

INVESTIGATION OF THE RECOGNITION OF OWN NAME IN BABIES FROM 4 TO 5 MONTHS: PILOT STUDY

Investigação do reconhecimento do próprio nome em bebês de 4 a 5 meses: estudo piloto

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ABSTRACT

Purpose: to verify that children aged between four and five months recognize their own names. **Method:** it is a cross-sectional study with 16 infants aged between four and five months, assessed by the Newborn Hearing Screening State Program (NHSP) in the Speech and Language Therapy Clinic of Hospital das Clínicas of Universidade Federal de Minas Gerais (HC – UFMG). In addition to the recognition test of the name, it was realized hearing and language assessment. A descriptive analysis of the variables of the study was held and the statistical analysis. Continuous variables were compared using the paired T test and it was considered a significance level of 5% and confidence coefficient of 95%. **Results:** it was verified a predominance of responses to recall the name itself, in most infants evaluated. **Conclusions:** on the basis of the criteria set out in this study, infants aged between four and five months are capable of recognize their own names.

KEYWORDS: Speech, Language and Hearing Sciences; Child Development; Hearing; Language; Speech Perception; Auditory Perception

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■ INTRODUCTION

The hearing is an important sensory pathway to the human development, mainly related to the development of the language, speech and psychosocial aspects. The language is permeated by biological, physiological, psychic e social processes, which the hearing acts as one of the facilitators in its acquisition and development¹. Accordingly, the recognition of the own name behind evidence of the acquisition process of the child's language, because it gives data about the hearing perceptiveness, the perceptual factors phonetic, phonological and prosodic aspects of the language and the relationship of the child with its surroundings.

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For the speech perception to occur, it's necessary an association of the sound with the sound source, which constitutes the final stage of the perception process. The absence of the association of the sound with the sound source can give clues about the perceptual process of the individual, which may present language alterations in function of the non integration of the cognitive abilities, like hearing memory, discrimination and localization of the sounds. The perception, comprehension, decoding and association of the speech language are facilitated by the redundancy of the message e depend on the integrity of the hearing pathways¹.

Some authors affirm that the recognition of the own name occurs from sixth month of life², but no empirical research was found about the theme. At four months of life some reflex responses disappears and the discrimination ability as well as the source sound search¹ are in developing, so it decided to investigate, experimentally, name recognition at this age.

Previous studies indicate children's preference for the sound of its own name³ and either the importance of the evaluation of auditory perception about to the memory, speech and auditory skills⁴. Other authors observed that it is by the recognition of the own name, the comprehension of other words becomes easier for the child⁵. The results of the researches that investigated the recognition of the own name in babies³ and used the method for responses with auditory stimulus⁴ were realized with the American population.

So, this research its important due the possibility of the application of the recognition test of the own name in the clinic practice, in order to equip professionals in primary health care, in a way that these

can detect possible alterations in the hearing and language development, in a simple and effective way.

The goal of this work was to verify if children aged four to five months recognize their own name, and to connect the data obtained with hearing and language evaluations and the recognition of the name.

■ METHOD

This is a transversal study. Were selected twenty-two children, of four to five months, with normal global development, selected by the analysis of records of the Universal Neonatal Hearing Screening Program, realized at the Speech and Hearing ambulatory in the Hospital Clinics of the Federal University of Minas Gerais and at the Division of Audiology. Finally, were included in the experiments sixteen children: nine with five months and seven with four months.

The inclusion criteria for this research were: be aged four to five months, normal results in the Universal Neonatal Hearing Screening, not have risk factors for hearing loss or development disorders, have a name that was in the list of the top 100 most common names (50 female and 50 male) – from data of the Universal Neonatal Hearing Screening Program, from January 2010 to March 2011; have families which Portuguese mother language, and also meet the criteria of the Questionnaire on linguistic experience of the child and the family about the first name, Figure 1, which are: have not the same name as one of the parents or caregivers and be not called by a nickname.

