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ENHANCING METAPHOR PERFORMANCE OF CHILDREN WITH LEARNING DISABILITIES

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Most children with learning disabilities exhibit language deficits. These language deficits may cause the child to interpret metaphors incorrectly. Enhanced feedback and practice may be effective for children with learning disabilities to aid in their analogical reasoning in interpreting metaphor. This study was to determine the effect of direct feedback and practice on metaphor performance of children with learning disabilities. Significant differences were found between the experimental and control groups during the treatment and posttest sessions. The further descriptive analysis indicated that sex, grade level, and reading level of the students correlated with metaphor performance. When multiple independent variables were combined, additional significant correlations were revealed.

Metaphors have long intrigued philosophers, linguists, and others interested in the nature and development of language. Indeed, in the fourth century B. C., Aristotle claimed that the shaping of such locutions was a sign of genius. In his view, people who perceived similar features among disparate things and encoded these in verbal descriptions were in possession of unusual and specialized talents. The act of "renaming," as Aristotle put it, represented in phrases like "old age is the sunset of life," is basic to metaphoric creation and is properly the work of poets. In our present century, however, certain philosophers and thinkers have taken the position that the impulse to make metaphors, rather than belonging to a few, is basic to human conception. These theoreticians view metaphor as an elementary mode of comprehending the world, on which constitutes "the omnipresent principle of language..." (Richards, 1936, p. 92).

According to Aristotle, each and every one of us is endowed with the gift of metaphoric creation, thus possessing a mode to comprehend the world around us. Comprehending the world around us is clearly a much simpler task for some than others. Children with learning disabilities are characterized as exhibiting a variety of language disorders

resulting in less effective communicative competence. Within these language disorders, research has shown that children with learning disabilities have a special problem recognizing the interpreting metaphors (Ortony, 1975). This problem of misinterpretation of metaphors frequently lies within a literal interpretation and the lack of opportunities to think in abstract terms. Those misinterpretations can have detrimental effects, and play a major role in the academic environment. In view of this, it is not surprising to find claims that metaphors are powerful in their capacity to relate new knowledge to old. Consequently, metaphors are said to have great pedagogical value (Ortony, 1975; 1980). It also be contended that they provide the possibility of communicating a more holistic and vivid impression of a phenomenon (Ortony, Reynolds, & Arter, 1978).

Developmental research into the comprehension of metaphor is becoming fashionable. It is a topic that is appearing more frequently in the pages of leading developmental journals. This increasing interest is an excellent sign for questions concerning the child's ability to comprehend metaphors which are not only of theoretical interest, but of practical importance as well, particularly in reading (Arter, 1976; Baldwin, Luce, & Readence, 1982). It appears that children need to be able to understand metaphors to understand the texts that they typically encounter in school.

The academic environment is rich and full of idiomatic expressions. The issue of addressing ways to lessen the problems possessed by children with learning disabilities must be attended to, if present or future problems encountered with metaphors in the academic milieu are to be ameliorated.

It has been estimated that two-thirds of the English language consists of idiomatic expressions (Boatner & Gates, 1969). Metaphor is a very powerful, pervasive and necessary phenomenon that possesses great pedagogical value. A review of related studies revealed that interpretation of metaphor does play an important role in language development and language deficits among nondisabled children (Billow, 1975; Cometa & Eson, 1978; Honeck, Sowry, & Voegtle, 1978; Nippold, Leonard, & Kail, 1984; Ortony et al., 1978; Reynold & Ortony, 1980; Seidenberg & Bernstein, 1986; Wiig & Semel, 1984; Winner, Resenstiel, & Gardnes, 1976) and children with hearing impairments (Fruchter, Wilbur, & Fraser, 1984; Iran-Nejad, Ortony, & Rittenhouse, 1981; Rittenhouse, Kenyon, Leitner, & Baechle, in press; Rittenhouse & Stearns, 1982; Schloss, Israelite, & Smith, 1985; Wood, 1988). Few studies have been conducted to investigate the comprehension of figurative language in special populations rather than those who are hearing impaired. Comprehensive evaluation of metaphorical understanding in children with learning disabilities is limited. To date, the data on children with learning disabilities indicates that these children exhibit a variety of language disorders resulting in linguistic delays and less effective communicative competence (Seidenberg & Bernstein, 1986; 1988). It has been suggested that many children with learning disabilities have a special problem in recognizing and interpreting metaphors because they frequently interpret figurative expression literally and seem unable to relate the disparate domains necessary for metaphoric comprehension (Wiig & Semel, 1984).

