

# THE DEVELOPMENT OF SPEECH OF ESTONIAN CHILDREN AGED 2-3 YEARS AND IT`S RELATIONS WITH THE FACTORS OF THE HOME ENVIRONMENT

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## **Abstract**

*Language is a catalyst of cognitive change during early childhood. Identification and assessment are crucial in speech therapy, especially in early years. The aim of current research is focused in children between 2;0 and 3;11 years old – to test preschooler's comprehension of the language (RDSL) and active vocabulary (HYKS) Parents fulfil the questionnaire about the family's background. Research group: 333 children. The article provides an overview of the Estonian children's speech and language level and its dependence on children cultural, social and economical environments.*

**Key words:** *preschoolers speech development, home environment, RDSL - test, HYKS-test.*

## **Introduction**

During preschool age a child develops fast – the whole cognitive development during this period is closely related to speech and language development. Although during preschool age child's intellectual development undergoes important changes and these become expressed in speech, age-related speech and language development are very important. Early diagnostics of speech and language development disorders and speech therapy are an important condition of further age-related development.

Environment's importance for child's development compared to genes has been evaluated differently; in general it falls between 20-60% (Rowe, Jacobson, & Van den Oord, 1999). This difference is probably related to the differences in rearing environments. The more attention we pay to the quality of the rearing environment, the more we are able to support and help child's development. Thus, one can say that the rearing environment plays an important part in how and to what extent individual's intelligence becomes manifested. The environment can be supporting, but also restraining.

According to Gottfried, Gottfried, Bathurst, & Guerin (1994:167) rearing environment plays a very important role in child's intellectual development and development of skills.

When knowing the factors that influence child's speech and general development favourably, educational scientists are able to give parents suggestions about how to develop the child with success.

### *The speech and language relations with cognitive development*

Speaking is one type of human activities, which is guided and regulated by the functional system of speech. Analysis of speech look at the creation and perception of speech, the acquiring and use of speech, the oral and written speech and the inner speech (Karlep, 1998: 54). Man has the ability to use conditional symbols – signs that have a certain content and idea. Man’s ability to symbolise is most spectacularly expressed by human language, which is more elaborate than whatever artificially created sign system and more universal than all special sign systems altogether (Hint, 1978: 7-8). Speaking ability is most accurately viewed in its biological and social unity. Man has biological premises for learning to speak. The social aspect of the ability to speak lies in the fact that the biological premises are realised only in a group. Child needs a language environment and age related activities that activate communication. In case of limited communication the development of speech takes longer time (Karlep, 1998: 60). The fact that children learn in certain times and in certain order is determined by nature, while what exactly will they learn has to do with culture (Fukuyama, 2001: 168-169).

It appears that it is not so much possible to teach children to speak, since they rather learn it themselves. Although imitation and following a model are important factors in terms of language development, it has so far not been precisely found out, how exactly children start to speak. One principle is meaningful for early development – children learn to speak through speaking, thus creating possibilities for speaking is very important (Croft, 1995: 158). The point of view that children, who are not in a normal environment during the development of speech (0-36 months), also do not acquire equal results compared to their peers, even if their development is significantly stimulated, is absolutely understandable (Tod & Blamires, 2001; Daniels & Stafford, 2004).

In early childhood language is an indicator of cognitive development. During this period language has a multifunctional role in changing cognition and communication. The goal of language is to show the development of biological and socio-cultural situations; language is a means through which one passes on knowledge and culture. Vygotski analysed the relationship between play and development. Play is the basis for development, since it creates the zone of proximal development. In play a child is always one step ahead from his/her everyday behaviour and development. Play is related to changing needs, to the development of the motives of will, to the behaviour in the imaginary. All this makes play very relevant for child’s development, since through play a child develops. Therefore, play can be called the main activity of a child in preschool age or the main activity that directs development (Vygotski, 1966: 62-76). According to some studies children who do not play or who are paid very little attention to, have 30% less neuronal connections in the brain compared to their peers (Nash, 1997: 52).

