The Effects of Rule Introduction on the Spelling Performance of Learning Disabled Children

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Running head: INTRODUCING SPELLING RULES TO LD CHILDREN

Abstract

Spelling difficulty is the characteristic most often used to differentiate learning disabled (LD) children from normal children. According to developmental research, the spelling performance of LD children is fundamentally different from normal children regardless of the stage of spelling development. Learning disabled students have been identified as have two major difficulties. Firstly, they have a problem incorporating new information and secondly, they have difficulty developing and revising the rules of orthography. Most schools in Ontario are using a teaching method bases on a top-down information processing model, however it is argued that LD children cannot learn by this method. An instructional approach based on a bottom-up information processing model may better suit the processing capabilities of LD students.

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In recent years, the definition of intelligence has broaden to include types of intelligence other than scholastic aptitude. For children with learning disabilities this shift in psychometric theory has been beneficial. A child is considered learning disabled if on standardized intelligence test his or her score on the performance portion of the test is below average and his or her score is above average on the intelligence part of the test. The child may be of average intelligence but failing school because of a specific deficit or disability that prevents learning (Hasselbring & Crossland, 1982). It has been the task of psychologists to develop better psychometric tests to identify LD children as well as develop models that represent cognitive development and functioning in LD children (Kaplan and Saccuzzo, 1988).

One of the major difficulties for psychologists is that the learning disabled population is heterogeneous and includes a wide variety and degree of deficits. However, spelling difficulty is the criterion used most often to discriminate

learning disabled students from non-learning disabled students (DeMaster, Crossland, & Hasselbring, 1986). Spelling, which is defined as the process of transcribing words into standard orthography, has long been considered an important part of effective communication. In Canada it is estimated that 10-25% of children in the mainstream school system are learning disabled with 82% of these children exhibiting difficulties with spelling (Lastman 1991). The first section of this paper explores the spelling performance of LD children in comparison to that of normal school-age children. The second section is discusses the present state of spelling in the education system and how LD children fit into this scenario.

LEARNING DISABILITIES AND SPELLING PERFORMANCE

Developmental Research and Spelling

Spelling acquisition parallels the acquisition of other complex behaviours such as language acquisition in that it involves a series of stages (Frith, 1980). According to research published by the Ontario Ministry of Education (1988), the normal child in learning to spell proceeds through a series of five developmental stages. In the first stage, the random letter stage, children use random ordering of letters from recall with little or no awareness of sound/symbol relationship. Next the child begins to develop an awareness of sound/symbol relationships. This second stage is

called the pseudo-phonetic stage. The third stage is the phonetic stage in which the children make definite and practical links between the letters they write and the sounds that are represented by the letters. This includes the gain of initial and final consonants, medial consonants and all vowel markers. The fourth stage, called the vowel transition stage, is marked by the child representing all syllables of the word. In the fifth and final stage, the child continues to test and generate spelling patterns. There is less reliance on phonetic spelling and more reliance on visual correctness based on word sensitivity gained from reading and seeing words used in various ways and for various purposes.

In a five part study completed by Gerber (1984) normal children were compared to learning disabled children. Gerber found that LD children proceed through the same stages as normal children but at a much slower rate. The spelling ability of LD children was found to be comparable to that of normal children three to five years younger. Thus, LD children are operating at earlier developmental stages than there same-age peers.

Other authors, (Leuenberger & Morris, 1990; Carpenter, 1983), argue that the spelling ability of LD children is fundamentally different from that of normal younger children. The studies have primarily been based on error analysis of the written work of LD children. Although on the surface the spelling performance of LD

children appear similar to that of younger children, closer scrutiny reveals fundamental differences in spelling rule use. These authors suggest that LD children are not only operating at inappropriate stages for their age and grade level but also that they have, in the course of formulating spelling rules, developed aberrant rule applications that they apply consistently.

Information Processing and spelling

Information processing is an integral part of spelling acquisition. In her book, Learning to Read: The Great Debate, Chall (1983), summarizes two information processing models concerning how children learn to read and spell. In the first model, the child progresses from the perception of letters to spelling patterns and then from words to sentence and paragraph meanings. An emphasis is placed on the alphabet and the teaching of rules. This is called the bottom-up or decoding model. The second model, the top-down or meaning emphasis model, is the basis of the present educational trend in teaching. The importance of language and higher cognitive function is stressed. According to this model, the child will decipher the rules of the language through exposure to it.

