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Using comics to teach multiple meaning of words

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USING COMICS TO TEACH MULTIPLE
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Dissertation Approval

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ABSTRACT

Using Comics to Teach Multiple Meanings of Words

by

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The purpose of the study was to investigate the efficacy of using comics to teach the multiple meanings of words to students with language and learning disabilities. Three research hypotheses were tested: (1) there will be a statistically significant difference in learning multiple meanings of words between subjects who received instruction with comics and subjects who received instruction without comics; (2) there will be a statistically significant increase in the subjects' perceived abilities to learn and remember words with multiple meanings after instruction using comics; and (3) there will be a statistically significant change in the subjects' interest in reading after instruction using comics. Twenty-three subjects (17 male, six female), aged 8.1 to 10.9 participated in the study. Subjects were assigned randomly to an experimental and control group. Subjects in the experimental group were taught multiple meanings of ten words using comics. Subjects in the control group were taught the same words without using comics.

A Multiple Meanings Task was administered before and after treatment to assess subjects' abilities to define words that had more than one meaning. A Subject Questionnaire was administered before and after treatment to (1) assess subjects' perceptions about their abilities to define and learn words with multiple meanings and (2) assess their interest in reading.

An Analysis of Variance (ANOVA) indicated a statistically significant difference between experimental and control subjects' abilities to define words with multiple meanings at the $p < .05$ level. Subjects in the experimental group performed significantly better than the subjects in the control group after the treatment. A paired two-tailed t-test indicated there were no within subject differences in perceived abilities to define and learn words at the $p < .05$ level for either experimental or control subjects. A paired two-tailed t-test indicated there were no within subject differences in perceived interest in reading at the $p < .05$ level for either experimental or control subjects. Therefore, hypothesis one was accepted and hypotheses two and three were rejected.

The conclusion drawn from this study was that using comics to teach multiple meanings of words is a potentially beneficial intervention for elementary students with language and learning disabilities.

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CHAPTER I

INTRODUCTION

Humor, in its many forms, plays an important role in our lives. It is used as a social tool to provide enjoyment for others and ourselves. It is found in many types of literature including both fiction and nonfiction. For effective teaching, it is important that teachers and speech-language pathologists (SLPs) know if understanding humor, whether it's in the form of a comic, joke, sarcasm, or figurative language, has the potential for causing difficulties for children who have language impairments or learning disabilities.

Visual humor (i.e., comics) can be funny because of the unexpected nature of what is said and shown. In fact, humor is based on the fact that what we see in the picture(s) and read in the caption(s) aren't in agreement (Shaeffer & Hopkins, 1988). The moment of humor occurs when the expected action or statement does not happen. This "unexpectedness" has been termed "incongruity" (Pien & Rothbart, 1976; Honig, 1988), and is considered to be one of two component parts of humor. The other essential component is "resolution" (Honig, 1988). Resolution occurs when an explanation can be provided for the incongruity.

Ambiguity is pervasive in our language (Spector, 1997). This ambiguity sometimes takes the form of idiomatic language (e.g., to hit the ceiling). Idiomatic language involves words that have more than one meaning. For example, the word "run" has

several meanings. It can mean "to operate," "to spread," or to "attempt to gain a political office." The student who understands only one meaning for the word "run" may not understand what he is reading.

In terms of idiomatic expressions (i.e., those combinations of words whose meanings are not taken literally), a student may need to know more than one meaning in order to understand the entire expression. For example, in the phrase "animal magnetism," the reader needs to know that "magnetism" means both an electrical pull and the appeal between two people.

Vocabulary knowledge has long been connected with cognitive ability. As children mature, the number of words they know and their ability to understand the various meanings of words increases. A body of literature (McGhee, 1971a; McGhee, 1971b) links the development of a child's cognitive functioning to the comprehension of ambiguous humor. Very often, students receiving therapy for language impairment have semantic (vocabulary) improvement as one of their goals. Students with learning disabilities frequently have academic goals that include vocabulary development as well.

Purpose of the Study

The purpose of the present study was to investigate the efficacy of using comics as a method for teaching the multiple meanings of words to students with language and learning disabilities. Three questions were of interest to the researcher.

1. Will students be able to learn definitions of words with multiple meanings, through the use of comics?
2. Will students perceive a difference in their ability to learn and remember words with multiple meanings after using comics?

3. Will students' interest in reading for pleasure change after using comics?

From these questions, the following hypotheses were formulated and tested:

Hypothesis 1. There will be a statistically significant difference in learning multiple meanings of words, between subjects who received instruction with comics and subjects who received instruction without comics.

Hypothesis 2. There will be a statistically significant increase in the subjects' perceived abilities to learn and remember words with multiple meanings after instruction using comics.

Hypothesis 3. There will be a statistically significant change in the subjects' interest in reading after instruction using comics.

Significance of the Study

This study is important for several reasons. First, educators continually search for innovative methods to teach the content of various curricula. Second, speech-language pathologists (SLPs) also search for novel ways of instructing their students (O'Toole, Baum, & Logemann, 1998) that will result in the remediation of a speech and/or language problem. Third, both educators and SLPs are interested in the effectiveness of an instructional method that can be used in a variety of instructional arrangements (e.g., small group, 1:1 instruction) and settings (e.g., special education classes, general education classes, speech-language therapy offices).

One of the primary areas of child development is the ability to read. Reading is strongly related to lexical development. Disorders in linguistic development, particularly in the area of vocabulary, frequently foreshadow disorders in reading the printed word (Catts & Kamhi, 1986). Readers must be able to predict the meaning of upcoming words

and use the context of the sentence to derive meaning from printed text (Catts & Kamhi, 1986). Thus, vocabulary instruction is very important. Lehr (1984) expressed concerns that typical vocabulary instruction demands the knowledge of one meaning for a word and not the broader scope of multiple meanings.

To perform successfully in academic subjects, such as English and Language Arts, students must acquire comprehensive vocabulary skills (Spector, 1997). Therefore, it is important for educators and speech and language pathologists to find motivating ways to teach students a variety of definitions during vocabulary instruction. Knowledge of words with multiple meaning may assist students in other academic subjects as well (e.g., science, social studies) (Milosky, 1994).

Several educators and researchers have offered opinions regarding the use of humor for instructional purposes. Kossack & Hoffman (1987) reported that the meaning of words can be conveyed through pictures in comics, and that students respond positively to this approach because there are fewer words to read. Honig (1988) suggested that humor aids in the retention of learned material. Bernstein (1986) discussed the use of humor to evaluate a student's awareness of supra linguistic features of printed material and pointed out that this awareness is important for reading.

Colwell & Wigle (1984) discussed learning theory and its relationship to the use of humor as an educational tool. Sensory information that is perceived must be stored in and then retrieved from memory in an efficient manner. The use of oral or written humor allows associations to be made between new and previously learned information. With more associations being made, humor provides a means through which learning is enhanced (Colwell & Wigle, 1984). Colwell & Wigle stated further that new learning

must be gained in context. The manner in which meaning is taught affects learning. The student must be made aware of the connections between the new concept to that which has already been learned. The use of humor may be a motivating method to help students to make these connections.

Students need to have a sense of curiosity about a subject to want to learn more about that subject. Humor may be viewed as one type of conceptual inconsistency that can stimulate curiosity, and consequently learning. Humor may present a more enjoyable way of learning for students, especially those who appear to be bored (Colwell & Wigle, 1984).

Although comics have been used to teach forms of idiomatic expressions, no experimental research was found to substantiate the use of comics as an approach in learning multiple meanings of words (Bernstein, 1986; Colwell & Wigle, 1994).

Definitions of Terms

The following definitions are used to clarify the terms used in the study.

Voice – “Sound produced at the level of the larynx by rapid vibratory excursions of the adducted vocal folds” (Van Riper & Erickson, 1996, p. 525).

Fluency – “The smooth, effortless, uninterrupted flow of an utterance” (Shames, Wiig, & Secord, 1990, p. G-7).

Pragmatics – “Aspect of language concerned with language use within a communication context” (Shames, Wiig, & Secord, 1990, p. G-13).

Speech-Language Pathologists (SLPs) – “...qualified individuals who diagnose, prescribe for, and/or remediate speech and/or language disorders” (Shames, Wiig, & Secord, 1990, p. 12).

Articulation – “Using the articulators (teeth, tongue, etc.) to produce speech sounds” (Shames, Wiig, & Secord, 1990, p. G-2).

Learning Disabilities (LD) – "... a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, ..." (Federal Register/ Number 48, Volume 64 34 C.F.R. § 300.7 March 12, 1999, p. 12422.)

Idiom – "An expression unique to a language, especially one whose sense is not predictable from the meanings and arrangement of its elements" (Spector, 1997, p. 243).

Lexical ambiguity – Words that may have more than one meaning (Spector, 1990).

Conceptual tempo – "...the degree to which an individual evaluates possible response alternatives in situations of moderate to high response uncertainty" (Brodzinsky, 1976, p. 881).

Comic – "A series of cartoons, as in a newspaper, usually telling a humorous or adventurous story." (Neufeldt, V. (Ed.), 1994, p. 279).

Summary

Students with language-learning impairments have difficulty understanding idiomatic expressions in language (Spector, 1997). Methods for developing knowledge of the multiple meanings of words with students with learning disabilities do not appear to have been researched to the extent that is necessary. Because vocabulary development is needed for success in reading, educators need effective methods to teach the meanings of words. This, especially, is true with the population of students who have experienced difficulty with reading, including those with language and learning disabilities. The results of this study are expected to have immediate implications for special educators and SLP practitioners as well as researchers.

CHAPTER II

REVIEW OF LITERATURE

Literature Review Procedures

Studies included in this review were located through a comprehensive search of studies in the Education Resources Information Center (ERIC). The following descriptors were used: comics, learning disabilities, learning disabilities-instruction, speech disorders, language disorders, special education, research design, vocabulary, vocabulary-instruction, and reading disorders.

A manual search through selected journals (1971 – present) and an ancestral search through the reference lists of obtained articles also were conducted. Included in these journal searches were Language, Speech, and Hearing Services in Schools, Teaching Exceptional Children, Exceptional Children, and Journal of Speech and Hearing Research, Journal of Speech and Hearing Disorders, and Topics in Language Disorders.

Selection Criteria

Experimental studies were included in this review if they (a) involved subjects from kindergarten through college, (b) examined humor or vocabulary acquisition and development, and (c) included a clear description of the subjects involved, research settings, experimental design used, how the data were analyzed, and significance of

results. As a result of this search and selection procedure, eleven experimental studies were located and reviewed. Additionally, 24 theoretical papers were located and subsequently included in this review.

Experimental Studies Related to Cognition and Humor

McGhee (1971a) conducted a study to identify significant changes during the development of conceptual thinking for the comprehension and appreciation of humor. He used two methods to determine humor comprehension. One method was to measure each subject's ability to explain why something was funny, and the other was to require each subject to remove the humor component in a stimulus.

McGhee included 90 boys from middle-class families in a small Ohio town. There were 30 boys each at ages five, seven, and nine. Intelligence for the seven- and nine-year-old subjects, ranged between 100 and 120. No scores for five-year-old subjects were reported. Subjects at this age were included if they did not fall into the categories of "very dull" or "very bright" (p.126) based on their teachers' opinions.

The ninety boys were individually assessed on four cognitive tasks and humor comprehension. For each subject, the cognitive tasks were assessed first and the humor comprehension was measured second. The cognitive tasks, devised by Piaget, were administered to assess the degree of cognitive development of the subjects.

The four cognitive tasks were: (a) conservation of mass; (b) conservation of weight; (c) class inclusion; and (d) lateral discrimination. First, the conservation of mass task was administered. Subjects were asked to take an amount of Play-doh and make a ball of equal size to the ball the examiner had made. For the conservation of weight task, subjects were asked to take a large ball of Play-doh and use as much of it as needed to

form a pancake like the one made by the examiner. The third cognitive task, class inclusion, was administered next. The examiner presented each subject with 12 wooden beads (i.e., 10 orange beads and two blue beads). Each subject was asked if there were more orange beads than all (i.e., 10 orange beads plus 2 blue beads) of the wooden beads. The fourth cognitive task, lateral discrimination was administered. Subjects were asked to distinguish right from left, first distinguishing between the examiner's hands and then between their own hands. The examiner further explored this using three objects (pencil, penny, and key) placed before the subjects. Subjects were asked to identify which object was on the right or left.

Cognitive tasks were rated. If the subject demonstrated accurate conservation of mass, a rating of "4" was assigned based on a five-point scale. Conservation of weight was rated using this same scale. McGhee did not identify how ratings of "1" to "3" were assigned. If subjects were correct in the "class inclusion" task, they scored "1." No description of the scale used for "class inclusion" was provided. "Lateral discrimination" was rated on a five-point scale, with a rating of "1" given for subjects not able to distinguish between their own left and right hands, and "5" given for correctly determining the left-right relationships between the objects. Further clarification regarding this rating was not provided. All four cognitive scores were combined for the researcher's data analysis. It was possible for subjects to amass 14 total points.

Twenty humor stimuli (i.e., 20 cartoons) were used in this study. The humor stimuli were divided into five groups, with four examples within each of five groups that were presented to the subjects. These included: (a) novelty cartoons without captions, (b)

novelty jokes (verbal, no pictures). (c) incongruity cartoons with captions. (d) incongruity jokes. and (e) incongruity cartoons without captions.

The humor materials were presented. Each set of four examples within each of five groups was alternately presented so that the cartoons weren't viewed in the same sequence, each of the four times they were presented to the subjects. When each stimulus was presented, the examiner initially asked three questions:

1. What is there about this cartoon (joke) that makes it a cartoon (joke) instead of a regular picture (story)?
2. Why do you think it's funny?
3. How could we change what is happening in the cartoon (joke) so that it wouldn't be a cartoon (joke) any more, so it wouldn't be funny? (McGhee, 1971a, p. 130).

The first question was asked only after the first two or three presentations of stimuli.

Then this question was discontinued and only questions two and three were asked.

After answering these questions, subjects were asked to rate the humor stimuli using a five-point rating scale. The scale included: (1) not funny at all; (2) just a little bit funny; (3) moderately funny; (4) funny; (5) very funny. To assist the five-year-old subjects with this rating system, stick figures were used to represent these concepts. Jokes and captions were read for the five- and seven year olds so that reading difficulties would not negatively influence the results.

Subjects' humor comprehension was rated on a four-point scale. A score of "1" was awarded for no response, or if only the "normal aspects of the stimulus" were given (p. 131). If the subject partially described any discrepancies in the cartoon or joke, he received a score of "2." A score of "3" was given if the humor component was

identified, and a “4” was given if a subject cited the central humor component and then tried to explain why the stimulus was funny. McGhee also examined subjects’ abilities to alter humorous stimuli. A successful alteration occurred when a subject changed the presented stimuli so that it wasn’t funny anymore.

Subjects’ determinations of how a humorous stimulus was funny were classified as “descriptive” (simple description of events) or “interpretive” (comparison of discrepant events, description of what should typically occur, or explained why a character acted in that manner).

In order to assess the relationship between cognition and humor comprehension (i.e., ability to identify what was funny and removing the humorous component), Pearson correlation coefficients were used to compare subjects’ cognitive scores (i.e., scores obtained based on the conservation tasks, class inclusion task, and lateral discrimination task) with their mean humor comprehension scores. Subjects’ ages and the types of humor (i.e., “novelty cartoons without captions,” “novelty jokes,” “incongruity cartoons with captions,” “incongruity jokes,” and “incongruity cartoons without captions”) affected the relationship between cognitive scores and humor comprehension. McGhee reported a strong correlation between humor and cognition for seven year olds for “incongruity” humor stimuli ($p < .01$) and “incongruity cartoons without captions” humor stimuli ($p < .05$).

The Fisher exact probability test was used to examine the relationship between cognitive score and the ability to remove humor from a situation. Subjects with higher cognitive scores were more easily able to alter “incongruity humor” (i.e., incongruity jokes and incongruity cartoons with and without captions) in the stimulus ($p < .05$), than

subjects with lower cognitive scores. With regard to “novelty humor.” (i.e., novelty cartoons without captions and novelty jokes) cognitive level was significant for seven year olds.

Based on these analyses, McGhee concluded that understanding incongruent humor is significantly related to level of cognitive thinking. Younger subjects (five year olds) experienced difficulty comprehending incongruous humor, extracting humorous components, and altering humorous events. McGhee noted a pattern among the seven year olds. Approximately half of this age group exhibited difficulties performing the humor tasks and approximately half were successful. This led him to conclude that age seven appeared to be a transition period in humor comprehension.

McGhee found that nine-year-old subjects consistently were able to demonstrate greater comprehension than five year olds or seven year olds. He concluded “comprehension of incongruity humor is positively related significantly to the degree of acquisition of concrete operational thinking” (p. 135).

Four weaknesses were noted in this study. First, rating scales were used that were not clearly defined making it somewhat difficult to interpret student performance. Second, different rating scales were used for the various measures within the study. Third, the ratings across the cognitive tasks were not consistent. For example, a rating of “1” in one task indicated successful completion, whereas a rating of “5” in another task indicated successful completion. These variances seem to add unnecessary confusion. Finally, intelligence testing was not completed for the five-year-old subjects. This raises a question regarding the levels of intelligence of the subjects at that age in comparison to the range of intelligence for the seven- and nine-year-old subjects.

A relative strength of this study was the use of cartoons. This allowed subjects to use visual and auditory skills to perform the tasks required of them in this study. Another strength of this study was the large subject pool. This allows for possible generalization to similar populations.

McGhee (1971b) examined further the role cognition plays in the development of children's humor comprehension and appreciation. This study differed from his previous one (1971a) in that he included what he described as other "need-related bases for humor." These included "hostility," "superiority," and "dependency" (p. 734).

McGhee's study involved the same 90 boys from his previous study with 30 subjects in each of three age groups: five, seven, and nine.

