



International Journal of Disability, Development and Education

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Editorial

IJDDE was established primarily for the publication of original research into the education and development of persons with disabilities. Of course there are times when it is necessary and appropriate to review and interpret this research. Thus, IJDDE also publishes literature reviews and issue-oriented papers. To quantify the extent to which IJDDE has fulfilled its primary mission, I decided to examine trends with respect to the publication of research versus reviews and issue-oriented papers.

The data in Table I came from examining all articles published from the first issue of 1989 (Volume 36, Number 1) to the second issue of 1995 (Volume 42, Number 2). In these Volumes, a total of 118 articles were published. Each of these 118 articles was examined and classified as either a research article, a literature review, or issue-oriented paper. Editorials and book reviews were excluded. As indicated in Table 1, nearly half of the total articles published were reports of original research ($n = 55$). Literature reviews constituted one-quarter of the published content ($n = 30$) and a similar number of issue-oriented papers (i.e., $n = 33$ or 28%) were published. These figures indicate that over the past six years, IJDDE has published a good mix of the various types of articles, although it has been, and will remain, primarily for the publication of original research.

Table 1. Percentage of Articles by Type

Type of Article	Percentage of Total
Original Research	47
Literature Reviews	25
Issues-oriented	28

Each type of article can make an important contribution. The present issue of IJDDE contains examples of each type of article and I believe readers will agree that each makes an important contribution. Research articles are important, of course, because they contribute new information and, to paraphrase Margaret Mead's father, there is perhaps no greater thing than to contribute to the world's store of information (Mead, 1972). The authors of the four research articles in this issue have done great things by adding to our understanding of reading and learning difficulties, the values of persons with physical and visual impairments, and the effects

of medication on academic achievement in children with Attention Deficit Hyperactivity Disorder.

Literature reviews and issue-oriented papers are important in helping to synthesize and interpret the existing research on a particular topic. By doing so, limitations in the existing data base often become evident. Sylvia Rodger makes a nice contribution to the present issue by reviewing research on IEPs. By doing so, she has highlighted the limited amount of data currently available on the actual implementation of IEPs. Her work will hopefully stimulate much needed research into this neglected area.

There is perhaps a third important type of contribution and that is to facilitate the dissemination of research to those who may benefit from such information. Along this line, Bashford, Townsley, and Williams make an important contribution by exploring the issue of how to make research accessible to people with intellectual disabilities. Their proposal to create parallel texts is innovative, yet practical and should increase the accessibility of much that is now published in academic journals. For its part, IJDE will continue to provide an outlet for important contributions to the understanding of disability, development and education, be they in the form of original research or reviews and issue-oriented papers.

Reference

Mead, M. (1972). *Blackberry winter*. New York: William Morrow & Company.

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A Four Year Follow-up Study of Low Socioeconomic Status, Latin American Children with Reading Difficulties

This paper presents the results of a follow-up study of reading difficulties among Spanish-speaking Latin American children of low socioeconomic background (SES) over four school years. The research started with a group of 93 children with reading difficulties (RD) by 2nd and 3rd grade teachers in four schools and a control group of 63 children without reading difficulties (ND), belonging to the same schools. Both groups were equivalent in age, grade, gender and SES. All children were tested on reading decoding and comprehension, reading and writing pseudo-words, verbal abilities, visual perception, phonological processing, and the WISC-R. Neither SES nor IQ accounted significantly for the reading difficulties in the R-D group. The most predictive variables of the final reading level in the RD group were phonological processing, verbal abilities, and the initial level of decoding. After four years, 17% of the initial RD children had reached an average level of reading, but 11% of this group remained with severe reading difficulties and may be considered as dyslexic children. The RD children who became average readers were not significantly different from the control group in verbal abilities, nor in phonological processing. Nevertheless, they were significantly different in terms of IQ scores. The neuropsychological characteristics of the children with severe reading difficulties appear similar to those found in children with dyslexia in more developed countries.

