Story Writing by Students with Hearing Impairments

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STORY WRITING BY STUDENTS WITH HEARING IMPAIRMENTS

by

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Students with hearing impairments (N = 21) wrote a personal narrative each academic year from 1990 to 1992. These narratives were rated on maturity of the story as a whole and maturity of the language used in the story by senior undergraduate students in the education department at Western Michigan University. The method used for rating was a holistic magnitude estimation technique.

Significant change over time was found for story scores, but not language scores. Grade level was found to have no significant effect on change from first to last ratings for either story scores or language scores. Degree of hearing loss had no significant effect on story scores or language score change. Educational placement had a significant effect on both story scores and language scores. Finally, no significance was found for the effect of interaction of hearing level and educational placement on story scores but a significant interaction effect was found on language scores. A number of significant correlations were also found among story scores and language scores.
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Finally, I dedicate this thesis to my family who put up with my bad moods and neglect of domestic chores during the writing of this thesis. They include my husband, James A. Ketchum, my daughter, Teri L. Theodore, my son, Arthur J. Ketchum, and my mother, Louise VanDyke. Thank you all for being there for me.

Lois A. Ketchum
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CHAPTER I

INTRODUCTION

This project is a longitudinal study of the written narratives of students with hearing impairments. These narratives were considered from many different perspectives. Several subject variables were taken into consideration during the examination of the data.

It is generally accepted that children with hearing impairments (HI) lag behind their hearing peers in language development. In fact, an historically common belief is that there is a plateauing of achievement by students with hearing impairments at the third grade level. Akamatsu and Yelon (1987) stated, "With the average deaf student measuring somewhere between a third and fourth grade reading level upon graduation from high school, there is concern among educators that we have not achieved the goal of making English accessible enough for deaf students to serve them as a base upon which to build literacy" (p. 19). Myklebust (1964) pointed out that students with hearing impairments plateau in their language ability between the ages of 9 and 15 with only relatively minor improvement in expressive language from ages 15 to 17 years.

Countering this common belief, Allen (1986) questioned conclusions "noting a leveling off in the achievement capabilities of hearing impaired students in reading comprehension and mathematics computation." Rather, Allen pointed
pointed out, "There is reason to believe that the cross-sectional mean performance of each age group, . . ., are not adequate representations of longitudinal growth" (p. 205). In considering the commonly held belief that reading and writing skills of students with hearing impairments plateau at the third grade level, Geers and Moog (1989) concluded that the picture may not be as bleak as it first appears. Their study of reading, writing, and speaking skills gives evidence that hearing-impaired students have more potential for development than was previously thought.

The purpose of the current study is to determine whether change over time can be detected in narrative story writing by students with hearing impairments in language-oriented oral programs. The technique used in this study for measuring change is that of holistic scoring by upper level undergraduate students in education courses in the teaching of reading. Although many analytic indices have been used to measure advances in maturity for written narratives, holistic methods have been recommended by written language experts as the more valid indicators of advancing maturity. For example, Cooper (1977) reported that "holistic evaluation by a human respondent gets us closer to what is essential in such a communication [writing] than frequency counts do" (p. 3). As part of this study, the usefulness of holistic analysis and direct magnitude estimation techniques for clinical, as well as research purposes, will be considered.

The research questions to be addressed in this investigation are:

1. Can significant change be detected in the three year period of the study
in:

a. story maturity, and

b. language maturity?

2. Are key subject variables, such as grade level in school, degree of hearing loss, and educational placement, associated with measured change in:

a. story maturity, and

b. language maturity?

The findings of this study could contribute to understanding the development of written language among students with mild to profound hearing loss. They also have potential application for influencing placement and curricular decisions for students with hearing impairments. When commenting on the education of students with hearing impairments, Ross, Brackett, and Maxon (1991) stated, "There is no doubt that we can do better than we are doing" (p. 46).
CHAPTER II

REVIEW OF THE LITERATURE

This chapter includes a review of causative factors involved in the slow progress in development of the language skills of students with hearing impairments, tasks involved in the process writing approach, and comparison of two different approaches to the measurement of change in ability. It ends with an expanded discussion of the purpose(s) of this study. The chapter establishes a basis for the need to analyze and monitor the progress or lack thereof in the development of language skills among hearing impaired students.

The Writing Task

"Writing is a complex process that requires students to master task-specific strategies and to acquire the metacognitive knowledge to regulate and control strategy use" (Englert & Raphael, 1988, p. 519). "Within most educational settings, writing is a primary means by which students demonstrate their knowledge, and it is a powerful tool for recording ideas and exploring thought" (Graham, 1988, p. 495). Writing is an abstract form of communication which requires the writer to use an indirect alphabetic-phonetic system that puts distance between the writer and the audience (Litowitz, 1981).