McGhee used the same four cognitive functioning tasks devised by Piaget that were used in the previous study (1971a). These were:

1. conservation of mass, in which the subjects were asked to create balls equal in *size* made from Play-doh;
2. conservation of weight, in which subjects were asked to create balls equal in *weight* made from Play-doh.
3. a lateral discrimination task to determine if the subjects could distinguish their left from right hands as well as the examiner's left and right hands. They were asked to distinguish right from left using three objects – penny, pencil and key.
4. a class inclusion task in which subjects were given two sets of wooden beads (i.e., one set of 10 orange and one set of two blue); subjects were asked which set, wooden (i.e., orange and blue) or orange, had more beads.

The cognitive tasks were rated according to a range of scores for each task, delineating a performance level for each task for each subject. For the conservation of mass and weight tasks, a subject was rated between "0" and "4"; for the lateral discrimination task, between "0" and "5"; for the class inclusion task, between "0" and "1". A subject could amass a total of 14 points for these tasks. This total score for each subject was used for later analysis of cognitive development.

Humor comprehension was measured next. McGhee used 18 cartoons divided into three sets: (a) Set I consisted of six cartoons, in which the sequential frames were cut apart; (b) Set II consisted of five cartoons in which one critical frame was missing from each; (c) Set III consisted of seven cartoons with three possible captions for each cartoon (p. 734-735).

For Set I, the subjects were told that the cartoons would be presented in a mixed-up order. The subjects were to reorder the cartoons so the cartoons would be funny. The examiner recorded how each subject arranged the cartoons. The examiner asked each subject what made the picture a cartoon instead of a regular picture, and what made it funny. The latter question (i.e., what made it funny) was asked after the first two or three presentations.

For Set II, the subjects were told they would see cartoons of which one half was missing. They were to select the other half from a field of three. There were no captions for these cartoons.

For Set III, subjects were asked to tell the examiner which caption made a presented cartoon funny. The examiner read the caption choices for the five-year-old and seven-year-old subjects, while the nine-year-old subjects read the captions themselves.

The subjects rated the funniness of each cartoon on a five-point scale: (a) "not funny at all;" (b) "just a little bit funny;" (c) "moderately funny;" (d) "funny;" and (e) "very funny" (p. 737).

McGhee devised a humor comprehension rating scale for the subjects' explanations. Subjects' descriptions of the reasons the cartoons were funny were classified as "descriptive" (simple description of events) or "interpretive," using the same criteria as in his previous study (i.e., comparison of discrepant events, description of what should typically occur, or explanation of why a character acted in that manner).

Pearson correlation coefficients were used to determine the relationship between the level of cognitive development and comprehension of the humor material. The mean comprehension scores for subjects were used with the total cognition scores for each subject. Strong correlations were found for seven-year-old subjects for Set I ($r = .550$, $p < .01$) and Set II ($r = .359$, $p < .05$), and for nine-year-old subjects for Set III ($r = .489$, $p < .01$).

The total number of correct choices for the sets of humor stimuli were counted. Subjects were divided into two groups based upon their cognitive scores. These were "high" (scores between five and nine), and "low" (scores between zero and four). Significance of the difference in the number of correct choices for the high and low cognitive score groups was determined using t-tests. Even though significance was not reached for pairings of cognitive scores and total number of correct choices, for each age-humor pairing, subjects with high cognitive scores made more correct choices than subjects with low cognitive scores.

Using the same “high” and “low” classification. Fisher exact probability tests were used to determine the relationship between providing interpretive explanations for humor cognitive level. Nine-year-old subjects primarily provided the examiner with interpretive explanations of the humor stimuli, while five-year-old subjects usually gave descriptive explanations of the humor stimuli. For each humor set, results for seven-year-old subjects reached significance (no statistics reported) for the high cognitive group.

Appreciation of humor was analyzed using Pearson correlation coefficients. These coefficients were figured between subjects’ cognitive scores and mean humor ratings for degree of funniness. No relationships were found between cognition and age for appreciation of humor.

Trend analyses were computed for each age-humor pairing to determine if a relationship between comprehension and appreciation of humor existed. A significant positive linear relationship ($p < .01$) was found only for Set II at age nine.

McGhee also examined changes that occurred by chronological age. He used one-way ANOVA procedures for comprehension of humor, frequency of correct choices, and humor appreciation. He found older subjects demonstrated significantly greater comprehension than younger subjects ($p < .001$), and greater comprehension for the picture-matching task than for the caption-matching task, $p < .05$ (Five year olds and seven year olds verbally indicated which caption read to them best matched the cartoon). Older subjects (not specified) made more correct choices for all humor sets ($p < .025$). Significance was reached for nine year olds demonstrating greater humor appreciation ($p < .05$) than five year olds. Chi square analysis was used to determine the relationship

between age and providing descriptive and interpretive humor explanations. For Sets I and II, significance ($p < .025$) was reached for these matching tasks with five year olds providing more descriptive explanations than seven year olds and nine year olds. Nine year olds provided more interpretive explanations than five year olds and seven year olds. With regard to Set II, all subjects, regardless of age, provided more descriptive than interpretive responses. For Set III, statistical significance ($p < .05$) was reached for "older subjects" for humor appreciation.

McGhee concluded higher cognitive abilities corresponded to an increased amount of correct choices of humor stimuli, since statistically significant results were not reached except at age nine. This indicated higher-level cognition is necessary for understanding abstract language. Subjects must have been able to distinguish differences among several options in order for the task to have been completed correctly. McGhee concluded also that cognitive functioning plays an important role in comprehending need-related humor.

A weakness in the reporting of this study was that there was no clear explanation of how the need-related humor components ("hostility," "superiority," and "dependency") were involved in this study. The relevance of these areas with regard to the relationship between cognition and humor is unclear.

A strength of the study was the use of cartoons to assist in humor comprehension. Subjects were able to use their visual skills along with their auditory skills to perform the tasks required of them in this study.

Pien & Rothbart (1976) investigated whether young children (ages four and five) could appreciate resolved incongruity of humor in cartoons. Subjects were 20 four year olds and 20 five year olds attending the same nursery school in a white, middle-class

neighborhood. There were 20 male and 20 female subjects. The subjects were assigned randomly (specific procedure not defined) to two groups. Different materials were used for two procedures in this study. The first procedure was a "paired comparison" procedure, and the second procedure was a "single-cartoon rating" procedure (p. 968).

In the "paired comparison" procedure, seven two- and three-frame field-tested cartoons were used. These cartoons were selected from magazines or books written for children and were separated into two groups: (a) "resolution-removed," in which the first or last frame was changed to remove the resolution of the humor, and (b) "pure incongruity beginning or ending version," in which the incongruity was kept in the first or last frame, but the information regarding the resolution was removed.

In the "single-cartoon" procedure, six one-frame field-tested cartoons were used. These were selected from magazines or books written for children. Two versions of each cartoon (original and "resolution-removed," p.968) were used. The element of the cartoon that would assist a reader in resolving the incongruent part of humor had been removed in the latter version of the cartoons. Two groups of cartoons were formed for this procedure. Three original and three "resolution-removed" cartoons were selected randomly for inclusion in each group with the stipulation that both forms of one cartoon could not be in the same group.

The subjects were told they would assist a female experimenter in determining which cartoons were funny. Each subject was assigned randomly (randomization procedure not specified) to one of two groups, to view one of the "paired-comparison" groups and one of the "single-cartoon" groups.

Subjects in each group were presented individually the "paired-comparison" cartoons first. The experimenter showed one cartoon with either two beginnings or two endings to each subject and asked the subject to select which version ("original" or "resolution-removed") made each cartoon funnier. Each cartoon was described to assist the subjects with attention to task and the relevant features of the cartoons. Each subject's cartoon selection and "spontaneous mirth response," (p. 969) were recorded by the experimenter. The mirth responses were rated according to a four-point scale. A score of "0" was given if the subject gave no response; a score of "1" for a partial smile; a score of "2" for a full smile; a score of "3" for a laugh.

Next, the "single-cartoon" procedure was administered individually to all subjects in each group. Subjects were presented with six successive cartoons, three original versions, and three "resolution-removed" versions, in random order. The experimenter described the cartoons the same way she did in the "paired-comparison" procedure, and asked subjects if each cartoon was funny or not funny. If subjects indicated that the cartoon was funny, they were asked if it was "a little funny" or "a lot funny" (p. 969). The experimenter used a three-point scale to rate the funniness of these cartoons. A "0" was given for "not funny;" "1" was given for "a little funny;" "2" was given for "a lot funny." Spontaneous mirth was rated for these cartoons using the same four-point scale employed in the "paired-comparison" procedure cartoons.

A correct score was awarded if subjects participating in the "paired comparison" procedure selected the beginning or ending for the original cartoon. A total score was obtained by adding the total number of correct responses for the seven paired comparison trials. Pien & Rothbart expected the number of correct responses achieved

by chance to be 3.5. Eighty percent (16/20) of the four-year-old subjects scored above that level. Eighty-five percent (17/20) of the five-year-old subjects scored above the level of chance. Using sign tests, Pien & Rothbart found that these proportions were significantly above the chance level ($p < .002$, $M = 4.75$ for four year olds; $p < .001$, $M = 4.80$ for five year olds). A 2 x 2 ANOVA was performed to determine if there were possible developmental changes in the role of resolution. No significant interactions or main effects were found. The researchers stated that these data indicated four- and five-year-old children could distinguish between two versions of cartoons and that a preference for the original version existed. The "mirth response" scores were analyzed using "an identical analysis." It was not clear which analysis, or precisely what results were obtained.

The score for the "single-cartoon" procedure was obtained by subtracting the sum of humor ratings for resolution-removed cartoons from the sum of the ratings for the original cartoons. If the result was a positive score, then the original cartoons were deemed funnier. If the result was a negative score, then the resolution-removed cartoons were deemed funnier. Sign tests were used to determine the proportion of four- and five-year-old subjects having a positive difference score. The proportion was not significantly greater than expected by chance, 32% (5/16) for four year olds, and 60% (6/10) for five year olds. The mirth responses also were analyzed for this cartoon procedure. Although the analysis process was unclear, Pien & Rothbart stated that there was a significant correlation between rating responses and mirth responses, $r = .46$, $p < .005$.

Pien & Rothbart concluded that young children appreciate both incongruous and resolvable aspects of cartoons. They are able to resolve incongruity, preferring resolved

incongruity. It was not specified in the study whether the dialogue was read to the subjects.

A weakness in the reporting of this study is the unclear description of the analysis used to analyze data related to the subjects' mirth responses. Several statistical procedures were used for the data analyses in this study; therefore the authors should have been very explicit regarding which procedures were used for each data set.

A strength of the study was using comics. This allowed subjects' visual skills to support auditory skills when performing the tasks required of them in this study. A second strength was field-testing the comics to ensure their funniness. This reduced the possibility of non-funny comics confounding the results of the study.

Brodzinsky (1977) investigated the individual differences among children in the understanding and enjoyment of verbal humor that contained linguistic uncertainty. He believed that something beyond cognitive level was involved in the comprehension and appreciation of humor.

Brodzinsky selected 50 fourth-grade children (25 boys and 25 girls) as subjects. They were from a middle-class environment in New Jersey, spoke only English, and were of average intelligence (per school records). He was concerned about a subject's conceptual tempo (i.e., the individual cognitive style used to solve problems or process information). He described four types of conceptual tempo that describe the speed with which problems are solved and the degree of accuracy of the solution. The four were (a) "reflective" (careful, but only relatively accurate); (b) "impulsive," (swift, but often inaccurate); (c) "fast-accurate," (swift, and highly accurate); and (d) "slow-inaccurate," (careful and inaccurate) (p. 960).

Twenty jokes were selected from a pool of “over 1000” jokes (p. 962). Those eliminated from the study were thought to be offensive or too difficult for elementary school children. Five jokes were selected to represent each of four types of ambiguity: (a) “phonological” (one phoneme, or sound is omitted or changed); (b) “lexical” (multiple meanings of a word); (c) “surface-structure” (words can be grouped in another way to change the meaning of the utterance); (d) “deep-structure” (an underlying meaning in a word or phrase exists). An additional set of five jokes were included with punch lines that had been changed to control for factors such as emotionally-laden content and subjects laughing because of social demands (e.g., laughing because it is expected even though the humor is not understood). All 25 jokes were tape-recorded in random fashion. No more than two jokes of the same type were recorded in succession.

Subjects were seen individually for each of two sessions in this study. The examiner was blind to the purpose of the study.

In the first session, subjects were administered the Matching Familiar Figures test (MFF) (Kagan, Rosman, Day, Albert, & Phillips, 1964). Noting subjects’ times to complete the tasks, and the number of correct responses, subjects were assigned to one of the four conceptual tempo groups (“reflective,” “impulsive,” “fast-accurate,” “slow-inaccurate”).

When the second session began, subjects were told that they would hear tape-recorded jokes and would be asked to decide how funny each joke was. The jokes were presented twice. During the first presentation, the examiner rated subjects’ responses to jokes on a five-point scale, with “1” given for a “blank expression,” and “5” given for obvious laughter (p. 962). Descriptions of ratings of “2,” “3,” and “4” were not provided.

Subjects rated the degree of funniness of the jokes on a five-point scale, with "1" given for "not funny at all," and "5" given for "very, very funny" (p. 962). The jokes were presented in the same order during the second presentation. Subjects were asked to tell the examiner why the jokes were funny. This was considered "spontaneous comprehension" of the humor. Subjects were prompted for further comprehension of the jokes when their responses did not completely explain why the jokes were funny (prompted comprehension). The subjects' responses were recorded exactly as stated and were rated on a six-point scale by the examiner to assess both types of comprehension (i.e., spontaneous and prompted). Scores were awarded as "1." (essentially no response by the subject); "2." different aspects of jokes were mentioned but not related to any form of incongruity; "3." subjects resolved or described the incongruity of the jokes; "4." subjects identified the incongruity but were unable to resolve it; "5." subjects identified the critical incongruity and partially resolved it; "6." subjects completely explained and resolved the humor (p.962-963).

A significant correlation was found between subjects' intelligence quotients and their abilities to comprehend humor ($r = .73$, $p < .001$ for spontaneous comprehension; $r = .68$, $p < .001$ for prompted comprehension). Separate 4 (conceptual tempo) x 4 (joke type) unweighted means analyses of covariance with repeated measures on joke type and IQ as covariate were gathered for both types of comprehension data.

Significance was reached for main effect for conceptual tempo, $F(3,41) = 8.44$, $p < .001$. This indicated that reflective and fast-accurate subjects showed greater spontaneous comprehension of humor than impulsive or slow-accurate subjects. The main effect for conceptual tempo was not significant for the prompted comprehension

data, $F(3,41) = 2.35$, $p < .10$. Significance was reached for joke type for both spontaneous, $F(3,41) = 207.04$, $p < .001$, and prompted comprehension data, $F(3,135) = 165.77$, $p < .001$. Subjects demonstrated greater comprehension of phonological ($M = 4.54$) and lexical ($M = 4.48$) ambiguous jokes than other types of jokes (not specified by authors). Phonological jokes yielded the highest comprehension scores ($M = 4.75$) followed by lexical jokes ($M = 4.58$), surface-structure ($M = 3.72$), and deep-structure jokes ($M = 3.64$).

A 4 (conceptual tempo) x 4 (joke type) unweighted means analysis of variance with repeated measures was used for determining significance of subjects' mirth and funniness rating scores. Significance was reached for main effect for conceptual tempo, $F(3,42) = 4.40$, $p < .01$. Impulsive subjects demonstrated the greatest mirth, followed by slow-inaccurate, reflective, and fast-accurate subjects. Significance was also reached for joke type, $F(3,126) = 14.85$, $p < .001$. Subjects smiled or laughed more at phonological ($M = 1.86$) or lexical jokes ($M = 1.81$) than the deep- ($M = 1.64$) or surface-structure ($M = 1.65$) jokes.

With regard to funniness of jokes, significance was reached only for main effect for joke type, $F(3,126) = 11.58$, $p < .001$. Subjects were more appreciative of phonological and lexical jokes than either surface- or deep-structure jokes.

Brodzinsky drew five conclusions from his research. These were:

1. Conceptual tempo, in conjunction with intelligence and operational thinking, helps to determine humor comprehension.

2. The style of response rather than cognitive ability negatively impacts humor comprehension. Questions that probe deeper can assist children in understanding critical elements of humor.
3. The type of joke affects the degree of comprehension of linguistic ambiguity.
4. Affective responding in reflective subjects was closely associated with their abilities to comprehend humor. Cognitive processes played a role in modulating their mirth responses.
5. The combination of latency and errors found on the MFF test. may be predictive of some children's affective behavior.

These conclusions supported Brodzinsky's hypothesis that something beyond cognitive level was involved in comprehension and appreciation of humor.

A weakness of the reporting of this study is the incomplete description of the scale used to rate the joke presentations. This made it difficult to determine the degree of variance among subjects' responses.

A strength of the study was the use of an examiner who was blind to the purpose of the study. This reduced the possibility of the examiner unduly affecting the results of the Matching Familiar Figures test and subject responses. Another strength of this study involved the topic that was selected to study. The researcher investigated whether conceptual tempo affected children's comprehension and appreciation of humor. Brodzinsky's results indicated that conceptual tempo was an additional factor in the development of humor comprehension. This expanded the work of McGhee (1971a, 1971b) who found that cognitive development is an important factor in the development of humor.

Shultz & Pilon (1973) investigated the ability of children to perceive different forms of linguistic ambiguity. Their subjects were 14 boys and 14 girls from each of four grade levels, one, four, seven, and ten. The subjects spoke English and were from middle-class neighborhoods.

Materials included six ambiguous sentences each of four types: (a) "lexical:" (b) "phonological:" (c) "surface-structure:" (d) "deep-structure" (p. 729). Unambiguous control sentences were written for each ambiguous sentence. For example, an ambiguous sentence was, "The duck is ready to eat," whereas the complementary unambiguous sentence was "The duck is ready to eat the food" (p. 729). Sentences were numbered one through 48. Two audiotapes were prepared. Tape 1 contained 24 odd-numbered sentences (12 ambiguous and 12 unambiguous) and tape 2 contained 24 even-numbered sentences (12 ambiguous and 12 unambiguous). One version of each sentence was on each tape recording. Three sentences of each type of ambiguity were on each tape. Two large (8" x 10") drawings were made to represent the meaning of each type of sentence.