The objectives of this research were to look for some neuropsychological variables that discriminate between a group of low socioeconomic level (SES) children who learned to read normally and another group of children with reading difficulties and to follow-up their reading development and variability over four successive school years.

A principal methodological problem for researchers in learning disabilities is the development of reading difficulties in dyslexic children with low SES. These children are disadvantaged by environmental problems other than the learning difficulties, which delay the development of their underlying basic processes for reading. Therefore, it is difficult for researchers to delimit the socioeconomic background and from the psychological disabilities brought about by developmental anomalies.

In this study, the terms "severe reading difficulties" and "dyslexia" are used interchangeably. Dyslexia can be defined as a specific and persistent disorder in learning written communication during the school years, which mainly affects reading reception and/or comprehension. The dyslexic child presents an underachievement in reading, according to their mental age, school grade and SES, characterized by persistent mistakes in decoding and/or low levels of comprehension that are not improved by current teaching methods (Bravo, 1985, 1994). Most cases of dyslexia are probably brought about by early disturbances in neuropsychological development independent of environmental factors (Duffy & McAnulty, 1990; Hynd, Marshall, & Sernrud-Clikeman, 1991; Galaburda, 1989).

According to Schonaut and Satz (1983), learning disabilities "constitute a serious social problem of epidemic proportions" (p. 572). In Latin American countries, learning disabilities is an epidemic problem. In Chile, for example, the prevalence of reading difficulties among children who have been seen in school Diagnostic Centres, is estimated at 78% (Schiefelbein & Villarreal, 1982). Most of these children are from low SES backgrounds. In addition, the rate of grade repetition and/or early drop-out because of reading difficulties is very high in these schools. Furthermore, follow-up studies of Latin American children show that their prognosis in learning to read is poor (Bravo, Bermeosolo, Pinto, & Oyarzo, 1994).

The follow-up studies analyzed by Schonaut and Satz (1983) found that the academic outcomes of children with reading difficulties was poor. One conclusion of their study is that SES "is a powerful variable" (p. 555), in early learning disabilities as well as in their outcome. The prognosis for low SES children was worse than for middle SES children. Therefore, SES is a variable that should be controlled in this type of research.

Though the lack of progress in learning to read can be related to early abnormalities in neuropsychological development, sociocultural and economic factors could also explain the poor reading progress of children with dyslexia from low SES. Among these other variables are the quality of the school and the teachers, the health of the children, the availability of books for children from families with low incomes, and the parents' awareness of and interest in the children's progress.

The present study involved a four year follow-up of children with severe reading difficulties (RD). All were Spanish-speaking. They were 7, 8 and 9 years old, and attended four urban schools for low SES children. A control group of normal readers (ND) was studied as well. Both groups presented the same educational and sociocultural characteristics.

Subjects

Two groups were selected: children with reading difficulties (RD) and children without reading difficulties (ND). The RD group was made up of 93 subjects, whose performance on a decoding test was lower than the 30th percent of the RD children read only some letters and syllables and scored below the 10th percentile on the

decoding test. They were practically nonreaders. The ND group was composed of 63 children with scores above the 85th percentile on the same test.

General Method

Procedural overview

The study was conducted in three phases over four school years. The first experiment compared the groups during the first year of this study. The second experiment, conducted the following year, involved the evaluation of silent reading comprehension (SRC) among children in both the RD and ND group, a comparison with the former level of decoding, and their progress as compared to the previous year. The third phase included a retest of reading and other abilities during the fourth year of the research, and a comparison of subgroups with dissimilar progress in SRC (Bravo, Bermeosolo, & Pinto, 1986).

Phase 1

Preliminary selection of the RD children was conducted by their own teachers. Teachers chose all the pupils who did not learn to read during the 1st, 2nd or 3rd grades. Thereafter, the group was assessed individually with tests of reading, intelligence, and neuropsychological abilities. In addition, these children were given a medical and neurological examination and those who presented with severe emotional, sensorial or motor disabilities were excluded. Together with this RD group, a control group of children without reading difficulties from the same schools was selected.