Simply making errors in language use in this new and elaborate activity is
not necessarily a sign of immature writing. In fact, errors normally accompany growth in semantics and syntactics. This takes place due to risk taking after increased exposure to language and effective instruction in the use of more mature structures (Weaver, 1982). Weaver (1982) found that "sentence fragments, especially, seemed to increase as the students become better writers" (p. 440).

Writing Levels of Students with Hearing Impairments

Demographic data summarized by Schildroth and Karchmer (1986) showed that reading levels of students with HI plateau at about the third grade level. Since the ability to write is generally thought to develop subsequent to the ability to read (Litowitz, 1981), it is to be expected that no one writes at a level higher than their reading level. The third grade level plateau is reached by most students with hearing impairments by 15 years of age and is maintained at least through age 18. However, as Geers and Moog (1989) pointed out, such conclusions are "based on cross-sectional data and may not adequately represent longitudinal growth" (p. 69). Myklebust (1964) also concluded, based on studies of read, written, and spoken language, that the syntax of students with hearing impairments of around age 17 was approximately equal to that of 7-year-old normal hearing students. If hearing students have a complex task in learning to write mature stories, how does the added complication of a hearing impairment affect this process? Mather (1989) addressed this issue by stating that deaf students
with hearing impairments who sign, like all second language users, must be able to "switch codes" and translate their thoughts from their first language (e.g., American Sign Language) into their second language (English), consciously applying the learned rules of English to their compositions.

Griffing (1970) listed characteristics which he believed students with hearing impairments should possess to assure reasonable success in a regular classroom. A key among these was that "The student is able to participate at or near the grade level of the regular class in using receptive and expressive skills, e.g., language, reading and writing" (p. 296). The lack of writing experience is common to students with HI (Moran, 1988) which limits their participation in the regular classroom further than the lack of normal hearing would indicate.

The Task Facing Students with Hearing Impairments

In discussing the hierarchy of language abilities (i.e., listening, speaking, reading, writing) in relation to writing ability, Litowitz (1981) stated, "If there is any problem with the language that the child acquires receptively (e.g., due to sensory impairment, auditory memory deficits, or auditory discrimination problems), then all capacities above this level will be affected" (p. 74). Akamatsu and Yelon (1987) stated, "Unlike hearing children, who learn to read and write in a language that they have already mastered, deaf children must learn to read and write in a language that is unfamiliar to them regardless of whether they have been exposed to signed forms of English" (p. 19). Atkinson (1989) stated that
hearing impairment "severely impedes the acquisition of written and spoken lan-
guage" (p. 10). Learning sign language and its syntax as a primary means of com-
munication, puts a student with hearing impairments at a disadvantage for learn-
ing the syntax of English. Writing grammatically correct English is a struggle.

Students who can hear normally acquire grammatical writing skill partially
by "overhearing" more mature speakers and partially through classroom instruc-
tion. Students with hearing impairments must acquire this skill almost exclusively
through classroom instruction, which is most often presented through extensive
drills. Gaura and Williams (1981) feel that these drills can be mastered on drill
sheets, but are not applied in students' spontaneous writing. Goldman and Rueda
(1988) stated, "a frequent criticism of language arts instruction (both reading and
writing) for many linguistic minority children is that it focuses on discrete skills
to the detriment of the more global task" (p. 543). Bryans (1979) agreed that "the
low levels of reading achievement and poor writing skills prevalent among deaf
children suggest that sentence-centered language teaching does not automatically
lead to proficiency with connected prose" (p. 430).

Mosenthal (1988) stated that students who conform least to "education's
operational criteria" are said to be the exceptionally poor students. "Traditionally,
hearing impaired youngsters have been viewed as deviant language learners"
(Kretchmer, 1974) because they tend to conform least to educator expectations.

The picture may not be as bleak as it first appears, however. Allen (1986)
noted that conclusions which indicate a leveling off in the achievement capabilities
of students with hearing impairments are questionable. He believes that the longitudinal growth of any group is not adequately represented by cross-sectional studies of separate age groups. Geers and Moog (1989) concluded from their study of 100 profoundly hearing-impaired 16- and 17-year-olds from the United States and Canada, "that hearing-impaired students have a much higher potential for literacy than has previously been reported and that the primary predictor of achievement is English language competence" (p. 69). Crandall (1978), citing Hammermeister (1971) and Crandall (1976), stated that it has been "demonstrated that, when provided with suitable instruction, deaf young adults are able to achieve far greater gains in reading and writing skill development than evidenced in current demographic studies" (p. 322).

