

**PSYCHOLINGUISTICS ON THE THRESHOLD
OF THE YEAR 2000**

**LA PSYCHOLINGUISTIQUE SUR LE SEUIL
DE L'AN 2000**

**A PSICOLINGUÍSTICA NO LIMAR
DO ANO 2000**

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Spelling and writing in portuguese primary school children.

To what extent do these processes/skills depend on a mastering of orality and on adequate reading methods?

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In 1994 Girolami-Boulinier and Pinto published the results of research into the comparison of spelling of 180 children attending primary school in London, Paris and Porto (60 children in each language group). This led to the study from a developmental perspective of the spelling and writing of 180 Portuguese children attending the 2nd, 3rd and 4th years of Primary school in Porto (60 children in each group). This was because the Portuguese children produced more phonetic errors than the English and French ones in the above mentioned study, and the problem involved the characteristics of the Portuguese spelling system.

In this paper it is my aim to show not only the number and types of spelling errors but also the accentuation errors and the punctuation from a developmental perspective. I also intend to discuss the results obtained by suggesting how Portuguese children's written performances may be influenced by the linguistic milieu, and could be improved by means of a method which insisted upon good sentence comprehension at the oral language level, and by means of adequate reading methods (indirect reading, semi-direct reading and silent direct reading (Girolami-Boulinier 1993; Girolami-Boulinier, Cohen-Rak 1985)) in order to improve their speech perception and their written production.

METHOD

Subjects

180 Portuguese children (boys and girls) attending Primary schools in Porto were divided into three age/school groups: group 1 (total number = 60) attended the 2nd school year (28 girls and 32 boys) and ranged in age from 7;5 to 8;4 (mean age 7;10); group 2 (total number = 60) attended the 3rd school year (25 girls and 35 boys) and ranged from 8;4 to 9;11 (mean age 8;11) and group 3 (total number = 60) attended the 4th school year (27 girls and 33 boys) and ranged in age from 9;5 to 10;11 (mean age 10;00). Children from each group belonged to whole classes.

Material and procedure

To collect the written narratives in the three age groups, it was necessary to use the two kinds of cartoons normally employed by A. Girolami-Boulinier (1984, 3). The first kind of car-

toon is used as support to the narratives of the children from pre-school to the 2nd year of Primary school. It is a very simple cartoon consisting of a story in three images. The 2nd type of cartoons corresponds to the 2nd level and serves as support to the narratives of the subjects from the 3rd school year onwards. The 2nd level support consists of two stories divided into 4 images each. The written narratives analysed in this study were obtained individually and at the end of the school year. The children were able to see the cartoons during the whole experiment.

The analysis of the spelling errors, accentuation errors and punctuation used Girolami-Boulinier's typology (Girolami-Boulinier 1984, 173 ff.).

The spelling errors were classified as usage, phonetic, linguistic and gender and number errors (Girolami-Boulinier 1984, 128-133).

The accentuation errors were classified as usage and reading errors and uncertainties (Girolami-Boulinier 1984, 173-174).

As far as punctuation is concerned particular attention was drawn to the way the children belonging to these three school groups use full stops and commas.

RESULTS

Spelling

The statistical analysis practised – a non-parametric analysis of variance (the Kruskal-Wallis test) – took into consideration the non homogeneity of the variances among the three school groups and the non normality of distribution.

The Kruskal-Wallis test has been used to compare the three groups and whenever there were significant differences (in at least two of the three groups) the Mann-Whitney test was used to localize the differences between groups.

Table I – Number of words and spelling errors per school year and average of words and average and percentage of spelling errors per school year

	Number of words and spelling errors per school year		Average of words and average and percentage of spelling errors per school year		
	words	errors	average of words	average of errors	% errors
2nd year	1509	237	25.15 (SD=9.70)	3.95 (SD=2.87)	15.7
3rd year	4485	414	74.75 (SD=23.28)	6.90 (SD=6.13)	9.23
4th year	4722	179	78.7 (SD=18.63)	2.98 (SD=3.11)	3.79

SD – Standard Deviation; % – Percentage

NUMBER OF WORDS

By comparing the number of words in the three groups, the Kruskal-Wallis test revealed the existence of significant differences – between at least two of the three groups compared – ($\chi^2 = 118.40$, $df=2$, $p < 0.01$).

