DOCUMENT RESUME

ED 192 273 CS 005 647

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TITLE A Comparative Analysis of Reading Miscues Made by Monolingual versus Bilingual Students.
PUB DATE Apr 80
NOTE 37p.; Paper presented at the Annual Meeting of the American Educational Research Association (Boston, MA, April 7-11, 1980).

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Bilingual Students: Comparative Analysis; Context Clues; Grade 3; Language of Instruction; *Miscue Analysis; *Monolingualism; Primary Education; Reading Instruction; *Reading Processes; *Reading Research; Reading Skills; *Spanish Speaking

ABSTRACT

An adaptation of a miscue taxonomy developed by G. A. Cziko was used to compare the reading performance of (1) monolingual English and bilingual third grade students reading in English, (2) monolingual Spanish and bilingual third grade students reading in Spanish, and (3) bilingual third grade students reading in both English and Spanish. Eight English monolingual, seven Spanish monlingual, and eight bilingual students participated in the study. While being videotaped, each read a story, first from his or her current reading book and then from reading materials especially prepared according to the language group the student was in. The sessions were then coded using a miscue analysis system that was adapted by adding or deleting categories. The results revealed that the students relied more on graphic information than on contextual information while reading. A trend toward increasing the use of contextual constraints of the text was found that seemed to be consistent with an interactive view of reading. In general, it was found that monolingual English readers used more contextual information than either the monolingual Spanish readers or the bilingual readers. (FL)

A Comparative Analysis of Reading Miscues Made by Monolingual versus Bilingual Students

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Paper presented at the American Educational Research Association 1980 Annual Meeting in Boston, Massachusetts, April 7-11, 1980.

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I. Introduction

The enactment of the Bilingual Education Act into the Elementary and Secondary Education Act of 1965 has raised an increasing public interest in bilingual education as a way to serve the needs of children in the United States, whose native language is not English. Up to now, many decisions made in regard to the design and management of these programs have been based on personal intuitions rather than on research. There is a need for a sound research base on decision making in this area. So that the programs will better serve the needs of culturally and linguistically different children in the United States.

The present study addresses one of the areas in which research is needed in bilingual education: reading in a bilingual school setting. Although several studies have been carried out in second language reading, most of the ones found by the investigators, except Young (1972) and Stafford (1976) involved adult or college level populations and/or were developed in settings outside the United States; Tucker (1975), Cummins (1975), Czicko (1976), Cziko (1978), Cowan and Sarmed (1976), Sezanson and Hawkes (1976). The present study will intent to explore and compare: a) the miscues produced by "Anglo" vs "Bilingual" third grade students as they read orally in English; the miscues made by bilingual students reading in both, Spanish and English; and c) the miscues made by monolingual Spanish and "bilingual" students while reading orally in Spanish.

II. Research in First and Second Language Reading

In general theories and research in reading are directed toward first language learners and very little has been done to study the reading

process in a second language. Most of the reading studies have been done in laboratory like experimental conditions where several aspects can be controlled. Much of this research attempts to study the sensibility of children and/or adults to semantic and syntactic contraints as opposed to the graphic information. Specifically, studies have analyzed the type of errors made by children; Goodman (1970), Weber (1970). Kolers (1970) found that adult readers were more sensitive to contextual (syntactic and semantic) constraints than to graphic information. Meyer, et al.(1974) and Tulving, et al. (1964) did experimental studies on the effect of semantic constraints in the perception of individual words and found that these constraints facilitate word perception. Other studies have compared the reading performance of good and bad readers and described characteristics of their performance(Golinkoff, 1975). She found that good readers use more effectively the contextual information in the text rather than paying attention to the graphic aspects of it. Biemiller (1970) has described strategies in the use of contextual versus graphic information used by first grade readers and discovered sequential regularity in the occurrence of the strategies.

Research by Goodman (1965), Biemiller (1970) and Golinkoff (1975-76) which studies the characteristics of good and bad readers, seems to show that one of the problems with poor readers is that they do not use their knowledge of the oral language while they are reading. In contrast, second language learners lack knowledge of their second language and this seems to underline their low reading performance. In regard to second language reading, Nicolson (1977) and Mes-Prat and Edwards (1978) studied the sensibility of second language readers to orthographic constraints. Their subjects were French-English bilinguals. Other studies with bilingual

subjects, such as MacNamara (1968), suggest that second language readers have difficulty using contextual constraints. Furthermore, Stafford (1976) and Young (1972) studied reading errors in second language readers and they both found that these readers can not fully use contextual constraints while reading so they rely more on the graphics of the text.

Hatch (1974) and Hatch, et al. (1974) used a letter cancellation technique to compare native and non-native speakers of English use of contextual and graphic information while reading. These studies showed that the non-native speakers of English were using the graphic information in the text more than the native speakers were. Tucker (1975) studied reading comprehension longitudinally on children attending French immersion programs in Canada. His findings suggest that: a) The subjects were good on word-discrimination in spite of their poor knowledge of grammar and b) Different processess and strategies are used by first and second language readers; namely (1) second language readers used more word-discrimination than the first language readers to compensate for their lack of contextual knowledge and (2) second language readers relied more on graphic information. This last strategy has already been suggested by Stafford (1976), Young (1972), Oller (1972) and Hatch (1974).

