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Performance of Brazilian Portuguese speakers in the Test of Narrative Language (TNL)

Desempenho de falantes do português brasileiro no "Test of Narrative Language (TNL)"

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Keywords

Narration
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Evaluation
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ABSTRACT

Purpose: Investigate the performance of native speakers of Brazilian Portuguese in the Test of Narrative Language (TNL) and correlate their performance in its oral narration and narrative comprehension subtests. **Methods:** Participants were 140 individuals with typical language development aged 5-0 to 11-11 (years-months) divided according to age group. **Results:** Statistically significant difference was observed between the 5-year-old group and all the other age groups and between the 6-year-old group and the 8-, 9-, 10- and 11-year-old groups. The 7-year-old group did not differ from the 6- and 8-year-old groups. Half of the 7-year-old group was in 1st grade of Elementary School and the other half was in 2nd grade, which may have contributed to the non-differentiation between this group and its border-age groups. No statistically significant difference was found between groups as of the age of eight years. Positive correlation was observed between performance in the narrative comprehension and oral narration subtests of the TNL in the 5-, 6- and 7-year-old groups, which did not occur for the other age groups. **Conclusion:** The Test of Narrative Language differentiated the 5-, 6- and 7-year-old groups, but did not differentiate groups as of the age of eight years. No correlation was found between performance in the oral narration and narrative comprehension subtests of the TNL as of the age of eight years, which suggests mastery of both skills from this age.

Descritores

Narração
Linguagem Infantil
Avaliação
Desenvolvimento da Linguagem
Testes de Linguagem

RESUMO

Objetivo: Investigar o desempenho de falantes do português brasileiro no *Test of Narrative Language* e correlacionar o desempenho nas tarefas de produção e compreensão da narrativa. **Método**: Participaram 140 indivíduos, entre 5 e 11 anos e 11 meses de idade com desenvolvimento típico de linguagem, divididos de acordo com a faixa etária. **Resultados:** Diferença significativa foi encontrada entre o grupo de 5 anos e todos os demais grupos etários, bem como para o grupo de 6 anos quando comparado ao grupo de 8, 9, 10 e 11 anos. O grupo de 7 anos não diferiu estatisticamente dos grupos de 6 e 8 anos. Metade do grupo de 7 anos cursava o primeiro ano e a outra metade, o segundo ano, o que pode ter contribuído para a não diferenciação do grupo com as faixas etárias fronteiriças. Não foi encontrada diferença estatisticamente significante entre os grupos a partir dos 8 anos. Observou-se correlação positiva entre o desempenho de compreensão e produção nos grupos etários de 5, 6 e 7 anos, o que não ocorreu para os demais grupos. **Conclusão:** O teste diferenciou as faixas etárias de 5, 6 e 7 anos, o que não ocorreu nas faixas etárias a partir dos 8 anos. Também, a partir dos 8 anos, não foi encontrada correlação entre a produção e a compreensão narrativa, sinalizando o domínio de ambas as habilidades a partir desta faixa etária.

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INTRODUCTION

Oral narration of stories is a complex language task that requires linguistic knowledge (syntactic, semantic, and phonological), knowledge about the world (pragmatics), and mastery of cognitive functions such as working memory, monitoring capacity, organization and integration of information, and ability to make inferences[1,2]; it is, therefore, an important task to investigate typical and deviant developmental trajectories[3].

Narrative ability begins at the age of three years, and by the age of six children are often able to produce well-structured, complete stories[1]. Approximately at the age of ten, development of narrative capacity reaches a peak of complexity[4], and around the age of twelve it is expected that children master the narrative story scheme and that, together with their linguistic and cognitive skills, be able to produce stories with multiple episodes and complex grammatical structures interconnected by cohesive elements, and use verbs to refer to the mental state of characters[5].

In addition to age and schooling, it is known that children's contact with the narrative story model in the family and school contexts is also a relevant factor in the development of narrative skills[2,6-8].

Because it is a task that enables investigation of children's ability to address schemes, organization, constructions, and conventions, even of illiterate children[2], and because narrative performance is considered a predictor of academic achievement[9,10], oral narration of stories has been widely used in studies conducted with children in typical and atypical circumstances of development[3,11-13].