Tests and experimental tasks

Test of Decoding and Reading (TEDE). This test evaluates the decoding of letters, syllables, words and pseudowords in Spanish (Condemarin & Blomquist, 1970). It was administered at the beginning and at the end of the first year.

Test of Silent Reading Comprehension (SRC). This test has a Spanish edition for Latin American children (Level 2, pretest and Level 3, posttest). It was administered in the second and third stage.

WISC-R. Eight subtests of the WISC-R were used: Similarities, Arithmetic, Vocabulary and Digit Span from the Verbal Scale; Picture Completion, Picture Arrangement, Block Design and Coding from the Performance Scale.

Bateria de Exploración Verbal para Trastornos de Aprendizaje (BEVTA) (Bravo & Pinto, 1987). Four verbal tests from this battery were used to evaluate some verbal skills that are not evaluated by the WISC-R. The specific tests used were: the Test of Verbal Immediate Memory (TAVI) for information recall; the CAT-V for evaluation of abilities to determine verbal categories and the naming of objects belonging to the same category of a wordstimulus; the Test of Verbal Abstraction (3-S) for detecting similarities among three objects; and the Test of Memory of Verbal Sequences (S-V).

Moreover, all children were tested with five experimental tasks during the first year of the research and retested with similar tasks at the end of the study. The tasks used were experimental situations, similar to some laboratory experiences used in experimental psychology. The aim of these tasks was to determine some neuropsychological differences between RD and ND subjects. The use of these experimental tasks arose from a scarcity of standardized tests for children in Latin America. It seemed useful to work with laboratory experiences because of the long time required for the standardization of some tests. All the tasks were administered in a similar way to all children. The experimental tasks were:

Listening to a Story (CE). The children listened to a recorded story for 12 min. and then answered 16 questions about the story. The purpose was to evaluate verbal auditory comprehension and verbal memory. The number of correct answers was recorded.

Auditory Perceptive Discrimination (DA). This task consisted of listening to a taped cassette with 16 similarly pronounced pairs of words (e.g., BOCAPOCA). The children had to indicate if the words were the same or different. The score was the number of correct answers.

Auditory Phoneme Sequences (SA). The children listened to a recorded sequence of phonemes and then indicated the word that is formed with them, in a series of four similar words (e.g., M-I-D-O = mido-nido-milo-pido). The task contained 12 series of segmented words.

Visual Sequences of Letters (PA). The children were shown a series of letters that formed a word. They had to recognize the word among a group of other words. The letters were presented visually by means of a series of slides, one letter per slide. The presentation of each slide lasted 2 seconds. Then the children had to indicate the target word formed by the letters presented among three visually similar words. For instance: "mido" - M-I-D-O. The words made with this series of letters were the same words as the SA task, but these two tasks were presented on different days.

Perception and Memory of Visual Sequences (MSV) without meaning. This task consisted of the projection of slides with 10 series of atypical geometrical designs that the child had to memorize and to recognize from among three similar designs. Each series was made up of three, four, five or six figures in different order. Each slide had one design and was exposed for 2 seconds. After the projection of one series, the children were asked which one was the target design. The score was the number of correct answers.

Each experimental task was administered individually in the same order. The five tasks required about 3 hrs and were administered in sessions of not more than 45 min.

The principal hypothesis of this research is that children with learning disabilities in the decoding of reading who show subsequent difficulties in reading comprehension, present underachievement in several neuropsychological abilities that would be independent of SES and IQ.

Phase 2

At the end of the second year of the research there were 75 children in the RD group and 48 in the RD group. Their average age was 10 years. The remaining children had dropped out of school. The silent reading comprehension tests (SRC) were administered in Phase 2 and progress to previous year compared.

Phase 3

During the third and fourth year, several children from both groups dropped out of school. The RD group was reduced to 45 children. This withdrawal from school is very common in Latin American schools among low SES children. Moreover, some children attended school irregularly, so that the number of subjects presents some variation.