One of the problems lies in the child's inability to interpret metaphors appropriately. It was found that nondisabled and hearing impaired children's skills of interpreting metaphor could be improved by direct feedback, practice, and related training (Cometa & Eson, 1978; Johnson & Malgady, 1979; Kogan, Connor, Gross, & Fava, 1980; Iran-Nejad et al., 1981; Rittenhouse, Morreau, & Iran-Nejad, 1981; Rittenhouse & Stearns, 1982; Silverman, Winner, & Gardnes, 1976). It was thought possible that, if given similar opportunities, similar enhanced interpretation could occur among children with learning disabilities.

The primary purpose of this study was to determine the effect of direct feedback and practice on metaphor performance of children with learning disabilities. A secondary purpose of this study was to investigate the metaphor performance patterns of children with learning disabilities according to different demographic aspects, such as age, sex, grade level, reading level, and special education program.

METHODS

Subjects

The subjects in this study were 52 students from 7 public schools in central Illinois. These schools used the definition of learning disabilities by the Illinois State Board of Education for providing special education services. According to this definition, children with learning disabilities exhibit "a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell or to do mathematical calculations" (ISBE, 1986, Sec. 226.552). Administrators of these schools chose the subjects if they met the following eligibility criteria of the study: chronological age of 8-13 and reading level at or above 2nd grade. Table shows the distribution of demographic aspects for subjects randomly assigned into experimental and control groups. The majority of the subjects were Caucasian. Other confidential data such as IQ and socioeconomic status were not accessible by the researchers in the present study.

Design

A pretest-posttest, comparison-control group experimental design was employed in this study. All subjects were initially given the pretest. The pretest consisted of 4 metaphor tasks which were completed by students without direct feedback and practice. On the pretest, each performance of the subject was scored. Any subject who completed 4 out of 4 metaphor stories correctly was to be eliminated from the study. Any subject who had 4 out of 4 stories correct was assumed to understand metaphor. No subject was eliminated from the study for that reason.

After the pretest, the subject were randomly assigned to an experimental or a control group. Subjects in the experimental group received 4 new stories supplemented with direct feedback and practice from the researcher regarding the correctness of his or her

Table 1
Sex, Chronological Age, Grade Level, Reading Level, and Type of Special Education Program of Subjects

Variable	Experimental Group (n=27)		Control Group (n=25)		Total (n=52)	
	n	%	n	%	n	%
Sex						
Male	20	74	19	76	39	75
Female	7	26	6	24	13	25
CA						
8	3	11	4	16	7	14
9	5	19	5	20	10	19
10	5	19	6	24	11	21
11	7	26	4	11	11	21
12	4	14	4	16	8	15
13	3	11	2	8	5	10
Grade						
2 nd	5	19	2	8	7	14
3 rd	6	22	9	36	15	29
4 th	5	19	3	12	8	15
5 th	2	7	4	16	6	12
6 th	8	29	7	28	15	29
7 th	1	4	0	0	1	0
Reading Level						
2 nd grade	9	33.3	11	44	20	38
3 rd grade	6	22.2	6	24	12	23
4 th grade	8	30	5	20	13	25
5 th grade	2	7	2	8	4	8
6 th grade	2	7	0	0	2	4
7 th grade	0	0	1	4	1	2
Program Type						
self-contained	14	52	11	44	25	48
resource	13	48	14	56	27	52

response as it related to metaphor. Following the instruction with direct feedback and practice, the subject were given 10 new metaphor stories to complete on their own, without direct feedback and practice. The control group did not receive the initial 4 stories with practice and feedback but, instead, received a total of 14 new metaphor stories to complete on their own, without direct feedback and practice. The posttest for the experimental and control groups consisted of 4 new metaphor stories without direct feedback and practice.