Studies by Cummins (1976), Cziko (1976) and Tucker (1975) found a correlation between second language and native language reading skills. This finding seems to indicate that the effective use of context information in reading is transferable, but it is not consistent with the current view that supports the belief that second language reading is dependent on the overall proficiency in the second language.

III. Rationale for the Study and Research Questions

As described before, most of the studies done in second language reading have tried to study the use of contextual and graphic constraints by second language readers. MacNamara (1972), Young (1972), Stafford (1976), Thébèrge (1976) found that second language readers have problems using context information. Young (1972) studied the errors made by fifth grade Mexican American children while reading. Cziko (1978) studied the errors made by seventh grade children reading in French, their second language.

Hatch, et. al (1974), Oller (1972) and Tucker (1975) found that second language readers rely more on graphic than contextual information while reading.

Goodman, K.S. (1969), Goodman, Y. (1967), Weber (1970), Hood (1975-1976) studied the errors made by monolingual English subjects to observe their sensibility to contextual (semantic-syntactic) constraints and to graphic information. For this purpose, they developed their own taxonomy of errors or miscues to observe and study. Following Hood (1975-1976), Cziko (1978) developed his own error coding system to be used in an analysis of errors made by second language readers.

Due to the differences found between L1 and L2 English readers in regard to the use of semantic and/or graphic constraints in the text, research involving reading miscue analysis with Spanish-English bilingual young children could be relevant to people involved on the education of these children. This type of study will show evidence as to whether bilingual and Anglo children make the same or different miscues while learning to read. The study may discovers strategies used by second language

learners while learning to read in L2 and the problems they may encounter in that process. This type of findings could be very useful for bilingual education practitioners and it will add research evidence as to bilinguals (Spanish-English) use of graphic and semantic constraints in a text.

By adapting a miscue taxonomy previously used with French-English bilinguals and carrying out a miscue analysis of oral reading behavior of English monolingual, Spanish monolingual and "bilingual" third grade students, the present study tries to answer the following questions:

1. Are miscue taxonomies developed for reading miscue analysis with English monolinguals and French-English bilinguals adaptable to third grade Spanish-English bilingual students?
2. What does the miscue analysis of third grade "Anglo" and "bilingual" students reading in English tell us about their similarities and differences in reading?
3. How do "bilingual" and monolingual Spanish students oral reading performance compare?
4. How does the performance of "bilingual" students compare across languages (Spanish vs English)?

IV. Methodology

A. Subjects

The subjects of this study are 23 children attending third grade in public schools in two different districts in Illinois. There are eleven boys and twelve girls in the sample. Eight of these children were English monolingual, seven were Spanish monolinguals and eight were "bilingual" students.

It is important to note that the classification of "bilingual" for this study does not mean that the students are equally functional in the two languages (L1 and L2). "Bilingual" children are those children who are attending bilingual programs because they lack English proficiency to fully participate in an all English class. They will show some proficiency in English and they were categorized at levels 3 or 4 of proficiency according to State of Illinois guidelines.

B. Procedure

The subjects of the study were chosen randomly. When a child missed school on the date of data collection, an alternate child was chosen.

Each child was called individually to read orally while being videotaped using a Sony 3600 video tape recorder and a Sony AV3250 stationary video camera. Each child read first a story from his/her current reading book and, then, the reading materials provided by the investigators according to the group they were in, namely monolingual English, monolingual Spanish and bilingual. It was thought that by letting the child read from his/her own book first he/she would feel more at easy, once he/she got to read the materials provided by the investigators.

The reading materials chosen for the study were analyzed using the Fries redability formula to determine their grade reading level. The English reading materials were chosen from the Santillana/Reading in Two Languages Series. The Spanish reading materials came from the Laidlaw Brothers Publishers Series/Por el Mundo del Cuento y la Aventura.

Although there was no problem finding the reading text in English according to the desired reading level, it was difficult to find the Spanish reading text using the Fries formula. It may be that since the

readability formula was designed to determine grade levels of English reading materials, peculiarities of the Spanish language do not allow the appropriate use of this formula with Spanish materials. The Spanish text that most closely fit the Fries formula requirements for a third grade level reading text was used in the study.

C. Data Analysis

The first step for treating this data was the development of a coding system which facilitated the organization of the data for later analysis.

Using an error taxonomy similar to the one used by Cziko (1978) with bilingual students, a coding system was developed which took into account the specific purposes of the study. We wanted to have a coding system which: a.-required the least transcription possible and b.-could be shown to be reliable and simple when used by undergraduate students who had been trained and were knowledgeable of the instructions included in the coding system instructions. The coding system developed for the study and an explanation of the different categories appear in Appendix A.

To check the reliability of the coding system, the data for three subjects reading in Spanish and three subjects reading in English were coded by two different native speakers of the language. This was done to assure that the people coding the tapes understood the different categories and identified miscues equally well. The interrater reliability was calculated with these data. A description and discussion of the findings will appear later in the paper.

After the video tapes for all subjects were codified, counts and percents tables were developed and t-test were carried out to determine the significance of the differences and facilitate the explanation of findings.

The t-statistic for two means was used when two different set of subjects were compared (Brownlee, 1965) and the paired t-statistic was used when two observations for a set of subjects were compared (Ostle, 1963).