In the fourth year, the average age of the children was 12 years. They were tested and retested by means of reading tests and they were retested in verbal abilities and other phonological skills previously tested in the first stage of the research, specifically:

Auditory Perceptive Discrimination (DA), Auditory Phoneme Sequence (SA) and verbal tests (B=A). Retests of the experimental tasks of these three tasks were undertaken.

A Test of Reading and Spelling of Pseudowords (R ps-w;- S ps-w). This test consisted of 15 pseudowords. The children had to read them aloud (R ps-w) and to write from the dictation (S ps-w). The score for each test is equal to the total number of pseudowords read and written correctly.

Experimental Tasks of Word Segmentation (SP). The children heard 15 words with two, three and four syllables and had to segment them into their phonemes.

Experimental Task of Blending Phonemes (SAO). This task is the opposite of the above. The children listened to a recorded sequence of phonemes and had to blend them into a word.

Experimental Tasks of Inversion of Trigrams (INV). In this task the children listened to a series of 16 trigrams (syllables with three letters) and after each trigram they had to say them backwards (Mil = lim; por = top; osa = aso). The score was the number of correct answers.

Results and Discussion

In this section the results of the three phases of the study are reported and their results discussed.

Phase 1

Between RD and ND there were mean differences in all the tests and tasks administered (see Table 1). The mean differences on the decoding test and initial reading determined the severity of the RD group's difficulties. This group's mean score of 26.9 represents the 11th percentile for the 7-year-old and the 2nd percentile for the 8-year-old children.

The RD group had lower scores than the ND group on all of the subtests of the WISC-R and the differences between both groups were significant on all of the Experimental Tasks and Verbal Tests. These results indicate a global cognitive and verbal deficit in the RD group. Nevertheless, the RD children's lower performance could be accounted for by their lower IQ or by SES dissimilarities within this group. To check this hypothesis a comparative study with subgroups, matched according to their IQ SES and age was undertaken.

Table 1. Means and Standard Deviations for Children with Reading Difficulties (RD) and Children without Reading Difficulties (ND) on Each of 13 Variables

Variables	ND (N= 93)		R-D (N 63)		P <
	M	SD	M	SD	
Age	7.9	0.76	7.8	0.7	ns
Reading	96.3	2.47	26.9	28.2	0.01
TAVI	52.9	8.0	40.2	7.9	0.01
3-S	47.3	8.6	40.7	7.3	0.01
CAT-V	44.2	11.0	33.7	8.7	0.01
S-V	48.9	7.2	43.1	6.9	0.01
Task CE	12.7	4.0	7.2	3.7	0.01
Task DA	13.3	2.2	10.6	3.1	0.01
Task SA	8.0	1.8	2.1	2.2	0.01
Task PA	8.2	1.3	5.3	2.1	0.01
Task MSV	4.6	1.4	3.6	1.3	0.01
Verbal IQ	106.1	8.9	96.9	9.8	0.01
Performance IQ	105.0	8.9	91.6	9.6	0.01

Prior to the comparison between the matched subgroups, a study of the children's familial and clinical characteristics that could influence the differences between them was undertaken.

An independent examiner interviewed and gave an inventory to each mother, and a pediatric neurologist checked the clinical information of the child's development from one of the

schools in the sample. By means of the interview and the inventory the family's SES, the father's educational and employment levels, and the quality of their home environment were evaluated.

This analysis did not yield significant differences between ND and RD children. All the families belonged to a low SES and most of the fathers were manual labourers with a low educational level. Some of them were illiterate. The history of the development of the children revealed significant differences only in the early development of language. RD children were delayed with respect to language development in comparison to ND children.

With the results of this preliminary study, 20 non-reading children and 20 normal readers were matched (11 males and 9 females in each subgroup). The matching was done according to age, IQ, school, SES and psychomotor development. The mean differences of the RD and ND children were maintained in all the variables, except in the Memory of Visual Designs without meaning task (MSV). The greatest differences between means were in the tasks of perceiving and retaining phonological information (SA), verbal comprehension (CE), perceiving and retaining visually sequenced letters (PA), and in the verbal tests of abstraction of similarities (see Table 2).