Instrumentation

The metaphor stories were taken from *An anthology of Metaphors Stories for Deaf and Hard of Hearing Children* (Rittenhouse, 1987). Rittenhouse et al. (1982) stated that while the program was developed for deaf children, it could be used with children who had other disabilities. The metaphor story, illustration, and multiple choices are based on Gardner's (1974) definition that a metaphor can be a figure of speech in which a descrip-

tive term is applied to a referent for which it is not literally appropriate, but to which it bears certain analogies. Billow (1977) described this kind of metaphor as similarity metaphor in which "the substitution and its reference are classified together on the basis of a similarity or shared attribute" (p. 82).

According to Rittenhouse and Stearns (1982), each of the metaphor items consisted of a short story (i. e., less than 50 words), and 4 possible interpretations. All interpretations are nonliteral, with one being metaphorical. The short stories were controlled for complex language and syntactic structures. The items were presented to the subjects in booklet form with one item appearing on each page.

To determine the readability level of metaphorical tasks, the Carris-Jacobsen Readability Formula 1 was applied (Harris & Sipay, 1980). Formula 1 was meant to be suitable for use with material that was thought to be below fourth-grade level in difficulty. Formula 1 had a high correlation coefficient with the criterion ($r = .90$). The readability check was used to verify that the reading level of the metaphor stories was at an appropriate level for the subjects in this study. The readability of the metaphor tasks was found to be at the lower second grade level.

Procedure

To ensure that the testing procedure was standardized, a list of directions were read to the subjects. For the pretest, the subjects were told, "We are going to read some short stories." The word "test" was never used so as to reduce any anxiety among the subjects. After the subjects read the short story, they were told to look at the picture below. After the subjects looked at the picture, they were asked to read the sentence below the picture. After they read the sentences, they were asked to choose one sentence that best "goes with" or "fits" the story above. If they were not sure which sentence to pick, they were asked to try their best and to choose one.

After the pretest, the subjects were randomly assigned to experimental and control groups and the treatment phase began. Subjects in the experimental group were told that "We are going to work on some more stories, but this time, we will work together." The researcher and the subjects worked on one story at a time. The treatment phase consisted of 4 stories with direct feedback and practice, after which the subjects read 10 more stories on their own. For reliability purposes, the treatment for each subject in the experimental group was always carried out by the same researcher.

During the treatment phase for the experimental group, the researcher emphasized that all the sentences under the story may seem strange, but that the subject should pick the one that best "goes with" or "fits" the story. It was continually emphasized that the ideas in these stories and the sentence were the same, but that the words were different. The subjects were told to complete the first of 4 stories in the treatment.

During treatment phase, subjects were put in small groups with a maximum of 4 subjects in each group. After the subjects gave their response to the metaphor story, the researcher asked one of the subjects who had the correct answer to explain his/her

answer. If the explanation was correct, the researcher would expand on the comments made by the students. If the student was incorrect, the researcher would ask the other students if they had a different explanation. If no others could explain, the researcher provided direct feedback on student responses, then explained the analogous relationship. During the treatment, the peer explanation seemed to be successful in increasing the subjects' understanding of the stories. The group did not move to the following story until each story was understood.

To check for comprehension during the treatment, each subject was asked to explain in his or her own words the correct response. The subject could not simply say he or she understood the story without explaining the concept correctly. Every subject explained the story in his or her own words correctly before moving on to the next story.