V. Results

A. The Coding System

The reliability of the coding system was checked so as to insure the usability of the coding system and the possibility of replication of the study. The data for three subjects per text in each, Spanish and English, was coded by two people and the interrater reliability was calculated for the different categories. The Pearson Product Moment Correlation was used to calculate the reliability. Table 1 shows the results for the reliability check in Spanish and in English.

Table 1

Interrater Reliability*
for main coding system categories

Categories	Spanish	English
Repetition (TR)	.39	.92
Word Order (WO)	**	**
Spanish Interference (SI)	**	**
English Interference (EI)	**	**
Meaningul Substitutions (MEASUB)	**	.86
Non-meaningful Substitutions (NONSUB)	.99	1.00
Similar Spelling or Sound (SMSP)	.94	.74
Insertions (INSERT)	.87	.69
Deletions (D)	***	.84
Corrections (→)	.97	.85

* The Pearson Product Moment Correlation was used for this purpose
** Not enough instances of the miscue found in the sample to calculate interrater reliability.
*** Complete misunderstanding of what D means by one coder.

As it can be noted, the inter-coder reliability for several categories could not be calculated due to the small number of occurrences in the data used for this purpose. In the case of deletions there was complete misunderstanding by one of the coders as to what deletions were. This definition was clarified later before the coding of the rest of the data was done.

B. Bilingual and Monolingual English Children's Miscues Compared: English Reading.

Table 2 shows the percent occurrence of each miscue per group. A total count and percent of sub-categories related to use of text structures, namely: non-conforming (NC), conforming to entire passage (DC), conforming to preceding structure (PC) was made. As it will be explained later, these subcategories were not reliable when breaking them down within each of the main categories due mainly to the small number of occurrences. They have been included in a total count across categories in this table because they might say something about the bilingual vs anglo children's use of the structure of the text.

To determine the significance of differences among the two groups, t-test were carried out for the categories where differences seemed significant. The t-statistic for 2 means (Brownlee, 1965) was used for this purpose. Table 3 shows the results of the t-test.

Table 2

"Bilingual" and Monolingual English subjects
percent miscue occurence

Miscues	Bilingual %	Anglo %
No Response (NR)	0	.2
Request for Help (H)	.5	.2
Repetition (TR)	10.4	9.2
Word Order (WO)	.3	.9
English Interference (EI)	0	0
Spanish Interfefance (SI)	1.9	0
Meaningful Substitutions (MEASUB)	3.00	6.1
Non-Contextual Substitutions (NONSUBS)*	7.4	4.5
Similar Spelling (SMSP)	36.5	15.8
Diphphong Break (Spanish DB)	0	0
Insertions (Insert)	3.8	9.2
Deletions (D)	9.00	12.00
Corrections (—>)	12.8	13.2
Miscues non-Conforming to Structure of Text (NC)	6.8	9.4
Conforming to Preceding Structure (PC)	2.7	4.2
Conforming to Entire Passage (EC)	4.9	13.9
Conforming to Sentence (SC)	0	1.2
Total Number of Miscues per Subject	45.9	47.22

Table 3

Monolingual English versus "Bilingual" Children:
Significant Differences on Miscue Occurrences

Miscue Categories	T	DF
No Response (NR)	-	-
Request for Help (H)	-18.97	14***
Repetition (TR)	2.16	14*
Word Order (WO)	-28.39	14***
English Interference (EI)	-	-
Spanish Interference (SI)	-	-
Meaningful Substitutions (MEASUB)	11.62	14***
Non-Contextual Substitutions (NONSUB)	6.47	14**
Similar Spelling (SMSP)	.60	14
Diphthong Break (Spanish DB)	-	-
Insertions (INSERT)	9.83	14***
Deletions (D)	5.69	14**
Correction (—>)	4.31	14***
Non-Conforming to Structure (NC)	3.73	14**
Conforming to Preceding Structure (PC)	-10.19	14***
Conforming to Entire Passage (EC)	5.90	14***
Conforming to Sentence (SC)	-44.98	14***
Total Number of Miscues per Subject	-.47	14

* $p < .05$
** $p < .01$
*** $p < .001$

As it can be seen from table 3, only one category, Similar Spelling, was not significantly different. An interpretation of these results will be given in the next section of the paper.

C. Bilingual and Monolingual Spanish Children's Miscues Compared: Spanish Reading.

Table 4 shows the percent occurrence of each miscue per group. Table 5 shows the significant differences in miscues occurrences among the two groups. The t-statistic for two means (Brownlee, 1965) was used for this analysis. The results will be interpreted later.