Taking into account the relationship between speech and psychological processes enables to appoint the accomplishable level of learning, to understand what and in which situation the child speaks, how he/she comprehends speech, and which means of language he/she masters. Speech cannot develop and function apart from other psychological processes like perception, memory, thinking, and emotions (Karlep, 1998: 31).

As the child develops the mutual relationships between psychological processes undergo a change. In accordance with the developmental phase, the leading processes can be perception (4-5 years), memory (up to 12-14 years), and finally, thinking. During every step of development the content and comprehension of speech depends on the most leading process. At the same time speech in turn has an impact on accomplishing intellectual operations, thus, on psychological processes in general. Up to the age of 5 child’s psychological activities are dominated by perception – child explores the environment and gets to know it. On the bases of perceptions appear concrete and thereafter general memory images. The main function of memory during this phase is to recognise familiar objects. At first the child talks only about what he/she perceives – speech is situational and depends on child’s activities. Understanding speech too depends on the perceived situation. Approximately around the age of 5 memory develops fast and becomes the main cognitive process. Characteristic to this age is that perception intertwines with memory images, and develops speech, which is external to the situation. On the basis of egocentric speech develops inner speech, which allows to operate with memory

images and to start regulating its activities. Thinking becomes the main psychological process at the age of 12-14. Characteristic to this is the intertwining of perception, memory and thinking. On one hand perception and memory give material for thinking, on the other one remembers and recalls through thinking (Karlep, 1998; Wood, 2003; DeLoache, 2005).

## Methodology of Research

Speech therapists need in their work standardised tests, the use of which gives an objective evaluation to the level of child's speech and is an important bases for the diagnostics of speech and communication disorders and for planning further speech therapy. Such tests have so far been unavailable in Estonia and speech therapists have tried to develop child's language skills relying on their subjective professional experiences and skills.

When studying speech one must take into account the fact that testing is significantly more superficial than studying spontaneous speech, but is the only way how to control all necessary and/or planned units and the only means to observe a big group of children on equal bases (Bloch, 1996: 77). Administering tests should be one part of a complex study of the child. The (the research question of this work was, that Reynell test (*Reynell Developmental Language Scales III*) can be used for assessing the level of how well Estonian children comprehend language and HYKS test (*HYKS'in sanavarastotesti; Helsingin yliopistollinen keskussairaala = HYKS*) can be used for testing Estonian children's vocabulary and hypothetically there are no differences between girls and boys results. The aim of the current study is to find out children's level of comprehending language and vocabulary at the age of 2;0 to 3;11.

The questionnaire for parents tried to bring forth children's cultural, social and economic growth environments. Used was a semi-structured questionnaire, where the parent had to mark one suitable answer and in case there was none to add his/her own version. The questionnaire was created by the author of the current article.

Testing children took place in Tallinn children's institutions between September 2004 and January 2007. Testing was administered individually and depending on the child it took 30-50 minutes to complete the test. All children were tested by the author of the current article. Parents were asked to fill in a questionnaire within one week and in case they were interested, they received oral feedback about their child's verbal development.

Tests were taken in 12 day care centres in Tallinn. Altogether 333 children participated in the study. The sample of children included 164 girls (49%) and 169 boys (51%). After completing the test each child was praised irrespective of his/her result.

## Results of Research

In this article it will be describe relationships between the level of verbal development and home rearing environment conditions.

Many genetic effects become apparent through the genes-environment correlation. In an active gene-environment relationship individuals can unconsciously choose environments, which support their genetic potential. (Rowe, Jacobson, & Van den Oord, 1999). Bachmann and Maruste argue that differences in IQ are 70% determined by genes and 20% by the so-called shared environment factors and 10% by the unshared or specific environment factors or events, which have a different influence on family members. The richer the language and communication, the more developed and richer is the person.

### *The relationship between language development and the time for saying the first words*

Opinions about when do **the first words appear** vary among different authors, but the most common view is that child says his/her first real word around the first birthday. Studies by Smith and McCartney showed that the first word appears already in 8-month-old children (Oksaar, 1987). Chapman (1992) presumes that the first word appears in the 11th month. The studies of other authors argue that a child should have 10-12 words in his/her active vocabulary by the time

he/she is one year old, others find that an optimal number is 9 words. Nelson (1973) marks that more important than the age of when the first word appears should be considered the age when the child has 10 words. In Nelson's studies this was on average around 15 months.