Davis, Elfenbein, Schum, and Bentler (1986) concluded that the "assumption that the greater the hearing loss the more severe the language and educational deficits is not supported by" the data collected in their study (p. 60). Klecan-Aker and Blondeau (1990) noted that "hearing-impaired children, in their written narratives, are exhibiting appropriate clause lengths and are generally writing true narratives" (p. 280). Ross, Brackett, and Maxon (1991) noted that "there is a relationship between performance in language and degree of hearing loss" (p. 47). However, they also commented that "factors other than hearing loss affect performance" (p. 50). They also noted that "All other factors being equal, the educational setting itself can influence academic and communication accomplishments" (p. 55).
Analytic Versus Holistic Measurement

The objective measurement of writing performance for students with mild disabilities was discussed by Parker, Tindal, and Hasbrouck (1991), who commented that "direct writing assessment methods--which examine actual student writing samples--have received considerable attention because they are considered to have high face and content validity" (p. 61). This is in contrast to formal testing which assesses the students' knowledge of mechanics. Welch and Link (1992) stated, "the process of assessment can vary from holistic, in which all writing elements are considered as a complete whole, to analytic, in which individual writing elements are considered separately" (p. 346).

Many studies have been done by counting words and/or phrases as measures of maturity or progress (Coop, White, Tapscott, & Lee, 1983; Finnemore, Breunig, & Taylor, 1980; Walter, Kahn, & Johannessen, 1983; Dixon, 1972; Klecan-Aker & Blondeau, 1990). Fewer studies have used a holistic approach (Cooper, 1977). Cooper (1977) stated "holistic evaluation by a human respondent gets us closer to what is essential in such a communication [writing] than frequency counts do" (p. 3). Also, Yoshinaga-Itano (1986) stated that, in order to assess the connection which students were making between semantic knowledge and reading comprehension, "written compositions must be examined as whole entities rather than as segmented units" (p. 72).

The main objective of holistic scoring is to assess the over-all impression
that a story makes on the reader as opposed to counting how many times a given grammatical event occurs within the story. A holistic approach to assessment may help professionals avoid the possibility of using a splinter-skill drill approach for remediating deficiencies. Holistic measurement, as adopted in this study, is discussed in greater detail in Chapter III.

What This Study Proposes to Achieve

The current study was designed to test the hypothesis that significant change in story writing skill by children with hearing impairments would be measurable over a three year period for students of various ages in grades 2 through 12. Further, it was hypothesized that subject variables such as grade level in school, degree of hearing loss, and type of educational placement, would correlate with measured growth. The findings of the current study could be used to help decide placement and teaching methods for students with hearing impairments.

Isaacson (1988) suggested that writing assessment has four purposes: (1) comparing interindividual differences, (2) planning instruction, (3) monitoring student progress, and (4) providing feedback.

In her discussion of writing behavior of students with hearing impairments, Sarachan-Deily (1982) stated, "Deaf students, at all ages, depend on writing for at least the same reasons that hearing students do, i.e., academic achievement, answering test questions, filling out job applications, writing business and personal letters, etc. Additionally, deaf students are dependent upon writing for basics,
such as communicating with the hearing world when their speech or signing is not understood, and using telecommunication systems (TTYs)" (p. 4). Thus it behooves us to analyze these students' writing and supply them with the education necessary to achieve their best in order to give them the best possible start in life.
CHAPTER III

METHOD

Subjects

The subjects for this investigation were 21 students in a Southwest Michigan county, who have been participating in a longitudinal study in which they were asked to write a narrative about a personal experience annually for three consecutive years. At the beginning of this study, 10 of the students were in a "largely self-contained" classroom setting and 11 of the students were in a "largely mainstreamed" classroom setting.

At the beginning of the study, the range of students' chronological ages was from 110 months (9 years, 2 months) to 240 months (20 years). The grade levels ranged from 2nd through 12th.

Hearing loss among these students ranged from mild to profound levels. However, categorizing individual students by their degree of hearing loss was no simple matter. As this study is somewhat retrospective in nature, and subjects were not available, aided audiological testing could not be performed in conjunction with this study. The only audiometric information available for use in classifying students according to degree of hearing impairment was that found in school records.

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For these reasons it was necessary to assign students to degree-of-loss categories based on unaided pure tone thresholds alone. The pure tone average for 500, 1000, and 2000 Hz was taken from each student’s audiogram. The degree of loss for the better ear was compared to the scale which follows. This scale is commonly used by audiologists in describing degree of hearing loss based on unaided pure tone results.

The categories of mild to profound loss were originally developed by Goodman (1965) and were later modified by Clark (1981). The use of 15 dB HL as a lower cutoff for normal hearing (instead of 25 dB HL) is credited to Kryter (1973) and is commonly used by many audiologists, particularly in reference to degree of loss for children.

Degree of Loss Categories
15-25 slight
26-40 mild
41-55 moderate
56-70 moderately-severe
71-90 severe
91+ profound

Then the relative slope of the audiometric profiles were examined. Students whose audiograms showed "similar slopes" were grouped together as having similar hearing losses and thus, potentially, similar needs for extra help acquiring the English language and skills for writing.