Subjects were tested individually in a small room in their respective schools. The examiner explained to the subjects they would be listening to tape recordings of sentences, and that some of the sentences would have more than one meaning. Half of the subjects from each grade and gender were randomly assigned to each of two groups – one listening to tape 1 and the other group of subjects listening to tape 2. Subjects were asked to state what each sentence meant. The examiner probed for a second meaning if a subject did not provide a second meaning. This was considered the "paraphrase measure" (p. 730).

Two pictures were presented. These two pictures conveyed both the ambiguous and unambiguous meanings of the tape-recorded sentence. The subjects were asked to indicate which picture illustrated the meaning or meanings of the sentence. Each subject's response was recorded on a tape recorder and later scored to determine whether two relevant meanings were given.

All of the unambiguous sentences were correctly interpreted by all of the subjects. Three patterns emerged from the analysis of the ambiguous sentences: "(a) two meanings were detected on both the paraphrase measure and the picture measure; (b) one meaning was detected on the paraphrase measure and two meanings were detected on the picture measure; or (c) one meaning was detected on both measures" (Shultz & Pilon, 1973, p. 730-731). Shultz & Pilon indicated that the use of the pictures assisted subjects to perceive the ambiguous component in the sentences.

An ANOVA was computed to analyze the paraphrase measure. Main effects were found for grade, $F(3, \infty) = 153.17$, $p < .001$ and type, $F(3, \infty) = 36.48$, $p < .001$, and for a grade and type interaction, $F(9, \infty) = 4.24$, $p < .001$. Subjects demonstrated improvement in detecting lexical ambiguity across grades. An increase in perceiving phonological ambiguity increased in grade four and waned slightly in grades seven and ten. Perception of both surface- and deep-structure ambiguity did not occur until grade seven.

The picture measure was analyzed next, using an ANOVA. Main effects for grade and type were $F(3, \infty) = 201.49$, $p < .001$, and $F(3, \infty) = 46.39$, $p < .001$, respectively. A significant main effect was found also for grade x type interaction, $F(9, \infty) = 2.99$, $p < .005$. The perception of ambiguity increased with each grade level for lexical and

phonological ambiguity. The perception of surface- and deep-structure ambiguity was not apparent in grades one and four, but improvement was noted in grades seven and ten.

Shultz & Pilon concluded the ability to perceive ambiguity is developmental and depends upon the type of ambiguity. The ability to perceive lexical ambiguity develops first within the context of linguistic competence.

One strength of this study was the emphasis on the acquisition of meaning prior to constructing syntax in order to learn language. This was important because comprehension precedes production. A second strength was counterbalancing the presentations of stimuli. This controlled for the influence of the order of presentations of materials that might have affected responses from subjects. Third, the researchers pilot-tested the cartoons proposed for their study. A fourth strength, was using children for the pilot that were different than those included as subjects in the study reported. Fifth, the researchers in this study used pictures to assist subjects in determining meaning, allowing subjects to use their visual skills along with their auditory skills to derive meaning.

Spector (1990) had two purposes for her study. The first purpose was to compare the humor comprehension of normally achieving and adolescents with language-impairment. The second purpose was to determine the ability to comprehend specific linguistic elements for these same populations.

She formed two subject pools, each consisting of high school subjects from grades nine through twelve. The subjects were from a middle socioeconomic community in New York State. The first group included 12 subjects (eight males and four females) with language impairments (LI) who ranged in age from 14 years 4 months to 19 years 2

months. The second group included 12 normally achieving (NL) subjects (seven males and five females) between the ages of 14 years 1 month and 18 years 1 month.

The LI subjects received speech therapy at the time of the study. A certified speech-language pathologist (SLP) administered the PPVT-R (Peabody Picture Vocabulary Test – Revised) (Dunn & Dunn, 1981) and CELF-R (Clinical Evaluation of Language Fundamental – Revised) (Semel, Wiig, & Secord, 1987) to each of these subjects to confirm a language impairment. Classroom observations of language functioning were conducted also. In contrast, the NL group was determined to be functioning at appropriate language levels for their ages, as determined by their teachers, and confirmed by the same test battery (i.e., PPVT-R and CELF-R) administered to the LI subjects.

Four categories of humor were used in this investigation. The four categories were: (a) “lexical” (e.g., “A famous sardine factory canned all its employees.”) (b) “phonological” (e.g., “Men’s briefs are manufactured in the West Undies.”); (c) “morphological” (e.g., “What do frogs sit on at mealtime? Toadstools.”); and (d) “syntactical” (“When the first credit card was used people got a charge out of it.”) (p. 534-535).

Two hundred jokes, puns, and riddles were collected from instructional handbooks for adolescents and a variety of humor-related books. These humor stimuli were classified according to the four categories (i.e., “lexical,” “phonological,” “morphological,” and “syntactical”) by each of three SLPs (two beside the researcher). Those not deemed appropriate for adolescents (too childish or too adult, unusual

vocabulary, ethnic jokes, and parodies) were not used. Eighty-seven humorous items were agreed upon by all three SLPs for use in the study.

Subjects were administered the humor items individually by the researcher in one session. The items were both read aloud by the researcher and presented in written form. The order of presentation was random and subjects' responses were tape-recorded for later analysis.

Two criteria were used to rate an answer as correct. The first criterion required the subject to locate the source of ambiguity in each example. The second criterion required the subject to provide two meanings that could be derived from the context.

Independent t-tests were performed to compare the NL and LI subjects' abilities on these tasks. The LI subjects performed significantly worse than the NL subjects for each of the four categories (lexical, $t(22) = 6.36$, $p < .001$; phonological, $t(22) = 8.87$, $p < .001$; morphological, $t(22) = 7.50$, $p < .001$; syntactic, $t(22) = 6.99$, $p < .001$). They had difficulty selecting what was humorous and telling why it was funny.

Spector drew three conclusions from her study. The first was LI subjects had difficulty pinpointing the humorous element in the stimuli and providing an explanation as to why it was funny. Second, the LI subjects had difficulty providing more than one meaning for the lexical humorous items. Third, strategies are needed to assist students to understand that words can have multiple meanings. Approaches incorporating cognitive strategies to resolve linguistic problems appear to be appropriate for this population.

Two strengths were noted in this study. First, the researcher and those who assisted her screened 200 potential jokes, puns, and riddles prior to their use in the study. This eliminated inappropriate stimuli for the study. Second, the normally achieving subjects

were administered the same battery of language tests to confirm normally developing language. There was no reliance on anecdotal reporting of language skills.

Carson, Skarpness, Schultz, and McGhee (1986) explored the influence of children's temperament and communicative competence on humor development. They defined "communicative competence" as "...those skills which enable children to use language in socially meaningful ways. It involves the capacity to engage in verbal and nonverbal behaviors which, appropriate to the particular situation, convey the intended meaning of the speaker while becoming maximally useful to the listener" (p. 416). They formed three hypotheses: (a) subjects thought to have an "easy temperament" would demonstrate a significantly larger amount of verbal and behavioral initiations of humor and more laughter than other subjects described as "slow-to-warm-up" and "intermediate" in temperament; (b) subjects described as "very active," "approaching," "highly adaptable to change," and "generally positive," would demonstrate a significantly larger amount of laughter and would initiate humor with greater frequency than the subjects not so described; and (c) subjects' communicative competence ratings would be "positively and significantly associated with and predictive of" their demonstrations of humor (p. 417).

This study included 158 four- and five-year-old subjects (78 males and 80 females), from nine different nursery school settings in Texas and California. The majority (145 or 92%) of subjects were from middle- to upper-class Caucasian families.

Parents rated the subjects' behaviors using the Behavioral Style Questionnaire (BSQ) (McDevitt & Carey, 1978), and the head teacher in each nursery school assessed the communicative competence of subjects at their respective sites, using the

Communication Developmental Age Scale (CDA), of the Developmental Profile II

(Alpern, Boll. & Shearer, 1980). Three seven-point humor scales were completed by the head teachers to rate the subjects at their sites in this area. Scores from the scales describe subjects in three areas of humor: (a) "frequency of laughter during social situations;" (b) "verbal attempts at initiating humor;" (e.g., telling jokes) and (c) "behavioral attempts at initiating humor" (e.g., facial expressions) (p. 418).

The subjects were grouped, for purposes of analysis of temperament into five groups. These groups were (a) "easy" (28%); (b) "difficult" (16%); (c) "slow-to-warm-up" (8%); (d) "intermediate high" (18%); (e) "intermediate low" (30%). The latter two groups were composed of subjects whose temperament fluctuated daily and could not easily be placed into one of the other groups.

To test the first hypothesis (temperament styles), a multivariate analysis of covariance (MANCOVA) was completed. Carson, et al. reported that the overall multivariate test was significant, however, the results were not reported. Temperament style was found to be a significant predictor of subjects' behavioral attempts at initiating humor, $F(4,152) = 2.45$, $p < .05$ through the use of univariate tests. Wilk's lambda = .82, $F(16,456) = 1.96$, $p < .02$, with the independent variables accounting for about 11% of the variance in the dependent variables, $\Omega^2 = .109$. Post-hoc testing did not demonstrate that easy- temperament subjects ($M = 3.91$) made significantly more reported behavioral attempts at initiating humor than the other groups. They concluded no support for this hypothesis was evident.

Pearson correlations were used to test both the second and third hypotheses. Of the nine dimensions of temperament ("activity," "rhythmicity," "approach/withdrawl,"

“adaptability,” “intensity,” “mood,” “persistence,” “distractibility,” “response threshold.” p. 420) examined, only “activity” and “approach/withdrawal” were significantly correlated with the three areas of humor expression. (a) “frequency of laughter,” (b) “verbal attempts at humor,” and (c) “behavioral attempts at humor” (p. 421). For “activity,” and the three areas of humor, the correlation coefficients were, respectively. (a) $r = .155$, $p < .05$; (b) $r = .199$, $p < .01$; (c) $r = .28$, $p < .001$. For “approach/withdrawal,” and the three areas of humor, the correlation coefficients were, respectively. (a) $r = -.343$, $p < .001$; (b) $r = -.316$, $p < .001$; (c) $r = -.21$, $p < .01$. “Mood” was related to frequency of laughter ($r = -.140$, $p < .05$), and low “response threshold” was positively and significantly correlated to frequency of laughter and behavioral attempts at initiating humor ($r = -.133$, $p < .05$ and $r = -.139$, $p < .05$, respectively). Subjects who were less persistent were described as exhibiting more behavioral attempts at initiating humor ($r = .131$, $p < .05$).

Stepwise regression analyses were conducted to determine the predictive value of communicative competence, activity level, approach, adaptability, and mood in relation to the subjects’ demonstrations of humor. Significance was found for the overall F test for goodness of fit for all measures of humor: (a) frequency of laughter, $F(3,154) = 12.30$, $p < .0001$; (b) verbal attempts at initiating humor, $F(3,154) = 14.70$, $p < .0001$; and (c) behavioral attempts at initiating humor, $F(3,154) = 13.61$, $p < .0001$.

Another regression analysis was done which included the computation of the nine dimensions of temperament (“activity,” “rhythmicity,” “approach/withdrawal,” “adaptability,” “intensity,” “mood,” “persistence,” “distractibility,” and “response threshold”) and communicative competence, in regard to the subjects’ various

expressions of humor. There were similar contributions to the proportion of variance from the dimensions of temperament and communicative competence accounted for in each demonstration of humor, with the range of R^2 from .07 to .117.

Hypothesis two was supported. Frequency of laughter (Beta = -.34, $p < .0001$) and verbal attempts at humor initiation (Beta = -.19, $p < .01$) were predicted by approach/withdrawal. Significance was found for activity level in predicting subjects' rated verbal attempts (Beta = .27, $p < .0003$) and behavioral attempts (Beta = .28, $p < .0004$) at initiating humor. Communicative competence was positively and significantly correlated to and predictive of all of the expressions of humor (frequency of laughter, Beta = .22, $p < .0001$; attempts at initiating verbal humor, Beta = .35, $p < .0001$; attempts at initiating behavioral humor, Beta = .33, $p < .0001$).

Carson, et al., concluded that subjects that attempted to initiate humor tended to be receptive of the humor attempts of other subjects. Competent communication plays an important social function. It develops before humor, and to some extent determines the development of humor. Finally, Carson, et al. concluded that the development of communication in children who are active, approaching, and highly responsive, is enhanced by humorous responses from others during the early childhood years, which in turn, helps in the development of humor. Therefore, a child's socio-communicative development has humor as an important component. Peer group interactions exist in social and academic settings. Appropriate socio-communicative abilities permit students to interact in both of these settings.

A strength of this study was the large number (158) of subjects in the study. This can allow for stronger generalization of their findings to similar populations.

Theoretical Literature Related to Humor Development

Honig (1988), in a theoretical paper, discussed a model for humor development that included five developmental stages. According to Honig's model, the first stage of humor occurs during infancy when babies respond to humorous physical stimulation by laughing and smiling. The second stage of humor development occurs in the early toddler years, when children have a sufficient command of the language to use objects to represent an incongruous action. In stage three, as language develops, in the later toddler years, the child uses words alone to create a humorous situation. Pretend play and misnaming objects or persons are common examples of this type of behavior. In the preschool years, around age three, as the children increase their ability to conceptualize incongruity, they engage in and perceive other humorous actions. Stage four begins when a preschooler begins to perceive levels of incongruity and begins to play with the sound system of language to create nonsense words. The final stage occurs when a child can understand that words can have more than one meaning. Honig (1988) believes that the last stage of humor development marks the onset of a child's growth toward more mature humor. It is dependent upon the child's ability to understand that words can have more than one meaning. In addition, the child begins to use logical thinking to comprehend the incongruities in humor.

Shaeffer & Hopkins (1988) also developed a model to describe humor development. Their model included four stages. The first stage occurs when children have developed enough language to use language in a representational manner. For example, they may use a block to represent an animal, and then pet the block while saying, "Nice dog." Stage two exists when a child can use language alone to create a funny situation. Humor

begins to serve a social function by gaining adult attention and maintaining interactions with peers. At approximately age three, stage three begins. Children start to use language to create images in which there are role reversals. For example, animals would use language rather than their expected sounds to communicate a message. Children in the fourth and final stage are beginning to understand that appearances are not necessarily what they seem. They realize there may be more than one meaning to the words they hear, and they begin to create and understand riddles. According to Shaeffer & Hopkins' model, one's sense of humor becomes increasingly abstract as one's problem-solving ability increases in complexity.

Bernstein (1986) and Honig (1988) consider the first area of humor to develop to be non-linguistic. In fact, toddlers may be able to detect the "silly" component in a sentence and find it funny (Honig, 1988). Children under six have difficulty comprehending the resolution of incongruities. By age six, children should be able to determine, for familiar words, when the rules of language have been breached (Honig, 1988). The perception of linguistic humor emerges after age six, and continues through age 12 (Pien & Rothbart, 1976; Bernstein, 1986). McGhee (1971a) delineated this further by saying that youngsters, from second grade on, increase their ability to understand humor when the meaning for a particular word is expected but a second meaning is provided. In addition, children under age eight generally have a difficult time appreciating ambiguity. As they mature cognitively, they increase their ability to understand lexical ambiguity (i.e., the multiple meanings of words) (McGhee, 1971a; McGhee, 1971b).

Bernstein (1986) and Honig (1988) concurred with McGhee (1971a; 1971b), adding that when humor stems from the manipulation of language, a certain degree of

metalinguistic ability related to a child's cognitive ability, is needed to understand the humor. Honig further stated that humor involves the comprehension of the incongruity in language in several forms (e.g., metaphors and multiple meanings of words) along with realizing that something unplanned might happen.

Experimental Studies Related to Vocabulary Acquisition and Instruction

Johnson and Anglin (1995) investigated the developmental changes in children's ability to state definitions of various words, and whether the ability to provide good definitions is dependent upon each word's part of speech (e.g., noun, verb, adjective), and/or morphological composition (e.g., compound words, inflected words, derived words). They also investigated the affect of the interplay of these two factors.

Words from a standard dictionary were selected randomly, by selecting "every seventh entry from every sixth page" (p. 615). This resulted in a sample of four hundred thirty-four words. A pilot study was conducted to determine the difficulty of the selected words. Ten adults and 20 children rated these words from easiest to most difficult. Neither the ages nor the grade levels of the children in the pilot study was identified.

Ninety-six subjects, 32 each from grades one, three, and five participated in the main study. These subjects were from Waterloo, Ontario. They were primarily Caucasian. The mean age for subjects in grade one was 6.8; for grade three, 8.8; for grade five, 10.8. The same number of males and females at each grade level were included. All subjects spoke English. No speech, language, or hearing impairments were reported. The researchers did not specify whether subjects from the pilot study were included in this subsequent study.

The subjects were asked to do three tasks: (a) verbally define the word. (b) use each word in a sentence. and (c) select a word's meaning from a field of four choices.

Subjects from grade one were asked about the first 103 words; those in grade three about the first 160 words; those in grade five about the first 196 words.

Subjects' responses were transcribed from audiotapes made during individual sessions. Each known word was coded according to the type of task (definition, sentence, multiple choice). The description and quality of responses were categorized as follows: (1) used the word in a sentence or when describing a personal experience; (2) used general knowledge of the word without being precise or using conventional syntactical form (i.e., noun for a noun); (3) attempted to define a word using either precise content or conventional syntax; (4) attempted to define a word using both precise content and conventional syntax.

Three hundred thirty responses were categorized from grade one, 656 from grade three, and 1362 from grade five. Significance was found for the developmental increase in word knowledge, $F(2,84) = 170.27$, $p < .001$. A multivariate analysis of variance (MANOVA) indicated a significant variance in the distribution of the definitional responses across the quality categories as a function of grade, $F(10,160) = 31.39$, $p > .001$.