For example, the first story in the treatment for the experimental group was entitled "The Cookies." The explanation was that the boy stole some cookies and he was punished by being sent to his room, just like a prisoner is sent to jail when he steals. The boy and the prisoner both did something wrong. They both were punished by going to either their room or a jail. The analogy pointed out that the boy was similar to the prisoner, and that the boy's room was similar to the prisoner's jail. In each story, it was continually emphasized that the ideas were the same, but the words were different. After the 4 stories with direct feedback and practice were completed, the subjects in the experimental group completed 10 new stories on their own.

The control group's treatment consisted of 14 new stories to be completed on their own without any direct feedback and practice. (They received the same general directions similar to the pretest.)

For the posttest, both the experimental and control groups were told they had 4 more stories on which to work. The general directions from the pretest were provided once again.

RESULTS AND DISCUSSION

Reliability

Kuder-Richardson 20 (KR20) Reliability Coefficients. To check the internal consistency and to establish reliability of tests during the pretest, treatment and posttest, the KR20 reliability coefficients were calculated for the experimental and control groups. For the experimental group, the reliability coefficient of the pretest (4 items) was derived to be .24 as compared to the same pretest for the control group, whose coefficient was .12. During the treatment (14 items) the reliability coefficient for the experimental group was .86 as compared to .70, the reliability coefficient for the same instrument for the control group. The reliability coefficients for the posttest (4 items) were .63 for the experimental group and .19 for the control group.

The low reliability coefficients on the pretest in comparison to the instrument used

during treatment may have been due to the number of items in the pretest (4 items) and posttest (4 items) compared to the number of items used in treatment (14 items). It was interesting to find that, after the treatment with direct feedback and practice, the experimental group had a much higher reliability coefficient (.63) than did the control group (.19) in the posttest. Subjects in the experimental group seemed to do less free guessing once direct feedback and practice were provided.

Equivalent Forms Reliability. Pearson correlation coefficients for the equivalent forms and internal consistency reliability for the experimental and control groups also were determined. In the experimental group, there were the following positive correlations: between the first 4 items during treatment and the last 10 items during treatment ($r = .5070, p < .01$); between the first 4 items during treatment and the total 14 items during treatment ($r = .773, p < .01$); between the last 10 items during treatment and the total 14 items during treatment ($r = .9576, p < .01$); between the first 4 items during treatment and the last 4 items during treatment ($r = .6044, p < .001$); between the last 4 items during treatment and the last 10 items during treatment ($r = .8661, p < .001$); between the last 4 items during treatment and the total 14 items during treatment ($r = .8846, p < .001$); between the pretest (4 items) and the posttest (4 items) ($r = .3767, p < .05$); between the posttest (4 items) and the last 10 items during treatment ($r = .5076, p < .01$); between the posttest (4 items) and the total 14 items during treatment ($r = .4690, p < .01$); and lastly a positive correlation between the posttest (4 items) and the last 4 items during treatment ($r = .4045, p < .05$).

In the control group, there were positive correlations between the first 4 items during treatment and the last ten items during treatment ($r = .4512, p < .05$); between the first 4 items during treatment and the total 14 items during treatment ($r = .732, p < .001$); between the last 10 items during treatment and the total 14 items during treatment ($r = .9383, p < .001$); between the posttest (4 items) and the first 4 items during treatment ($r = .373, p < .05$); between the posttest (4 items) and the last 10 items during treatment ($r = .4406, p < .01$) and lastly, between the posttest (4 items) and the total 14 items during treatment ($r = .4822, p < .01$).

Comparison Between Two Groups

T tests between experimental and control groups by sex, chronological age, grade level, reading level, and type of special education programs were conducted to establish equivalency between the two groups. The t-test results revealed that there were no significant difference between the groups in relation to the demographic aspects.

T-test analysis between experimental and control groups were conducted during the pretest, treatment, and posttest performance on metaphor stories (Table 2). The results indicated that there was no significant difference between the 2 groups on the pretest. During the treatment phase, a significant difference ($t = 4.24, p < .01$) was found between the 2 groups. A significant difference between the 2 groups on the posttest also was found ($t = 2.40, p < .05$).