The Mann-Whitney test showed significant differences between the 2nd and the 3rd school years ($z = -9.34, p < 0.01$), between the 2nd and the 4th years ($z = -9.39, p < 0.01$), and non significant differences between the 3rd and the 4th years ($z = -1.57, p > 0.05$).

Total number of spelling errors

As far as the comparison of the total number of the spelling errors was concerned, the Kruskal-Wallis test revealed significant differences between at least two of the three groups ($\chi^2 = 18.35, df=2, p < 0.01$). The Mann-Whitney test showed significant differences between the 2nd and the 3rd years ($z = -2.41, p < 0.017$), between the 3rd and the 4th years ($z = -4.08, p < 0.017$) and non significant differences between the 2nd and the 4th years ($z = -2.27, p > 0.017 - n.s.$).

In order to accomplish a non-parametric analysis of variance, taking as the independent variable the school year and as the dependent variable the percentage of the number of errors in relation to the total number of words, we used the Kruskal-Wallis test. The test revealed that the 2nd year children (Mean Rank = 122.27) make more errors than the 3rd year children (Mean Rank = 93.71), who make more errors than the 4th year children (Mean Rank = 55.53).

Types of spelling errors

Table II – Total of number of words and spelling errors per school year, and number and percentage in relation to the total number of errors of the different types of spelling errors per school year

Words Number	Total of spelling errors N	Types of spelling errors							
		Usage errors		Phonetic		Linguistic		Gender/Number	
		N	%	Perc. N %	Read. N %	L1 N %	L2 N %	N	%
2nd year 1509	237	63	26.58	76 32.07	32 13.5	15 6.33	46 19.41	5	2.11
3rd year 4485	414	78	18.84	151 36.47	42 10.14	63 15.22	70 16.91	10	2.42
4th year 4722	179	42	23.46	56 31.28	10 5.59	40 22.35	26 14.53	5	2.79

N – Number

% -Percentage in relation to the total number of errors

Perc -Errors of perception

Read. – Errors of reading conventions

L1 – Errors of morphology of the verbs

L2 – Errors of lexical individualization/identification

USAGE ERRORS

The Kruskal-Wallis test revealed significant differences when the three groups are compared ($\chi^2 = 6.35$, $df = 2$, $p < 0.05$), although the Mann-Whitney test did not show any significant differences among the groups.

Taking as the independent variable the school year, and as the dependent variable the percentage of the number of usage errors, the Kruskal-Wallis test showed the existence of significant differences among the three groups ($\chi^2 = 25.70$, $df = 2$, $p < 0.01$). When we take into consideration the relationship between the percentage of the number of errors of use and the number of words produced, we notice that the 2nd year children (Mean Rank = 115.01) make a greater number of errors than the 3rd year children (Mean Rank = 87.48) and the 4th year children fewer errors than the other two groups (Mean Rank = 69.01).

PHONETIC ERRORS

Errors of perception

In spite of the fact that the Kruskal-Wallis test revealed significant differences among the three groups ($\chi^2 = 14.22$, $df = 2$, $p < 0.01$), the Mann-Whitney test showed only significant differences between the 3rd and the 4th years ($z = -3.70$, $p < 0.017$).

When we consider the relationship between the percentage of the number of errors of perception and the number of words produced, the Kruskal-Wallis test shows that the 2nd year children (Mean Rank = 104.32) make a larger number of errors than the 3rd year children (Mean Rank = 99.40) and the 4th year children a lower number than the two other groups (Mean Rank = 67.78).

Reading errors

The Kruskal-Wallis test revealed significant differences among the three groups ($\chi^2 = 13.64$, $df = 2$, $p < 0.01$). The Mann-Whitney test showed non significant differences between the 2nd and the 3rd school years ($z = -0.29$, $p > 0.05$ – n.s.) and significant differences between the 2nd and the 4th years ($z = -3.31$, $p < 0.01$) and the 3rd and the 4th years ($z = -3.40$, $p < 0.01$).

