AKADEMIE FÜR MEDIZIN UND THERAPIE

Success in learning words: highly dependency on the strength of the input

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Introduction & Theoretical background

The therapy project „Lexical and syntactical therapy in children with multiple developmental disorders and late talker profile (LST-LTS-Project)" is a project to measure effectivity and effectiveness of input-oriented language therapy in children from 2 years onwards. The existing data gives strong evidence that learning form input in therapy contexts is effective, when the modeling of the speech-language-therapist (SLT) exceeds a certain strength level (Herzog-Meinecke & Siegmüller 2008). Modeling as an intervention procedure replicates and intensifies natural language learning conditions. To intensify means - the SLT produces an atypically large number of examples of the target linguistic structure for the particular child, with no expectation of any response in terms of language production by the child (McLean & Cripe 1997: 356). In the past, modeling was defined as providing a higher frequency of the target structure (Dannenbauer 1994). In the LST-LTS-Project this method was further developed.

Following the methodological guidelines of the *Patholinguistic Therapy Approach* (PLAN; Siegmüller & Kauschke 2006), the modeling of input can be realized in two ways:

- as a sequence (the SLT prepares a story which is read to the child)
- as an interactive setting (SLT plays with child and provides input during play)

In the LST-LTS-Project we developed a formula in order to measure the strength of the presented language input (strong or weak inputlevel):

$$\frac{\text{Number of sentences with target structure}}{\text{Number of uttered sentences during modeling}} = \text{input level (between 0 and 1)}$$

The closer the computed fraction is to 1, the stronger is the input level. We classified the input level as *strong* when the fraction is 0.7 to 1.0, and *middle* when the result ranges from 0.4 to 0.69. A fraction below 0.39 represents a *weak* input level. This categorization allows to evaluate the learning behavior of the child in an innovative way: The stronger the input level is, the easier the child shall acquire the target structure.

The aim of this single-case-study is to document the child learning behavior during such an input-oriented therapy process and to relate successful and failed learning modeling situations to the rate of the input level.

Subject

Jerry is a 3-years-and-7-months-old boy with diagnosed specific language disorder (SLI). At therapy start his language profile was recorded on the German CDI for children of one year of age (see table 1).

Table 1: Jerrys language profile at therapy start (oriented at ELFRA 1; Grimm 2000)

	Jerrys Lexicon
Number of types produced	10
Number of types comprehended	161
Number of gestures comprehended and produced	30

He produced his first words within the normal range (10th month of life), but showed a longer plateau after the acquisition of the word one and two. At the start of the therapy Jerry lacked word combinations of more than two words and showed problems in the comprehension of every-day-requests.

Description of the therapy

The aim of the therapy within the LST-LTS-Project is to establish the early lexicon of the children and to guide them into the vocabulary spurt. For this reason, Jerrys productive lexicon was documented with a total of 15 words (see figure 1). The composition of his lexicon corresponds to a young child of about 16 months. He lacks complex parts of speech, such as verbs, and uses mainly typical early words (personal-social words).

The therapy was oriented on the word list of the project (containing 166 words). From this list, Jerry´s lexicon was detracted. The first target word was *Opa* (*Grandpa*), which is word Nr. 12 on the list. For the first 8 sessions, one new word per session was introduced via modeling. In session 9, the number of new words per session was increased to two words; in session 21 to 3 words. The therapy solely aimed to increase Jerry´s comprehension abilities.

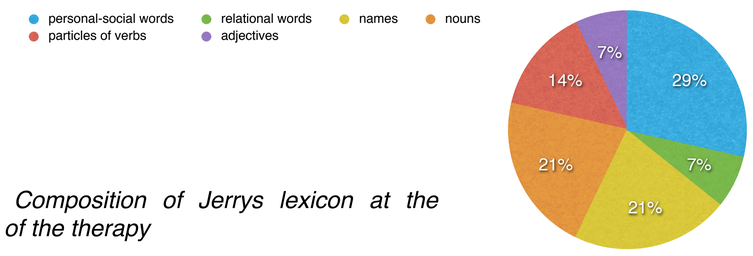

Figure 1: Composition of Jerrys lexicon at the beginning of the therapy

Results

Jerry learned to comprehend the new words. Furthermore, he began to produce words instantly within the therapy sessions and in everyday life. Figure 2 shows his learning rate of new words in comprehension and production. Overall, he showed a mean learning rate of 1.7 words per session (comprehension).

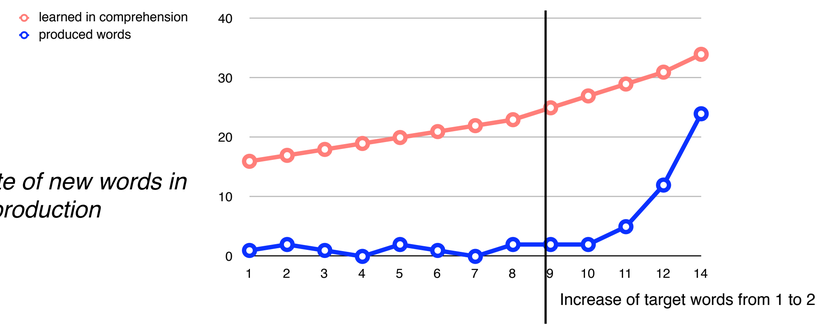

Figure 2: Learning rate of new words in comprehension and production

All input sequences in session 1-6 ranged from 0.7 to 0.85 (strong input level, see figure 3). From session 7 onwards the input level decreased to 0.6. In session 11, the SLT supposed that Jerry had reached the vocabulary spurt. The therapy additionally targeted now three-word-utterances, parallel lexical therapy was continued (session 12-24).

In the summer holidays (after session 14) the therapy paused. During this time Jerry learned only 2 words (within two months).

The therapy started again with an input level of 0.6. Jerry did not learn the target words. In the following session the input level was increased to 0.8. Jerry learned the target words. The therapy was carried on for 6 further sessions (total of 24 session lexical therapy + 4 sessions syntactical therapy).

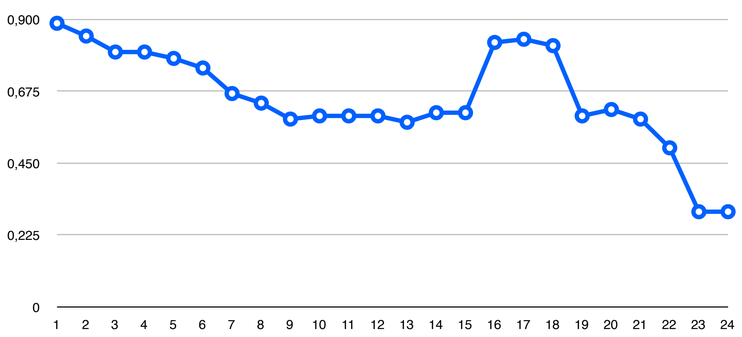

Figure 3: Documentation of the input level before and after summer holidays

Discussion

Jerry´s success in learning words before the summer holidays (session 1-14) depended on the strength of the input level. During the holidays, the everyday input provided not enough information for him to allow acquisition of new lexical representations. Furthermore, we needed to return to a higher input level, in order to get him into word learning again. After summer the input level was decreased systematically. After session 24 the input level was weak enough to match the everyday input level and lexical therapy ended.

Jerry provides strong data that intensifying linguistic target structures helps a child to acquire language. However, it does not prepare the child for process everyday input. Therefore SLTs need to decrease their modeling in terms of weaker input levels, before a therapy phase will be finished. This single case supports the view that input modeling is the strongest therapy method in the methodological pool of the intervention.

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