Table 4

"Bilingual" versus Monolingual Spanish Subjects
percent miscue occurrences Spanish reading

Miscues	Bilingual %	Spanish %
No Response (NR)	0	0
Request for Help (H)	0	4.5
Repetition (TR)	9.8	3.0
Word Order (WO)	0	0
English Interference (EI)	4.2	1.5
Spanish Interference (SI)	.5	0
Meaningful Substitutions (MEASUB)	.9	1.5
Non-Contextual Substitutions (NONSUB)	10.2	18.2
Similar Spelling (SMSP)	23.4	22.7
Diphthong Break (Spanish DB)	1.5	0
Insertions (INSRT)	5.10	4.5
Deletions (D)	.9	9.1
Corrections (—>)	37.4	34.9
Miscues non-Conforming to Structure of Text (NC)	.9	0
Conforming to Preceding Structure (PC)	0	0
Conforming to Entire Passage (DC)	3.3	0
Conforming to Sentence (SC)	1.9	0
Total Number of Miscues per Subject	26.75	9.43

Table 5

"Bilingual" versus Monolingual Spanish Children:
Significant Differences on Miscue Occurrences

Miscue Category	T	DF
No Response (NR)	-	-
Request for Help (H)	-3.88	13**
Repetition (TR)	-3.16	13**
Word Order (WO)	-	-
English Interference (EI)	-	-
Spanish Interference (SI)	-	-
Meaningful Substitutions (MEASUB)	-20.42	13***
Non-Contextual Substitutions (NONSUB)	-5.93	13**
Similar Spelling (SMSP)	-1.51	13
Diphthong Break (Spanish DB)	-18.93	13***
Insertions (INSERT)	-5.86	13***
Deletions (D)	-6.08	13***
Corrections (—>)	-.16	13
Non-Conforming to Structure (NC)	-26.99	13***
Conforming to Preceding Structure (PC)	-	-
Conforming to Entire Passage (DC)	-16.66	13***
Conforming to Sentence (SC)	-26.12	13***
Total Number of Miscues per Subject	1.52	13

* $p < .05$
** $p < .01$
*** $p < .001$

D. "Bilingual" Children Miscues Occurrence Across Languages (Spanish vs English).

Table 6 shows a percent comparison of miscues made by "bilingual" children while reading in Spanish and in English. Significant differences were calculated using the paired t-statistics (Ostle, 1963) and they are found in Table 7.

Table 6

"Bilingual" Children: A Comparison of miscues produced across languages (Spanish-English)

Miscues	Bilingual Spanish %	Bilingual English %
No Response (NR)	0	0
Request for Help (H)	0	.5
Repetition (TR)	9.8	10.4
Word Order (WO)	0	.3
English Interference (EI)	4.2	0
Spanish Interference (SI)	.5	1.9
Meaningful Substitutions MEASUB)	.9	3.0
Non-Contextual Substitutions (NONSUB)	10.2	7.4
Similar Spelling (SMSP)	23.4	36.5
Diphthong Break (Spanish DB)	1.5	0
Insertions (INSRT)	5.1	3.8
Deletions (D)	.9	9.0
Corrections (—>)	37.4	12.8
Miscues Non-Conforming to Structure of Text (NC)	.9	6.8
Conforming to Preceding Structure (PC)	0	2.7
Conforming to Entire Passage (DC)	1.3	4.9
Conforming to Sentence (SC)	1.9	0
Total Number of Miscues per Subject	26.75	45.9

Table 7

"Bilingual" Children Miscues in Spanish and English
Significant Differences Across Languages

Miscue Categories	T	DF
No Response (NR)	-	-
Request for Help (H)	-	-
Repetition (TR)	.65	7
Word Order (WO)	1.00	7
English Interference (EI)	-1.51	7
Spanish Interference (SI)	-	-
Meaningful Substitutions (MEASUB)	2.16	7*
Non-Contextual Substitutions (NONSUB)	.45	7
Similar Spelling (SMSP)	2.51	7*
Diphthong Break (Spanish DB)	-	-
Insertions (INSERT)	.29	7
Deletions (D)	1.65	7
Corrections (—>)	2.00	7*
Non-Conforming to Structure (NC)	2.71	7*
Conforming to Preceding Structure (PC)	3.03	7**
Conforming to Entire Passage (EC)	1.95	7*
Conforming to Sentence (SC)	-1.87	7
Total Number of Miscues per Subject	.66	7

* $P < .05$
** $P < .01$
*** $P < .001$

VI Discussion of Results

To facilitate the interpretation of results and to try to answer the questions researched in this study, each question will be answered individually and in relation to the results presented in the previous section.

A. Question 1

Are the miscue taxonomies developed for reading miscue analysis with English monolinguals and French-English bilinguals adaptable to third grade Spanish-English bilingual students?

As it was explained before; the miscue taxonomy used for this study was an adaptation of the one developed by Cziko (1978). The types of miscues chosen for coding and analysis in the study appear in Apendix A.

The interrater reliability check (Table 1) could not be calculated for all categories due to the fact that some miscues did not occur much in the data. Reliabilities for seven categories in English and six in Spanish were calculated. In the Spanish reading sample, a complete misunderstanding by one of the coders in regard to the meaning of deletions made it impossible to calculate its reliability. The interrater reliability correlations ranged from .39 to 1.00 and were all significant ($p < .01$)

In regard to data coding, it seems as if categories such as, meaningful substitution, insert, deletion, word order, and self correction were easily understood and coded. Non-meaningful substitutions and similar spelling categories caused some confusion and they were difficult to distinguish among the coders. This is not reflected directly in the interrater reliability results shown here because the differences were specified before the coding of the data was done. In order to clarify the NONSUB category, it was called non-contextual substitution rather than non-sense substitution.