If we take into account the relationship between the percentage of the number of phonetic errors of perception and the number of words produced, the 2nd year children (Mean Rank = 103.52) present a larger percentage of reading errors than the 3rd year children (Mean Rank = 95.46) and an even larger percentage than the 4th year children (Mean Rank = 72.53).

LINGUISTIC ERRORS

Morphological errors

As far as this kind of error is concerned, the Kruskal-Wallis test revealed significant differences among the three groups ($\chi^2 = 22.31$, $df = 2$, $p < 0.01$). On the other hand, the Mann-Whitney test showed that there were significant differences between the 2nd and the 3rd years

($z = -4.72$, $p < 0.01$), between the 2nd and the 4th years ($z = -2.89$, $p < 0.01$), and non significant differences between the 3rd and the 4th years ($z = -1.93$, $p > 0.05 - n.s.$).

When we take into consideration the relationship between the percentage of the number of morphological errors and the number of words produced, we observe that the 3rd year children (Mean Rank = 105.67) present a larger percentage than the other two groups (4th year children – Mean Rank = 88.25; 2nd year children – Mean Rank = 77.58).

Errors of lexical individualization/identification

Once more the Kruskal-Wallis test revealed significant differences among the three groups ($\chi^2 = 11.81$, $df = 2$, $p < 0.01$) and the Mann-Whitney test showed that there were only significant differences between the 3rd and the 4th years ($z = -3.43$, $p < 0.01$) and that there were non significant differences between the 2nd and the 3rd years ($z = -1.44$, $p > 0.05 - n.s.$) and between the 2nd and the 4th years ($z = -2.03$, $p > 0.017 - n.s.$).

Taking into account the relationship between the percentage of the number of ind./id. errors and the total number of words used, the 2nd year children (Mean Rank = 100.99) present a greater percentage of ind./id. errors than the 3rd year children (Mean Rank = 99.13) and than the 4th year children (Mean Rank = 71.38).

Errors of gender and number

This is the kind of error which by percentage in relation to the total number of errors is not very representative in the three groups (see Table II).

Types of errors of perception

The phonetic errors of perception are the most important in percentage in relation to the total number of errors in the three groups. This evidence led us deeper into the analysis of this kind of error and observe how children produce the different types (substitutions, omissions, inversions and additions) and which of them is the most frequent (see Table III).

Substitutions

Children who make fewer errors of substitution are those attending the 4th year followed by those of the 2nd and the 3rd years. The difference observed between the 2nd and the 3rd years may once more be related to the number of words produced at the two levels.

In relation to the total number of errors of perception, we verify a decrease in the percentage of errors of substitution with age. It is however the most frequent type of error of perception in the three groups.

Omissions

This type of error is less representative in the 4th year (total number of errors = 14) and more representative in the 3rd year (total number of errors = 38). The 2nd year stays in the middle with a total number of errors = 16.

Considering the 2nd level separately, we noticed an almost equal value of the percentages in relation to the total number of errors in the two school years.

Additions

The children who present a greater number of errors of addition are those of the 3rd year (total number of errors = 18) followed by those of the 4th year (total number of errors = 13) and finally by those of the 2nd year (total number of errors = 12). In terms of percentage in relation to the total number of errors of perception, the most relevant value is observed in the 4th year (23%), with 16% in the 2nd year and 12% in the 3rd.

Inversions

This type of error is not produced by the children of the 2nd year and the children of the 3rd and the 4th years make the same number of errors (total number of errors = 6), although there is an increase from the 3rd to the 4th year in terms of percentage in relation to the total number of errors of perception (3.97% vs. 10.71%). It is the least frequent kind of phonetic error of perception.

Table III – Total of the number of words per school year, total of the phonetic errors of perception per school year and number and percentage in relation to the total number of errors of perception, per school year, of the four types of phonetic errors of perception

Words Number	Totals of the errors of perception		Types of spelling errors							
			Substitutions		Omissions		Additions		Inversions	
	N	%	N	%	N	%	N	%	N	%
2nd year 1509	76	32.07	48	63.16	16	21.05	12	15.79	0	0
3rd year 4485	151	36.47	89	58.94	38	25.17	18	11.92	6	3.97
4th year 4722	56	31.28	23	41.07	14	25.00	13	23.21	6	10.71

Taking into consideration the two levels (2nd year vs. 3rd and 4th years), Table IV shows that in the 3rd year the number of errors of accentuation is more important (total number of errors = 68) than in the other two years.