Saying the first words cannot be considered to be a condition of the rearing environment, but it is undoubtedly an emotional sign about child's development. Parents marked 8 months as the youngest age for children to start saying words and 16 months as the oldest. According to parents the average age when children who participated in the study started to say their first words was 10.05 months. It appeared from the analyses of the responses that in all age groups those children who started to say words earlier, received also better results on the vocabulary test. Children who obtained better results said their first word on average at the age of **9.5** months, while children whose results were lower started at **10.6** months. There was, however, no statistically significant differences between the test results and saying the first words (the relationship with Reynell test was significant at  $p = 0.317$  and with HYKS test at  $p = 0.189$ ).

### *The relationship between language development and making the first steps*

In addition to verbal development in the first year of life children also make big progress in physical development (turning, crawling, sitting, walking) – the speed of this is expressed as motor intelligence. Studies show that the higher child's motor intelligence at the age of 12 months the earlier he/she says the first words (Veisson, 2001). According to literature children **make their first steps** around the first birthday, however, the parents of the children participating in the current study gave different results. The earliest first steps were made in the 5th month - probably parents of those children thought, that the first step was made with significant help from parents, not steps made completely independent - and the latest in the 16th month. On average children started to make their first steps at the age of 10.8 months.

When children were distributed into two groups according to the median of the test results, it appeared that in each age group those children who made their first steps earlier obtained also better results on tests. Those children who started to walk later, performed also worse on tests.

Children who received better results, started to walk on average at **10.6** months, while those who received weaker results started on average at **11.05** months.

Statistically significant differences ( $p = 0.045$ ) appeared between those groups of children who started to walk before the 8th month and those, who made their first steps later than 12th months.

### *The relationship between language development and reading a bed-time story*

**Listening to a bed time story** is an emotional activity, which is supposed to create a calm atmosphere and develop child's fantasy and imagination. The questionnaire given to parents allowed the following responses: every day, a couple of times per week, once a week, seldom, never. It appeared from parents' responses that on average 2/3 of the children listen to a bed time story every day or a couple of times a week. The story is predominantly read by mother (81%), while other family members do it significantly less frequently. Worrying is the result that 21% of children hear it seldom or never. On many cases parents had written a commentary that the child is still too small for a bed time story. At the same time it is possible to find age-related stories for every age. However, it is not clear from the responses whether this shows parents' unawareness or unwillingness.

Children who were read stories, obtained on average 6.3% better results. A statistically significant difference appeared in case of both: the Reynell test ( $p = 0.004$ ) and the HYLS test ( $p = 0.025$ ). Analysis of the research results indicates that as expected the biggest differences appeared between those children who hear a bed time story every day compared to those who are never read one. The difference is statistically significant both in case of the Reynell test ( $p = 0.001$ ) as well as the HYKS test results ( $p = 0.029$ ).

*The relationship between language development and parents' level of education*

The **educational level of parents** who participated in the current study was higher than the average of Estonia. Altogether 69% of parents had higher education (Bachelor's and Master's degree, diploma or applied secondary education), 23% had secondary education and 8% basic education. Nobody marked a lower educational level. The reason for this can be considered to be the fact that mostly young persons from Tallinn participated in the study, while the statistics from the census includes the whole population of Estonia. Of participating parents mothers had on average a higher education than fathers. 66% of the fathers and 73% of the mothers had higher education (Bachelor or Master's degree), 24% of the fathers and 21% of the mothers had secondary education, and 10% of fathers and 6% of mothers had basic education.

The educational level of mothers and fathers was moderately correlated ( $r = 0.392$ ), thus the educational level of both parents was rather likely equal.

Comparing the children of mothers with basic education to the children of mothers with a Master's degree, it appeared that in all age groups children, whose mothers had higher education, obtained better results. On average the children of mothers with higher education received 4% better results. It is important to note the fact that although all age groups had a tendency where children of mothers with higher education obtained better results on the vocabulary test, the differences between the results in all age groups were not absolute. However, in all age groups those children, whose mothers had basic education, obtained lower results compared to other children.