Table 2. Initial Means and Standard Deviations for Matched Groups of Non-readers and Normal Readers on 12 Measures

	Non-readers (N = 20) M age 7.8 years		Normal Readers (N-20) M age 7.8 years		t	P <
	M	SD	M	SD		
Reading WISC-R	12.0	6.9	95.9	2.45	-	
Verbal IQ	102.4	8.6	101.3	7.8	-	-
Performance IQ	96.6	7.6	98.8	7.8	-	-
Total IQ	99.5	6.7	99.9	6.5	-	-
Verbal Tests						
TAVI	42.25	10.18	49.75	10.83	2.20	0.03
3-S	42.1	4.73	48.2	7.59	2.95	0.006
CAT-V	33.9	7.4	41.1	13.0	2.10	0.04
S-V	42.35	4.92	46.2	6.87	1.99	0.051
Experimental Tasks						
CE	6.65	5.24	10.4	4.09	3.13	0.004
DA	10.50	2.31	12.50	1.86	2.94	0.006
SA	1.35	1.53	8.15	1.42	14.20	0.000
PA	5.25	2.28	8.18 a	1.46	4.43	0.00

Note. As subjects were matched according to WISC-R total IQ, the mean differences in IQ have not been calculated. Differences in reading are evident. 'Only 17 of the 20 Normal Readers were tested on this task.

In Table 2, the differences in IQ or in SES between children with and without reading difficulties did not explain the differences in achievement in the verbal tests and in the specific perceptive tasks. Severe reading difficulties appear independent of SES and IQ. Moreover, within the group with low SES there were children with normal school achievement and normal IQ.

The underachievement in the specific skills and in the verbal abilities for the group of RD low SES Latin American children are similar to results found in research done with samples of English-speaking middle SES children. The subjects of our sample belong to the lower SES level of the Chilean population. It is very possible that the sociocultural and economic deprivations had a negative effect on the development of these children which increases their difficulties, but the social deprivation did not appear to be the cause of their learning disabilities.

The differences found in the verbal tests of abstraction of similarities, verbal categorization and verbal memory between the matched subgroups show that the break in the reading code is dependent on these higher verbal processes. Otherwise, the differences in the specific phonological and visual perceptive tasks and the comprehension of an oral story support the hypothesis that these skills are a key to early decoding. The mean score for normal readers was better on these perceptive tasks than for the RD group. The visual and phonological processing that discriminates the ND children would not be a simple perceptive discrimination of the stimuli, but a linguistic process that allows the children to deal more easily with the code.

There were no differences between both subgroups in the memory and perception of serial stimuli without meaning, but there was a difference in the tasks with visual-verbal association. The former tasks are not verbally codifiable for memory retention; in the second task the stimuli can be encoded to be retained. Visual perception affects the learning to read process when the subject can associate the stimulus perceived with the verbal memory of their phonemes. The differences found in the visual perception tasks show that these skills are significant for early reading when they are related to verbal meaning. Visual perception and memory of stimuli without meaning should be irrelevant to reading as Vellutino (1979) noted.

The differences found between RD and ND children of similar IQ and SES, showed that reading difficulties were dependent on certain specific neuropsychological verbal deficiencies. The children's SES does not appear to account for their specific reading difficulties.

Phase 2

The silent reading comprehension tests (SRC) showed that 16 children from the RD group continued as non-readers. The remainder of the RD group retained the reading differences with respect to the ND group ($p < .001$).

The predictability of the variables tested at the beginning of the follow-up study-as independent variables-was estimated in the group with reading difficulties by means of multiple and simple correlations with the SRC test as a dependent variable. There was 55% common variance between the reading decoding test and the SRC test ($r = .74$).