Table 2
T Tests of Metaphor Performance Between Experimental Control Groups*

Variable		\bar{X}	S.D.	t	p
Pretest	Group A	1.0000	.961	0.00	NS**
	Group B	1.0000	.913		
Treatment	Group A	9.0370	3.757	4.24	< .01
	Group B	5.0000	3.041		
Posttest	Group A	1.7037	1.382	2.40	< 0.5
	Group B	0.9200	0.909		

*Group A = Experimental Group (n = 27), Group B = Control Group (n = 25).
**NS = No significant difference.

The fact that no significant difference between two groups during the pretest again showed equivalency before the treatment. The difference during the treatment shows the experimental group performed better due to treatment in comparison to the control group. The experimental group also scored higher on the posttest than the control group and a significant difference was found. These results disclosed that treatment of direct feedback and practice with the experimental group may be successful in warranting significant difference in the present study.

T tests of metaphor performance between pretest, treatment, and posttest within each group also were conducted. In the experimental group (Table 3), the metaphor performance of the subjects during treatment was significantly higher than during pretest ($t = 5.68, p < .001$). The metaphor performance of the experimental group during posttest also was higher than during pretest ($t = 2.70, p < .05$). It is interesting to find that subjects in this group performed better during treatment than during posttest ($t = 3.53, p < .01$).

Table 3
T Tests of Metaphor Performance Between Pretest, Treatment, and Posttest of Experimental Group (n = 27)

	%	S.D.	t	p
Pretest	25.00	24.02	-5.68	< .001
Treatment	64.55	26.84		
Pretest	25.00	24.02	-2.70	< .05
Posttest	42.59	34.54		
Treatment	64.55	26.84	3.53	< .01
Posttest	42.59	34.54		

In the control group (Table 4), there were no significant differences between the pretest and treatment performance, or between the pretest and posttest performance. There was an unexpected significant difference between the treatment and posttest scores ($t =$

Table 4
T Tests of Metaphor Performance Between Pretest, Treatment, and Posttest of Control Group (n = 25)

	%	S.D.	t	p
Pretest	25.00	22.82	-1.58	NS*
Treatment	35.71	21.72		
Pretest	25.00	22.82	.30	NS*
Posttest	23.00	22.73		
Treatment	35.71	21.72	2.81	< .01
Posttest	23.00	22.73		

*NS = No significant difference.

2.81, $p < .01$).

Percentage of scores were calculated for the number and percentage of correct items during the pretest, treatment, and posttest sessions for the experimental and control groups for a more detailed comparison. It was found that there were increased subjects in the experimental group who demonstrated higher percentage of accuracy during treatment and posttest phases, while subjects in the control group stayed about the same. In fact, during the treatment (14 items), 41% of the subjects in the experimental group scored above 78% (11-14 items), while only 8% of the subjects in the control group scored above 78%. During the posttest (4 items), 30% of the subjects in the experimental group completed above 75% (3-4 items) of the metaphor tasks correctly, while only 4% of the subjects in the control group completed above 75% (3-4 items) correctly.

Descriptive Analysis

Analysis of Relationships. In the experimental group, the Pearson correlation indicated that metaphor performance was significantly related to grade level ($r = .419, P < .01$) and reading level ($r = .663, p < .001$). All other variables (i.e., sex, chronological age, and type of special education program) were found to have no significant relationship with the metaphor performance of the experimental group. In the control group, the t-test analysis indicated that metaphor performance was significantly related to sex ($t = 2.95, p < .01$). The Pearson correlation analyses in this group indicated that metaphor performance was also significantly related to grade level ($r = .448, p < .05$) and reading level ($r = .419, p < .05$). Other variables were found to have no significant relationship with the metaphor performance of the control group. It was found that grade level and reading level were the most consistent variables having significant relationship with the metaphor performance of both the experimental and control groups.