Developmental spelling studies have revealed that normal children proceed in spelling by formulating, testing and revising hypotheses about the orthorgraphic spelling rules of a language

(Beers, 1980): thus a discovery approach like that stemming from the top-down model might adequately meet their needs. However, research in the field of learning disabilities has indicated that LD spellers lack either sufficient skills or strategies for directing and controlling the information processing necessary to solve orthographic problems (Gerber and Hall, 1980). Hence, failure to respond correctly can result not only from a defective output system but also from a defective input and/or information processing system (Kaplan and Saccuzzo, 1989).

EDUCATING LD CHILDREN

> Some educators think children should be able to assimilate the rules of grammar and spelling through creative-writing programs and that formal instruction and practice aren't necessary. It's an idea that's plainly ludicrous (Lastman, p. A13).

In the last decade, most schools in Ontario have abandoned formal spelling lessons in favour of a teaching method that emphasizes the importance of creative-writing and comprehension (Chall, 1983). This approach is most often referred to as process writing. A great deal of controversy surrounds this shift in teaching practice, some educators and parents sing the praises of process writing while others whole-heartedly reject the premise on which it is based (Lastman, 1991).

The underlying tenet of the debate is that not all children who are taught by this method become effective communicators. In fact, it is estimated that between 15 and 25 percent of school-age children are learning disabled (LD) and cannot learn through process writing (Lastman, 1991). This statistic indicates that there are two important questions that must be considered in teaching learning disabled children. Firstly, why do LD children have problems with process writing? Secondly, how do you teach these children to spell effectively?

Process writing and learning disabilities

Evidence, from both empirical and clinical literature, indicates that the most common identifying characteristics of LD spellers is an inability to acquire spelling accurately and rapidly (Poplin, Gray, Larsen, Banikowski & Mehring, 1980). For LD students the lack of effective instructional effort has severe consequences (Gerber & Hall, 1987). There are two well documented characteristics of learning disabled students that are equated with difficulties in learning to spell through process writing (Poplin, 1984).

Firstly, LD students have great difficulty acquiring new information and then integrating this information with their other cognitive skills (Goldman & Pellegrino, 1987). A problem arises because spelling in the process writing program is not directly

taught to students. According to the process writing teacher's manual, children will develop conventional spellings through exposure to words in their reading and writing lessons (Waterloo County Board of Education,1989) . Goldman & Pellegrino (1987) argue that learning disabled children can not learn conventional spelling by this indirect method because they have difficulties incorporating new information. In fact, research has shown that learning disabled children do not receive sufficient opportunities to practice spelling skills to an adequate level of mastery even if they are attending classes developed for exceptional children (Hasselbring and Crossland, 1982).

In the process writing program, spelling rules are not to be taught directly to the student but rather they are to be discovered by the student, but the second characteristic of LD children pertains to a problem with spelling rule formulation and application (Goldman & Pellegrino, 1987). LD children were also found to operate under deviant spelling rule applications (Bailet & Lyon, 1985, Bailet, 1990). Because process-writing discourages rule teaching, its use for teaching LD children to spell is questionable.

Thus, process writing is not an adequate means of teaching LD children to spell, primarily because two identifying characteristics of learning disabilities are in conflict with two

basic principles of the program. The second question stated earlier must be considered. How can these children be taught to spell effectively?

Alternative teaching methods

Graham and Freeman (1986, pp. 15) conclude that, "although spelling problems are particularly pronounced in the LD population, spelling instruction for disabled learners has received little attention in the research literature." The few studies completed focus on the difficulty of LD spellers to acquire new information (Graham & Freeman, 1986; Olendick, Matson, Esveldt-Dawson, & Shapiro, 1980). These studies examine spelling practice as a means of remediation.

Spelling Practice

Graham and Freeman (1986) examined the spelling performance of 40 LD student in response to strategy training and three different practice conditions: a) directed study; b) student-controlled; and c) teacher directed. Results indicated that students who were taught a five-step study strategy recall the correct spelling of more words than students who devised their own method of study. The different study conditions did not affect spelling performance. Graham and Freeman interpreted the results to suggest that LD students' spelling difficulties may be associated with problems in developing study strategies.

Practice was found to have a moderate positive effect. Thus, an instructional program that included a set practice strategy may benefit LD spellers.

Ollendick et al. (1980) completed two studies which examined the effectiveness of spelling remediation procedures using an alternating treatment design. The four treatments studied in varied combination included: a) positive practice; b) positive reinforcement; c) overcorrection and d) no remediation. Both studies indicated that the combined positive practice plus positive reinforcement procedure was more efficient and was preferred by the children. The problem is that, unless the child is in a special class for exceptional children, the positive practice plus positive reinforcement procedure is difficult to maintain. Research has shown, however, that computer-assisted instruction programs based on the positive practice plus positive reinforcement procedure can be used effectively for spelling instruction with LD children (Hasselbring & Crossland, 1982).