For purposes of statistical analysis, subject variables were defined in the following categories:

1. Grade level in school, with two levels:
1. early grades (2nd through 6th) (n = 5), and
2. later grades (7th through 12th) (n = 16);

2. Degree of hearing loss, with three levels:
   a. mild-moderate (n = 6),
   b. severe (n = 10), and
   c. profound (n = 5);

3. Educational placement, with two levels:
   a. largely self-contained special education (1.0 full time equivalent (FTE) to 0.7 FTE) (n = 10),
   b. largely mainstreamed (0.6 FTE through 0.0 FTE in special education) (n = 11).

For data related to individual subjects, see Appendix J.

Procedure

Story Writing Task

Stories were written under the guidance of the classroom teacher or consultant for hearing impaired about a personal experience. The students were given instructions to write a story about something which happened to them and to make it interesting. Story samples were gathered each year beginning in 1990, with the most recent stories being gathered in 1992.
Preparation of Samples for Rating

McColly (1970) reported that the appearance of the writing sample (e.g., the quality of the handwriting or cleanliness of the paper) is strongly related to the holistic rating the paper will receive. Further, Charney (1984) stated, "we should take steps wherever possible to reduce the effect of such superficial features" as handwriting and spelling (p. 79). Therefore, each of the handwritten stories was transcribed into a computer data base. The only change made in the transcriptions from the original stories was to correct spelling errors. This was done to prevent the raters from being influenced or distracted by poor handwriting or inaccurate spelling. Spelling errors that resulted in real words were retained (e.g., "there books"). Any identifying information was left off the top of the story and any proper names used within the story were replaced by an initial and blank spaces (e.g., B ____ ) to preserve confidentiality. Each story was then given an identification number and printed out on a separate page. Photocopies were made of each story so that more than one rater could read the same stories at the same time.

To check the reliability of the transcription of the hand written stories to computer generated stories, a random group of 20 stories were checked for errors in transcription. This check resulted in an accuracy of 94.5% - 100%. Refer to Appendix A for reliability percentages. Samples of handwritten and computer generated stories may be seen in Appendix B.
Holistic Scoring Method

As summarized in the review of the literature, holistic scoring has advantages for analyzing written compositions. Charney (1984) commented that quantitative methods only test whether a student can identify or employ certain constructions. They are insensitive to students' abilities to "write cogent, coherent and fluent prose" (p. 67). Charney (1984) further stated, "Holistic rating is a quick, impressionistic qualitative procedure for sorting or ranking samples of writing... Holistic ratings may be assigned simply on the basis of the total impression a piece makes on a reader" (p. 67-68).

Stories can be judged holistically using a variety of different tools, such as rating scales and other descriptive measures. For this study, however, a "direct magnitude estimation" technique (Campbell & Dollaghan, 1992, p. 43) was chosen to quantify the holistic judgments of those rating the stories. Magnitude estimation techniques have statistical analysis advantages over such tools as Likert scales because they are not subject to ceiling and floor effects.

Magnitude estimation techniques require raters to judge a set of stories one at a time, assign each story a rating, and scale each succeeding story so that the rating numbers are proportional relative to the maturity perceived for the other stories in the set. As illustrated in Appendix C, raters in this study were told to use any range of numbers they wished. The decision not to use a marker story to establish a standard for the ratings was based on rationale expressed by Stevens.
(1971), who commented, "Experience has shown that it is usually better not to designate a standard. The subject [rater] then remains free to choose his own modulus" (p. 428). As explained to the raters in this study, if a scale of 1 to 10 had been prescribed by the investigator, then upon reading the first story in a group, the rater feels that it is a good story and gives it a rating of 8 or 9, then finds that in reality the first story was the worst in the group, there is no place to go with the remaining stories (ceiling effect).

Since each individual rater was allowed to use any range of numbers, the direct magnitude estimates were then converted to a common scale of 1 to 10, chosen by the investigator, before analysis began. Once the conversion was done, mean ratings across raters were computed for each story, calculating the relative ranking of each sample (Campbell & Dollaghan, 1992, p. 47).

The task assigned to raters was simply to rate the overall maturity of the story and to rate the overall maturity of the language used in the story.

Raters

Cooper (1977), citing the studies of Follman and Anderson (1967), specified that readers assigning holistic scores should come from similar academic backgrounds so that they will draw as much as possible from common experience and values. McColly (1970) recommended selecting a group of readers whose common academic background creates a good chance for agreement and allows them to arrive at their own set of criteria.
The 38 judges in this study were senior undergraduate students enrolled in the course, ED352, Reading and Related Communication Skills for Middle and Upper Grades. This course is a study of how youngsters in the middle and upper grades record and interpret language, particularly in content area reading and writing. Emphasis is placed on the implications of current research as it affects reading programs and reading instruction. Learning skills for reading in the content fields, testing, and remedial techniques are stressed. The ED352 course follows ED351, Reading and Related Communication Skills for Early Childhood. ED351 has a similar emphasis on recording and interpreting written language, but emphasizes acquisition of narrative text structures in the early grades. Demographics on the judges may be found in Appendix D.