While coding the data in Spanish, it was found that a category parallel to similar spelling (SMSP) which was called similar sound (SMSO) should be included in the coding system when used with Spanish readers. Another category which was added to the Spanish miscue analysis, only, was the diphthong break (DB) which occurs maybe due to the methodology used to teach reading to some of the subjects.

A category which could be deleted from the system, as it stands now, is the one called repetition (TR). Although TR showed to be reliable for coding, some reading specialists do not recognize it as a miscue. It could be suggested, that if used, TR should not include instances where only the first one or two syllables are repeated before reading the entire

word.

In general, categories non-response (NR), request for help (H), and word order (WO) did not appear frequently in our data. In relation to subcategories related to structural conformance to text, subcategories conforming to preceding sentence (PC) and conforming to sentence (SC) did not occur as much as non-conforming to structure (NC) and conforming to entire passage (DC). It is suggested that future users of this taxonomy delete the subcategories PC and SC and, instead, they should state whether the miscues either do or do not conform to the semantic and syntactic constraints of the entire passage.

In answering the question in relation to the adaptability of existing miscue taxonomies to new situations with English L2 and Spanish L1 readers, it is possible to say that they can be adapted to be used with children at different grade levels and from different linguistic backgrounds. For this purpose, the user may have to add or eliminate categories, according to the nature of the language studied and according to the questions to be answered. The interrater reliability should always be checked for the different categories. It is recommended though, that all tapes be transcribed before using the coding system and that the trainer of student coders be very thorough in this training. For that matter, it is recommended that: 1. a tape with quite a variety of miscues be chosen for training, and 2. the trainer codes a complete set of data with the trainees, so that questions, ambiguities, and other problems found in the coding system could be clarified. A reliable coding system will enhance the chances for replicability of the study and generalization of the findings.

B. Question 2

What do the miscue analysis of third grade "Anglo" and "bilingual" students reading in English tell us about their similarities and differences in reading?

As it can be noted from table 3, twelve out of the eighteen categories for which enough data were coded for the two groups show significant differences between the English monolingual and the "bilingual" subjects. By putting the meaningful substitutions (MEASUB) and non-meaningful substitutions (NONSUB) into one category which will be called total substitutions (SUBTOT), we found that for English monolinguals 57.5% of the substitutions are MEASUBS. In contrast, the "bilingual" group showed only 29% of MEASUBS and 71% of the substitutions produced by this group were non-contextual substitutions. This shows that the Anglo group is using the semantic constraints of the text more than the "bilingual" children. In the case of "bilingual" children, the high percent of non-meaningful substitutions and the large number of similar spelling miscues produced (37.5% of total miscues) seem to show a tendency toward using the graphics rather than the contextual constraints while reading.

Significant differences were found among the two groups in the production of deletions ($p < 0.01$) and insertions ($p < 0.001$). The English monolinguals produced more insertions and deletions than the "bilinguals". This seems to show that these children were not paying as much attention to the graphics of the text as the "bilinguals" which made less deletions and insertions while reading. The "bilingual" students showed a higher tendency to produce repetition (TR) miscues while reading which may reflect their lack of familiarity with the language and a strategy used to read an unfamiliar word or sentence properly from the graphic rather than the

contextual point of view. In the case of corrections (→), significant differences were found among the two groups ($p < 0.01$), the English monolingual students producing more correction miscues than the bilinguals. This may show the monolingual English readers' tendency toward paying more attention to the contextual (semantic and syntactical) rather than the graphic aspects of the text while reading.

In the case of miscues related to the structure of the text or part of it, significant differences were found for categories non-conforming to structures of the text (NC) ($p < .01$) and structures conforming to contextual constraints of entire text (DC) ($p < .01$). The English speaking group showed higher occurrences of these miscues than the "bilinguals". This contrasts Cziko's (1978) findings where seventh graders native speakers produced less NC and more DC miscues than L2 learners. This findings seem to show that maybe by third grade monolingual English speakers are still learning to read and do not use the contextual constraints of the text as well as more mature seventh grade readers. It is important to note, though, that the monolingual English children produced more conforming to entire text (DC) miscues (53= 13.9% total) than NC miscues (36= 9.4% of total). While non-significant, these results show already a tendency by monolingual English readers toward using the contextual rather than the graphic information of the text while reading. In contrast, "bilingual" readers produced less non-conforming to entire text (NC) and conforming to entire text (DC) miscues as well as conforming to preceding structure (PC) and conforming to entire sentence (SC) miscues than the English speakers. This shows that "bilinguals" still are making comparatively more non-conforming with text structure miscues (NC, 25= 6.8% of total) than miscues conforming to entire passage (DC, 18= 4.9% of total)

and as such they are not using the contextual information of the text as well as their English speaking counterparts. In relation to the Spanish interference miscues found in the "bilingual" group, they account only for 1.9% of all miscues they produced and this seems to be consistent with Dulay and Burt (1974) and Gonzalez and Elijah (1979) which seem to suggest very little influence of L1 in L2 production.

In conclusion, the data presented here seem to show that the monolingual English children are using more the contextual (semantic-syntactic) constraints of the text than their bilingual (Spanish-English) counterparts. The data seem to show though that monolingual English third graders still have problems using the contextual constraints of the text. The finding that English monolingual students used better the contextual constraints of the text while reading than L2 learners is consistent with previous research findings. Cziko (1978), Hatch (1974) Young (1972), Stafford (1976), and Tucker (1975) among others found that L2 readers have trouble using the contextual constraints of the text and in turn they used the graphic rather than the contextual information of the text while reading.