Rule introduction

The research into rule usage by LD spellers is limited to two studies that document deviations in spelling rule use through an error analysis approach (Bailet, 1990; Bailet et al., 1985).

In Bailet et al. (1985), spelling rule application skills were examined in an adult with spelling disabilities. The subject

completed two different spelling dictation lists. The first list of words contained words that followed a derivational spelling rule while the second list contained the root word prior to the derivational spelling of the target word. An overall improvement in spelling performance was found in the second task. However, the authors noted that errors occurring in the second set of words indicate deficiencies in rule application. Further, they suggest that in cases where spelling skills are deficient, subjects would benefit from spelling practice.

In the second study, Bailet (1990) compared the spelling performance of LD students with that of same-age normally achieving subjects and younger normally achieving subjects. Previous research had shown that the spelling performance of LD children is comparable to that of younger normally achieving subjects (Gerber, 1984). However, Bailet found significant differences in spelling rule use between LD children and their normal achieving peers. The author suggests that for LD children the use of rule introduction with supervised practice may be necessary to achieve internalization and mastery of spelling patterns.

SUMMARY

From the above review of the literature several important facts about LD children can be noted.

a) LD children are often identified by spelling deficits:

b) LD children's spelling rule development differs from that of normal children:

c) Most schools in Ontario are teaching by process writing which is a top-down approach that does not include spelling instruction.

d) LD children have two problems with regard to spelling: 1) they have difficulty learning new information and 2) they develop deviant spelling rules:

e) Research on instruction intervention is bases solely on practice:

f) It is argued that a bottom-up instructional approach that incorporates both rule introduction and practice would be more beneficial for teaching LD children to spell (Bailet, 1990).

CONCLUSION

At the present time I am unaware of any studies that incorporate a full bottom-up instructional approach with LD children. Specifically, it could be hypothesised that the spelling performance of LD children will be enhanced by a method of spelling instruction that incorporates practice with rule introduction relative to a method of instruction using practice alone.

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Running Head: SPELLING AND LD

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Spelling, the process of transcribing words into a standardized orthography, has long been considered an important part of two of the three R's, reading and writing. Yet in the last decade, formal spelling lessons in many Ontario classrooms have been abandoned in favour of an approach stressing comprehension of material (Chall, 1983).

In her book, Learning to Read: The Great Debate, Chall (1983), outlines the three basic models of how children learn to read and spell. In the first model, the child progresses from the perception of letters to spelling patterns and words, to sentence and paragraph meanings. An emphasis is placed on the alphabet and the teaching of rules. This the bottom -up or decoding model. The second model, the top-down or meaning emphasis model is the basis of the present educational trend in the teaching of reading. In this approach, the importance of language and higher cognitive function is stressed. According to this model, the child will decipher the rules of the language

through exposure to it. The third model involves a combination of these models at different stages along the developmental pathway and thus, has been labelled the interactive model.

The spelling performance of the majority of children has been unaffected by this shift in theory. There is however, at least one group of children for whom this shift in educational practice has been detrimental, learning disabled (LD) children. A child is considered learning disabled if standardized testing has indicated a discrepancy between normal intellectual ability and academic achievement that can not be attributed to primary causes of learning deficits such as mental retardation, sensory impairments, emotional disorders, cultural or economic disadvantage and poor teaching. It is presumed to be a dysfunction of one or more of the basic learning processes (DeMaster, Crossland and Hasselbring, 1986).

Developmental spelling studies have revealed that normal children proceed in spelling by formulating, testing and revising hypotheses about the orthographic

rules of a language (Beers, 1980); thus a discovery approach like that stemming from the top-down model might adequately meet their needs (Lyons-Bailet, 1990). However, research in the field of learning disabilities has indicated that LD spellers lack either sufficient skills or strategies for directing and controlling the information processing necessary to solve orthographic problems (Gerber, 1984). Therefore, research into to educational intervention for LD spelling problems has been based on a bottom-up approach to spelling.

Several studies have indicated that LD children learn to spell more effectively under a directed study approach than a free study approach. (Foster and Torgensen, 1983; Graham and Freeman, 1986.) Directed study involves the teaching of word study strategies which usually include oral repetition and/or writing the word out. In the free study condition, the children study the material in whatever style they preferred. Results from these studies indicate that the direct study approach is superior to the free study approach. The authors of these articles argue for the use of a decoding approach when teaching LD children to spell.