The Rating Procedure

1. Three judges rated each story.

2. Each rater had 15 stories to read and to rate on 2 dimensions (one for story maturity and one for language maturity) in a one-half hour time limit. The time limit was established because McColly (1970) claimed that with increased speed, comes increased validity and reliability.

3. Raters used the form found in Appendix E to record their data.

4. The task was explained to the potential judges using consistent language, which is found in Appendix C.
CHAPTER IV

RESULTS

This study was designed to test two major questions about the observed changes in story maturity and language maturity for students with varying degrees of hearing loss and varying educational placements. The first question addressed the basic issue of whether change could be detected over time in the story and language maturity ratings for the total group. The second question addressed potential effects of important subject variables. These included:

1. Grade level in school, with two levels:
   a. early grades (2nd through 6th) \( (n = 5) \), and
   b. later grades (7th through 12th) \( (n = 16) \);

2. Degree of hearing loss, with three levels:
   a. mild-moderate \( (n = 6) \),
   b. severe \( (n = 10) \), and
   c. profound \( (n = 5) \);

3. Educational placement, with 2 levels:
   a. largely self-contained special education (1.0 full time equivalent (FTE) to 0.7 FTE) \( (n = 10) \),
   b. largely mainstreamed (0.6 FTE through 0.0 FTE in special education) \( (n = 11) \).
The results of the study are discussed below in two sections. The first presents descriptive statistics and data analysis results regarding the question about basic change. The second presents results regarding the influences of the other subject variables (grade level in school, degree of hearing loss, and educational placement) on the observed changes.

Change in Story and Language Maturity Over Time

Since the judges were not given a standard scale to work with in order to avoid a ceiling or basement effect on their ratings, the ratings for "Story Maturity" and "Language Maturity" ranged from a low of .25 to a high of 300. These numbers needed to be adjusted to a standard scale for the purpose of analysis.

The raw data (i.e., the scores entered by the judges) were entered into a computer analysis program where they were statistically adjusted to fit a standardized scale of 1 to 10. Once this was done, the three "Story Maturity" scores for each individual story were averaged to obtain a single rating for each story. The same process was done with the "Language Maturity" ratings for each story.

After receiving the single story scores, all "Story Maturity" scores for a single year were averaged to obtain a group score for the year. The same procedure was completed using the "Language Maturity" scores for each of the years under consideration. The results of this process can be seen in the table and the figure in Appendix F. This Table shows the means of all the scores for the 21 students who wrote three stories over the period of the study (1990 - 1992).
The means and standard deviations for the story scores for the three years were as follows: story one (mean = 3.99; SD = 1.74); story two (mean = 5.11; SD = 2.29); story three (mean = 5.99; SD = 1.85). The means and standard deviations for the language scores for the three years were as follows: story one (mean = 3.74; SD = 2.13); story two (mean = 4.40; SD = 2.23); story three (mean = 5.09; SD = 2.34).

The story maturity scores and language maturity scores were included in two separate multivariate analyses of variance (MANOVAs) using the SPSS-X statistical package for the VAX cluster (Norusis, 1988). In the first MANOVA, story scores for stories one, two, and three were used as the dependent variables for measuring change over time. For testing significance, the Pillai's Trace Statistic was selected as the most robust of several alternatives because the significance level based on it is reasonably correct even when the assumptions are not exactly met (Norusis, 1988). Using this procedure, the null hypothesis of no time effect on story scores was rejected ($F = 10.14, df = 2, p = .002$) in the first MANOVA. In the second MANOVA, language scores for stories one, two, and three were used as the dependent variables for measuring change over time. The results of this analysis showed that the null hypothesis of no time effect on language scores could not be rejected ($F = 1.38, df = 2, p = .285$). These results show that significant change over time did occur for the story scores, but not for language scores.

Pearson correlation coefficients were also computed to examine relationships.
between story scores and language scores. In this analysis, correlations were computed for first story scores, first language scores, last story scores, and difference-scores for first and last stories. Significant positive correlations were found between first story scores and first language scores ($r = 0.82, p = 0.0001$), between first and last story scores ($r = 0.48, p = 0.028$), and between last story scores and story-difference scores ($r = 0.55, p = 0.009$). Significant negative correlations were found between first story scores and story-difference scores ($r = -0.46, p = 0.034$) and first language scores and story-difference scores ($r = -0.43, p = 0.05$), and last story scores and story-difference scores. These negative correlations suggest that lower first story scores and language scores were significantly correlated with greater improvement in story scores over time. Additionally, higher last story scores were significantly correlated with greater change. The only nonsignificant correlation in this analysis was between the first language score and the last story score ($r = 0.34, p = 0.13$).