Multiple Regression Analysis. When the multiple regression analysis was conducted in the experimental group, many combined variables showed significant results (Table 5). Twenty variable groups were found significantly related to the metaphor performance of

the experimental group. The combination of independent variables in experimental group that was significant in relating the metaphor performance at the $p < .001$ level was reading and type of special education program ($F [2,24] = 8.81$). The combinations of independent variables that were significant at $P < .01$ level were reading and sex ($F [2,24] = 5.53$); reading and grade ($F [2,24] = 8.04$); reading, Sex, and chronological age ($F [3,23] = 5.61$); grade, sex, and program ($F [3,23] = 4.67$); reading, sex, and program ($F [3,23] = 6.03$); reading, sex, and grade ($F [3,23] = 5.49$); reading, program, and chronological age ($F [3,23] = 5.63$); rreading, program, and grade ($F [3,23] = 6.22$); reading, sex, program and chronological age ($F [4,22] = 4.35$); reading, sex, chronological age, and grade ($F [4,22] = 4.86$); reading, sex, program,

Table 5
Multiple Regression Analyses of Independent Variable Groups on Metaphor Performance of Experimental Group (n = 27) and Control Group (n = 25)

	Experimental Group (n = 27)			Control Group (n = 25)		
	F	df	p	F	df	p
CA, Sex	1.46	2	NS	2.20	2	NS
Prog., Sex	.41	2	NS	1.58	2	NS
Grade, Sex	3.30	2	<.05	3.14	2	NS
Read., Sex	8.55	2	<.01	3.07	2	NS
Prog., CA	1.80	2	NS	1.37	2	NS
Grade, CA	4.44	2	<.05	3.41	2	NS
Read., CA	8.39	2	<.01	2.68	2	NS
Grade, Prog.	5.53	2	<.01	4.74	2	<.05
Read., Prog.	8.81	2	<.001	2.48	2	NS
Read., Grade	8.04	2	<.01	3.55	2	<.05
Prog., Sex, CA	1.85	3	NS	1.57	3	NS
Grade, Sex, CA	3.23	3	<.05	2.26	3	NS
Read., Sex, CA	5.61	3	<.01	2.04	3	NS
Grade, Sex, Prog.	4.67	3	<.01	3.08	3	<.05
Read., Sex, Prog.	6.03	3	<.01	1.96	3	NS
Read., Sex, Grade	5.49	3	<.01	2.46	3	NS
Grade, Prog., CA	4.49	3	<.05	3.25	3	<.05
Read., Prog., CA	5.63	3	<.01	1.85	3	NS
Read., Prog., Grade	6.22	3	<.01	3.57	3	<.05
Grade, Sex, Prog., CA	3.92	4	<.05	2.33	4	NS
Read., Sex, Prog., CA	4.35	4	<.01	1.58	4	NS
Read., Sex, CA, Grade	4.86	4	<.01	2.06	4	NS
Read., Sex, Prog., Grade	5.03	4	<.01	2.56	4	NS
Read., Prog., CA Grade	5.29	4	<.01	2.79	4	NS

NS = No significant difference.

CA = Chronological age.

Prog. = Special education program (self-contained, resource).

Read. = Reading level.

and grade ($F [4,22] = 5.03$); and reading, program, chronological age, and grade ($F [4,22] = 5.29$). The combinations of independent variables that were significant at $P < .05$ level were grade and sex ($F [2,24] = 4.44$); grade, sex, and chronological age ($F [3,23] = 3.23$); grade, program, and chronological age ($F [3,23] = 4.49$); and grade, sex, program, and chronological age ($F [4,22] = 3.92$).

In the control group, when multiple regression analysis were performed, 5 combinations of independent variables were found to be significantly related to the metaphor performance of the subjects (Table 5). The combinations of independent variables that were significant at $p < .05$ were grade and program ($F [2,22] = 4.74$); reading and grade ($F [2,22] = 3.66$); grade, sex, and progam ($F [2,22] = 3.66$); grade, sex, and program ($F [3,21] = 3.08$); grade, program, and chronological age ($F [3,21] = 3.25$); and reading, program, and grade ($F [3,23] = 3.57$). All other combinations of the independent variables in the experimental and control groups showed no significant differences.