The quality of definitions was assessed. These responses were rated as "too particular," "too general," or "other" (i.e., the definition did not provide a synonym or capture the essential meaning of the word) (p.618). A MANOVA was used to analyze these data. Significance was found, $F(8,162) = 5.66$, $p < .001$, for a change in response distributions (i.e., too particular, too general, or other) as a function of grade. High-

quality definitions increased significantly, $F(2,84) = 14.40$, $p < .001$ as a function of grade.

Additional analyses were performed to examine parts of speech and morphological composition. A pairwise comparison indicated high-quality definitions were more often expressed for nouns than verbs at each grade, and for nouns over adjectives at grades three and five. A mixed-model ANOVA was used to analyze high-quality responses with morphological type (i.e., root, inflected, compound, derived). High-quality definitions varied as a function of grade, $F(3, 252) = 51.98$, $p < .001$, morphological type, $F(3, 252) = 17.75$, $p < .001$, and their interaction, $F(6, 252) = 2.86$, $p < .01$.

Johnson & Anglin (1995) concluded that regardless of age group, better definitions were expressed more often for nouns than verbs. Subjects in grade five expressed better definitions for root (i.e., "closet") and compound words (i.e., "outgrow") than for derived words (i.e., "stillness.") (p. 619). The ability to express definitions changed depending on parts of speech and form. All age subjects provided definitions for root and compound nouns more easily than other word types (i.e., verbs, adjectives, compound, derived). All subjects easily combined meanings with the appropriate syntactical forms. As the subjects improved their linguistic competence, they were able to define verbs and adjectives better in terms of core meaning, even though the syntactical forms may not have developed equally. The researchers concluded new information can be connected to previously-learned information. Last, they concluded targeting nouns for definition activities, can foster a connection between new information and previously-learned meanings of the targeted word.

A strength of this study was the examination of word type (i.e., noun, verb) within definitions. By asking subjects for single meanings of various words, rather than multiple meanings, Johnson & Anglin demonstrated that there was a hierarchy for the ability to define nouns, verbs and adjectives. This has an important practical implication. When instructing students in vocabulary, this hierarchy (i.e., nouns, verbs, adjectives) should be used for word selection.

Medo & Ryder (1993) examined the effects of teaching academic vocabulary on the understanding of expository text and the ability to make connections with other concepts. The subjects were thirty-one matched pairs of eighth graders from a midwestern city were subjects. The subjects were divided into two groups using their scores on the Iowa Tests of Basic Skills (ITBS) (Hieronymus, A., Hoover, H., & Lundquist, E., 1986) and their scores on a reading selection.

From each pair of subjects, one was assigned to the treatment group and one to the control group. Both control and experimental subjects were classified as "high" ability (ITBS scores at or above the 70th percentile) or "average" ability (ITBS scores at or below 69th percentile) (p. 122).

A comprehension pretest, descriptions of the meanings of eight words used in the test passage ("volcano," "lateral blast," "magma," "eruption," "earthquake," "crater," "avalanche," and "sulfur dioxide," p. 124), a test passage, and a comprehension posttest were used in this study. The pretest contained six open-ended questions to assess subjects' knowledge of volcanoes and Mt. Saint Helens' eruption. The researchers selected a passage from a science trade book that discussed the eruption of the Mt. Saint

Helens volcano. The posttest had eleven questions. These questions required subjects to make reasoned connections between concepts they had learned during this study.

The lead researcher trained the classroom teacher for this study. Testing occurred during the school day during reading class. The study spanned three days.

On the first day, subjects in the experimental group were given instruction about four words ("earthquake," "avalanche," "crater," and "sulfur dioxide") from the original eight words. An overhead projector was used to display descriptions of these words from an encyclopedia. These were read and discussed. Subjects worked in pairs to diagram relationships among the four words.

The next day, experimental subjects reviewed the same four words, and then created a semantic map for "volcano." A presentation of the remaining four words ("volcano," "lateral blast," "magma," and "eruption") was conducted as before. Subjects were required to use remembered information and the new diagram (i.e., semantic map) to write a paragraph about volcanoes. During the first two days, control subjects were given direct instruction and guided practice in how to ask questions about a passage.

Experimental and control subjects were combined on day three for the last activity. They read a passage unrelated to volcanoes and responded to two questions. The answers were openly discussed after all the subjects responded in writing. The teacher pointed out information needed to connect various concepts in the passage, and described how to make these connections. Subjects then read the test passage about volcanoes and responded to questions on the posttest.

A scoring protocol was created for both the pre- and posttests by the researchers. The protocols consisted of the questions and acceptable answers. A subject received a score

of “1” for each correct answer and a total of correct responses was tallied. Significant results were found for experimental subjects, $F(1.60) = 10.954$, $p < .002$, for vocabulary instruction, using an ANOVA. High- and average-ability subjects in the experimental group ($M = 7$ and $M = 4.125$, respectively) scored higher than high- and average-ability subjects in the control group ($M = 4.4$ and $M = 2.312$, respectively) on the posttest.

The results of this investigation indicated that providing direct instruction of vocabulary using semantic maps significantly increases a subject’s ability to understand expository text. This is especially true when the instruction occurs prior to reading the text in which the vocabulary appears. Medo & Ryder (1993) suggested vocabulary instruction improved subjects’ ability to make inferences as well.

A weakness in the reporting of this study was found. It was not clear whether the control group was present when vocabulary instruction was in progress with the experimental group.

Two strengths were noted with this study. The first strength concerned the format of vocabulary instruction. Students were provided multiple practice opportunities. Additionally, a limited amount of new words were presented at one time. The second strength in this study involved the use of semantic maps. These maps provided a visual representation of the introduced concepts. Visual representation of concepts provides another medium for learning. It provides support for auditorally-presented material. Finally, working with peer groups allowed for concentrated study.

Jenkins, Matlock, & Slocum (1989) studied the use of two strategies for vocabulary instruction. These were (a) direct instruction of unfamiliar words, and (b) deriving meaning from context. These strategies were applied to two groups of fifth grade

subjects (N=135), from a suburban school district in the Pacific Northwest area of the United States. Subjects were from six classes in three schools and from middle-class families. Three classes were randomly assigned to the direct instruction condition, and three to the deriving word meaning condition. Each class, within each condition, was assigned a different amount of practice – low, medium, or high.

Basal readers for fifth grade were used to select 45 words used for the study: 25 were used for the direct instruction word condition and 20 of these words were used for the deriving meaning condition. The 45 words were grouped into nine sets of five words each. All of the words were believed to be unknown to the subjects in the study.

For the direct instruction of individual unfamiliar words group, subjects in the “low practice” group received one exposure to a set of words; the “medium practice” group received three exposures to a set of words; the “high practice” group received six exposures to a set of words. The words, their definitions, and two sentences containing each word were presented on transparencies. Teachers were provided instructional scripts. After the teacher read a word and its definition, the subjects responded, in kind, using choral reading. The teacher covered the definitions and had the subjects read the word and provide the definition on their own. This was repeated, with the definitions in view rather than the words. The last task consisted of the subjects reading the sentences and providing a synonym for the target word. This exercise was considered one exposure. The low practice group received one exposure for each of the 45 words over nine days. The medium practice group had instruction for eleven days, with three exposures for each word. The high practice group had 20 days of instruction with six exposures for each word.

One strategy was taught to the group of subjects who were trained to derive meaning.

They were taught the strategy through an acronym – SCANR. This represented:

Substitute a word or expression for the unknown word.

Check the context for clues that support your idea.

Ask if substitution fits all context clues.

Need a new idea?

Revise your idea to fit the context. (p. 221).

The teacher, again, used transparencies on which an unknown word in a sentence was typed. The sentence was read aloud and subjects were asked for possible meanings. The teacher modeled the use of the strategy. A second sentence also using the first target word was uncovered. The strategy was modeled again. The subjects were asked if anyone had derived the correct meaning. The meaning was provided when no one had derived the meaning.

The low practice group attempted to derive meanings of five words in each of nine sessions. The medium practice group practiced 15 words per day, practiced once per day, for 11 sessions. The high practice group had “over 20 sessions” (p.222), practicing 15 words once each day.

Two pretests were administered: (a) words-in-isolation, requiring subjects to provide synonyms or definition; (b) words-in-context, requiring subjects to provide a synonym or definition for a word in a sentence. The pretests included 20 of the words used in both treatments. The tests were administered over four days, beginning with the words-in-isolation test.

Jenkins, et al. (1989), created six posttests. The words-in-isolation and words-in-context posttests were similar in design as the pretest, requiring subjects to write meanings of words for which they received instruction. There were two multiple-choice tests ("easy" and "difficult") requiring selection of the meaning of instructed words among a field of six options. The last two posttests examined subjects' abilities to derive meaning of unknown words from a contrived context and basal context by writing the meanings of words that were in sentences. In the "contrived" (p.223) context, target words were in each of two sentences that had ample context, but did not provide a definition. In the "basal" (p.223) context, nonsense words were used in sentences from fifth-grade basal readers where targeted words should have been placed. In both cases, targeted words were underscored in the sentences. The posttests were administered four weeks after the conclusion of instruction.

Posttests were analyzed using a 2 x 3 ANOVA. Statistically significant main effects were found for treatment, $F(1,124) = 140.27, p < .001$, practice, $F(2,126) = 24.35, p < .001$, and for the interaction between treatment and practice, $F(2,124) = 29.66, p < .001$.

The individual meanings/high group scored higher than all other groups, reaching significance ($p < .05$) using Newman-Keuls tests. The individual meanings/low group scored higher than the deriving meaning/high group, reaching significance ($p < .05$) using the Newman-Keuls tests.

With regard to the words-in-context test, significant main effects for treatment, $F(1, 126) = 113.33, p < .001$, practice, $F(2,126) = 19.29, p < .001$, and for the interaction between treatment and practice, $F(1,123) = 217.026, p < .001$, were found. Newman-

Keuls testing indicated ($p < .05$) the individual meaning/high group performed better than all other groups.

There were significant main effects for treatment, $F(1,123) = 226.47$, $p < .001$, for practice, $F(2,123) = 34.03$, $p < .001$, and for the interaction between treatment and practice, $F(2,123) = 16.54$, $p < .001$, for the easy multiple-choice test. Significance also was found for the difficult multiple-choice test, treatment, $F(1,126) = 185.02$, $p < .001$; practice, $F(2,126) = 39.18$, $p < .001$, and for their interaction, $F(2,126) = 6.51$, $p < .001$. Newman-Keuls tests ($p < .05$) indicated all individual meaning groups scored significantly higher than all deriving groups.

There was a significant main effect for treatment, $F(1,127) = 4.66$, $p < .05$ on the contrived context test. With regard to the basal context test, there were significant main effects for treatment, $F(1,126) = 5.45$, $p < .02$ and practice, $F(2,126) = 3.61$, $p < .03$ only. For both of these tests, deriving meaning groups scored higher than individual meaning groups, using Newman-Keuls tests ($p < .05$).

The researchers concluded direct instruction was more beneficial for teaching specific words than deriving meaning from sentences, unless there was a good amount of practice. Increased practice resulted in increased learning. They also suggested that a combination of direct instruction and deriving meaning techniques could increase vocabulary.

Three strengths were noted in this study. First, Jenkins, et al. (1989) established that a group of subjects should receive a large amount of practice in order to learn words. This was an important finding that subsequent researchers (e.g., Medo & Ryder, 1993) replicated. Second, a cognitive strategy, in acronym form, was used to learn how to

derive meaning. Applying a strategy to a variety of learning situations is a more efficient means of solving problems, than using one problem-solving method for each type of learning situation encountered. Third, a large amount of subjects (135) were used in this research. This may allow for generalization of these findings to other middle-class populations.

Simmons & Kameenui (1990) conducted a two-pronged study to determine the quality of vocabulary of subjects with learning disabilities and to evaluate the extent to which varying a task affected subjects' abilities to express their vocabulary knowledge. They also compared these subjects' abilities with those of peers without disabilities. Forty-eight subjects participated in this study. Twenty-four were 10 years of age, and 24 were 12 years of age. Within each age group, half had a learning disability (LD) and half were normally achieving (NA). Subjects with LD also were enrolled in special programs for students with LD, had normal vision and hearing, and had a reading achievement level of at least one year below grade level. Subjects that were NA scored within the average range of achievement (between 23rd and 77th percentiles) on two subtests of the Stanford Achievement Test (Gardner, Rudman, Karlsen, & Merwin, 1982) (culled from school records), attended general education classes, had normal vision and hearing, had not repeated a grade, and had not received special education services. All subjects had average intellectual ability (between 90 and 110 IQ) as determined by the WISC-R (for subjects with LD) and the Otis-Lennon School Ability Test (Otis & Lennon, 1982), for NA subjects.

The vocabulary items for this study were age-appropriate words selected from verbal analogies. A different set of vocabulary words was selected for each age group. For

example, "pound" and "pupil" were among the words selected for 10 year olds, and "complete" and "obey" were among words selected for 12 year olds. Subjects were administered 45 vocabulary words individually by a graduate student. Responses were audiotaped for later transcription and analysis by research assistants.

A vocabulary assessment was completed using two types of questions. These were "unprompted production response" and "prompted choice response." The former asked questions in the form, "What is a/an ____?" and the latter required a pointing response ("Show me the ____.") (p. 293) when selecting among four drawings. The "prompted choice response" was used when a definition was unclear or incorrect. Unprompted production responses were scored using a rubric of three levels: (a) "3 points" ("full concept knowledge"); (b) "2 points" ("partial concept knowledge"); and (c) "0 points" ("inadequate or inaccurate concept knowledge") (p. 293). For the "prompted choice task," one point was given when a subject pointed to the correct picture, and no point was given when an incorrect choice was made.

A one-factor between group design was used in this study. The effect of type of learner (learning disability or normally achieving) was analyzed at each age level for (a) "mean composite vocabulary score" (b) "the completeness of verbal definitions of vocabulary" and (c) "the conditional probability of correct solutions on prompted choice tasks given incorrect solutions on unprompted production tasks" (p. 294).

Analysis of covariance (ANCOVA) was used to analyze composite vocabulary knowledge for each age group. For 10-year-old subjects, there was significance according to learner classification, $F(1,22) = 5.078$, $p < .036$. There was no significant main effect for learner classification for 12-year-old subjects, $F(1,22) = .045$, $p < .834$.

This indicated that when reading measures were partialled out, differences in vocabulary knowledge between students with LD and NA students existed for the 10 year olds, but not for the 12 year olds.

To assess the quality of subjects' vocabulary knowledge, Chi square procedures were performed. There was a statistically significant relationship between level of concept knowledge by learner classification for 10-year-old subjects, $\chi^2 = 17.44$, $p < .001$ and for the 12-year-old subjects, $\chi^2 = 20.29$, $p < .001$ (degrees of freedom and N not reported for either statistic).

To analyze whether varying a task affected subjects' abilities to express vocabulary knowledge, conditional probabilities were determined to derive the "probability (P) of success (S) on prompted response tasks" when failure (F) occurred on the previously presented unprompted response task (p. 294). Simmons & Kameenui used an "index" ($P[S/F]$ p. 294), which measured each experimental group's ability to use prompts to enhance their performance. Ninety-three percent (62) of the total unprompted production responses of the 10 year olds with LD were correct. Seven percent (38 words) were defined incorrectly. When given prompts to select a picture that represented these words, the subjects successfully selected 56% of the 38 pictures. In addition, t-tests were used to compare each group's conditional probabilities of success on prompted tasks. No differences between the means of 10 year olds were found, $t(15) = -1.48$, $p < 1.58$, nor of 12 year olds, $t(21) = .165$, $p = .643$. For 10-year-old groups of subjects, those with LD were less successful in using prompted-choice responses than NA peers. For 12-year-old subjects, this difference was not observed.

Simmons & Kameenui (1990) concluded it was difficult for students with learning disabilities to define vocabulary terms. They indicated that the intertwining of vocabulary and reading achievement negates any differences between learner vocabulary knowledge. The abilities of the subjects to completely and appropriately respond varied by task. Normally-achieving subjects were more likely to produce complete definitions verbally than subjects with LD. They suggested this was due to subjects with LD having limited language skills with which to demonstrate what they know. They felt this was a function of the learners' ability, type of task, and the difficulty of the target word. Consistent with Shultz & Pilon (1973), Simmons & Kameenui believed the use of pictures could assist in reducing the cognitive difficulty of a vocabulary task by providing a visual, physical structure in addition to the syntactic structure of the sentence.

A weakness of this study was the use of two different tests of intelligence (WISC-R and Otis-Lennon). It was not made clear why this was done. Differences in test format, presentation, and design, may have made a difference in obtained scores.

Zimmerman (1997) investigated an approach to vocabulary instruction for students learning English as their second language. Thirty-five post-high school students participated. Twenty-seven subjects were planning to earn a college degree and eight were learning English as a second language. The majority (57%) of the students spoke Japanese, Korean, or Mandarin. There were nine primary languages spoken by the subjects, although those other than the three Asian languages noted were not specified. The subjects were divided into two groups: experimental and control. The experimental

group received three hours per week of “interactive vocabulary instruction” (p. 125).

The lessons consisted of five components:

1. multiple exposures to words
2. exposures to words in meaningful contexts
3. rich and varied information about each word
4. establishment of ties between instructed words, student experiences, and prior knowledge
5. active participation by students in the learning process (p. 125)

Vocabulary words from frequently used university-level texts, in addition to those words on the checklist devised by Zimmerman as a pre- and posttest, were selected for the instruction.

A 50-item checklist was administered as a pretest to assess current levels of vocabulary knowledge. Each item was rated using a four-point scale: (1) “I don’t know the word:” (2) “I have seen the word before but am not sure of the meaning:” (3) “I understand the word when I see or hear it in writing:” and (4) “I can use the word in a sentence” (p. 127). The subjects were required to read five hours of personally selected materials each week. They reported the amount of actual reading time at the end of each week. In addition, subjects had required reading assignments for class. Subjects were administered the same 50-item checklist, with the words presented in a different order, at the conclusion of the study.