*The relationship between language development and parents' foreign language skills*

The parents of the children who participated in the current study were asked about their abilities **to communicate in a foreign language**. It is positive to note that only 4% of the parents lack a foreign language skill. 2/3 of the parents speak 2 or 3 foreign languages. Maximally, knowledge of 5 foreign languages was marked. Parents' foreign language skills might not have a direct relationship with child's language development, since parents do not communicate with children in foreign languages but in the mother tongue. However, foreign language skills in general show a wider range of interests, erudition, better linguistic competence, and more conscious attitude toward language as a means of communication.

When comparing the results of the children who participated in the study, an expected tendency emerged. Namely, children whose parents spoke more foreign languages obtained better results on the vocabulary test. When comparing the children of parents who do not speak foreign languages with those whose parents speak 3 or more other languages, it appeared that in every age group the latter obtained more points (Reynell test  $p = 0.008$ ; HYKS test  $p = 0.055$ ). On average, children whose parents spoke 3 or more languages received 6% better results compared to children whose parents spoke none or only one foreign language. Statistical analysis indicated that the correlation between foreign language skills of mothers/fathers and child's language development is small (with Reynell test  $r = 0.206$ /  $r = 0.186$  and HYKS test  $r = 0.188$ /  $r = 0.175$ ), but nevertheless statistically significant. Relations with mothers' foreign language skills were in case of the Reynell test significant at  $p = 0.022$  and HYKS test at  $p = 0.037$ . In case of fathers' foreign language skills the relationships were significant at  $p = 0.044$  and  $p = 0.059$  respectively.

*The relationship between language development and family income*

Parents of children who participated in the study were also asked about **the average income** per on family member. In case of these answers one must nevertheless take into account the fact, that since the time this questionnaire was first administered, changes in the Estonian economy have also significantly changed the average wage. In 2003 the average wage was 6723 croons and the average income per one member of the household was 2789 croons. By the year 2005 the average wage had increased to 8073 croons and the income per one household member was up to 3475 croons.

The most common income for one family member, in families that participated in the current

study, was 2000-5000 croons per month. 14% of the families had to manage with less than 2000 croons for one person, which means living under the poverty threshold. 4% of the respondents had marked their income per one family member to be over 10000 in month. The results of the study indicated that in every age group children from families with smaller incomes received less points on the vocabulary test compared to children from families with higher monthly incomes. When comparing the incomes of the families in the lower and the upper end – those who receive 2000 croons versus those who receive 10000 croons per one family member – it appears that on average children from families with very low incomes (up to 2000.-) obtained 12,4% lower results compared to children from families with high incomes (more than 10000).

There were no statistically significant differences in case of the different incomes neither with the Reynell test ( $p = 0.954$ ) nor the HYKS test ( $p = 0.365$ ). A reason for this could be the fact that the number of children in different income groups was very different. Family incomes had a very significant relation with the birth order of the child in the family ( $p = 0.002$ ) and the size of the family household ( $p = 0.000$ ).

### *The relationship between language development and the frequency of events attended outside home*

Parents were also asked questions about what **events outside home** the child, the mother, and the father attend together (cinema, theatre, concert, visiting friends, etc.). The responses were: several times a week, once a week, a couple of times in month, once a month, once a year, very seldom, not at all. It appeared that 71% of the children attend events outside home once or more times per week. 10% of the children go out once a month or less.

Without children parents go out significantly less often – 25% of parents go out once a year or even less. 5% of parents claim that they never go out. The questionnaire did not give much information about the reason for not going out – is it lack of interest, time or money. At the same time the tendency that the child is taken out a lot is in every way positive and it rather shows the interest of families to spend time together and expresses their wish to spend as much time as possible with the child.

The analyses of the study results tried to find out to what extent is taking the child to events outside home related to language development. In general the differences were in the limits of 1-2%. One exception was the age group from 2;6 to 2;11, in case of which the results of children who go out several times a week was 9% better from the results of children who go out once a month or less often.