However, it must be noted that significant factors for both groups were reading and grade combined with other independent variables.

CONCLUSIONS

The results indicated that for the subjects in this study, direct feedback and practice significantly increased the metaphor performance of children with learning disabilities. During the treatment phase, the researcher worked with groups of four subjects in the experimental group. At times, due to special circumstances the subjects were tested on a one-on-one basis. This kind of intense teaching clearly demonstrated that the closer attention (one-on-one) the researcher gave a subject, the higher comprehension, attention and greater amount of time on task he or she received. The researcher ideally wished she would have had time to carry out the one-on-one approach throughout the study, however, due to time constraints, this was not feasible. The researcher feels that if the treatment session could have been carried out on a one-on-one basis, higher metaphor performances might have been demonstrated.

Techniques such as direct feedback and practice should be recommended for teachers of all children. Direct feedback and practice can be a powerful tool, however, at times, the researcher feels that the coined term "direct feedback and practice" can truly be an overexemplified and glorified phase. "Direct feedback and practice" is simply a different phrase for good old fashioned teaching within itself. Every good teacher should use "direct feedback and practice" when teaching any domain, not just metaphor. It would seem blatant that teaching a domain in contrast to no instruction would enhance performance.

In teaching metaphor, one helps the subject learn to generalize once originally concrete thoughts to abstract ones. This kind of generalization that metaphor may promote may in turn help the subject generalize in different domains and possibly could assist in a

wide variety of academic proficiency. Helping subjects understand metaphor promotes analytical and abstract thinking. We believe that children with learning disabilities cannot interpret metaphors due to lack of appropriate experience and encouragement, and these children's metaphor performance can be improved through teachers' instructional efforts.

Other results related to the demographic Variables (i. e., sex, chronological age, grade level, reading level, and type of special education program) revealed that the metaphor performance patterns among the subjects in this study varied significantly by grade level, reading, and sex in the control group. Metaphor performance did not vary according to chronological age and type of special education program. In the multiple regression analysis, however, there were many independent variables which, when combined, proved to be significant in relating to the metaphor performance of children with learning disabilities. Further studies with more subjects and more metaphor items included in each testing or treatment session are needed to confirm this conclusion.