Statistical significance was found for the effect of the covariate on the checklist pretest and on the checklist posttest, $F(1,30) = 23.995$, $p < .000$. Significance was not found for the covariates self-selected reading, $F(1,30) = .334$, $p = .568$, and required

reading, $F(1,30) = .008$, $p = .929$, suggesting amount of reading did not affect posttest results. Interactive vocabulary had a significant effect on vocabulary instruction, when differences in amount of reading were controlled.

The mean score on the posttest for the experimental group ($M = 161.37$) was greater than the control group ($M = 152.90$). This suggested a difference in the groups' self-reported word-knowledge. The treatment effect was significant, $F(1,30) = 5.91$, $p < .05$.

Zimmerman drew three conclusions from her study. The first conclusion was that context appeared to assist in learning new vocabulary words. She indicated this was consistent for both written and oral presentations. Context provided redundant information, enhancing learners' understanding of multiple meanings of words. Second, subjects valued activities and reading as learning methods. When students were encouraged to choose their own material to read, they learned the value of context to derive meaning. Third, students' motivation for learning new words was increased when a small number of words were selected and when the features about each of those words were drawn to the attention of the learners.

One strength of this study is the use of context to teach new words. As Jenkins, et al. (1989) found, the use of context assists the learner in deriving meaning. The second strength is the use of content vocabulary. These are words the subjects will likely use throughout their academic careers. When this concept is related to elementary students, teaching the meanings of content vocabulary may help comprehension of core subjects.

Theoretical Literature Related to Vocabulary Acquisition and Instruction

Theoretical literature on vocabulary acquisition and instruction has added information to the current knowledge base related to instructional techniques for learning vocabulary.

Children learn new words based upon the knowledge they have previously acquired. The new words they learn increase the accuracy of and further enrich their current vocabulary (Baker, Simmons, & Kameenui, 1995; Johnson & Anglin, 1995; Zimmerman, 1997). During the primary grades, when children are learning to read, more than reading to learn, it is easier to identify vocabulary as a separate skill from reading (Baker, et al., 1995). Teaching new vocabulary should be connected to previous knowledge to create and enrich semantic relationships. These relationships are important for reading, since word meaning is viewed as an important component of comprehension (Chall, 1983). When a student with a weak vocabulary continues through school without specialized assistance to increase word knowledge, the gap between this student's vocabulary and reading ability and the abilities of other students widens. Differences in reading ability are detectable as early as the first grade (Baker, et al., 1995). With limited background knowledge of vocabulary and insufficient general knowledge, a student will have difficulty comprehending the ideas being conveyed in text (Medo & Ryder, 1993).

When words are examined for their meaning within connected speech or in written form, better understanding emerges for those words (Baker, et al., 1995). For students with a reading disability, vocabulary acquisition is an important part of their curriculum. These students have a great deal of difficulty learning the meaning of words through inference (Carlisle, 1993; Nagy, 1988).

Although knowing definitions of words is important, single definitions alone won't encompass complete understanding of words. The appropriate use of words may not be evident, allowing a student only the most basic understanding and usage (Nagy, 1988; Nagy & Herman, 1984). Dictionaries or glossaries provide meanings that are not always

appropriate to the situation. Combining teaching definitions with the use of context, and emphasizing each word's conceptual value and how each word relates to other words, aids in the acquisition of new vocabulary words (Nagy, 1988; Baker, et al., 1995). Baker, et al. (1995), stated that students can be expected to learn approximately 3000 words each year. This creates tremendous pressure for students who already have difficulty learning small sets of important words.

Students with reading difficulties require instruction to acquire the meanings of new words. This is true especially as students mature. They are expected to infer meaning from increasingly difficult passages in textbooks. These texts often use words that have more than one meaning. The relationship between word knowledge and reading ability increasingly becomes intertwined (Simmons & Kameenui, 1990; Carlisle, 1993). One's vocabulary increases with an increased ability to read throughout adulthood (Baker, et al., 1995). Texts are difficult to read and appreciate when full understanding of words is not in a student's grasp (Nagy, 1988). Students with this problem often do not respond as well as expected: giving partial or unsubstantial responses to questions concerning the text (Carlisle, 1993).

Students need an increased depth and flexibility of their word knowledge by learning that some words may have more than one meaning (Carlisle, 1993). Words with multiple meanings can create a sense of confusion when read in texts that use the figurative meaning rather than the literal meaning. Thorough instruction about several possible meanings of words, especially those from texts, will assist students in both vocabulary and reading comprehension (Humes & Cronnell, 1977; Carlisle, 1993; Tyson & Mountain, 1982).

Stahl (1986), in his theoretical article, discussed three principles to be used when instructing students about vocabulary. These were (a) provide the context and definitions, (b) encourage “deep” processing, and (c) provide many exposures to the words.

The first principle involves exposing the student to a dictionary-type definition. This illustrates the word’s relationship to other words. The teacher also provides a varied set of contexts to demonstrate how the word is used in different situations. This can be done using sentences or pictures.

To foster in-depth learning of words, the second principle involves making as many connections between the new word and previous knowledge as possible. This can be accomplished through creating associations, demonstrating comprehension of the new word by applying it to a situation, and creating a novel utterance using the word.

The third principle involves the amount of time a student practices using a new word to increase his comprehension of that word. The amount of time devoted to learning new words is critical for instruction to be effective (Carlisle, 1993; Stahl, 1986; Jenkins, Matlock, & Slocum, 1989). Repeated exposure to a set amount of words results in a better sense of how words are used in conversation (Zimmerman, 1997; Carlisle, 1993). Controlling the context of the linguistic environment, such that these exposures include the social world of the student, also assists the student to learn and understand the meaning of words in a variety of contexts (Nelson, 1986; Zimmerman, 1997; Nagy, 1988; Carson, Skarpness, Schultz, and McGhee, 1986).

Baker, et al.(1995) and Nagy & Herman (1984) agreed from their theoretical perspectives, that to encourage the retention of newly learned words, students must have

a strategy for learning to use these words. This is true for unfamiliar words that are experienced only a few times. Students without disabilities seem to have greater flexibility in using strategies to learn and use words than students with disabilities.

Summary

Three conclusions pertinent to this dissertation research are drawn from this review of literature. These conclusions involve: (a) cognition and humor; (b) the importance of vocabulary instruction for reading; and (c) methods of vocabulary instruction.

The first conclusion is that cognitive abilities and humor are intertwined (McGhee, 1971b). When cognitive abilities are impaired, the ability to problem-solve also is impaired (Brodzinsky, 1977; Bernstein, 1986; Honig, 1988) and it is difficult to detect the inconsistencies and nuances of meaning in text (Shaeffer & Hopkins, 1988). The ability to problem-solve and detect incongruity in text are necessary skills across content areas in school.

The second conclusion is that inferring meaning from text is difficult for students with learning disabilities (Carlisle, 1993; Nagy, 1988). New word knowledge is based upon previously learned information, and vocabulary knowledge influences the degree of understanding written material (Baker, et al., 1995; Johnson & Anglin, 1995; Zimmerman, 1997).

The third conclusion is that the manner in which vocabulary is instructed affects auditory and written vocabulary comprehension. Teaching vocabulary using several techniques may improve a student's ability to comprehend oral and written material. These techniques include: (a) direct instruction, (Jenkins, et al., 1989) (b) increased practice opportunities (Klesius & Searls, 1991; Carr & Wixson, 1986), (c) making

connections between new and previously known material (Blachowitz, 1991), and (d) using pictures as a form of context (Simmons & Kameenui, 1990; Shultz & Pilon, 1973).

This dissertation study used some of the best practices from the research reviewed in this chapter in several ways. It also differs from these studies and the findings should add knowledge to the literature. First, the intervention in this study involved a combination of direct instruction, multiple practice opportunities, associating new information with previously-learned information, and using pictures in the form of comics to teach multiple word meanings. None of the studies included in this review of literature used a combination of these interventions to promote vocabulary development. Second, the subjects in this dissertation study had language and learning disabilities. Only one study (Spector, 1990) in this review used students with language and learning disabilities as subjects. Third, the subjects in this study were provided semantic instruction in their existing language therapy groups with a familiar person, their respective speech-language pathologist. Eight of the previous studies (McGhee, 1971a; 1971b; Pien & Rothbart, 1976; Brodzinsky, 1977; Shultz & Pilon, 1973; Spector, 1990; Johnson & Anglin, 1995; Simmons & Kameenui, 1990) used treatments that involved one-to-one instruction from an unfamiliar person. Finally, while some studies (Brodzinsky, 1977; McGhee, 1971a, 1971b; Pien & Rothbart, 1976) used comics as materials, their purpose was to study the relationship between cognition and humor, not the use of comics for instructional purposes. This study investigated the efficacy of using comics to teach multiple word meanings.

CHAPTER III

METHODOLOGY

The purpose of this study was to investigate the efficacy of using comics as a means to teach the multiple meanings of words to students with language and learning disabilities. A comparison method was used to establish whether a relationship existed between a control group and an experimental group.

This chapter is organized into eight sections related to the methodology for this study: (1) statement of the research hypotheses: (2) participant selection process: (3) subject characteristics: (4) description of the setting: (5) description of the research instrumentation: (6) inter-rater reliability: (7) description of materials: and (8) description of procedures.

Statement of Research Hypotheses

Following are the research hypotheses that were tested in this study:

Hypothesis 1. There will be a statistically significant difference in learning multiple meanings of words, between subjects who received instruction with comics and subjects who received instruction without comics.

Hypothesis 2. There will be a statistically significant increase in the subjects' perceived abilities to learn and remember words with multiple meanings after instruction using comics.

Hypothesis 3. There will be a statistically significant change in the subjects' interest in reading after instruction using comics.

Participant Selection Process

Selection of Speech-Language Pathologists

Five SLPs were selected from a total of 176 staff members from the speech-language therapy services department of the Clark County School District (CCSD), using a cluster sampling procedure (Hinkle, Wiersma, & Jurs, 1994; Ary, Jacobs, & Razavieh, 1979). This procedure was used because it looks at individuals who exist as one naturally occurring group, in this case, a staff of speech-language pathologists. The SLPs were selected based upon six criteria: (a) having earned the Certificate of Clinical Competence in Speech-Language Pathology (CCC-SLP); (b) willingness to participate; (c) availability of intact therapy groups in which all subjects in the group met selection criteria (discussed in a subsequent section); (d) researcher's personal knowledge of their therapeutic skills; (e) recommendation of other supervisors of speech-language pathologists; and (f) no additional departmental project work.

Selection of Subjects

For subjects to participate in this study, several criteria had to be met. The subjects had to be students of average intelligence (at least one component of a standardized intelligence test, e.g., performance score), as tested on one of five standard measures of intelligence (Table 3.1, p.61). Subjects could be no younger than eight years of age because previous research (i.e., McGhee, 1971a, 1971b) indicated subjects typically developed the cognitive ability to comprehend verbal humor at approximately age seven.

Subjects could have no more than three absences during the previous quarter of the current school year.

In addition, reading achievement scores for each potential subject, from tests that had been administered previously were reviewed. To be eligible to participate in this study, the reading achievement score had to be at least one standard deviation (SD) below expected grade level. Table 3.1 (p.61) summarizes intelligence and reading achievement data for the experimental and control groups, respectively.

Table 3.2 (p.62) summarizes data obtained for receptive and expressive vocabulary testing for both experimental and control groups. To participate in this study, the subjects' receptive vocabulary scores from standardized receptive vocabulary tests (such as the Peabody Picture Vocabulary Test-III, Dunn, L., Dunn, L.M. & Williams, K., 1997) had to be at least one standard deviation (SD) below the norm for their chronological ages. A standardized expressive vocabulary test (such as the Expressive One Word Picture Vocabulary Test – R, Gardner, M., 1990) had to be no more than three SDs below the subjects' chronological ages. This resulted in a total of 23 subjects (12 experimental and 11 control). See page 73 for experimental and control group assignments.

Subject Characteristics

Based upon the previously described criteria, twenty-three subjects were selected from the caseloads of the five participating speech-language pathologists (SLPs) of the Clark County School District. These subjects were receiving support services for learning disabilities and speech and language therapy as a related service. Each of the subjects was enrolled in a general education class for at least part of the day. Table 3.3

Table 3.1

Subject Data Related to Intelligence and Reading Achievement

Test	Experimental		Control	
	N=12	Range	N=11	Range
Intelligence Tests				
WISC-III	5	84-103	4	86-101
SB	4	76-96	2	86-90
K-ABC	2	81-91	4	81-87
DAS	1	85	0	0
MAT	0	0	1	91
Reading Achievement Tests				
WIAT	9	67-84	6	63-79
WRAT	2	75-77	4	65-81
K-ABC	0	0	1	74
KTEA	1	67	0	-

Key:

N = Number of subjects taking each test

WISC-III = Wechsler Intelligence Scale for Children (Wechsler, 1991)

SB = Stanford-Binet (Thorndike, Hagen, & Sattler, 1986)

K-ABC = Kaufman Assessment Battery for Children (Kaufman & Kaufman, 1983)

DAS = Differential Abilities Scale (Elliott, 1990)

MAT = Metropolitan Achievement Test (Balow, Farr, & Hogen, 1992)

WIAT = Wechsler Individual Achievement Test (Wechsler, 1992)

WRAT = Wide Range Achievement Test (Wilkinson, 1993)

KTEA = Kaufman Test of Educational Achievement (Kaufman & Kaufman, 1985)

Table 3.2

Subject Data Related to Receptive and Expressive Vocabulary

Test	Experimental N=12	Range	Control N=11	Range
Receptive Vocabulary Tests				
ROWPVT	5	63-93	1	69
PPVT – 3	5	72-89	6	63-89
ASSET	2	78-80	2	70-71
OWLS	0	0	2	54-75
Expressive Vocabulary Tests				
EOWPVT – R	9	>55-82	5	68-78
EVT	2	63-64	2	55-62
ASSET	1	75	2	66-74
OWLS	0	0	2	58-67

Key:

N = number of subjects taking each test

ROWPVT = Receptive One-Word Picture Vocabulary Test (Gardner, 1985)

PPVT – 3 = Peabody Picture Vocabulary Test – 3 (Dunn, Dunn, & Williams, 1997)

ASSET = Assessing Semantic Skills Through Everyday Themes (Barrett, Bowers, & Huisinigh, 1988)

OWLS = Oral and Written Language Scales (Carrow-Woolfolk, 1995)

EOWPVT – R = Expressive One-Word Picture Vocabulary Test (Gardner, 1990)

EVT = Expressive Vocabulary Test (Williams, 1997).

(p.64) displays demographic data for each subject group. Seventeen subjects were male and six subjects were female. The subjects were in grades two through five, with 12 of the subjects being in grade three. The ages in the Experimental Group ranged from 8.4 to 10.6, and in the Control Group from 8.1 to 10.9. The mean age for the subjects in the control group was 8.67, and the mean age for the subjects in the experimental group was 9.25. Nine of the total subjects were white; nine were African-American; two were Hispanic; three were other.

Description of the Setting

Speech therapy rooms in seven elementary schools within the Clark County School District served as the research sites (Two of the five SLPs had participating therapy groups at two different sites.). All treatment sessions were conducted in the speech therapy rooms, with a maximum of three subjects in each therapy group.

Description of the Research Instrumentation

There were two instruments used in this study: Multiple Meanings Task (see Appendix A, p. 94-95) and Subject Questionnaire (see Appendix B, p. 97).

The Multiple Meanings Task was a researcher-created test to determine the subjects' knowledge of ten words with multiple meanings. These ten words were selected from the ten comic strips that were used during the treatment process. The words in the test were: "organ," "net," "swat," "foul," "log," "scale," "part," "poker," "master," and "monster."

This individually administered test required subjects to provide two meanings for each word. Each subject was asked to listen to the presented word and tell what the

Table 3.3

Gender, Grade, Ages, and Ethnicity of Subjects

Subject Information	Experimental	Control
Gender		
Male	8	9
Female	4	2
Total	12	11
Grade		
2	0	1
3	8	4
4	2	3
5	2	3
Ages		
Mean	9.25	8.67
Range	8.4-10.6	8.1-10.9
Ethnicity	Male / Female	Male / Female
White	1 / 1	7 / 0
African-American	5 / 3	0 / 1
Hispanic	0 / 0	2 / 0
Other	2 / 0	0 / 1

word meant. Then, an additional meaning was requested ("What else does it mean?"). If two correct meanings for a word were given, a score of "2" was awarded. If one correct meaning of a word was given, a score of "1" was awarded. No response, or no correct response resulted in a score of "0". The test took approximately 15 minutes to administer.

The Subject Questionnaire consisted of ten statements about reading and/or comics. A five-point Likert scale was used on this instrument. The descriptors were "Never," for a rating of "1," "Rarely," for a rating of 2, "Sometimes," for a rating of "3," "Often," for a rating of "4", and "Always," for a rating of "5" (see Appendix B, p.97). Subject responses to questions four and eight were used to determine statistical significance for research hypothesis two. Questions one and three were used to determine statistical significance for research hypothesis three. The remaining questions were included to obtain additional information related to subjects' perceptions concerning vocabulary, reading, and understanding humor.

Inter-rater Reliability

Inter-rater reliability was established for pre-treatment and post-treatment administration of the Multiple Meanings Task. The formula used for determining inter-rater reliability was the number of agreements divided by the number of agreements plus the number of disagreements, multiplied by 100 (Tawny & Gast, 1984).

For the pre-treatment Multiple Meanings Task, the two meanings the subjects provided were reviewed and scored for each word presented. The number of agreements and disagreements between the scores obtained by the five SLPs and the scores obtained

by the researcher were calculated. There were 213 instances of agreement and nine instances of disagreement for scoring the pretests of the control subjects. This resulted in 96% inter-rater reliability. There were 228 instances of agreement and 12 instances of disagreement for scoring the pretests of the experimental subjects. This resulted in 95% inter-rater reliability.