Influences of Other Variables on Change

The second research question in this study actually consisted of several parts. One of the variables, grade level (early or late), was treated in a separate analysis. The variables of hearing level and educational placement were included in the previously described MANOVA. Effects for each of the variables are considered in separate sections below. Interaction effects are considered in the final subsection.
Grade Level Effects on Change Over Time

Analysis of grade level effects over time was used to answer the research question of whether change in writing ability is greater in the earlier grades than in the later grades. The means and standard deviations for this grouping of the students are found in the figure and graphs in Appendix G. This question was raised because of earlier reports that the writing skills of students with hearing impairments tend to plateau before students reach secondary school.

For this study, students were classified as being in the "lower grades" when they were in grades 2 through 6 (n = 5). They were classified as being in the "upper grades" when they were in grades 7 through 12 (n = 16). To measure change in this analysis, "difference scores" were used. That is, for each student, the first story score was subtracted from the third story to yield a "story difference score." Similarly, the first language score was subtracted from the third language score to yield a "language difference score." This procedure yielded a mean story difference score of 2.17 (SD = 1.62) for the lower grades and a mean story difference score for the upper grades of 1.95 (SD = 1.95).

The t-test on the "story difference scores" resulted in a finding of no significant difference (t = 0.252, p = 0.81) in the amount of change for story score ratings between the lower and upper grades. The mean language difference score for the lower grades was 1.13 (SD = 2.38), and for the upper grades was 1.41 (SD = 2.98). The t-test (for unequal variance) on the "language difference scores"
also showed no significant difference in the degree of change for students in the lower grades when compared with the upper grades ($t = -0.214, p = 0.84$).

As the standard deviations for these difference scores suggest, the degree of change (and even its direction) was highly variable across students. Clearly, however, there was not strong evidence of different patterns of development for the entire group between the lower and upper grades when either story scores or language scores were considered.

**Degree of Hearing Loss Effects on Change Over Time**

Hearing level was included as a between subject grouping variable in the two MANOVAs (one for story scores and one for language scores). The means and standard deviations for this grouping of the students are found in the figures and graphs in Appendix H.

In these analyses, students were categorized in one of three groups, mild-moderate, severe, or profound. The MANOVA for hearing level effect on story scores (repeated measures on stories 1, 2, and 3) showed no significant difference on the basis of hearing level ($F = 1.527; df = 4; p = 0.219$). However, the MANOVA for interaction between hearing level and language scores earned at different times neared significance ($F = 2.591; df = 4; p = 0.056$).

**Educational Placement Effects on Change Over Time**

Educational placement was also included as a subject grouping variable in
the multivariate analyses. The means and standard deviations for this grouping of the students are found on the figure and graphs in Appendix I.

Students were assigned to the "largely self-contained" subgroup if they spent 70 percent (0.7 to 1.0 FTE) of the schoolday or more in a classroom for hearing impaired students during each year of the study (n = 10). Students who spent 60 percent or less of the schoolday in a classroom for hearing impaired students (0.6 to 0.0 FTE) were classified as being "largely mainstreamed" (n = 11). Repeated measures ANOVA showed that educational placement had a significant effect on both story scores (F = 7.39, df = 1, p = 0.015) and language scores (F = 11.34, df = 1, p = 0.004). The MANOVA based on repeated measurement using story scores showed no significant interaction between educational placement and story score earned at a particular point in time (F = 2.618, df = 2, p = 0.108). The MANOVA based on repeated measurement using language scores also showed no significant interaction effect for educational placement and language scores earned at a particular point in time (F = 0.061, df = 2, p = 0.941).

An additional analysis was done on the effect of educational placement on story scores and language scores separately for each of the three years of the study, 1990, 1991, and 1992 (stories 1, 2, and 3) using Duncan's Multiple Range Test. In 1990, the story scores for students who were "largely mainstreamed" had a mean of 4.40 (SD = 1.84); whereas the mean story score for students who were "largely self-contained" was 3.54 (SD = 1.59). These two groups were not significantly different. In 1991, the story scores for students who were "largely main-
streamed" had a mean of 6.34 (SD = 1.99). These story scores were significantly higher than the story scores for the students in the "largely self-contained" group (mean = 3.76, SD = 1.85). In 1992, no significant differences were found for the story scores of the "largely mainstreamed" group (mean = 6.43, SD = 1.88) and the "largely self-contained" group (mean = 5.51, SD = 1.79).

In 1990, no significant differences were found for the language scores of the "largely mainstreamed" (mean = 4.59, SD = 2.30) and "largely self-contained" (mean = 2.82, SD = 1.55) students. In 1991, the language scores for students who were "largely mainstreamed" had a mean of 5.27 (SD = 2.44). These language scores were significantly higher than the language scores for the students in the "largely self-contained" group (mean = 3.45, SD = 1.60). However, in 1992, the language scores for students who were "largely mainstreamed" had a mean of 6.09 (SD = 2.25). These language scores were significantly higher than the language scores for the students in the "largely self-contained" group (mean = 3.98, SD = 1.99).