Child's name: _____
Mother's name: _____
Father's name: _____
D.O.B.: ___ / ___ / _____ **Age:** (On date of research) _____ **Sex:** () F () M

• Interview by telephone:

1. Any nicknames? () YES () NO Which? _____
2. Does the child have the same name as one of the parents? () YES () NO
3. By which name is the child called? () the first name () nickname
 () more than one name () "baby" () others: _____
4. Stays with a caregiver? () YES () NO
5. Who is the caregiver ?
 () mom () dad () babysitter () daycare () grandparents
 () other: _____
6. Caregiver's name: _____
7. How does the caregiver call the child? _____
8. Stays at a daycare? () YES () NO
9. How is the child called at the daycare? _____
10. Are there other children with the same name at the daycare? () YES () NO
11. Plays with other children with the same name in other places?
 () YES () NO. Which places? _____
12. Address: _____

• Interview on the research location:

1. Responds as She/He is called by the name? () YES () NO
2. Has a compound name? () YES () NO
 a) Is the child called by both names? () YES () NO
 b) By which name does she attend? _____
3. When did the child receive the name by the parents? _____
4. Since when was the child called by her own name? _____
5. In útero was the child already called by her name? () YES () NO. Since _____ months.
6. How many adults live in the house? _____
7. How many children in the house? _____ children. What ages? _____
8. Parents' education?
 a) Mother: () Elementary/Middle School () High School () Undergraduate/ () complete
 () incomplete
 b) Father: () Elementary/Middle School () High School () Undergraduate/ () complete
 () incomplete
9. Caregiver's education?
 () Elementary/Middle School () High School () Undergraduate/ () complete ()
 incomplete
10. Caregiver's age? _____ years old
11. How many hours does the child spend at the daycare? _____ hours
12. The daycare is () public () private
13. Since what age does the child stay at the daycare? _____

Figure 1 – Questionnaire on linguistic experience of the child and the family about the first name

The exclusion criteria were: neurological and visual disorders, recorded in the medical report; not accept to participate in this research and refuse to sign of the consent form, by the parents or the responsible adult; present inadequate results in the hearing and language evaluations.

The subjects selection included the following stages: selection of the most common names of the children from the Universal Neonatal Hearing Screening Program; drawing up a list that contained 100 names, 50 female and 50 male, for subsequent recording; study of the medical records and selection of babies, according with the criterias of inclusion and exclusion of the research.

The recording of the stimuli, the list of pairs of names, was done with a statement of appeal and extension of the last syllable, characteristics of the “motherese”⁶, by a female talker, Portuguese mother language. For the recording of the stimulus it was considered three categories of evocation, as follows: Category 1 (different length) – names with different number of syllables or oppositions between two syllables and polysyllabic words (example: Julia and Maria Eduarda); category 2 (same length) – names with the same number of syllables, but with different phonological composition (example: Lucas and Vitor), category 3 (same duration and phonetic similarity) – names with the same number of syllables and only one phoneme difference (example: Luan and Ruan). The criteria used in this step based on the assumption that babies are able to discriminate the duration of sound stimulus^{3,7}.

The next stage was the development of a questionnaire, about the linguistic experience of the child and family, related to the first name. Then, those responsible for the babies were invited by telephone to participate in the study. Then, if there was agreement to participate, the first part of the Questionnaire on linguistic experience of the child and the family about the first name was filled and the date for conducting the auditory, language evaluations and recognition of the name itself was scheduled.

On the day scheduled with the parents, to carry out the research in place, they were given information about the research and the second part of the Questionnaire on linguistic experience of the child and the family about the first name was completed. Then the parents signed consent form, upon agreement to participate in research.

The evaluations comprehended auditory, language aspects and recognition of the own name.