Inter-rater reliability also was determined for the 23 posttests. There were 232 instances of agreement and six instances of disagreement for scoring the posttests of the control subjects. This resulted in 97% inter-rater reliability. The same procedure was followed to determine the posttest inter-rater reliability for the experimental subjects. There were 226 instances of agreement and 14 instances of disagreement. This resulted in 90% inter-rater reliability.

Description of Materials

Ten comic strips were selected for this study. Selections of "Fox Trot," "B.C.," "Marvin," "Crock," "Bent Offerings," and "Wizard of Id" were selected from a local newspaper. Selections of "The Far Side" were selected from published collections of these comics (Larson, 1987; Larson, 1995a; Larson, 1995b). Each comic strip was from one to two frames in length, because length could have affected the comprehension of humor (Bernstein, 1986). In addition, comics with low levels of aggression were selected to reduce the possibility of distracting the subject from attending to the salient components of the comic (Brodzinsky, 1977). None of the selected words were a part of an idiomatic expression (e.g., "raining cats and dogs"). The copies of the comics used for each group of subjects were black and white. Each comic was mounted individually

on a black sheet of construction paper for support and laminated. The text of the comics can be found in Appendix C, p.99.

Description of the Procedures

Permission to conduct this research was secured from the Office of Sponsored Programs, University of Nevada, Las Vegas (see Appendix D, p.104), and the Testing and Evaluation Office of the Clark County School District. To obtain permission, protocols provided by these offices were completed. Descriptions of the subjects, instrumentation, and research procedures were included in these protocols. Considerations that had to be made included the potential risk(s) and benefit(s) for the students.

There were four phases in this study: testing of study materials and treatment procedure, pretreatment activities, treatment, and post-treatment. Phase one was designed to explore the adequacy of the instructional procedures, the pre- and posttest instrument, and the selected comics. The speech-language pathologist (SLP) who volunteered to participate selected two of her students who met the criteria for participation in the study. Phase two involved training for the SLPs, group assignment and pretesting of the subjects (i.e., Multiple Meanings Task and pre-intervention Subject Questionnaire). Phase three involved implementation of the instruction, and phase four involved post-treatment testing and administration of the follow-up questionnaire.

Phase One: Testing of Study Materials and Treatment Procedure

In order to explore the viability of conducting a study related to the use of comics to teach multiple meaning words, one SLP was selected by the researcher to assist with this exploration. She was selected on the basis of several criteria. These included: (a)

personal knowledge of her professional skills, as determined by the researcher's supervision: (b) having the Certificate of Clinical Competence in Speech-Language Pathology (CCC-SLP), as awarded by the American Speech-Language Hearing Association; (c) availability and willingness to participate; and (d) availability of two subjects.

The SLP selected for the testing of study materials and treatment procedure was given a one-hour training session by the researcher. A packet of materials to be used for the testing of study materials and treatment procedure was reviewed first. This packet contained the Multiple Meanings Task (see Appendix A, p. 94-95) for the pre- and posttesting, a sample of the treatment training script that contained acceptable prompts for the training of the words, a large (8 1/2" x 11"), two-framed comic corresponding to the training script (Hamersky, 1995), mounted and laminated copies of the ten comics to be used in the study, and Data Collection sheets (see Appendix E, p. 106).

The training session began with a brief discussion about the project. Next, the assessment instrument for the pre- and posttest was reviewed. The researcher and the participating SLP discussed the administration instructions and scoring method. The researcher explained how to use the Multiple Meanings Task form on which the students' responses were recorded. The SLP was directed to either circle an acceptable sample response that was provided, or write the subjects' responses in the space reserved for the definitions they could provide.

Next, the treatment training script was reviewed. This script included the introduction to the task (i.e., "Today we are going to read several comics"), directed questioning (i.e.,

“What’s funny about it?” “What would make the notes/music?”). possible cues (i.e., “Look at their faces”), and reinforcements (i.e., “Exactly! Great job”).

Finally, the Data Collection sheets were reviewed. Each sheet contained spaces for recording presentations concerning two words. Notations could be made on one sheet for each of two words. Notations (“tick marks”) were placed in spaces marked: (a) subjects in each therapy group; (b) number of presentations of each target word; (c) number of cues and prompts given for each word; (d) meaning of the word had been given; and (e) therapy minutes per day for the treatment session. Space for comments about the treatment sessions was provided. The SLP was instructed to place “tick” marks to indicate correct or incorrect responses from the students.

The last ten minutes of the training session was spent answering questions and reviewing the project procedures. The SLP understood that she was testing materials. (i.e., comics, Multiple Meaning Task form, and Data Collection sheet) and exploring the viability of using comics to teach multiple meanings of words in a future study. She was eager and willing to participate.

The SLP individually administered the pretest to one boy and one girl. Neither of these subjects was able to provide two meanings for any of the ten words on the test.

The SLP presented two words each week, for three weeks of treatment to the subjects. Four words were taught during the last week because the SLP was finishing the school year at that time. The comics were used as the sole treatment material. During each session, the previously introduced words were reviewed two times. Then, new words were presented two times using the comics. The SLP recorded the number of presentations of new and reviewed words as a reminder to present each word twice. She

also recorded the number of cues provided to each subject and whether or not each subject defined words accurately during the practice sessions. This was a typical recording procedure used by the SLP to monitor student progress in therapy groups.

Pre- to post-treatment improvement was noted for both subjects participating in the testing of study materials and treatment procedure. One subject increased her score from 0/10 (0%) to 4/10 (40%), and the other subject increased his score from 0/10 (0%) to 5/10 (50%).

Thus, this method of instruction, using comics, appeared to help these subjects with language and learning disabilities learn multiple meanings of words. Additionally, anecdotal comments from the SLP suggested the subjects enjoyed this method of instruction and were motivated to come to their therapy sessions. The SLP specifically reported that the subjects eagerly greeted the SLP in the hallway asking when they would be coming to the speech therapy room again to “look at comics.” It was determined that this intervention was worthy of further study. Therefore, a decision was made to design a dissertation study to evaluate the effects of using comics to teach multiple meaning words.

This 3 week testing of procedures and materials resulted in information that was used in designing the subsequent dissertation study. In addition to determining that instruction using comics may be beneficial to students with language and learning disabilities, it also was determined that the selected comics were appropriate. The subjects were capable of learning to understand the humor and use the picture cues to learn multiple word meanings. Thus, a decision was made to use the same comics in the dissertation study.

Since the SLP reported the subjects enjoyed this method of instruction and appeared to be motivated to come to their therapy sessions, a decision was made to administer a follow-up questionnaire to subjects in the subsequent dissertation study. This would allow the researcher to assess subjects' changed perceptions regarding their reading abilities and interest in reading.

Additionally, based on feedback from the SLP, changes were made to the Data Collection sheet. Specifically, the SLP suggested three modifications. The modifications included (a) changing the orientation of the page from landscape to portrait; (b) using a single space to note each word, rather than allowing for two words per page; and (c) omitting therapy minutes per day. It had been determined that therapy groups met for 20 minutes, two times per week, so this information would have been redundant (see Appendix E, p.106).

Phase Two: Pre-treatment Activities

SLP training. The five SLPs selected to participate in this study were given a one-hour training session. The researcher conducted this training session. There were seven components of the training session. These components were: (1) explanation of participation requirements, (2) explanation of the subject questionnaire, (3) explanation of pre- and post-treatment testing, (4) discussion of inter-rater reliability, (5) mock testing, (6) mock treatment, and (7) use of the Data Collection sheet.

The researcher briefly explained what would be involved in the study (i.e., teaching multiple meanings of 10 words to subjects with language and learning disabilities). The researcher also discussed the importance of obtaining written permission from the

parents, SLPs, and subjects. Copies of these permission forms (see Appendix D, p. 101-103) were distributed and reviewed.

Next, each participating SLP was given a copy of the Subject Questionnaire (see Appendix B, p. 97). The SLPs were instructed to assist the subjects in completing the questionnaire both pre- and post-treatment (e.g., reading unknown words to the subjects). The SLPs were told that information from this questionnaire would be used for data analysis purposes.

Then, the pre- and post-treatment Multiple Meanings Task (see Appendix A, p. 94-95) was distributed to the SLPs. The directions for administration for pre- and post-treatment testing were reviewed. It was stressed that the Multiple Meanings Task was to be administered both prior to and after treatment.

Inter-rater reliability was discussed next. The researcher explained that pre- and post-treatment subject responses on the Multiple Meanings Task would be reviewed to determine inter-rater reliability for scoring of the subject responses. The term "inter-rater reliability" and the method to determine this form of reliability were explained.

A mock testing situation was conducted to ensure correct administration of the Multiple Meanings Task by all SLPs. Each SLP was asked to administer the Multiple Meaning Task to another SLP. Roles were changed so each SLP both administered and took the Multiple Meanings Task. One pair of SLPs at a time participated in the mock testing. The researcher critiqued each pair of SLPs with regard to correctly giving directions and scoring the Multiple Meanings Task. They were expected to administer the Multiple Meanings Task with no errors and demonstrated an ability to do so.

Mock treatment sessions were conducted next. Pairs of SLPs, one pair at a time, practiced conducting a treatment session using comics. A training script (see Appendix F, p.108-109) with its corresponding comic was used during this component of the training session. The SLPs were told first to read the training script and view the accompanying comic as the specific parts of the comic were discussed. Then, each pair proceeded to enact the treatment session. The SLPs were told that the researcher would be observing them for accuracy with regard to using the prompts and reinforcements in the training script and pointing out features in the pictures as the script directed. They were expected to complete this portion of the training with no errors and demonstrated an ability to do so.

Each SLP was given a copy of the Data Collection sheet (see Appendix E, p. 106). They were instructed to use one sheet for each subject in their treatment group. Each time a word was presented, it was to be recorded on the sheet. Each time a subject required cues or the meaning to be given, it was to be recorded on the sheet. The SLPs were to use "tick marks" to indicate the number of presentations, cues and/or word meanings.

Each SLP received legal-size pocket folders that contained the 10 comics and yellow, standard-size file folders for each subject in the study. Each file folder contained the Multiple Meaning Task, Subject Questionnaire, the parent and subject permission forms, and the Data Collection sheet.

Group assignment. Intact therapy groups, in which all members met the participation criteria, were assigned randomly to either the experimental or the control group using a simple random sampling without replacement procedure (Hinkle, Wiersma, & Jurs,

1994). In this procedure, each group was given the same chance of being assigned to the treatment or control group. Once an intact group was selected for the treatment or control condition, the intact group could not be selected a second time. Keeping existing language groups intact eliminated the need to reschedule students solely for the purpose of participating in this research.

Each intact therapy group was listed on equal-sized separate sheets of paper. The first SLP's lists of intact groups were placed face down on the table. One group was randomly selected and assigned to the treatment group; the remaining intact group was assigned to the control group. This process was repeated with each SLP's intact groups and ultimately resulted in an experimental group consisting of 12 subjects and a control group consisting of 11 subjects.

Pretesting of subjects. The participating SLPs administered the Multiple Meanings Task to the 23 subjects who took part in this study. The pretests were administered to each subject individually (See instrumentation section for a description of this instrument, p. 63.). The testing was conducted during the school day at the subjects' school sites. The SLPs also administered the pre-treatment Subject Questionnaires prior to beginning the treatment phase of this study.

Phase Three: Treatment

The study proceeded for four weeks. A 4 week period enabled the subjects to resume intervention on speech and language goals and benchmarks in their Individualized Education Programs (IEPs) other than vocabulary. Each of the therapy sessions was twenty minutes in length, with two sessions weekly for each therapy group.

The purpose of the treatment was to teach subjects with learning disabilities and language impairments two word meanings for ten words using comics as the instructional materials. For the first session, only two new words were introduced through comics. For subsequent sessions, the following sequence was followed: (1) review of previously introduced words and their meanings; (2) presentation and practice of two new words and their meanings (except in the final week when four words were taught); and (3) review of the newly presented words.

The SLPs introduced each session with a brief overview of what was to occur during the session. They told the subjects that the words that were presented during the previous session would be reviewed and then they would learn two new words. For the review, the previous comics were presented one at a time. The students were asked to recall the meanings of the targeted words used in the comics. If needed, the SLPs assisted the subjects in recalling the meanings of the targeted words using allowable prompts. These prompts included questions about what the characters were doing, pointing out facial features and punctuation marks. Then the SLPs proceeded to present the new words.

The SLPs working with experimental subjects began each new presentation by saying, "Today we are going to read two new comics. I want you to tell me what is funny about them. I'll help you if you're not sure." Each comic was presented individually. One of the experimental subjects was asked to read the comic aloud to the group. If there was a word in the comic the subject did not know, the SLP simply said the word to reduce disruption in comprehension. Then, the SLP asked the subjects as a group what was funny about the comic. When the subjects initially could not identify the meaning of the key word, the SLP directed the subjects to look at the segments of the

comic to determine what was occurring. This was done for each frame of each comic. Possible cues were provided for the SLPs to use. These included questions about what the characters were doing, facial expressions, and punctuation marks. For example, one of the comics concerned a foreign legion officer with his soldiers carrying a log. The word "log" was the key word. The officer said, "Stop complaining! All great leaders keep a log of their adventures." The subjects were asked, as a group, about the words the characters used. Additional prompts included pointing out the style of writing used in the text (e.g., italics, all capital letters), and the existence of thought and speech bubbles.

The other subjects in the group participated by listening to an open discussion about the comic and key word and by assisting each other in deriving a word's meaning from the context. Each subject was given the opportunity to read a comic and attempt to provide the meaning of the targeted word. During the review of the new words, the comics were presented in reverse order. In this way, each subject was asked to read the comic and attempt to state the meaning of the targeted word the other subject had first attempted. Separate Data Collection sheets were marked (see discussion on p. 73) for each subject for each presentation.

The control group subjects received direct instruction on the same ten words. Their instruction, however, did not involve the use of comics. Instead, the words were presented with procedures typically used by the SLPs when teaching students new vocabulary terms. Words were presented verbally and in print, and the subjects were initially asked if they knew what the words meant. When they responded that they didn't know the meaning of the words, the words were defined, with one meaning, and then a second meaning was provided. The words were reviewed using game formats. The

number of words that were included in the game practice increased during each subsequent session. As new target words were introduced, they were included in the game reviews.

Phase Four: Post-Treatment

The Multiple Meanings pretest was re-administered as a posttest using procedures that were identical to those used for the pre-treatment condition. Subjects were administered the test individually, by each participating SLP. The posttesting was done during the school day in the speech therapy rooms.

Subjects were given the post-treatment subject questionnaires (see Appendix B, p. 97) to complete. These were the same questionnaires that were distributed for completion during pre-treatment. Responses were analyzed to determine if differences in subjects' perceptions concerning vocabulary and reading behavior occurred, when compared to the questionnaire responses given during the pre-treatment phase of the study.

CHAPTER IV

ANALYSIS OF DATA AND RESULTS

A repeated measures group design (Fraenkel & Wallen, 1994; Berg & Latin, 1994) was used to investigate the effectiveness of using comics to teach multiple meanings of words. Using this design, three research hypotheses were formulated and tested. Intact groups of subjects with language and learning disabilities were randomly assigned to either the experimental or control group. All subjects received the same Multiple Meanings Task (see Appendix A, p. 94-95) and Subject Questionnaire (see Appendix B, p.97) prior to treatment. Then, the experimental group received the treatment for the study, and the control group did not receive the treatment. At the conclusion of the treatment phase, both groups were post-tested and the Subject Questionnaire was completed again. This chapter contains the results of statistical analyses of data obtained in this investigation. Results related to subject perceptions also are reported.

Hypothesis Testing

The raw data from pre-testing and post-testing conditions were collected from the subjects and analyzed using an Analysis of Variance (ANOVA) to test the first research hypothesis at the $p < .05$ level. Paired two-tailed t-tests were used to test the second and third hypotheses at the $p < .05$ level. Results related to these hypotheses are reported below.

Hypothesis 1. There will be a statistically significant difference in learning multiple meanings of words, between subjects who received instruction with comics and subjects who received instruction without comics.

Table 4.1 (p. 80) displays the pre- and post-treatment raw scores and percentages of correct answers on the Multiple Meanings Task for both experimental and control subjects. Table 4.2 (p. 79) displays the means (M) and standard deviations (SD) for the pre- and post-treatment administrations of the Multiple Meanings Task, for experimental and control subjects.

Table 4.2

Means and Standard Deviations for Experimental and Control Subjects on Multiple Meanings Task

	Experimental N=12		Control N=11	
	Pre-treatment	Post-treatment	Pre-treatment	Post-treatment
Mean	3.417	12.833	4.545	8.727
Standard Deviation	2.35	3.92	2.77	3.46

An ANOVA was performed using the post-treatment experimental and control data, to determine if there was a statistically significant difference between the two conditions. The results of the ANOVA performed for these data resulted in a statistically significant difference, $F(1,21) = 7.010$, $p < .015$, between experimental and control subjects on posttesting assessments. To rule out preexisting differences on this dependent variable

Table 4.1

Raw Scores and Percentages for Experimental and Control Subjects on MultipleMeanings Task

Control Subjects			N=11	
	Pretest	Posttest	Pretest	Posttest
Student	Raw Sc	Raw Sc	%Correct	%Correct
J.D	0	16	10	80
O.M.	3	9	15	45
D.J.	6	7	30	35
C.C.	8	9	40	45
J.P.	7	8	35	40
M.T.	8	10	40	50
M.C.	5	7	25	35
M.D.	5	12	25	60
A.G.	4	7	20	35
D.S.	0	2	0	10
B.B.	4	9	20	45

Experimental Subjects			N=12	
	Pretest	Posttest	Pretest	Posttest
Student	Raw Sc	Raw Sc	%Correct	%Correct
B.H.	7	12	35	60
C.R.	2	8	10	40
D.B.	3	15	15	75
D.A.	2	19	10	95
T.T.	6	8	30	40
K.T.	2	8	10	40
B.T.	1	13	5	65
E.W.	2	18	10	90
A.B.	7	16	35	80
J.S.	0	15	0	75
D.L.	4	13	20	65
J.A.	5	9	24	45

between experimental and control groups, an analysis of covariance was performed using pretest scores as the covariant. The results consistent with the simple ANOVA revealed a statistically significant difference, $F(1,20)=5.875$, $p=.025$, between experimental and control groups, favoring the experimental group.