Narrative performance has been investigated by means of different excerpts and parameters of analysis. Analysis based on macrostructure components considers the presence and organization of story elements, such as maintenance of the character and theme, and the relation between events, outcome, and coherence of the narrative[14-16]. In turn, analysis based on microstructure components considers the sequentiality and meaning of the narrative, in addition to the elements of cohesion that govern the structural sequence, based on the syntactic and semantic principles and measures of vocabulary and syntactic complexity[16,17].

Among the few formal instruments available to investigate the skills of narrative comprehension and oral narration covering both the macro- and micro-structural aspects of the oral narrative, the Test of Narrative Language (TNL)[18] is an instrument widely used in the international literature to assess the performance of children. This instrument has been used in typical and atypical developmental circumstances with the purpose of investigating the narrative performance of children with attention deficit hyperactivity disorder[19]; investigating the effects of noise on narrative skills in children with typical development[20]; deepening knowledge about the narrative difficulties of children with language disorders[12,21]; associating the influence of updating working memory with narrative performance in typical developmental circumstances[22], investigating the narrative ability of bilingual children with or without language impairment[23,24]; monitoring intervention directed to the narrative skills of children with language impairment[25].

In Brazil, the TNL has been translated and culturally adapted by Rossi et al.[26], and no studies on the performance of children using this tool have been conducted with native speakers of Brazilian Portuguese to date. In view of this, the present study was proposed based on two hypotheses: (a) Will there be difference between age groups with superior performance in narrative comprehension and oral narration for children in older-age groups using the TNL version adapted to Brazilian Portuguese? (b) Will the performance of children in narrative comprehension be superior to that in oral narration in younger-age groups and will this performance be similar with increasing age?

The purpose of this study was to investigate the performance of native speakers of Brazilian Portuguese in the Test of Narrative Language (TNL) and correlate their performance in its oral narration and narrative comprehension subtests.

METHODS

Ethical aspects

This study was approved by the Research Ethics Committee of the aforementioned Institution under protocol no. 1015/2014. Prior to study commencement, all participating children signed an Assent Term and their parents and/or legal guardians signed an Informed Consent Form (ICF) prepared for the specific purposes of this research according to resolution no. 466/12 of the National Health Council (CNS) on the Guidelines and Standards of Research Involving Human Beings.

Study sample

Initially, 146 individuals aged 5-0 to 11-11 (years-months) were selected for Speech-language Pathology (SLP) screening. Children who agreed to participate in the study and had an ICF signed by their parents and/or legal guardians underwent assessment to confirm the absence of language disorders prior to being submitted to the Test of Narrative Language (TNL). SLP screening was conducted according to the Descriptive Mapping of Child Speech-language Pathology Assessment[27]. This descriptive guide is organized in eight sections, namely[1], identification data and information about the child[2]; perceptual-sensory functions[3]; cognitive functions[4]; speech[5]; speech-related dimensions (voice, articulation, fluency, and oral and verbal praxis)[6]; functions associated with manipulation, ingestion and deglutition of food[7]; written language[8]; mathematical skills[27]. Of the 146 children selected, six (one girl and five boys) were excluded from the survey because of their low language skill performance. Inclusion criteria were as follows: history of visual, auditory, sensory and/or neuropsychomotor impairments and absence of language and/or learning impairments.

The final study sample was composed by 140 native speakers of Brazilian Portuguese with typical language development, of both genders, with chronological age between 5-0 and 11-11 (years-months). Study participants were divided into seven age groups according to the normative data of the original version of the TNL (Table 1).