The non-reading tests that had higher predictability of the silent reading comprehension were: the experimental tasks of Auditory Phoneme Sequences (SA), $r = .49$, $P < .01$; Listening to a story (CE) $r = .32$, $p < .05$; and the Picture Arrangement subtest of the WISC-R, $r = .38$, $P < .01$.

The WISC-R did not present significant correlations with the reading comprehension test in the RD group. However, the subtest of Picture Arrangement was a predictive variable. Performance in this subtest depends on the ability to obtain a perceptive visual comprehensive view of some sequential situations and to grasp the meaning of a stimuli. This ability would be essential for reading comprehension.

In spite of the lack of significant correlations between the WISC-R and the reading comprehension test, the mean differences in IQ between non-reader and reader with difficulties subgroups was significant. It is possible that the children with reading difficulties need a minimal threshold in IQ to progress in reading comprehension. According to the mean scores for each subgroup, this threshold would be around IQ 90. The RD children with an IQ lower than 90 would have difficulty in looking for alternative strategies to overcome their specific reading difficulties and for understanding the text. Instead, the RD children with a higher IQ would be able to attempt cognitive strategies to understand the meaning of the text.

The outcome of this second stage of the follow-up study indicates that the transition between reading decoding and early reading comprehension in RD children is accounted for by the skills of visual and auditory perception, memory of letters and phonemes and the ability to understand serial visual and oral comprehensive stimuli. IQ appears to be a necessary, but not sufficient, requisite for progress from the decoding stage to the reading comprehension stage.

Phase 3

There was progress in reading for both groups. The means of the tests and tasks show significant progress of the RD group in decoding pseudowords and a decrease of visual and phonemic confusions. Nevertheless, despite the progress in the RD group, the differences in reading with the control group were maintained ($p < .01$) and the SRC mean of the RD group was lower than the ND group by one standard deviation.

According to the first testing, the reading progress within the RD group was not the same for all the children and 65% changed their range in reading performance. The comparison between the RD children who raised and lowered their reading comprehension showed significant differences in all the variables tested except Auditory Discrimination (DA) (see Table 3).

Table 3. Means and Standard Deviations for Total Group and Each Subgroup Across the Eight Measures

Tests	Total Group		Subgroup that Increased		Subgroup that Lowered		P <
	M	SD	M	SD	M	SD	
Reading	33.9	13.1	44.4	9.1	25.0	9.9	.001
3-S	37.4	11.1	49.9	6.5	34.0	10.8	.005
CAT-V	44.6	10.2	53.2	6.6	40.8	10.8	.005
SA	9.2	1.7	10.7	0.9	8.6	1.9	.005
DA	14.6	1.4	15.5	1.3	14.2	1.4	NS
SP	7.1	3.8	10.5	1.6	5.8	3.8	.001
INV	9.4	4.6	12.3	2.3	7.6	3.8	.005
SAO	5.6	2.6	7.5	1.3	4.5	2.1	.001

The outcome of this step indicates that the reading advance was accounted for by children's progress in the higher verbal processes of abstraction and categorization and in the phonological processing. The RD subgroup who decreased their performance level in reading performed the worst in verbal and in phonological testing.

At the end of the follow-up study the mean differences between ND and RD groups remained significant for all but Auditory Perceptive Discrimination (DA) (see Table 4).

Table 4. Means and Standard Deviations for Children with Reading Difficulties and Children without Reading Difficulties Across 13 Tests at the End of the Follow-up Study

Tests	Children with Reading Difficulties		Children without Reading Difficulties		Differences P <
	M	SD	M	SD	
Reading	33.9	13.3	59.1	18.9	.01
Verbal IQ	96.7	6.9	109.2	11.4	.01
Performance IQ	95.3	11.0	111.8	11.5	.01