Hypothesis 2. There will be a statistically significant increase in the subjects' perceived abilities to learn and remember words with multiple meanings after instruction using comics.

Two questions from the pre- and post-treatment Subject Questionnaires (see Appendix B, p. 97) were analyzed to test hypothesis two. The subject responses to questions four ("I learn new words easily.") and eight ("It's hard to remember what words mean.") from the Subject Questionnaire were totaled to attain one score per subject which, allowed a paired t-test analysis to be performed. This procedure is appropriate to use to determine whether a statistically significant difference exists between two small samples. The results indicated that, for experimental subjects, the difference between pre-treatment ($M=6.09$) and post-treatment ($M=5.91$) on the questions associated with learning and remembering the meaning of words was not statistically significant, $t(10)=.724$, $p=.362$. For the control subjects, the difference between pre-treatment ($M=4.62$) and post-treatment ($M=5.62$) on the questions associated with learning and remembering the meaning of words was not statistically significant, $t(7)=.154$, $p=.077$.

Hypothesis 3. There will be a statistically significant change in the subjects' interest in reading after instruction using comics.

The ratings obtained from questions one ("I read the comics in the newspaper.") and three ("I read on my own.") on the Subject Questionnaires, were combined to obtain one score for

each subject to test research hypothesis three. A paired two-tailed t-test was used to analyze these data.

The results for experimental subjects indicated that, for research hypothesis three, the difference between pre-treatment ($\underline{M}=5.45$) and post-treatment ($\underline{M}=5.00$) on the questions associated with reading the comics in the newspaper and reading on one's own was not statistically significant, $t(10)=.228$, $p=.270$. For control subjects, the difference between pre-treatment ($\underline{M}=6.375$) and post-treatment ($\underline{M}=7.875$) on the questions associated with reading the comics in the newspaper and reading on one's own was not statistically significant, $t(7)=2.36$, $p=.285$.

Subject Perceptions

Subjects' pre- and post-treatment perceptions about reading, vocabulary, and understanding humor were measured using the ten-question Subject Questionnaire (see Appendix B, p. 97). As discussed earlier (p. 81), subject responses to questions four and eight were used to test hypothesis two and questions one and three were used to test hypothesis three in this study. Subject responses to the remaining six questions (i.e., two, five, six, seven, nine, and ten) are reported in Table 4.3 (p.83) and Table 4.4 (p. 84). Table 4.3 (p. 83) displays the frequencies of pre- and post-treatment responses for the experimental subjects. Table 4.4 (p. 84) displays the frequencies of pre-and post-treatment responses for the control subjects.

Table 4.3
Frequency of Pre- and Post-treatment Questionnaire Responses for Experimental Subjects

Question	N=12 Pre*/Post	Never 1 Pre/Post	Rarely 2 Pre/Post	Sometimes 3 Pre/Post	Often 4 Pre/Post	Always 5 Pre/Post
1. I read the comics in the newspaper.	12/12	7/7	2/2	1/0	1/2	1/1
2. I ask for help to read the comics.	10/12	5/4	2/3	2/2	0/0	1/3
3. I read on my own.	12/12	0/2	1/0	8/9	2/1	1/0
4. I learn new words easily.	12/12	0/0	2/3	3/4	2/2	5/3
5. I ask about words I don't know.	12/12	0/1	1/1	6/7	2/2	3/1
6. I understand why comics are funny.	10/12	3/2	0/1	1/4	2/3	4/2
7. I understand why things my friends say are funny.	12/12	1/1	1/0	5/2	0/6	5/3
8. It's hard to remember what words mean.	12/12	0/1	1/0	4/6	6/4	1/1
9. The comics helped me remember what words meant.	10/12	4/0	2/2	1/3	2/4	1/3
10. The comics made learning fun.	10/12	4/0	0/1	3/4	2/5	1/2

Note: N = Number of respondents per question

*One SLP did not have her experimental subjects respond to question 2, 6, 9, and 10 in the pre-treatment phase of the study. She noted "N/A" for these questions on each experimental subject's questionnaire.

Table 4.4
Frequency of Pre- and Post-treatment Questionnaire Responses for Control Subjects

Question	N=11	Never	Rarely	Sometimes	Often	Always
	Pre*/Post**	1 Pre/Post	2 Pre/Post	3 Pre/Post	4 Pre/Post	5 Pre/Post
1. I read the comics in the newspaper.	8/9	2/2	0/2	4/1	0/0	2/4
2. I ask for help to read the comics.	8/9	4/2	0/1	3/4	1/0	0/2
3. I read on my own.	8/9	2/0	0/0	1/3	2/1	3/5
4. I learn new words easily.	8/9	1/1	0/0	5/5	1/1	1/2
5. I ask about words I don't know.	8/9	0/0	1/0	3/2	1/3	3/4
6. I understand why comics are funny.	8/9	1/0	1/1	3/3	1/1	2/4
7. I understand why things my friends say are funny.	8/9	1/1	2/0	0/3	2/2	3/3
8. It's hard to remember what words mean.	8/9	0/1	1/0	2/5	2/1	3/2
9. The comics helped me remember what words mean.	7/9	3/1	1/2	1/4	1/2	1/0
10. The comics made learning fun.	7/9	1/0	1/1	1/2	1/2	3/4

Note: N = Number of respondents per question

*Eleven control group subjects should have completed the pre-treatment questionnaire. One SLP forgot to give the pre-treatment questionnaire to her three control subjects. One additional control subject didn't respond to questions nine and ten.

** Questionnaires for three control subjects were sent home for completion and two questionnaires were not returned.

CHAPTER V

DISCUSSION, CONCLUSIONS, & RECOMMENDATIONS

The purpose of this study was to investigate the efficacy of using comics as a method for teaching the multiple meanings of words to students with learning and language disabilities. In this chapter, findings related to the three hypotheses and subject perceptions are discussed, conclusions are stated, and recommendations for future research are provided.

Discussion Related to Research Hypotheses

Each of the three hypotheses that were tested in this study is presented below. Following each hypothesis is a summary of the results and related discussion.

Hypothesis 1. There will be a statistically significant difference in learning multiple meanings of words, between subjects who received instruction with comics and subjects who received instruction without comics.

Post-treatment scores from the Multiple Meanings Task revealed a statistically significant difference between the experimental and control groups. The experimental group, having received treatment with comics, outperformed the control group who received direct instruction without comics. Therefore, hypothesis one is accepted.

Comics provided a visual context for subjects that seemed to assist with determining at least one meaning of the targeted word. This supports the findings of Simmons and

Kameenui (1990) who indicated that using pictures assists in reducing the cognitive difficulty of vocabulary-related tasks. The speech-language pathologists (SLPs) focused subjects' attention on previously learned knowledge of the words. The treatment included repeated presentations of the vocabulary words. Each word was practiced twice during initial presentations, and subsequently reviewed during each treatment session. This repeated practice seemed to be beneficial. This finding concurs with Medo & Ryder (1993) and Jenkins, Matlock, & Slocum (1989). These researchers found that greater amounts of practice opportunities resulted in increased vocabulary learning. The combination of instructional techniques (pictures as context, associating new information with previously learned information, and multiple presentations) seemed to assist with learning and retaining the meanings of the words. This finding was consistent with Zimmerman (1997), who concluded that providing context offers redundancy of information and enhances learners' understanding of multiple meanings of words.

Hypothesis 2. There will be a statistically significant increase in the subjects' perceived abilities to learn and remember words with multiple meanings after instruction using comics.

Responses to questions four and eight on the Subject Questionnaire were combined to test this research hypothesis. These questions asked subjects to assess their ability to learn and remember new words. The data analysis revealed no statistically significant difference between the experimental subjects' perceived ability to learn and remember words with multiple meanings after receiving instruction using comics. The data analyzed for control subjects also revealed no statistically significant difference in

perceived ability to learn and remember new words after receiving direct instruction without using comics. Therefore, research hypothesis two was rejected.

When attempting to interpret these results and understand why neither group of subjects changed their beliefs about their vocabulary abilities over the course of the study, several factors should be considered. First, the intervention period only lasted four weeks. It may take more than four weeks for internal belief systems to change even when subject performance is improving. Several educators have noted that students with disabilities have difficulty recognizing success in their academic endeavors. Mercer (1983) noted that students with language and learning disabilities frequently have little confidence in their academic abilities. Bryan (1986) and Montgomery (1994) both noted that students with learning disabilities have more negative self-concepts regarding academic competence than students without disabilities. Moreover, Deshler, Schumaker, & Lenz (1990) noted that students with disabilities fail to link academic success with their own personal efforts. Instead, they attribute academic success (e.g., good grades) to external variables (e.g., teacher likes me). Thus, in addition to an extended intervention period, it may be necessary to prompt subjects to think about their performance during vocabulary activities. Teaching subjects to use self-monitoring systems (e.g., self-recording, self-evaluation, self-reinforcement) may help accomplish this.

A second factor to consider when interpreting these results is whether or not elementary-aged subjects, especially subjects with language and learning disabilities, can reliably self-monitor their learning abilities. The language in the instrument used to measure subject perceptions (i.e., Subject Questionnaire) may have been too difficult for elementary-age subjects to accurately complete even with assistance. The Questionnaire

should have been piloted. Additionally, the questionnaire may not have been sensitive enough to detect differences in subjects' perceptions. Perhaps if the subjects in this study were interviewed rather than asked to complete a questionnaire, more in-depth information regarding their perceptions about their ability to learn and remember words with multiple meanings could have been obtained.

Hypothesis 3. There will be a statistically significant change in the subjects' interest in reading after instruction using comics.

Responses to questions one and three on the Subject Questionnaire were combined to test this hypothesis. The questions asked subjects if they read the comics in the newspaper, and read on their own. Data analysis indicated no statistically significant change in experimental subjects' interest in reading based upon pre- and post-treatment questionnaire responses. Data analysis also revealed no statistically significant change in control subjects' interest in reading between pre-and post-treatment. Therefore, research hypothesis three was rejected.

The use of comics to teach multiple meanings of words in this study may not have been powerful enough to change the subjects' interest in reading. There does not appear to be a direct relationship between improved abilities to define words and increased interest in reading. It may be difficult for elementary-age subjects to reliably rate their perceptions over a span of four weeks.

Discussion Related to Subject Perceptions

As indicated in the previous discussion, four questions from the Subject Questionnaire were used to test hypotheses two and three. The remaining six questions (i.e., two, five, six, seven, nine, and ten) were asked to obtain additional information

related to subjects' perceptions regarding their willingness to seek assistance while reading comics, their understanding of humor, their use of comics to assist with remembering word meanings, and the degree to which they enjoyed using comics. Due to the small number of respondents, a decision was made to report frequency of responses for each of the possible Likert ratings for all six questions. These data were reviewed to determine whether trends emerged from the pre- to post-treatment measures. Experimental and control subjects' perceptions remained fairly stable across the two measures.

Without further study, however, it is difficult to interpret why there was little change in subject perceptions between the pre-and post-treatment measures. As noted in the previous discussions regarding questions one, three, four, and eight (used to test hypotheses two and three) a number of factors may have contributed to the finding that subject perceptions did not change significantly. These same factors may have contributed to the finding that subjects' perceptions on questions two, five, six, seven, nine, and ten also remained fairly constant across the pre- and post-treatment measures. Included among these factors are: (a) four-week intervention period may not be long enough to result in changed perceptions, (b) subjects with language and learning disabilities may have difficulty with self-assessment, (c) the Subject Questionnaire may not have been the most appropriate method for measuring subject perceptions, and (d) there may have been flaws within the instrument itself.

In retrospect, several procedural changes may have provided more useful information related to subject perceptions. First, interviewing subjects before and after the treatment may result in more meaningful data and provide greater insight into subjects' self

perceptions. Second, it might be beneficial to use interviewing in conjunction with a subject questionnaire. If a subject questionnaire is used, it should be validated with a similar group of subjects prior to initiating the study. Additionally, the researcher needs to ensure that all individuals responsible for administering the questionnaire understand the importance of obtaining pre- and post-treatment questionnaires from all subjects in the study. This should have been communicated more strongly during the SLP training session and perhaps follow-up telephone calls the night before the initiation of data collection. Another option would be for the researcher to collect questionnaire data or hire an unbiased research assistant to collect questionnaire data. Finally, a longer intervention period should be considered if a change in perceptions (i.e., subjects' willingness to seek assistance while reading comics, their understanding of humor, their use of comics to assist with remembering word meanings, and the degree to which they enjoy using comics) is to be measured. This involves careful consideration and planning with regard to the realities of conducting research in public school settings (e.g., gaining access to subjects; working around school schedules including holidays, special events, and track breaks in year-round schools; balancing instructional time used for research with instructional time needed for the subjects to meet educational goals that are unrelated to the study).

Conclusions

The results of this research indicated that using comics to teach multiple meanings of words is a potentially beneficial intervention for elementary students with learning and language disabilities. Pairing the use of comics with other instructional methods (i.e., repeated presentations over time, linking new information to previously learned

information) appears to help students learn new vocabulary words. Students with language and learning disabilities in elementary schools who are receiving speech and language therapy could benefit in their vocabulary development with the instructional approach used in this research.

Limitations of the Study

This research was limited to elementary students with language and learning disabilities, therefore the findings should not be generalized to other age groups or students with other disabilities without additional research.

Recommendations for Future Research

Since this study represents an initial contribution to literature involving the use of comics for vocabulary instruction, additional research is needed. Reflection on the procedures used in this study, as well as the results obtained, led to the following recommendations for future study.

1. Research is needed to determine if other specialized populations would benefit from using comics as a method of instruction. These populations may include students with hearing impairment, mental retardation, or those with pragmatic (social) language difficulties.
2. Research is needed to determine if using comics benefits secondary students with language and learning disabilities.
3. Researchers need to examine the long-term effects of using comics to teach vocabulary. It would be interesting to determine whether or not this method of instruction facilitates retention of vocabulary terms over time (e.g., one week later, one month later).

4. Additional comic-related research is needed to investigate the effects of this instructional method on students' abilities to generalize the use of the newly learned terms to other settings. It would be interesting to determine what supports are needed for students with language disabilities to transfer their newly-acquired knowledge from speech-language therapy sessions into other classroom settings (e.g., general education class, resource room).

5. Additional research is needed to determine whether this instructional method can be adapted and used in large-group instructional arrangements (i.e., general education classes). The use of transparencies and overhead projectors or power point presentations to present the comics could be explored.

APPENDIX A

MULTIPLE MEANINGS TASK

Student _____ Pretest _____ Posttest _____

Date _____ School _____ SLP _____

DIRECTIONS:

Ask the student to respond to the statement below:

Tell me what _____ means.

When the student has given you a definition of the targeted word, ask the following:

Tell me something else _____ means.

Allowable prompts include:

What else can you tell me?

What else does _____ mean?


Scoring:

2 point = two or more correct definitions

1 points = only one correct definition as a response

0 points = no correct definitions given

0 points = gesturing provided to demonstrate the word's meaning

Word	Definition	Acceptable Responses	Points
1. net		(a) mesh netting for sports (b) internet	
2. organ		(a) body part (b) instrument	
3. SWAT		(a) physical action (b) police team	
4. foul		(a) out-of-bounds (b) bad	
5. log		(a) from a tree (b) journal	
6. scale		(a) part of a fish (b) to climb (c) part of music	
7. part		(a) space in your hair (b) area (c) role	
8. poker		(a) game (b) andiron (c) person who pokes	
9. master		(a) owner of a pet (b) top of profession (c) to learn	
10. monster		(a) creature (b) brat	
		Total Points 	

Total Possible Points **20**

Percent Correct: _____

Comments:

APPENDIX B

Subject Questionnaire

Directions: Please read the sentences below. or have an adult help you. Circle the number below the letters that matches what you think. It's okay to have an adult help you.

Never (N) =1

Rarely (R) =2

Sometimes (S) = 3

Often (O) =4

Always (A) =5

	N	R	S	O	A
1. I read the comics in the newspaper.	1	2	3	4	5
2. I ask for help to read the comics.	1	2	3	4	5
3. I read on my own.	1	2	3	4	5
4. I learn new words easily.	1	2	3	4	5
5. I ask about words I don't know.	1	2	3	4	5
6. I understand why comics are funny.	1	2	3	4	5
7. I understand why things my friends say are funny.	1	2	3	4	5
8. It's hard to remember what words mean.	1	2	3	4	5
9. The comics help me remember what words mean.	1	2	3	4	5
10. The comics make learning fun.	1	2	3	4	5

APPENDIX C

Text of the Comics Used in this Study

1. No text. One-frame comic depicting a man carrying an organ on his back heading towards a door marked. "Organ Donors."
2. One- frame comic depicting a man on fire. The caption reads. "Step back. Loretta! It's a red-hot poker!"
3. One- frame comic depicting a man's scalp with a part. The caption reads. "Say, ain't you a stranger in this part?"
4. One- frame comic depicting a teacher in front of a classroom of students. The thought bubble over the teacher's head reads. "Miserable little monsters."
5. One- frame comic depicting a master painter at work with a dog watching. The thought bubble over the dog's head reads. "So where's my dinner?...One of the great masters indeed."
6. Two- frame comic depicting two babies facing the netting of their playpen. The speech bubble over one of the babies' head reads. "I've heard all the talk...but frankly, I fail to see what all the excitement is about the 'net.'"
7. Two- frame comic depicting two flies in flight. The speech bubbles read. "Oh my gosh...Fly for your life!!" "What is it?" "A swat team!"
8. Two- frame comic depicting a sentry and his king. The dialogue reads. "The huns are scaling the north wall!" "Yikes!" "I didn't even know the north wall had scales."
9. One- frame comic depicting a foreign legion troop carrying a log, and its commander. The speech bubble reads. "Stop complaining! All great leaders keep a log of their adventures."
10. One- frame depicting two young boys attempting to figure out the game of baseball. The dialogue reads. "Right into the dog doo." "I think that clearly counts as 'foul.'"