Reading research with LD children has argued for a strategy based remediation with regard to comprehension and reading (Borkowski, Weyhing and Carr, 1988). Although LD children have been found to operated under deviant rule applications in spelling as well, (DeMaster, Crossland and Hasselbring, 1986; Gerber, 1984; Lyons-Bailet, 1990), this author is unaware of any studies which have used this method of teaching.

The premise of the present study is that the introduction of a rule in combination with a direct study approach will facilitate the subjects' recall of words studied under this condition. Those words studied under the direct study alone will be less well remembered.

Method

Subjects

Six learning disabled subjects will be selected from the doctor recommended children at the Communication Disorders Unit of the Group Health Centre. Selection criteria are as follows: a) parental consent to participate in the study; b) grade two or three placement; c) IQ scores between 84-116 on Wisc-R with no short term memory deficits evident; d) identification by

the specialists at the Group Health Centre as evidencing significant difficulties in spelling. and e) scores of 25 or less on a pretest of 90 target words targeted for instruction; f) Identification as LD by the local school system.

Apparatus

An Apple computer with a "Spell It" program will be used in this study. Stickers for attendance will be given at the end of each session. Stimuli will be three sets of 30 words each following a rule.

Design

The present study will employ within subjects design using alternating treatment procedure (ABAB). To control for ordering effects half of the subjects will undergo the opposite treatment pattern (BABA).

Procedure

All spelling will be done on the computer without prompting from the experimenter excepted in the case of technical problems with the computers operations.

The experiment will take eight half hour sessions distributed over three weeks. In the first session, the child will be instructed on the use of the computer

program. A pretest of ninety words will also be given. During the following seven sessions treatments will be introduced as depicted in the following chart.

EXP. DAY	GROUP I	GROUP II
DAY 1	PRETEST ALL THE WORDS	PRETEST ALL THE WORDS
DAY 2	RULE I SET Ia	NO RULE SET 1a
DAY 3	NO RULE SET 1B	RULE I SET 1B
DAY 4	RULE II SET 2a	NO RULE SET 2a
DAY 5	NO RULE SET 2b	RULE II SET 2b
DAY 6	RULE III SET 3a	NO RULE SET 3a
DAY 7	NO RULE SET 3b	RULE III SET 3b
DAY 8	POST TEST ALL THE WORDS	POST TEST ALL THE WORDS

RULE I:
PLURALS: TO FORM THE PLURALS OF MOST NOUNS, SIMPLY ADD S.
EXAMPLE: BALLOON BALLOONS
ADD ES TO NOUNS ENDING IN CH, SH, S, X, AND Z.

SET 1a BOXES CHAIRS LUNCHES GLASSES TAXES
MONKEYS DISHES ROCKS PLANES WATCHES
BUSHES SONGS LOGS SISTERS STARS

SET 1b FOXES HAIRS BUNCHES CLASSES AXES
TURKEYS WISHES DOCKS LANES MATCHES
RUSHES TONGS FROGS BROTHERS WARS

RULE II: WHEN THERE IS A SILENT e THE OTHER VOWEL IS USUALLY LONG.
EXAMPLE; RODE, MADE, USE, THESE

SET 2a FACE CAKE GAME RIDE ROPE
HATE ICE SALE LINE SMILE
HOLE ROSE PAGE FIRE FRAME

SET 2b RACE LAKE SAME PRIDE HOPE
LATE RICE GALE PINE PILE
POLE HOSE RAGE TIRE FAME

Rule III: WHEN ADDING A SUFFIX OR ENDING TO A WORD THAT HAS A SHORT VOWEL SOUND BEFORE THE FINAL CONSONANT-THIS FINAL CONSONANT IS DOUBLED BEFORE THE ENDING.
EXAMPLE: STOP STOPPING STOPPED STOPPER

SET 3a KISSED GRIPPED HOPPED PETTING FILED
RIDING TAPPING HANDED CANNED DROPPED
DRAGGING MAILING SLIPPED BAGGED RAKED

SET 3b MISSED CLIPPED MOPPED PILED NETTING
RIDING LAPPING LANDED FANNED MOPPED
FLAGGING NAILED FLIPPED SAGGED BAKED

Results

The post test and the pretest scores will be compared. Post test words will be broken down into to their sets and subset and the number of correctly spelled words in each subset will be noted.

It is predicted the Group One will remember the words the A subset better than they do the B subset and group two will remember the words in the B subset better than they do the a subset.

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