3-S	37.4	11.1	50.0	9.5	.01
CAT-V	44.6	10.2	50.8	11.8	.03
S-V	33.4	8.7	37.0	9.9	ns
INV	9.4	4.6	14.6	2.1	.01
SA	9.2	1.7	11.1	1.2	.01
DA	14.6	1.4	15.3	0.8	.01
SP	7.1	3.8	10.3	2.4	.01
SAO	5.6	2.6	8.6	2.2	.01
R Ps-words	12.4	3.0	13.8	1.3	.01
S Ps-words	10.8	3.6	13.3	1.09	.01

The RD children continued to underachieve on the verbal, phonological and intelligence tests over the four school years. The persistence of these differences compared to the normal readers, indicates that the underachievement of the RD children supports the hypothesis of a lasting neuropsychological dysfunction.

Thereafter, a comparison of mean scores between normal control readers (ND) and a RD subgroup, formed by "average reader children" whose SRC scores came within one standard deviation of the normal reader's means (between - 1 and +1 SD), was made (see Table 5).

This comparison showed that the subgroup of "average readers" did not present significant mean differences with the control group in any of the tests, except the WISC-R. Those RD children who reached an average reading level, caught up with the normal readers in the neuropsychological specific skills. The differences in IQ show that global intellectual achievement did not have a direct role in reading progress. The average readers retained their lower IQ with reference to the normal readers.

All the phonological tasks were significantly correlated with the reading comprehension tests in the RD group. The multiple correlation of the four perceptive phonological tasks (INV, DA, SP and SAO) for the RD group was $r = .80$ ($p < .001$). In the ND group this multiple correlation was not significant (Bravo, Bermeosolo, & Pinto, 1992).

Table 5. Differences between the Average Reading Subgroup and Normal Readers

Tests	Differences	
	t	P
Reading pseudo-words	1.15	ns
Spelling pseudo-words	1.74	ns
SA (retest)	2.23	ns
INV	2.3	ns
DA (retest)	0.0	ns
SP	1.82	ns
SAO	1.48	ns

3-S	2.19	ns
Verbal IQ	3.16	.004
Performance IQ	2.81	.008

The phonological task that correlated best with reading comprehension was the inversion of phonemes sequence (INV). This task assesses the skills for discriminating the phonemes, perceiving their temporal sequence, disconnecting them and, finally, blending them into the opposite temporal order. This process is highly complex and the RD groups needs minimal development of temporal and phonological processing to perform it. Moreover, the multiple correlation between silent reading comprehension, pseudoword reading, and spelling was significant ($r = .70$; $p < .001$).

General Discussion

The successive comparisons between the RD and ND groups in this study pointed to the severity of the reading difficulties and the insufficient progress for some of these children. The RD group was initially formed by all the children that scored below the 30th percentile on the test of initial reading, TEDE, and 87% of them were non-readers, with a score below the 10th percentile. Moreover, 63% of the initial RD group were 8 years or older at the beginning of the follow-up study.

In the last stage, when the average age of the children was 12 years, 17% of the early RD group had reached an average level of reading, and 11 % of this RD group remained severely delayed with respect to reading.

IQ scores were not directly related to reading difficulties in the low SES group. Although there were significant differences in IQ scores between the groups, the comparison of matched pairs of RD and ND children showed that IQ did not account for the reading difficulties, as did the specific skills and verbal abilities.

One characteristic of the RD group, prior to entrance to school, was that they had been delayed in early verbal development. This lag in the onset of language learning in the RD children has been observed in other studies as a characteristic of children with dyslexia (Bravo, 1985; Rutter, 1978). The comparison of matched pairs of RD and ND low SES children argue against socioeconomic variables and IQ as principles causes of their difficulties in verbal development.

During the follow-up study, the comparisons of mean differences showed that the RD children underachieved in most of the variables tested. These differences between RD and ND children support the hypothesis that the specific reading difficulties were related to poorer development of verbal abilities of memory, abstraction and categorization, and of perceptive phonological and perceptive visual-verbal association. As a consequence of these differences, the RD children could be called "dyslexic" because of the severity and the persistence of their reading difficulties and the phonological deficiencies (Catts, 1989).