The Kruskal-Wallis test revealed significant differences among the three groups ($2z = 12.04$, $df = 2$, $p < 0.01$).

The Mann-Whitney test, on the other hand, showed a significant difference between the 2nd and the 3rd years ($z = -3.42$, $p < 0.017$) and the existence of non significant differences between the 2nd and the 4th years ($z = -1.98$, $p > 0.017$ – n.s.) and between the 3rd and the 4th years ($z = -1.64$, $p > 0.05$ – n.s.).

If we consider the relationship between the percentage of the number of errors of accentuation and the total number of words used, we notice – through the Kruskal-Wallis test – that the 3rd year children present a larger percentage of errors (Mean Rank = 101.87) than the two other groups (4th year children – Mean Rank = 88.26; 2nd year children – Mean Rank = 81.38).

Types of errors of accentuation

The categorization of the errors of accentuation (usage errors, reading errors and uncertainties) allows us to observe the types of errors which are more representative and the school year in which they are produced in greater quantity (see Table IV).

Table IV -Total number of accentuation errors per school year, and number and percentage in relation to the total number of accentuation errors of the types of accentuation errors per school year

Total of accentuation errors		Types of accentuation errors					
	Number	Usage Errors		Reading Errors		Uncertainties	
		N	%	N	%	N	%
2nd year	37	18	48.65	14	37.84	5	13.51
3rd year	68	17	25	46	67.65	5	7.35
4th year	49	5	10.2	41	83.67	3	6.12

N – Number

% – Percentage in relation to the total number of errors of accentuation

Punctuation

The punctuation used by the children of the three school groups under consideration revealed that the rules of punctuation at this learning stage have not been mastered.

2nd year:

- no use of full stops 33.33% (20/60)
- use of the full stops only at the end of the text 46.66% (28/60)
- no use of comma 100% (60/60)
- no use of punctuation 33.33% (20/60)

3rd year:

- no use of full stops 0% (0/60)
- use of full stops only at the end of the texts 40% (24/60)
- no use of commas 66.66% (40/60)
- use of commas with value of full stop or semicolon 20% (12/60)
- use of only one comma 11.66% (7/60)
- use of exclamation marks 1.66% (1/60)

4th year:

- no use of full stops 3.33% (2/60)
- use of full stops only at the end of the texts 25% (15/60)
- no use of commas 53.33% (32/60)
- use of commas with value of full stop or semicolon 23.33% (14/60)
- use of only one comma 18.33% (11/60)
- use of commas to separate the subject from the predicate 3.33% (2/60)
- use of colon 3.33% (2/60)
- use of ... 1.66% (1/60)
- use of dash 1.66% (1/60)
- no use of punctuation 1.66% (1/60)

DISCUSSION AND CONCLUSION

The results obtained in the present developmental study in Portuguese reveal once more that Portuguese children do not commit many spelling errors and that, as expected, when we consider the relationship between the percentage of the total number of errors and the number of words produced, 2nd year children make more errors than the 3rd year children, who make more errors than the 4th year children. We think that the Portuguese spelling system, more phonetic than the French and English (cf. Fijalkow 1982, 67; Reitsma 1989, 52; Sampson 1985, 173; Segalowitz 1989, 71; Snowling 1989, 1) is, in a certain way, responsible for these results. We observed then that the Portuguese children of the 4th school year committed more phonetic errors in relation to the total number of errors than French and English children. If we consider phonetic errors of perception, we verify that they are the most representative in the three school years of this developmental study in Portuguese. Besides, when we take into account the relationship between the percentage of the errors of perception and the number of words produced, 2nd year children make more errors than 3rd year children, who make more errors than 4th year children. These results may once more accentuate the type of spelling system of the Portuguese language and perhaps the influence of speech perception on written performance. Are the Portuguese children writing their suggested productions using as a cue either their oral production or the oral productions to which they are exposed without taking into account the visual-orthographic representation of the words? Some of the examples of the phonetic errors of perception rather confirm this assumption. On the other hand, the accentuation errors and the punctuation show that children are not very familiar with the written production and with some inevitable conventions of writing.