**Interactions of Hearing Level and Educational Placement Effects on Change Over Time**

A final portion of the analysis of variance that is of interest is the potential for an interaction effect for hearing level and educational placement on story scores and language scores, respectively. The interaction effect was not significant on story scores (F = 2.67, df = 2, p = 0.102), but was significant on language scores.
scores \((F = 5.18, \text{ df} = 2, p = 0.019)\).

Summary of Results

In summary, statistically significant results were found in several areas. Significant change over time was found for story scores, but not language scores. Grade level was found to have no significant effect on change from first to last ratings for either story scores or language scores. Degree of hearing loss had no significant effect on story score or language score change. Educational placement had a significant effect on both story scores and language scores. Finally, no significance was found for the effect of interaction of hearing level and educational placement on story scores but a significant interaction effect was found on language scores. A number of significant correlations were also found among story scores and language scores. What these statistical results do not adequately represent are the individual differences among students. Those are considered in Chapter V.
CHAPTER V

DISCUSSION

This chapter will examine the results presented in the previous chapter. Various group scores as well as individual student's results will be covered. Ideas and suggestions for further research will also be addressed.

The Group as a Whole

As illustrated by the figure and graph in Appendix F, the group as a whole appeared to improve in both story maturity and language maturity over the course of the three stories. This impression, based on graphic representation of means, is supported by the MANOVA for the change in story scores. However a significant main effect for change in language scores was not found by the MANOVA. In other words, even though there appears to be improvement in the graphic representation, it is not statistically significant when considering change in language scores.

The improvement in story maturity scores indicates that the students in this study were increasing their ability to tell a good story. Their stories were of interest to persons who were more mature and experienced. The students were gaining the ability to hold the interest of their audience.

The results of the analysis of the language ratings may reflect increased risk
taking by older students, as noted in the review of the literature (Weaver, 1982). Since the rating was done by senior university students, they may not have taken this element into account when considering the maturity of the language used to write the story.

The Group Classified by Grade Level in School

Examination of the chart and figure in Appendix G will show that a general trend of improvement is evident through grade 11, with a peak at grade 8. The drop at the 12th grade level may be due to the fact that only one student was at that grade level. This impression of a continued general incline in story scores is confirmed by the t-test results which found no significant difference in the degree of change for story and language scores between the lower grades and upper grades. There was not strong evidence of different patterns of development for the entire group between the lower and upper grades when either story scores or language scores were considered. This did not hold true when examining individual students. Thus, with this group of students with hearing impairments, there was no plateauing of skill development for the group, when considering either story scores or language scores, at the third grade level as suggested in earlier reports of the literacy skills for students with hearing impairments.

The Group Classified by Degree of Hearing Impairment

On the charts and figures in Appendix H, it may be noted that the students
with mild-moderate and severe hearing impairments made improvements in both story maturity and language maturity over the course of the three stories. However, the mean scores for both story maturity and language maturity for students with profound hearing impairments actually showed a decrease the third year. In spite of this, the third story ratings remain higher than the first story ratings, indicating an improvement.

The MANOVA confirms the general impression for the story scores only. When the MANOVA for language scores is considered, the impression of improvement does not hold true. Hearing level was found to near a significant interaction with the changes in the language scores of the students in this study. That is, the students with severe hearing losses showed continued positive change over the three year study. Those with mild-moderate and profound losses both showed other patterns of change.

The Group Classified by Educational Placement

Examination of the chart and figures in Appendix I will show that the mean scores for both story ratings and language ratings increased in each of the years of this study. This general impression of positive progress is confirmed by the ANOVA but not confirmed by the MANOVA performed on these data.

The repeated measures ANOVA showed that educational placement had a significant effect on both story scores and language scores. The students who were placed in the "largely mainstreamed" subgroup earned higher scores both for
story maturity and language maturity than did those students who were in the "largely self-contained" subgroup.

In examining the MANOVA for educational placement it is apparent that students in this study made similar progress whether placed in a "largely self-contained" classroom environment or a "largely mainstreamed" classroom environment. The finding of no statistically significant change in story ratings for the stories written by the "largely self-contained" subgroup was matched by the change in story ratings for the stories written by the "largely mainstreamed" subgroup. The same result held true for the language maturity ratings for the stories written by the two subgroups.

The Duncan's Multiple Range Test which was performed on these data revealed that there was no significant difference between the two subgroups in either story scores or language scores in 1990. The "largely mainstreamed" subgroup received significantly higher scores in both story maturity and language maturity than did the "largely self-contained" subgroup in 1991. When the same test was executed on the story scores and language scores for 1992, the result was no significant difference for the story scores and a significant difference for the language scores.