The findings related to dyslexic underachievement in the phonological processing is consistent with the outcome of studies of children with dyslexia in other countries, such as those of Vellutino and Scanlon (1987) with English-speaking children, Lecocq (1991) with French-speaking children, and Lundberg, Olofsson and Wall (1980) with Swedish-speaking children. Together with the lower achievement on the specific phonological skills, the RD group performed below the normal readers on verbal abilities and in IQ. The insufficient development of these abilities could explain why children with dyslexia did not successfully use other verbal strategies for decoding and reading. The development in the performance of the RD group appeared to be mainly determined by the variability of the subjects. Notwithstanding the individual variability, it is possible to outline some common psychological traits for the RD group.

The performance in silent reading comprehension (SRC) was mainly accounted for by the level of reading decoding tested at the beginning of this follow-up study. The common variability between the test TEDE and the first testing of SRC was 55% ($r = .74$; $p < .01$) and with the SRC retested three years later, 32% ($r = .57$; $p < .01$). The influence of the early reading decoding was maintained during those years and the initial disabilities in reading persisted as lower reading comprehension.

Butler, Marsch, Sheppard and Sheppard (1985), after a seven year follow-up study, pointed out that level of early reading is a good predictor of later learning. Lundberg (1985) and Bravo, Bermeosolo, Pinto and Oyarzo (1994), in two follow-up studies, came to similar conclusions.

In these studies, the reading underachievement during the early school years accounted for the later reading difficulty. The severe reading disabilities in some younger children persisted throughout the school years. Probably, they are due to neuropsychological abnormalities, as has been found by Galaburda (1989). The progress of the RD group between the stage of reading decoding to the stage of early reading comprehension seems to be dependent on the interaction of the former reading level with the children's performance in perceptive visual-sequential-verbal association and in phonological skills. This neuropsychological threshold for learning to read does not seem to depend directly on the socioeconomic status nor IQ

In spite of the mean differences in IQ, the WISC-R did not predict reading progress. However, the subgroup of children who did not progress presented the lowest IQ. While IQ may point out a threshold or minimal level for initial learning and reading progress, it did not appear to account for the specific neuropsychological processes involved in reading.

Morais, Alegria and Content (1987a, 1987b) and Wagner and Torgesen (1987) noted that phonemic awareness and phonological processing are clues to learning to read. Spanish-speaking children from a low SES background presented neuropsychological traits similar to other dyslexic children. Their principal reading disability was an underdevelopment of some specific abilities and skills related with the processing of the phonological and verbal information.

This outcome could be of interest as one of the possible causes of illiteracy in Latin American countries, where many children drop out of school without having learned the minimal decoding processes. In these countries there are neither resources for setting up diagnostic centres nor specialized educational systems for learning disabilities. Instead compensatory educational programs for preschool children, aimed at stimulating those specific skills and abilities would be more feasible. Most of the RD group's disabilities were undetected during the preschool years.

An educational strategy for the rehabilitation of children with reading difficulties should be to focus on the interaction between the development of specific skills and metalinguistic abilities. The stimulation only of the specific perceptive visual-sequential and the perceptive phonemic skills, without a larger metalinguistic context, could reinforce a limited strategy for reading.

A limitation of this research is that it did not control the methodological variables for teaching reading in the schools, nor the remedial strategies for the children with reading difficulties. Thus the differences in teaching within the classes and schools could account for differences in reading progress. In addition, familial-cultural influences were not studied. A very interesting subject for future research in children with low SES and learning disabilities would be to understand how much school performance depends on familial influences in low versus high SES children. Another limitation was the use of non-standardized experimental tasks due to the scarcity of appropriate assessment tools for Latin American children. Moreover, the use of the WISC-R is frequently questioned in Latin America because of its culturally biased items. However, the combination of some international tests (e.g., WISC-R) with other local standardized tests (e.g., the BEVTA Battery) and experimental tasks with content validity, appeared useful for the objective of this research.

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