In the Swedish, French and English groups there appears to be a relatively stable amount of individual variation across time while in the Japanese group, it seems to increase. In Figure II we see the mean for each of the four language groups at the four word-points. We see that the Japanese children as a group, reach the 4-word point, about two months later than the others. The mean age in the English, French and Swedish groups lies at 12 months while the Japanese have a mean age of 14 months. At the 15-word point the four groups have spread over a three month period in the order from earliest to latest: English, French, Swedish and Japanese. This order remains at the 25-word point. Again, we want to stress that these are preliminary results that might be subject to later revision.

Figure II
LANGUAGE GROUPS



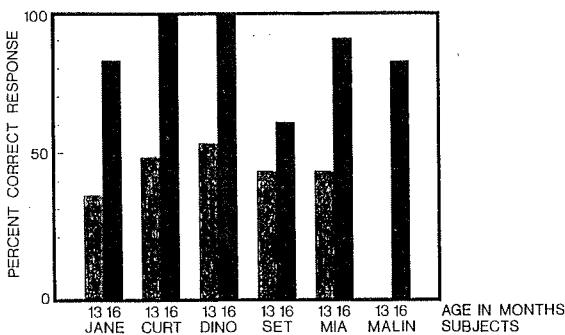
This Figure shows the mean in age at the four word-points.

We also want to point out that the individual variation within each group is so large that it seems difficult to draw any direct conclusions about language specific effects based on these data only. Even if it is too early to say anything definite about when and how the language groups differ, there are some characteristics which seem to surface differently in the groups. One such characteristic is the occurrence of longer babbling sequences, known as jargon. French and Japanese are traditionally analysed as having longer surface phonological

units than Swedish and English (Ferguson 1985). This is supposed to be reflected in a higher occurrence of polysyllabic vocalizations in the French and Japanese infants. This expected difference seems to be confirmed by the available data. Further, there appears to be a difference in the use of final consonants. The English infants have a higher use of final consonants than do the Japanese and French. There also appears to be a difference in preference of manner of articulation for consonants, so that the English group shows a higher proportion of stops while the French have a more even distribution of stops, fricatives, nasals and laterals.

In Figure III we present the results from the imitation test at 13 and 16 months. From the histogram we read that there is a dramatic increase in performance between 13 and 16 months. The tendency to imitate increases by 47 percent in three months (if the sixth child, Malin is excluded, the increase drops to 39 percent but is still impressive). Four of the children have reached their 4-word points by the time the 13-month test is conducted. The same four children have reached their 15-word point by 16 months and they all have over 80 percent correct responses at that test. The fifth child (Set) is just as successful as the other four at 13 months but fails to do as well at 16 months. The sixth child (Malin), does not respond correctly at all at 13 months but does as well as the first four at 16 months. Both these children (Set and Malin) were the last to reach the 4-, 15- and 25-word points. The purpose of this test is to determine whether the tendency to imitate can be correlated with the lexical development. A tentative conclusion is that there seems to be a correlation between these two factors so that the lexical "spurt" that occurs between the 4- and 15-word point co-occurs and to a certain extent might be said to depend on, an increased imitative ability.

Figure III



This Figure shows percent correct response of the four Swedish children at 13 and 16 months imitation test.

A final report on the Swedish findings of this project should be available by autumn 1989.

References

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