We suggest then that children should practice the indirect reading technique first (Girolami-Boulinier, Cohen-Rak 1985, 11) in order to learn to listen, to retain and to reproduce the semantic groups proposed to them, while developing their performance at the oral language level and improving their phonetic awareness. Secondly, the practice of the semi-direct reading technique (Girolami-Boulinier 1993, 33) should be implemented too. This technique begins by giving the children the chance of correctly reproducing the words they have retained among those proposed to them in the interior of semantic groups not only orally but also in written form (without the presence of the model). Finally, the direct silent reading technique (Girolami-Boulinier, Cohen-Rak 1985, 11), which allows learners to see, retain and reproduce in the absence of the model, will help them when they have spelling problems. With these techniques, the errors of gender and number will also be reduced if the learner becomes attentive

to the agreement rules. As far as accentuation and punctuation are concerned, we believe that they will be improved if the learner is attentive to what he/she is reading, retaining and reproducing.

Both these reading techniques and the language method proposed by Girolami-Boulinier (1987; 1989) contribute to increasing linguistic awareness by means of helping the learner to feel the function and nature of the different linguistic items existent in the speech chain. It is our opinion that this methodology plays an important role in improving the learner's oral language, their spelling performance and their writing.

REFERENCES

- Fijalkow, J. 1982. Langage écrit. In J. A. Rondal, X. Seron eds. *Troubles du langage, diagnostic et rééducation*. Bruxelles, Pierre Mardaga, 63-81.
- Girolami-Boulinier, A. 1984. *Les niveaux actuels dans la pratique du langage oral et écrit*, Paris, Masson.
- Girolami-Boulinier, A. 1987. Langage: Pour une pédagogie de l'immédiateté. *Bulletin de la Société Alfred Binet et Théodore Simon*, n^o. 610, I, 30-47.
- Girolami-Boulinier, A. 1989. *La grammaire langage en 20 leçons*. Issy-les-Moulineaux, EAP.
- Girolami-Boulinier, A. 1993. *L'apprentissage de l'oral et de l'écrit*. Paris, PUF. Col. Que sais-je?, n^o. 2717.
- Girolami-Boulinier, A.; Cohen-Rak, N. 1985. S.O.S. au C.E.S. *Bulletin de la Société Alfred Binet et Théodore Simon*, n^o. 694, III, 6-14.
- Girolami-Boulinier, A.; Pinto, M. da G. 1994. A ortografia em crianças francesas, inglesas e portuguesas. *Revista da Faculdade de Letras – Línguas e Literaturas, Porto, II Série*, Vol. XI, 115-129.
- Reitsma, P. 1989. Orthographic memory and learning to read. In P. G. Aaron, R. Malatesha Joshi eds. *Reading and writing disorders in different orthographic systems*, Dordrecht, Boston, London, Kluwer Academic Publishers, 51-73.
- Sampson, G. 1985. *Writing systems*, Stanford CA, Stanford University Press. Cited in Ardila, A.; Posselli, M., Pinzon, O. 1989. Alexia and agraphia in Spanish speakers. Cat correlations and interlinguistic analysis. In A. Ardila, F. Ostrosky-Solis eds. *Brain organization of language and cognitive processes*, New York, London, Plenum Press, 147-175.
- Segalowitz, S. J. 1989. ERPs and advances in neurolinguistics. In A. Ardila, F. Ostrosky-Solis eds. *Brain organization of language and cognitive processes*. New York, London, Plenum Press, 61-81.
- Snowling, M. J. 1989. The English language. Developmental dyslexia: A cognitive developmental perspective. In P. G. Aaron R., Malatesha Joshi eds. *Reading and writing disorders in different orthographic systems*. Dordrecht, Boston, London, Kluwer Academic Publishers, 1-23.