Hearing evaluation was composed of: a) otoscopy, whose objective was to verify the condition of the external ear canal and tympanic membrane; b) examination of the transient evocated otoacoustic

emissions (TEOAE) to verify the cochlear integrity. For this, it was used the Audix Biologic equipment; and c) evaluation of auditory behavior in order to investigate the auditory abilities. Children who responded within the normal range were referred for language evaluation.

The language evaluation was performed using the protocol adapted for children aged 0 to 24 months⁸. If the child had answers within normal limits, she was referred to the name recognition evaluation. If the child presented any alterations in the hearing or language evaluations, the child was sent to the Basic Health Unit.

The evaluation for the recognition of the own name followed the procedure below:

1. The child was referred to a sound-treated room, which contained a digital decibelimeter, Icel brand – model dl-4020 to control the intensity of the noise environment;
2. During testing the child sat on the lap of the mother or caregiver;
3. The mother or caregiver stayed with ear protector and earphones (C3 Tech brand – model voicer confort), in both ears, which had a musical stimulus, at comfortable levels, so that there was no interference in the responses of the child;
4. In front of the child it was a screen on which was displayed a DVD, *baby Einstein: Baby Bach / Musical Adventure* (The Walt Disney Company, 2004), no audio, appropriate to the age of the target population. All children watched the same film;
5. Were presented to the child name pairs in sequences randomly varied as to order and sides;
6. Each pair of names (the child’s name and another name) was presented and each name was repeated three times with an interval of 3 seconds at an average intensity of 60 decibels, sound intensity level (dBNIS). The stimuli were offered at a distance of 30 inches from the child’s ear, through two speakers (Polk Audio brand – Model Subwoofer PSW125). The evocation of the name was made with the statement of the appeal and prolonging the last syllable, features of the “motherese”.
7. During the name recognition evaluation the child was filmed using a camcorder, Sony brand – HDR-CX12 model, positioned in the face and above the child’s head, at 60 inches apart. Subsequently, the videos were analyzed. In the analysis were considered as criteria for name recognition: a) the displacement of the head and eyes toward the sound source, b) the

time of fixation of gaze at the sound source and
c) attention to the evocations.

All evaluations described occurred in a single meeting.

For analysis of the dates two judges were invited two judges, previously trained, which recorded, individually, the behavior of babies, setting double-blind method. The datas was entered into a database in Excel, version 2007, and subsequently conferred. In cases of disagreement between raters a third judge was called. The judges also signed the consent form, upon agreement of participation in the research.

This research was analysed and approved by the Research Ethics Committee of the Federal University of Minas Gerais, grant 0418.0.203.000-11.

For statistical analysis, it was adopted the Statistical Package for Social Sciences (SPSS), version 15.0 for windows – SPSS Incorporation, Chicago, Illinois, USA, 2008. In addition, descriptive analysis was performed of the variables used in the study. For the categorical variables were made frequency distribution tables. For continuous variables were used measures of central tendency and variability (mean, standard deviation, minimum and maximum). Continuous variables were compared using the paired T test, as it is from the continuous response variables, sample dependent and normally distributed. It was considered the significance level (p value) of 5% and a confidence coefficient of 95%.

■ RESULTS

Regarding the application of the first part of the Questionnaire on linguistic experience of the child and the family about the first name, the twenty-two contacted parents answered the questions related to the linguistic knowledge around family. Thus, a child, from a family Japanese mother language, was excluded. On the date set for the start of the auditory, language evaluations and name recognition, the other twenty-one parents showed up and signed the consent form.

Of the twenty-one children referred for hearing evaluation, only two of them did not complete all stage of the evaluation. However, the other nineteen children were evaluated and showed normal results, but two these do not completed the language evaluation. The remaining seventeen babies were referred to the recognition of the name test. At this stage, one of the children cried during the test and it was not possible to register other reactions, which was not crying.

Regarding the final data of the sixteen babies, it was found that all children tested with name recognition, presented the reactions of localization and attention to the sound source, during the evocation of his own name and as for the other names. Based on these reactions, we analyzed the time of the fixation gaze during the attention and localization of sound sources whose statistics are described in Table 1 and Figure 2.