C. Question 3

How do "bilingual" and monolingual Spanish students compare in oral reading performance as seen from the results of the miscue analysis?

The miscue analysis done shows that ten out of eighteen variables for which t-test were calculated were significant (see table 5). Again, several variables could not be used in the t-test due to their low occurrence.

The total substitutions (TOTSUB) variable shows that both groups produced more non-contextual substitutions (NONSUB) (92.3% monolingual Spanish, 91.7% "bilingual") than meaningful substitutions (MEASUB) (7.7%

monolingual Spanish, 8.3% "bilingual"). The proportion of MEASUBS and NONSUBS is very similar for both groups. Most of the substitutions are non-contextual substitutions which shows that both groups are using more the graphic than the contextual constraints of the text. Could this be due to the methodology used to teach them Spanish reading where emphasis is placed on sounding syllables and words more than on comprehension? Or do this show that by third grade children are still at a stage of reading development where graphic use of the text is more prevalent over reading for meaning? This are questions which should be studied further.

In regard to insertions and deletions, there are significant differences in the occurrence of these miscues among the two groups ($p < 0.01$) (see table 5). The "bilingual" group makes more insertions than the monolingual Spanish subjects but the latter makes more deletions. The two groups seem to be using different strategies while attempting to use the contextual information from the text. The Spanish monolingual group seems to be using the contextual constraints of the text more often percentwise than the "bilingual" group, though.

The Spanish monolinguals show a very high percent of corrections among their miscues, while the "bilinguals" make less correction miscues. This may show a tendency toward reading for meaning and, furthermore, a higher level of development of reading skills in the Spanish subjects. There is a significant difference ($p < .01$) among the two groups in terms of English interference (EI) miscues. The "bilingual" group producing more (4.5%) of interference miscues than the Spanish monolinguals (1.5%). As expected, the "bilinguals", by having more experience in English, show more language interference in reading behavior but the number of occurrences is not high enough as to affect development in reading. This is consistent with data presented by Dulay and Burt (1974) and Gonzalez and Elijah (1979) which suggest that there is very little influence of L1 in L2 production and reading development respectively. It is interesting to note that the diphthong break (DB) miscue appeared mainly in "bilingual" Spanish readers. This may be due to the methodology and books used in teaching reading to the subjects studied.

In terms of miscues related to the contextual structure of the text, no miscues were produced by Spanish monolingual readers while some were produced by the bilingual group (see table 4). It is important to point out that the categories conforming to the entire passage (DC) and conforming to sentence structure (SC) are used more than the category non-conforming to the structure of the text (NC) by the "bilinguals". This seems to suggest a tendency toward using the contextual constraints more than the graphic information of the text.

The picture that emerge from these data seems to suggest, in general, more similarities in miscues production between these two groups than between the English monolingual and the "bilingual" group, in spite of the significant differences found. Both groups seem to rely more on the graphic than on the contextual constraints of the text. As explained above, it may be due to the methodology and books used to teach them reading in Spanish or it may be that a developmental trend toward a higher level of reading abilities starts later in Spanish reading and/or "bilinguals". The fact that monolingual Spanish speakers made use of the contextual information of the text more often than the "bilingual" students while reading in Spanish could be related to research findings by Skutnabb-Kangas and Toukomaa (1976) with Finnish students attending Swedish schools. They found that the better knowledge of L1 the Finnish children had before being introduced to L2, the better their school achievement was in L2. It may be that the "bilingual" children in our study started to read in L1 (Spanish) only and were introduced to reading in L2 before they have developed good basic reading skills in L1. This, in turn, precluded their development of reading skills in L1 which would have been transfered into L2. Further,

research comparing the reading behavior of children who were introduced to L2 reading, after having learned to read in L1, to a group of "bilinguals" who were introduced to L2 before they had the basic knowledge of reading in L1, is very much needed and may give further evidence in this respect.

D. Question 4

How does the performance of "bilingual" students compare accross languages (Spanish versus English)?

Out of eighteen categories for which t-scores were calculated, six categories showed significant differences among the bilinguals' performance accross languages. The similar spelling (SMSP) category ($p < .01$) shows the "bilingual" group producing more SMSP miscues in English than Spanish. It may be possible that less SMSP miscues should be expected in Spanish since Spanish is a phonetical language. For this reason, it was recommended to add to the coding system a category (similar sound SMSOU) when analyzing Spanish reading data. This significant difference may show the lack of knowledge of the spelling system in English by the subjects involved. It is an indication, too, that this students were paying more attention to the graphic rather than the contextual constraints of the text; particularly in English.

Corrections occur significantly more ($p < .05$, table 7) in Spanish than in English. It seems as if corrections were made to correct meaningless or syntactically incorrect sentences. Definitely, the "bilingual" group was using more the contextual constraints of the text when reading in L1 than in L2; which in turn shows a more advanced stage in reading development in Spanish.