Table 1. Distribution of the study sample according to age and gender

Age group	Age (years-months)	Sample size		Male		Female		Mean age (months)	Standard deviation
		n	(%)	n	(%)	n	(%)		
05	5-0 to 5-11	20	100	10	50	10	50	66	3.7
06	6-0 to 6-11	20	100	10	50	10	50	78.8	4
07	7-0 to 7-11	20	100	10	50	10	50	88	3.6
08	8-0 to 8-11	20	100	10	50	10	50	103	2.8
09	9-0 to 9-11	20	100	10	50	10	50	115	4.5
10	10-0 to 10-11	20	100	10	50	10	50	123.4	2
11	11-0 to 11-11	20	100	10	50	10	50	139.5	3.8

Table 2. Distribution of the study sample according to schooling

Age group	Number of participants in each grade						
	Kindergarten II	1st grade	2nd grade	3rd grade	4th grade	5ºthgrade	6th grade
05	19	1	-	-	-	-	-
06	-	20	-	-	-	-	-
07	-	10	10	-	-	-	-
08	-	-	1	19	-	-	-
09	-	-	-	3	17	-	-
10	-	-	-	-	-	20	-
11	-	-	-	-	-	1	19

Table 2 shows the distribution of the participants according to schooling and age group.

Procedures

In order to investigated narrative performance, the translated and culturally adapted version[26] of the Test of Narrative Language (TNL)[18] was applied to the study participants. The test is divided into two subtests: narrative comprehension and oral narration, which are measured by six tasks comprising three different formats: without picture support, with support of sequenced pictures, and with support of a single picture. The measures provided by the TNL enable establishment of values that represent, separately, the performance in the subtests of narrative comprehension and oral narration. These measures are represented by a raw score, age equivalent, and standard percentile score. The test also predicts a global measure, represented by the Narrative Language Ability Index (NLAI), percentile rank, and descriptive rank of children's performance (very superior, superior, above-average, average, below-average, poor, and very poor)[26].

Participants' narration accounts were recorded and transcribed for analysis according to the norms contained in the manual for the original instrument. For this study, among the measures provided by the TNL, the following were used: narrative comprehension subtest raw score, oral narration subtest raw score, and raw total score (sum of the scores of both subtests). The raw total score was used in the present study because it represents the sum of the correct responses in each subtest.

Statistical analysis of the data

Data were organized in Microsoft-Excel 2013® spreadsheet and processed using Statistical Package for Social Sciences - IBM-SPSS 23.0® software. The following statistical tests were applied: Jonckheere-Terpstra, Mann-Whitney adjusted with Bonferroni correction, and Spearman's correlation. A significance level of 5% ($p<0.05$) was adopted for all statistical analyses.

RESULTS

Table 3 presents the descriptive and comparative analyses of the raw scores for the TNL narrative comprehension and oral narration subtests, as well as the raw total score (sum of the scores in both subtests) of the Test of Narrative Language (TNL) according to age group. Statistically significant difference was observed between the age groups regarding raw score in the three measures analyzed.

The Mann-Whitney test adjusted with the Bonferroni correction was used to investigate the differences in the raw scores (narrative comprehension, oral narration, and total) between the age groups aiming to identify differing age groups in the pairwise comparison (Table 4).

Statistically significant difference was found between the 5-year-old group and all other age groups for all variables analyzed. The 6-year-old group did not present statistically significant difference compared with the 7-year-old group for all variables investigated, which did not occur in the comparison with the other age groups (8-, 9-, 10-, and 11-year-olds). The 7-year-old group did not show statistically significant difference compared with the 8-year-old group, but difference was observed in the comparison between the first and the other age groups (9-, 10-, and 11-year-olds). As of the age of eight years, the groups did not present statistically significant difference between them for all variables assessed.

The Spearman's correlation coefficient was used to verify the degree of correlation between the total scores of oral narration and narrative comprehension subtest in each age group (Table 5).