Table 1 – Mean of the time of permanency of the baby’s look during the evocation of the own name and of another name, in the three categories

	TOTAL OF CHILDREN							
	GENERAL		CATEGORY 1		CATEGORY 2		CATEGORY 3	
	PN	ON	PN	ON	PN	ON	PN	ON
Number of children	16	16	9	9	16	16	7	7
Mean	6,36	5,5	5,22	4,33	6,44	5,06	4,57	3,29
Median	4,75	4,5	3	2	4,5	2,5	3	0
Standard deviation	6,33	4,7	7,1	5,27	5,99	4,8	4,392	4,75
Minimum	0	1	0	0	0	0	0	0
Maximum	22	14	23	13	22	14	10	11
p value	0,001		0,058		0,001		0,033	
IC	2,98-9,73				3,25-9,63		0,51-8,63	

Label 1: PN= own name; ON= other name; IC= interval of confidence.
Test t-pared; *Level of significance p <0,005

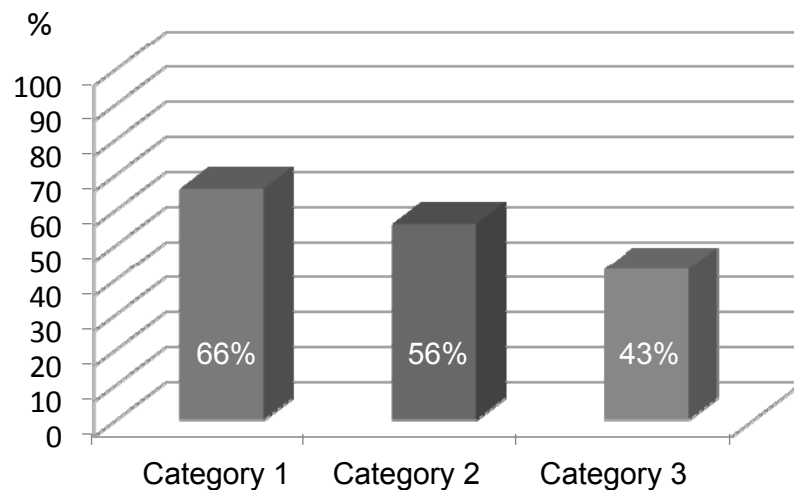


Figure 2 – Predominance of the babies responses to the evocation of their own name, by category, according to the sample

■ DISCUSSION

This study aimed to determine whether children aged between four and five months recognize their own name. It was found that although the literature reports that babies recognize and respond to the call of their own name, from six to nine months of age², most children, participants in this study recognized their own name.

The results in Table 1 indicate the predominance of the permanence of the gaze at the name in category 2, which is related to the fact that all children in the sample fell into place in this category, because the names presented as stimulus had the same number of syllables. In categories 1 and 3 not all the names of the children in the sample met the criteria of length and similarity. Thus, the number of children in the two categories was lower, which explains the lower average in relation to category 2. It was found that in all categories there was a predominance of time spent looking at the call of his own name.

The Figure 2 shows that there were responses of babies to the evocations of his own name in all categories of evocation, but there were a greater number of responses for category 1 (contrast between disyllabic names and polysyllables). The predominance of responses to its own name – 66% – this category confirms what is described in the literature about the ability of infants to discriminate the duration^{3,7,9}. Comparing the highest number of responses – 56% – of children to the presented stimulus in category 2 (same length but with different phonological composition) with a number of responses – 43% – from babies to the presented

stimulus in category 3 (phonetic similarity with only one phoneme different) observed that there is a greater ability of the child to discriminate words with more extensive phonological variation.

It was found through the Questionnaire on linguistic experience of the child and the family about the first name that all families had the perception that the own name recognition of the babies is only related to the fact that whether or not the child has normal hearing. However, it is important that the general health of the child is checked before it is observed whether or not she recognizes the name. Likewise, it is necessary that if the child does not recognize the name, the results of hearing and language evaluations are confirmed.