In the case of categories concerned with the conformance to the

structure of the text, our data shows that the "bilingual" group produced less non-conforming to structure of text (NC) miscues in Spanish (.9%) than in English (6.8%). Again this suggests a more advanced stage development in reading in L1 than in L2. At the same time, the "bilingual" group produced significantly more miscues DC (conforming to entire passage) and SC (conforming to sentence structure) in English than in Spanish which shows a trend toward increasing use of contextual constraints of the text in reading development.

In regard to MEASUB (meaningful substitutions) and NONSUB (non-contextual substitutions), only MEASUB shows a significant difference (English better than Spanish). A total count of substitutions (SUBTOT) shows that generally the "bilingual" group made more non-contextual substitutions (91.7% in Spanish and 71.8% in English) than meaningful substitutions. This may suggest that by third grade the development of reading skills in L1 as well as L2 is still at a graphic more than at a contextual (semantic-syntactic) stage of development, in terms of the interactive view of reading skills development (Rumelhart, 1976).

It appears, though, as if the learning of reading in L1 in the "bilingual" group is at a more advanced level than in L2. Corrections show a significant difference across languages (see table 7). They occur much more in Spanish than English. This may be due to the fact that children are trying to use the contextual constraints of the text more in L1 than in L2. It is possible to say, then, that our data with third grade "bilingual" subjects seem to show that they are still at a graphic level in both languages in terms of usability of the context of the text while reading, but that they are in a transition toward an increased use of the contextual constraints of the text. In general, subjects seem to be reading

for meaning more in L1 (Spanish) than in L2 (English) but a trend toward contextual use of the text (a higher developmental stage in reading) appears in the two languages. Should these "bilingual" subjects been allowed to develop more advanced reading skills in L1 before being introduced to L2 reading, maybe their reading skills in L1 could have transfered to L2 and, as such, they would have been using more of the contextual constraints of the text by third grade.

VII. Educational and Research Oriented Implications of the Study.

The analysis of reading miscues made by "bilingual", monolingual English, and monolingual Spanish subjects has given us some information as to developmental reading strategies found among the subjects studied. The strategies studied were related to the use of contextual and graphic information of the test by third graders. The data show that the three groups are still using prevalently the graphic information of the text to read, although they seem to be using contextual information as well, especially among the monolingual English group. The use of the contextual constraints of the text is a higher level cognitive strategy than the use of graphic information. Since third graders seem to be able to use the contextual information strategies well, as shown by the monolingual English readers, but are not using it consistently, the findings of this study support a rationale for teachers to emphasize the learning of usage of contextual information from a text by grade three.

Findings of the study showed that L1 interference has little influence in L2 production and reading. These findings are consistent with those of Dulay and Burt (1974) and Gonzalez and Elijah (1979), and should help teachers understand better the role of L1 interference in L2 learning. Our findings suggest that the "bilingual" third graders were using a little

more contextual information in L1 (Spanish) than in L2 (English). This may suggest that teachers of these children should improve their use of contextual information in L1 first so that, subsequently, it may transfer to L2. Finally, this study has implications for future research as well. Cziko (1978) found specific language proficiency related differences in regard to the use of graphic and contextual constraints by seventh graders. The present study, by contrast, show that third grade children, in general, are starting to use contextual information while reading; but they still are paying more attention to the graphics in the text. It will be interesting to study whether third grade is an optimal period for developing strategies which will increase the use of contextual information in reading. A study of this nature will be relevant not only for teachers and other practitioners, but to people supporting an interactive model of reading such as the one proposed by Rumelhart (1976) and to psycholinguists in general. The results of the study raise the question as to when should L2 reading be introduced to "bilingual" children who were introduced to L1 first. Should L2 reading be introduced immediately as they start learning English as a second language in schools or should the emphasis be put into bettering their L1 reading skills while oral language development in L2 occurs? This is a question which future research should address. Research in the nature of transfer of reading skills from L1 to L2 is very much needed to clarify this issue, too.

VIII. Conclusion

The purpose of this study was twofold. First, we wanted to explore the possibility of adapting existing miscue taxonomies to lower grade children and to Spanish reading and, second, to use this taxonomy to carry

out a comparative analysis of miscues produced by different groups of children, namely monolingual English, monolingual Spanish, and "bilingual." The taxonomy used in this study was found to be adaptable to different grade levels and to different languages. New categories were needed to better answer the purpose of the particular study to be done, and to make it more specific to Spanish. For this purpose, a similar sound (SMSOU) and diphthong break (DB) were added to Cziko's (1978) and some of his categories were deleted or changed. A reliability check and an intensive training session for data coders is advised for future users of the coding system to raise its usability and the chances of replicability of findings.

Our findings suggest that in general, by third grade, children are still using more the graphic than the contextual information from the text while reading, although they are starting to use the contextual information as well. This suggests support for an interactive model of reading (Rumelhart, 1976), where graphic as well as contextual use of information in the text interact in the process of reading.

The comparison between the "bilingual" and the monolingual English students reading in English showed that the English speakers, although still attending to the graphics of the text, were attending more to the contextual constraints of the text than the "bilingual" students. English monolinguals were reading more for meaning than "bilinguals" who were not completely fluent in L2 and, as such, "Anglos" were looking closely at the semantic as well as syntactic aspects of the text. These findings are consistent with previous research (Cziko 1978, Tucker 1975, Young 1972, Stafford 1976, among others) which show that L2 readers have difficulty using the contextual constraints of the text.