There were no statistically significant differences in case of neither – the Reynell test ( $p = 0.364$ ) nor the HYKS test results ( $p = 0.943$ ).

## **Conclusions and Discussion**

The aim of the current study was to find out the level of 2 to 3 year old children's understanding of speech and vocabulary and to find relations between the level of language development and the conditions of the home rearing environment.

About 5% of preschool children have speech and language disorders and in case of different methods this indicator can be even up to 20% (Reynolds, 1995). Speech and language development disorders in early childhood are a big risk factor for developing later studying disorders and they are related to a qualitative lack in cognitive and social development. Therefore, early diagnosing and speech therapy are very important in terms of child's further development. In order to evaluate objectively the level of language development speech therapists need different speech and language tests. One of the aims of the current work was to adapt the Reynell and HYKS tests into Estonian language and to do a primary analysis of the results of Estonian children.

The hypothesis of this work about Reynell and HYKS tests eligibility was confirmed – those tests can be used for find out objective results about Estonian children's speech and language development. Using the chosen tests – Reynell test for comprehending language and HYKS vocabulary

test was justified. The obtained results were similar to those in the countries of origin of the tests (Reynell test in the UK and HYKS in Finland).

In general girls are considered to be verbally more talented and it is presumed that they outperform boys in terms of verbal development. The hypothesis about fact, that boys speech and language development is equal to girls, was assure partially, hereafter it is necessary to test more children to find out statistically significant results. Comparing the results of boys and girls, the results of girls were somewhat better and there were statistically significant differences in the results of the Reynell test ( $p = 0.021$ ). In case of the HYKS active vocabulary test the differences were not significant. Thus, one can conclude that girls are somewhat better in comprehending language compared to boys, but apparently there are no significant differences in their levels of vocabulary.

A lot of attention in recent years has been turned to the early rearing environment of children and its influence on child development side by side with heredity has been proved. According to different sources environment constitutes 20-60% in the development of intelligence, thus, one can presume that such difference in percentages is largely related to differences in rearing environments. The more we turn attention to the quality of the rearing environment, the more we are able to support and help the child through it.

According to the results of the study reading bed time stories has a good influence on child development. There were statistically significant differences in this area, while children who fell asleep with a bed time story had better results on tests. Although 2/3 of the children participating in the current study can hear a bed time story every evening, 1/5 of the children are never read a story in evenings. Young parents should be told about this traditional evening activity. One only needs to choose an appropriate literature suitable for the age and skills of the concrete child. Also previous researches in Estonia found out, that those children who can listen bedtime story, can have the highest intelligent ( $p=0.015$ ) (Veisson, 2001).

There was a tendency in all age groups that the results of the children whose mothers had basic education were lower from those children whose mothers had higher levels of education. However, children of parents who spoke more foreign languages, thus, were verbally better educated, obtained better results on tests. The researches makes earlier assess, that there is a strong correlation between mothers education and children's mental intelligent ( $r= 0.409$ ,  $p=0.012$ ) (Veisson, 2001).

The study showed that the majority of children in the current study came from families with average incomes. Economically well off families (more than 10000 croons per family member in month) made up only 4% of the sample, while 8% of the children live under the poverty threshold (less than 2000 croons per person). Since the number of children in different income groups was very different, the differences between different levels of language development were not statistically significant. The earlier researches in Estonia confirm – if the income for one person in family is bigger, then have children better language development ( $p= 0.010$ ) (Veisson, 2001).

The analyses of the study results tried to find out to what extent is attending children's events outside home related to the level of language development. In most cases the differences were around 1-2% and statistically not significant. It appeared that the majority of children (71%) go out with their parents at least once a week to events such as theatre, cinema, long walks, visiting friends, etc. About 10% of the children go out once a month or less frequently.

To sum it up, one can say that the earlier child starts to say the first words and the younger he/she starts to walk, the faster is his/her development of speech and language skills. The current article showed that from among the environmental factors observed reading bed time stories, higher educational level of mothers, parents' foreign language skills and family's material well-being have a positive influence on speech and language development.

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