Note that the criteria adopted for the recognition of the own name, in this study included: the displacement of the head and eyes toward the sound source, the time spent looking for the sound source and attention to the evocations. However, only the criteria of permanence of the look presented significant value.

Regarding the method used in this study, it is noted that in addition to rigorous, it is unpublished in Brazil. The studies that used similar methods were performed in^{3,4} Anglophone countries. Thus there is no description in the literature of its use with the Brazilian population.

It was found that the development of the hearing and language, of all the children evaluated in this study, is within the expected range for their age and that there is a relationship between hearing, language development and recognition of the own name. In other words, recognition of the own name depends on speech perception, which in turn

depends on the development of language, and all these factors are linked to the integrity of the auditory system.

Furthermore, this was a pilot study with small sample size, the results obtained so far pointed to the need for continuing research in order to obtain results through larger sample in number and age groups.

■ CONCLUSIONS

It was found that the development of hearing and speech, most of the children in this experiment

were as expected for their age and that there is a relationship between the language development of hearing, and recognition of the name. Based on the criteria used in this study, children aged four and five months are already able to recognize their own name.

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RESUMO

Objetivo: verificar se as crianças na faixa etária entre quatro e cinco meses reconhecem o próprio nome. **Método:** estudo transversal, realizado com 16 bebês com idade entre quatro e cinco meses, avaliados pelo programa Estadual de Triagem Auditiva Neonatal Universal (TANU) no Ambulatório de Fonoaudiologia do Hospital das Clínicas da Universidade Federal de Minas Gerais (HC-UFMG). Foram realizadas avaliações auditiva e de linguagem, além do teste de reconhecimento do próprio nome. Realizou-se análise descritiva das variáveis utilizadas no estudo e análise estatística. As variáveis contínuas foram comparadas por meio do teste T pareado e considerou-se nível de significância de 5% e coeficiente de confiança de 95%. **Resultados:** verificou-se predominância das respostas dos bebês à evocação do próprio nome, na maioria dos bebês avaliados. **Conclusões:** com base nos critérios utilizados neste estudo, entre quatro e cinco meses as crianças já são capazes de reconhecer seu próprio nome.

DESCRIPTORIOS: Fonoaudiologia; Desenvolvimento Infantil; Audição; Linguagem; Percepção da Fala; Percepção Auditiva

■ REFERENCES

1. Russo ICP, Santos MTM. *Audiologia Infantil*. 4 ed. São Paulo: Cortez; 1994.
2. Northern JL, Downs MP. *Audição na Infância*. 5 ed. Rio de Janeiro: Guanabara Koogan; 2002.
3. Mandel DR, Jusczyk PW, Pisoni DB. Infants' recognition of the sound patterns of their own names. *Psychological Science*. 1995;6:315-7.

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4. Nelson DGK, Jusczyk PW, Mandel DR, Myers J, Turk A, Gerken L. The headturn preference procedure for testing auditory perception. *Infant Behavior and development*. 1995;18:111-6.
5. Jusczyk PW, Aslin RN. Infants' detection of sound patterns of words in fluent speech. *Cognitive Psychology*. 1995;29:1-23.
6. Pierotti MMS, Levy L, Zornig SAJ. O manhês: costurando laços. *Estilos clin*. 2010;15(2):420-33.
7. Ramus F, Nespor M, Mehler J. Correlates of linguistic rhythm in the speech signal. *Cognition*. 1999;73:265-92.
8. Gordo A, Parlato EM, Azevedo MF, Guedes ZCF. Triagem auditiva em bebês de 2 a 12 meses. *Pró-Fono*. 1994;6(1):7-13.
9. Christophe A, Gout A, Peperkamp S, Morgan J. Discovering words in the continuous speech stream: the role of prosody. *Journal of phonetics*. 2003;31: 585-98.