In the case of the comparison between Spanish monolinguals and "bilingual" students reading in Spanish, the groups were more similar in the types of miscues they produced. Both groups seemed to be looking at the graphic aspects of the text, although the monolingual Spanish group seemed to be using the context better; at least in terms of their use of corrections to get meaning from the text.

When the "bilinguals" performance was compared in L1 (Spanish) and L2 (English), they showed better performance in the use of contextual information in L1 than in L2. In English, they seemed to show that they used mainly graphic information to read. In Spanish, they produced many corrections which were an indication of contextual information use. It may be that our subjects started to read in L1 and were introduced to L2 before having the basic reading skills in L1. If this is true, these findings seem to be supported by research done in Sweden with Finnish immigrants (Skutnabb-Kangas and Taukomaa, 1976). These research findings suggest that children who developed language skills in L1 before being introduced to L2 showed higher achievement levels in school than those who learned L2 before having a good basic knowledge of L1.

In general, the data showed a trend toward going from using a graphic constraints strategy to an increased attention to contextual constraints while reading. The groups reading in L1 (Spanish and English monolinguals) seemed to be using contextual constraints more often than the "bilinguals" reading in L1 and L2. The fact that all the groups seemed to be in transition, in terms of the use of constraints from the text, appeared to predict that third grade may be an optimal time to introduce exercises in class that will induce students to use contextual constraints while reading. In the case of the "bilinguals" subjects, it seemed more advisable to

introduce these exercises in the stronger language for which they already have more knowledge and show a higher degree of development in reading. Finally, it is recommended that studies in the area of miscue analysis should be done not only accross languages but accross grades to find out any developmental trends in information processing in reading. Because of the results of this study, it is suggested that an interactive theory of reading behavior (Rumelhart, 1976) may be the proper model to explain these developmental trends.

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Appendix A

Coding System for Miscue Analysis

The criteria for counting miscues (any deviation from text) were adapted from those of Cziko (1978), Hood (1975-76), Biemiller (1975), and Goodman (1969). If the miscue is repeated more than once by the reader of the same text (ie. I11/I'll, no response for same unknown word), a tally will be kept, but the miscue will be recorded in the total only once for each reading passage. Names should not be included as miscues.

No Response	NR	Reader looks at an unknown word-makes no attempt to read it orally-pauses-continues to read ex. The ____family*/Gonzalez.
Request for Help	H	Reader verbally expresses need for help ex. "What's this word?"
X Repetition	TR	Reader repeats correctly part or all of a word or words. If repeat first 2 syllables, don't count as TR ex. I'll I'll I'll
Order	WO	Reader reverses or changes order of text or 2 syllables withing 1 word. ex. Said Pat/Pat said feria/fiera
Spanish Interference	EI	Reader uses English pronunciation or syntax for Spanish text. ex. Ja ja/ya ya
Meaningful Substitution	MEASUB	Reader exchanges word or words that do not alter the meaning. ex. a/the a lot of/lots of it/the ball
X Non-Contextual Substitution	NONSUB	Reader exchanges meaningful utterances that alter the meaning, are not or cannot be categorized as SIMSPE, because no similarity in spelling.

* Actual response precedes the slanted line. The text follows.
X= Changes in original coding but coding for the study was done according to original

Similar Spelling	SMSP	Reader begins word with correct letter but some or all subquent letters are not identical to the text. ex. the/this this plants/these plants lots/lost maek/makes mara/mira
Diphthong Break	DB	Diphthong break. In Spanish reading, breaking words into syllables, children will break diphthongs.
Similar Sound	SMSOU	Found mainly in Spanish ex. peak/need.
Insertion	INSRT	Reader adds entire word or inflection to the text. ex. lands/land sees/see Ralph said, and/Ralph said. He Cannot/can't a (mi) papa/a papa
Deletion	D	Reader omits entire line word, or inflection from text. ex. A boy and girl/a boy and a girl; land/lands did not see Ralph after her/... Ralph run after... I'm/I am Other/others la loras/las loras len/leer
Corrections	→	Reader corrects himself after reading any type of miscue. The symbol → is used following miscue. ex. plants have always → ways NONSUB → ex. did → they did D NC →

The following criteria will be used in conjunction with the previous categories. A meaningful miscue includes the following: (MEASUB-WO - INSRT - D) ex. D NC

Non Conforming structure	NC	Meaningful miscue that does not conform to previous syntactic and semantic constraints of the sentence. ex. There is lands in the city/ there is land.....
Conforming to preceding structure	PC	Meaningful miscues that conform ONLY to PRECEDING syntactic and semantic structures of the sentence. If one reads only up to and through miscue, the passage still "makes sense" ex. And Pat did hit it the ball/ ...did hit the ball.. There is a/There is never There never/There is never
Conforming to entire passage	DC	Meaningful miscue that conforms to both syntactic and semantic constraints of ENTIRE TEXT... ex. ...didn't see the ball fall/ ...didn't see it fall. MEASUB - DC
Totals	TMSOS	Total number of miscues will be tabulated
	TNONSUB	Total number of nonsense substitutions will be tabulated
	T ->	Total number of corrections will be tabulated.