REFERENCES

- Arter, J.L. (1967). *The effects of metaphor on reading comprehension*. Unpublished doctoral dissertation, University of Illinois, Urbana, Illinois.
- Baldwin, R.S., Luce, T.S., & Readence, J.E. (1982). The impact of subschemata on metaphorical processing. *Reading Research Quarterly*, 4, 458-543.
- Billow, R.M. (1975). A cognitive developmental study of metaphor comprehension. *Developmental Psychology*, 11, 415-423.
- Billow, R.M. (1977). Metaphor: A review of the psychological literature. *Psychological Bulletin*, 84(1), 81-92.
- Boatner, M.T., & Gates, J.E. (1969). *A dictionary of idioms for the deaf*. Washington, D. C.: National Association of the Deaf.
- Cometa, M.S., & Eson, M.E. (1978). Logical operations and metaphor interpretation: A Piagetian model. *Child Development*, 49, 649-659.
- Fruchter, A., Wilber R., & Fraser, B. (1984). Comprehension of idioms by hearing-impaired students. *The Volta Review*, 86, 7-20.
- Gardner, H. (1974). Metaphors and modalities: How children project polar adjectives onto diverse domains. *Child Development*, 49, 327-331.
- Harris, A.J., & Sipay, E.R. (1980). *How to increase reading ability*. New York: Longman.
- Honeck, R.P., Sowry, B.M., & Voegtler, K. (1978). Proverbial understanding in a pictorial context. *Child Development*, 49, 327-331.
- Illinois State Board of Education (December, 1986). *Title 23 Illinois Administrative Code 226*, Springfield, IL: ISBE.
- Iran-Nejad, A., Ortony, A., & Rittenhouse, R. (1981). The comprehension of metaphorical uses of English by deaf children. *American Speech-Language-Hearing Association*, 24, 551-556.
- Johnson, M.G., & Malgady, R.G. (1979). Some cognitive aspects of figurative language: Association and metaphor. *Journal of Psycholinguistic Research*, 8, 249-265.
- Kogan, N., Connor, K., Gross, A., & Fava, D. (1980). Understanding visual metaphor: developmental and individual differences. (Monograph) *Society for Research in Child Development*, 45, 1-77.
- Nippold, M., Leonard, L., & Kail, R. (1984). Syntactic and conceptual factors in children's understanding of metaphor. *Journal of Speech and Hearing Research*, 27, 197-207.
- Ortony, A. (1980). *Metaphor and thought*. Cambridge, MA: Cambridge University Press.
- Ortony, A. (1975). Why metaphors are necessary and not just nice. *Education Theory*, 25, 45-53.
- Ortony, A., Reynold, R.E., & Arter, J.A. (1978). Metaphor: Theoretical and empirical research. *The American Psychological Association*, 85 (5), 919-943.
- Reynolds, R.E., & Ortony, A. (1980). Some issues in the measurement of children's comprehension of metaphorical language. *Child Development*, 51, 1110-1119.
- Richards, I.A. (1987). *An anthology of figurative language stories for deaf and hard-of-hearing children*. Salem, WI: Sheffield Publishing Company.
- Rittenhouse, R.K., Kenyon, R., Leitner, J.R., & Baechle, C.L. (in press). Metaphor and conservation in hearing-impaired children: Cued speech, manually-coded English and oral-aural comparisons. *Journal of Childhood and Communication Disorders*.
- Rittenhouse, R.K., & Stearns, K. (1982). Teaching metaphor to deaf children. *American Annals of the Deaf*, 127 (1), 12-17.
- Mittenhouse, R.K., Morreau, L.E., & Iran-Nejad, A. (1981). Metaphor and conservation in deaf and hard-of-hearing children. *American Annals of the Deaf*, 126 (4), 450-453.
- Schloss, P.J., Israelite, N.K., & Smith, M.A. (1985). Teaching metaphor recognition in the total communication environment. *Journal of the British Association of Teachers of the Deaf*, 9 (3), 67-73.
- Seidenberg, P.L., & Bernstein, D.K. (1986). The comprehension of similes and metaphors by learning-disabled and nonlearning-disabled children. *Language, Speech, and Hearing Services in School*, 17, 219-229.
- Seidenberg, P.L., & Bernstein, D.K. (1988). Metaphor comprehension and performance on metaphor-related language tasks: A comparison of good and poor readers. *Remedial and Special Education*, 9 (2), 39-45.
- Silverman, J., Winner, E., & Gardner, H. (1976). On going beyond the literal: The development of sensitivity to artistic symbols. *Semiotica*, 18, 291-312.
- Wiig, E.H., & Semel, E.M. (1984). *Language assessment and intervention of learning disability*. Columbus, OH: Charles E. Merrill.
- Winner, E., Rosenstiel, A., & Gardner, H. (1976). The development of metaphoric understanding. *Developmental Psychology*, 12, 289-297.
- Wood, P.R. (1988). *A descriptive analysis of conservation and metaphor performance among children with hearing impairments who use either cued speech or oral /*

aural mode of communication. Unpublished master's thesis, Illinois University, Normal, IL.

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促進學習障礙兒童之隱喻性語言能力

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摘 要

大多數學習障礙兒童都具有語言方面的缺陷。這種語言缺陷可能導致兒童對隱喻性文字或口語上之錯誤理解與詮釋。本研究旨在評價直接回饋與訓練對學習障礙兒童隱喻性語言能力之影響。統計資料分析結果發現實驗組與控制組之間有顯著的差異。本研究更進一步發現學習障礙兒童之性別、年齡、年級、閱讀能力、與特殊教育方式等，加以組合，則顯現出更多有意義之相關。