Table 3. Performance comparison between age groups regarding the raw total score of the Test of Narrative Language (TNL) and the raw scores in its narrative comprehension and oral narration subtests

Variable	Age group	M	SD	Min	Max	Md	*p*
Narrative comprehension subtest raw scores	5	23.30	5.45	16.00	34.00	21.00	<0.001*
	6	29.05	3.79	21.00	33.00	29.50	
	7	29.50	3.62	23.00	36.00	29.00	
	8	32.35	2.08	27.00	36.00	33.00	
	9	34.40	2.68	28.00	39.00	34.50	
	10	33.60	4.12	29.00	46.00	33.50	
	11	34.20	2.04	30.00	38.00	34.00	
Oral narration subtest raw scores	5	30.35	6.12	18.00	40.00	30.50	<0.001*
	6	35.70	5.73	24.00	45.00	35.50	
	7	39.05	7.97	26.00	51.00	37.00	
	8	46.50	11.02	25.00	61.00	47.50	
	9	50.10	7.75	31.00	63.00	49.50	
	10	51.95	7.05	40.00	64.00	53.50	
	11	54.60	7.33	39.00	72.00	55.00	
TNL raw total scores	5	53.65	10.53	37.00	73.00	51.50	<0.001*
	6	64.75	8.64	45.00	77.00	65.00	
	7	68.55	10.86	50.00	87.00	66.00	
	8	78.85	11.85	55.00	94.00	80.50	
	9	84.50	8.60	62.00	98.00	84.50	
	10	85.55	9.00	71.00	102.00	86.00	
	11	88.80	7.58	75.00	106.00	88.00	

*Jonckheere-Terpstra test
Caption: M = mean; SD = standard deviation; Min = minimum; Max = maximum; Md = Median; significant values for $p<0.05$

Table 4. Pairwise comparison between age groups regarding the total raw score of the Test of Narrative Language (TNL) and the raw scores in its narrative comprehension and oral narration subtests

Pair of age groups	Narrative comprehension subtest raw score *p*	Oral narration subtest raw score *p*	TNL total raw score *p*
5 x 6	0.001*	0.010*	0.001*
5 x 7	0.001*	0.001*	0.001*
5 x 8	< 0.001*	< 0.001*	< 0.001*
5 x 9	< 0.001*	< 0.001*	< 0.001*
5 x 10	< 0.001*	< 0.001*	< 0.001*
5 x 11	< 0.001*	< 0.001*	< 0.001*
6 x 7	0.946	0.249	0.416
6 x 8	0.002*	0.002*	0.001*
6 x 9	< 0.001*	< 0.001*	< 0.001*
6 x 10	0.002*	< 0.001*	< 0.001*
6 x 11	< 0.001*	< 0.001*	< 0.001*
7 x 8	0.007	0.020	0.007
7 x 9	< 0.001*	< 0.001*	< 0.001*
7 x 10	0.003	< 0.001*	< 0.001*
7 x 11	< 0.001*	< 0.001*	< 0.001*
8 x 9	0.013	0.357	0.136
8 x 10	0.428	0.163	0.049
8 x 11	0.010	0.042	0.010
9 x 10	0.237	0.456	0.797
9 x 11	0.795	0.076	0.119
10 x 11	0.270	0.408	0.238

*Mann-Whitney test adjusted with Bonferroni correction; significant values for $p<0.05$

Table 5. Correlation between the total scores in the oral narration and narrative comprehension subtests of the Test of Narrative Language (TNL)

Pair of variables	Age group	*r*	*p*
Oral narration subtest total score × Narrative comprehension subtest total score	5	+0.729	< 0.001*
	6	+0.571	0.009*
	7	+0.688	0.001*
	8	+0.270	0.250
	9	+0.146	0.540
	10	+0.272	0.246
	11	+0.130	0.583

*Spearman's correlation coefficient
Caption: *r* = correlation coefficient; significant values for $p<0.05$

Correlation was found between the variables (oral narration and narrative comprehension) in the 5-, 6-, and 7-year-old groups. No correlation was observed as of the age of eight years.

DISCUSSION

The objective of the present study was to investigate the performance of native speakers of Brazilian Portuguese in the Test of Narrative Language (TNL) and correlate their performance in its oral narration and narrative comprehension subtests.

Study participants' performances, analyzed by means of the raw total score of the TNL and the raw scores of its narrative comprehension and oral narration subtests, are shown in Table 3. As demonstrated in the comparison between the age groups, statistically significant differences were found regarding the variables analyzed (raw oral narration, narrative comprehension and total scores). However, in the pairwise comparison (Table 4), only the 5-year-old group presented statistically significant difference compared with all other age groups investigated.