APPENDIX D

Parent Consent

I, Robin Stall, am a doctoral student in the Department of Special Education of the University of Nevada, Las Vegas. I am requesting your permission to allow your child to participate in a research study to determine whether using comics to teach multiple meanings of words is an effective method. The study will last 4 weeks.

Your child will be working with his/her current speech-language pathologist (SLP) under my guidance and direction. Your child will be asked to define 10 words that have more than one meaning, as a pre- and post-test. Then your child will continue to participate in his/her regularly scheduled therapy sessions, concentrating on vocabulary development for 4 weeks. Your child will be presented two comics each week (one per session) and will be guided and taught strategies to determine the various meanings of each word. During each session, a review of the previously presented comics will occur before the new word is presented.

When the intervention phase has been completed, the SLP will ask your child to state at least two meanings for the words used during the 4-week study to determine if this new skill has been maintained.

Your child will learn multiple meanings for commonly used vocabulary words. In addition, it is hoped that your child will be more interested in reading and have a better understanding of humor.

An agreed upon reward will be provided to your child for successful completion of the study. This will be decided between the SLP and your child. An example of a reward might be pizza brought in for lunch. There will be no monetary compensation for participation in this study.

Information about your child will be held in the strictest confidence. Your child's name will not be used when reporting the findings of this study.

If you have questions about this research, you may call your child's SLP or Robin Stall at 799-7437. You may call the University of Nevada, Las Vegas, Office of Sponsored Programs at 895-1357, for questions concerning the rights of research subjects. If you decide to grant permission, you will receive a copy of this form.

Participation in this study is voluntary and you may withdraw your child from participating in this study at any time.

_____ has my permission to participate in this study.

Child's Name

Parent/Guardian

Date

Researcher

Date

Speech-Language Pathologist Consent Form

I, Robin Stall, am a doctoral student in the Department of special Education of the University of Nevada, Las Vegas. I am requesting your permission to assist me in this research study.

The purpose of this study is to determine whether using comics to teach multiple meanings of words is an effective method. It is anticipated that the study will last approximately 5 weeks.

You will be asked to attend a one-to-two hour training session to learn about the study, and the procedures that have been designed for it. This should be the only time spent outside of your regular day for this study. You will be asked to administer a quick pre- and posttest. I will visit to observe the lessons and record responses as an independent observer.

At the conclusion of the study, an award will be provided for the students who participated for the entire study. The type of reward (such as a pizza lunch) will be agreed upon by you and your students. The reward will be provided by the researcher. There will be no monetary compensation for this study.

Information about the students and you will remain in the strictest confidence. No names will be used when reporting the results of this study.

If you have any questions about this research, you may call me at 799-7437. If you decide to participate in the study, you will receive a copy of this form.

Speech-Language Pathologist

Date

Researcher

Date

Child Consent Form

The reason for doing this study is to see whether using comics will help children learn about words.

I will ask you to take a particular test two times – one before we begin the study, and one at the end of the study. You will be asked to learn the meanings for ten words.

You will be working with your usual speech-language pathologist. I will visit from time to time.

As a result of this study, you will learn how to think about words differently. This will help you in reading and understanding why something is funny.

You do not have to be a part of this study if you don't want to. You can stop participating at any time. You must talk this over with your parents before you decide to help with this study. They will be asked to give their permission for you to be a part of this study, too. If you become a participant in this study, you will receive a copy of this form.

If you have questions about the study, feel free to ask your speech-language pathologist, or have him or her ask me. I would really appreciate your being a part of this special experience. Thank you.

Student

Date

Researcher

Date

UNLV

DATE: January 20, 2000
TO: Robin Stall
Special Education
M/S 3014

FROM: Dr. William E. Schulze, Director
Office of Sponsored Programs (x 13 5 7)

RE: Status of Human Subject Protocol entitled:
"Using Comics to Teach Multiple Meanings of Words"
OSP # 305sl299-181s

This memorandum is official notification that the protocol for the project referenced above has been approved by the Office of Sponsored Programs. This approval is for a period of one year from the date of this notification, and work on the project may proceed.

Should the use of human subjects described in this protocol continue beyond a year from the date of this notification, it will be necessary to request an extension.

If you have any questions or require assistance, please contact the Office of Sponsored Programs at 895-1357.
cc: OSP File

Office of Sponsored Programs 4505 Maryland Parkway * Box 451037 * Las Vegas, Nevada
89154-1037 (702) 895-1357 9 FAX (702) 895-4242

APPENDIX E

DATA COLLECTION

WORD	DATE	#PRESENTS.	# CUES	GAVE MNG.

APPENDIX F

Training Script

The training script uses a comic that is not taught to the subjects.

SLP: Today we're going to read several comics. I'll help you if you want me to.

SLP: (Presents comic with the word
"horn" as the key element.)

Subj.: (reads comic aloud)

SLP: "What's funny about it?"

Subj.: "Well, it's just funny, that's all."

SLP: "Look at each part of the comic. Let's start with the first frame. What's happening/going on here?"

Subj.: (describes picture by action, who is speaking to whom, where the characters are, etc.)

SLP.: "Great! Now let's do the same thing with the second frame."

Subj.: (does the same thing)

SLP: "Okay. Let's look at these (musical Notes). What are they?"

Subj.: "notes"

SLP: "Where are they coming from?"

Subj.: "the barn"

SLP: "What would make the notes/music?"

Subj.: (names instruments, hopefully "horns": if not ...)

SLP: (Possible cues:

-What other instruments?

-What would be another name for a trumpet?)

....corresponding responses

Subj.: "horn?"

SLP: "That's right! A horn. Why do you think there is an exclamation point over the chicken's head?"

Subj.: "It's surprised."

SLP: "Yes it is. Now let's look again at what the people are saying."

Subj.: "I still don't get it."

SLP: "Let's look at the word 'horn.' You told me it was an instrument. It is. The girl in the comic asked about the cows. What do you know about cows that might have something to do with horns?"

Subj.: "Oh! Cows have horns on their heads. So...the farmer thinks the cows are 'playing their horns.'"

SLP: "Exactly! Great job! You figured out what was funny about this comic. One word could have more than one meaning. These kinds of words are called 'multiple meaning words.' Let's read the comic one more time."

REFERENCES

- Alpern, G., Boll, T., & Shearer, M. (1980). Developmental Profile – II. Aspen, CO: Psychological Development Publications.
- Ary, D., Jacobs, L., & Razavieh, A. (1979). Introduction to research in education (2nd ed.). New York: Holt, Rinehart, Winston.
- Assistance to States for the Education of Children With Disabilities and the Early Intervention Program for Infants and Toddlers With Disabilities: Final Regulations. 34 C.F.R. § 300 and 303 (1999).
- Baker, S., Simmons, D., & Kameenui, E. (1995). Vocabulary acquisition: Synthesis of the research. (Report No. 13). Eugene, OR: National Center To Improve the Tools of Educators. (ERIC Document Reproduction Service No. ED 386 860)
- Balow, I. & Shearer, M. (1980). Metropolitan Achievement Test – 7. San Antonio: Psychological Corporation.
- Barrett, M., Bowers, L., & Huisinigh, R. (1988). Assessing Semantic Skills Through Everyday Themes. East Moline, IL: LinguiSystems.
- Berg K. & Latin, R. (1994). Essentials of modern research methods in health, physical education, and recreation. Englewood Cliffs, NJ: Prentice Hall.
- Bernstein, D.K. (1986). The development of humor: Implications for assessment and intervention. Topics in Language Disorders, 6(4), 65-71.
- Blachowicz, C.L. (1991). Making connections: Alternatives to the vocabulary notebook. Journal of Reading, Writing, and Learning Disabilities, 7(4), 297-308.

Brodzinsky, D.M. (1976). Pleasure associated with cognitive mastery as related to children's conceptual tempo. Child Development, 47, (3), 881-884.

Brodzinsky, D.M. (1977). Children's comprehension and appreciation of verbal jokes in relation to conceptual tempo. Child Development, 48(3), 960-967.

Bryan, T.H. (1986). Self-concept and attributions of the learning disabled. Learning Disabilities Focus, 1, 82-89.

Carlisle, J.F. (1993). Selecting approaches to vocabulary instruction for the reading disabled. Learning Disabilities Research & Practice, 8(2), 97-105.

Carr, E. & Wixson, K. (1986). Guidelines for evaluating vocabulary instruction. Journal of Reading, 29(7), 588-595.

Carrow-Woolfolk, E. (1995) Oral & Written Language Scales. Circle Pines, MN: American Guidance Service, Inc.

Carson, D.K., Skarpness, L.R., Schultz, N.W., & McGhee, P.E. (1986). Temperament and communicative competence as predictors of young children's humor. Merrill-Palmer Quarterly, 32(4), 415-426.

Catts, H. & Kamhi, A. (1986). The linguistic basis of reading disorders: Implications for the speech-language pathologist. Language, Speech, and Hearing Services in Schools, 17, 329-341.

Chall, J.S. (1983). Vocabularies for reading: How large? What kind? Anaheim, CA: Annual Meeting of the International Reading Association. (ERIC Document Reproduction Service No. ED 235 460)

Colwell, C. & Wigle, S. (1984). Applicability of humor in the reading/language arts curriculum. Reading World, 24(2), 73-80.

Deshler, D.D., Schumaker, J.B., & Lenz, B.K. (1984). Academic and cognitive interventions for LD adolescents: Part I. Journal of Learning Disabilities, 17(2), 108-117.

Dunn, L., & Dunn, L. (1981). Peabody Picture Vocabulary Test – Revised. Circle Pines, MN: American Guidance Service, Inc.

Dunn, L., Dunn, L., & Williams, K. (1997). Peabody Picture Vocabulary Test – III. Circle Pines, MN: American Guidance Service, Inc.

Elliott, C. (1990). Differential Ability Scales. San Antonio: The Psychological Corporation.

Fraenkel, J. & Wallen, N. (1994). How to design and evaluate research in education. New York, NY: McGraw-Hill Publishing Co.

Gardner, E., Rudman, H. & Karlsen, B. (1982). Stanford Achievement Test. San Antonio: Psychological Corporation.

Gardner, M. (1990). Expressive One-Word Picture Vocabulary Test- R. Novato, CA: Academic Therapy Publications.

Gardner, M (1985). Receptive One-Word Picture Vocabulary Test. Novato, CA: Academic Therapy Publications.

Hamersky, J. (1995). Cartoon cut-ups: Teaching figurative language and humor. Eau Claire: Thinking Publications.

Hieronymous, A., Hoover, H., & Lundquist, E. (1986). Iowa Tests of Basic Skills. Chicago: Riverside Publishing.

Hinkle, D.E., Wiersma, W., & Jurs, S.G. (1994). Applied statistics for the behavioral sciences (3rd ed.). Boston: Houghton Mifflin Company.

- Honig, A.S. (1988). Humor development in children. Young Children, 43(4), 60-73.
- Humes, A. & Cronnell, B. (1977). Specifications of content for vocabulary instruction in alternative language: Figurative, affective, and confusing language. (Report No. SWRL-TN-3-77-09). Los Alamitos, CA: Southwest Regional Laboratory for Educational Research and Development. (ERIC Document Reproduction Service No. ED 173-751)
- Jenkins, J.R., Matlock, B., & Slocum, T.A. (1989). Two approaches to vocabulary instruction: The teaching of individual word meanings and practice in deriving word meaning from context. Reading Research Quarterly, 24(2), 215-235.
- Johnson, C.J. & Anglin, J.M. (1995). Qualitative developments in the content and form of children's definitions. Journal of Speech and Hearing Research, 38(3), 612-629.
- Kagan, J., Rosman, B.L., Day, D., & Phillips, W. (1964). Information processing in the child: Significance of analytic and reflective attitudes. Psychological Monographs: General & Applied, 78(1, Whole No. 578).
- Kaufman, A. & Kaufman, N. (1983). The Kaufman Assessment Battery for Children. Circle Pines, MN: American Guidance Service, Inc.
- Kaufman, A. & Kaufman, N. (1985). The Kaufman Test of Educational Achievement. Circle Pines, MN: American Guidance Service, Inc.
- Klesius, J. & Searls, E. (1991). Vocabulary instruction. Reading Psychology, 12(2), 165-171.
- Kossack, S. & Hoffman, E. (1987). A picture's worth a thousand words: Comprehension procession via the comics. Journal of Reading, 31(2), 174-176.
- Larson, G. (1987). The far side observer. Kansas City, MO: Andrews and McMeel.

Larson, G. (1995a). The prehistory of the far side: A 10th anniversary exhibit. Kansas City, MO: Andrews and McMeel.

Larson, G. (1995b). A far side collection: Unnatural selections. Kansas city, MO: Andrews and McMeel.

Lehr, F. (1984). Promoting vocabulary development. Journal of Reading, 27(7), 657-658.

McDevitt, S. & Carey, W. (1978). The measurement of temperament in 3-7 year old children. Journal of Child Psychology and Psychiatry, 19 (3), 245-253.

McGhee, P.E. (1971a). Cognitive development and children's comprehension of humor. Child Development, 42, 123-138.

McGhee, P.E. (1971b). The role of operational thinking in children's comprehension and appreciation of humor. Child Development, 42, 733-744.

Medo, M. & Ryder, R. (1993). The effects of vocabulary instruction on readers' ability to make causal connections. Reading Research and Instruction, 33(2), 119-134.

Mercer, C.D. (1983). Students with learning disabilities (2nd ed.). Columbus, OH: Bell & Howell Company.

Milosky, L.M. (1994). Nonliteral language abilities. In G. P. Wallach & K.G. Butler (Eds.), Language learning disabilities in school-age children and adolescents: Some principles and applications. (pp. 275-322). New York: Macmillan College Publishing Company.

Montgomery, M.S. (1994). Self-concept and children with learning disabilities: Observer-child concordance across six context-dependent domains. Journal of Learning Disabilities, 27, 254-262.

Nagy, W.E. (1988). Vocabulary instruction and reading comprehension. (Report No. 431). Cambridge, MA: Center for the Study of Reading. (ERIC Document Reproduction Service No. ED 300 781)

Nagy, W. & Herman, P. (1984). Limitations of vocabulary instruction. (Report No. 326). Cambridge, MA: Center for the Study of Reading. (ERIC Document Reproduction Service No. ED 248 498)

Nelson, N.W. (1986). What is meant by meaning (and how can it be taught)? Topics in Language Disorders, 6(4), 1-14.

Neufeldt, V. (Ed.) (1994). Webster's new world dictionary of American English (3rd college ed.). New York: Prentice Hall.

Otis, A. & Lennon, R. (1982). Otis-Lennon School Ability Test. San Antonio: Psychological Corporation.

O'Toole, T., Baum, H., & Logemann, J. (1988). Issues in conducting language research in non-traditional settings. Topics in Language Disorders, 19(1), 44-53.

Pien, D. & Rothbart, M. (1976). Incongruity and resolution in children's humor: A reexamination. Child Development, 47, 966-971.

Semel, E., Wiig, E.H., & Secord, W.A. (1987). Clinical Evaluation of Language Fundamentals – Revised. San Antonio: The Psychological Corporation: Harcourt Brace Javanovich.

Shaeffer, M. & Hopkins, D. (1988). Miss Nelson, knock-knocks & nonsense: Connection through humor. Childhood Education, 65(2), 88-93.

Shames, G.H., Wiig, E.H., & Secord, W.A. (1990). Human communication disorders: An introduction (4th ed.). New York: Merrill.

Shultz, T. & Pilon, R. (1973). Development of the ability to detect linguistic ambiguity. Child Development, 44, 728-733.

Simmons, D. & Kameenui, E. (1990). The effect of task alternatives on vocabulary knowledge: A comparison of students with and without learning disabilities. Journal of Learning Disabilities, 23(5), 291-297, 316.

Spector, C.C. (1990). Linguistic humor comprehension of normal and language-impaired adolescents. Journal of Speech and Hearing Disorders, 55(3), 533-541.

Spector, C.C. (1997). Saying one thing, meaning another. Eau Claire: Thinking Publications.

Stahl, S.A. (1986). Three principles of effective vocabulary instruction. Journal of Reading, 23(5), 291-297.

Tawny, J. & Gast, D. (1984). Single subject research in special education. Columbus, OH: Charles E. Merrill.

The ERIC clearinghouse on disabilities and gifted education. Council for Exceptional Children. Reston, Virginia.

Thompson, L. & Frager, A. (1984). Individualized vocabulary instruction in developmental reading. (ERIC Document Reproduction Service ED 253 844)

Tyson, E. & Mountain, L. (1982). A riddle or pun makes learning words fun. Reading Teacher, 36(2), 170-173.

Van Riper, C., Erickson, R. (1996). Speech Correction: An introduction to speech pathology and audiology (9th ed.). Boston: Allyn and Bacon.

Wechsler, D. (1974). Wechsler Intelligence Scale for Children - Revised (WISC-R). San Antonio: The Psychological Corporation.

Wechsler, D. (1991). Wechsler Intelligence Scale for Children – III (WISC – III). San Antonio: The Psychological Corporation: Harcourt, Brace.

Wechsler, D. (1992). Wechsler Individual Achievement Test. San Antonio: Psychological Corporation.

Wilkinson, G. (1993). Wide Range Achievement Test – 3. Wilmington, DE: Wide Range, Inc.

Williams, K. (1997). Expressive Vocabulary Test. Circle Pines, MN: American Guidance Service, Inc.

Zimmerman, C.B. (1997). Do reading and interactive vocabulary instruction make a difference? An empirical study. TESOL Quarterly, 31(1), 121-140.

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