No statistically significant differences were observed between the 6- and 7-year-old groups in the narrative comprehension and oral narration subtests of the TNL. The same occurred with respect to differences between the 7- and 8-year-old groups for all variables (Table 4). Nevertheless, the 7-year-old group differed from its border-age groups (6- and 8-year-olds); this may have occurred because the group was heterogeneous in terms of school grade attendance, although all children were in the 7-year-old group, half of them were in 1st grade whereas the other half were in 2nd grade when the test was applied. (Table 2).

This finding may be attributed to the schooling of the individuals, considering that children in the 7-year-old group who were attending 1st grade (50%) had the same time of exposure to school as those in the 6-year-old group. Children with longer time of exposure to school may have developed the skills needed to perform well in oral narration, such as literacy, which begins in 1st grade and consolidates in the following year. Some studies have highlighted literacy as a determining factor in the development of oral narration, because writing requires more than just learning a code, but mastery of resources such as cohesion, logical sequence, and linguistic constructions and conventions[2,8,9]. It is worth mentioning that this is still a speculative explanation, because in this study a specific analysis was not performed to enable proper discussion of the influence of literacy on oral narration performance, and it is suggested that it be conducted in further studies.

A for the other age groups, no statistically significant differences were observed in the pairwise comparison between the 8-, 9-, 10-, and 11-year-old groups for any of the variables analyzed (Table 4). This last finding indicated that performance in oral narration, as measured by the TNL, does not discriminate the 8- to 11-year-old groups.

In the original version of the TNL[18], the effect of age on test performance was investigated, and positive correlation was found between age and the raw scores in the oral narration and narrative comprehension subtests, although the means of the raw scores, mainly that of narrative comprehension, were also similar between the age groups as of the age of nine years.

It is worth mentioning that the TNL currently has a new version[28], with expanded analysis data in groups for children aged 4-0 to 15-11 (years-months), suggesting continuity of studies with this instrument in Brazil including its new version. Increased sample size, including a representative sample from private education and other regions of the country, should promote a more robust discussion on the data found so far.

In addition, what could justify the results observed more specifically for the groups as of 9 years of age is the fact that, according to some previous studies, the most representative changes in narrative performance would occur until the age of eight years, when most of the narrative scheme has been acquired by children[29], although narrative capacity continues to develop after this age[1-3,8].

Regarding the correlation between performance in oral narration and narrative comprehension, positive correlation was observed between the variables (oral narration and narrative comprehension) in the 5-, 6- and 7-year-old groups, indicating that the higher the oral narration score, the higher the narrative comprehension score (Table 5). The absence of correlation as of the age of eight years could be explained by the fact that, from this age, there would be no significant differences between the skills of oral narration and narrative comprehension.

Finally, it is important to consider that the results found should not be generalized for all regions of the country, because collection was performed in the southeast region, and it is known that Brazil is a country with wide cultural diversity. It is suggested that studies be continued so that the sample is expanded, including rural areas and inhabitants from different

regions of the country, as well as extension of the sample for collection in private schools.

Differences in the performance of speech and written narrative of children from public *vs.* private schools have been observed[30], and should also be explored in the context of oral narrative.

CONCLUSION

The Test of Narrative Language (TNL) statistically differentiated the 5-, 6- and 7-year-old groups, but did not differentiate the groups as of the age of eight years.

Correlation was observed between performance in the narrative comprehension and oral narration subtests of the TNL, with positive correlation between the 5-, 6- and 7-year-old groups, that is, the better the performance in the narrative comprehension tasks, the better the performance in the oral narration tasks, which did not occur for the older-age groups. Analysis of narrative performance should consider both narrative comprehension and oral narration. These skills are correlated early in the development of narrative capacity and will only become independent when children acquire large repertoire of narrative skills.

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Author contributions

GMC was responsible for the study design, collection and analysis of the data, and writing of the manuscript; NFR and CMG were in charge of requesting permission from the publisher, PRO-ED, to use the procedure and contributed to the study design, data analysis, and writing of the manuscript; CMG was the study adviser.