A possible reason for the significant difference in language scores between the two subgroups, found in the ANOVA, may be that the "largely mainstreamed" subgroup was exposed to more English language usage through association with peers who have normal hearing. The teachers of this subgroup may also use a
different teaching method and/or different language in teaching the "largely mainstreamed" subgroup. This speculation was not confirmed but easily could be by classroom observation as well as observation of the interactions between students during nonclassroom activities.

Individual Students

A chart of individual student scores and graphs of those scores may be seen in Appendix J. Examination of these graphs will reveal that some students with a profound hearing loss were able to attain high scores for story maturity and language maturity (e.g., students #10, 14, & 18). Conversely, some students with mild-moderate hearing loss were given low ratings for story maturity and language maturity (e.g., students #4, 7, & 20). However, since a near significant interaction between hearing impairment and repeated measures of language maturity was found, it can be assumed that these individuals are exceptions.

Because the Pearson R showed a significant correlation between first story maturity score and first language maturity score, it is appropriate to conclude that students who started out with low story scores were also likely to have low language scores at first. The significant negative correlations that appeared for both story and language maturity indicates that those students who started out with lower scores for the first story made the most improvement over the period of the study.
Future Research

Since only one story was written each academic year, many factors such as illness, poor attitude, events in personal life, in the student on that particular day, could have a notable effect on the quality of the story written that day. The scores received by any one story may also be an artifact of the physical, mental, and/or emotional state of the raters on the day of the rating process. This effect would be most apparent in looking at individual students since the scores were averaged for group measures. Assessing stories written several times (3-4) during the academic year would be a more accurate measure of the progress being made by individual students.

Future studies would do well to extend the study over more than the 3 years of this study. This would provide sufficient time to confirm or refute the continued progress of students with hearing impairments beyond the third grade level in language development. Also, a larger population of students with hearing impairments might reveal other data which did not appear in this study of a relatively small group.

The holistic method of magnitude estimation would give an indication of the extent to which the student is implementing skills learned in drills and skill sheets. This indication of progress would not be influenced by a ceiling effect since the scale is open ended and the judges could extend their scores as high as necessary to indicate improvement.
All students, whether they have hearing impairments or not, need to be given more practice in written discourse. This discourse needs then to be assessed and critiqued by educators. Rewriting by the student would then help the student to see where the "splinter skills" learned in drills and skill sheets fit into the writing process. Just because a student is able to do well in language drills and on skill sheets does not mean that that same student is able to write a good story. This ability will come through practice (i.e., writing stories).

Just because a student's ears are not functioning as they should does not mean that the brain is deficient. We need to get through to the brain and help the student acquire the skills needed to meet the demands of the academic environment. This can be accomplished, in part, by increased practice in writing.

There is a great need for further study in this area. Educators need a way to better assess and remediate any lack of maturity in the language skills of all students but especially for those students with special needs. Every person deserves to receive the best education he or she is capable of attaining. With better assessment methods and better knowledge of potentials of students, the educator can better meet the needs of special students and help them reach their highest potential.

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Appendix A

Transcription Reliability
## Transcription Reliability

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<tr>
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The Fourth of July

On the fourth of July my grandpa B__, and my sisters came over to my house. Then at night we all lit firecrackers, bottle rocket and other stuff. We had a war with some kids down the street, my grandma watched us and my baby sister did too. After that we went into my friends yard and lit some sparklers. At 12:00 I went in the house.

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We Went to Florida

Last summer, I went to Disneyworld with my family. We stayed at a big hotel with three pools. It was a big trip and a lot of fun. First day we went to MGM Studios. Then a second day we went to Universal Studios. There was a whole bunch of 3-D things and the King Kong one scared me. We did more stuff then came home after 10 days. I had a lot of fun.
When I was a little boy 6 year old

I got lost at South Bend church so my mom found my footprint trail so, my mom follow my footprint and she almost found me and I walked and I stop and I heard mom is calling at me. The wind blew at me and I fell down and I cried and my mom found me. My mom told me that stay inside and do not leave that church.
"My name is Lois Ketchum. I'm a graduate student in the Speech Pathology and Audiology Department on East Campus. I am asking you today to help me in my master's thesis work. I have packets of stories that were written by hearing impaired students ranging from second to twelfth grade.

"Your name will not be used in any way in the writing of my thesis. You will receive a packet containing stories, a score sheet, and an information sheet. The information sheet is on top. The first thing I would like you to do is fill out the information sheet. Your name is not asked for, the only information requested is background information so I can indicate the type of individuals who did the rating on the stories."

The packets were passed out at this time and 3 to 4 minutes were allowed for students to fill out the information sheet. [A copy of the information sheet can be found in Appendix D.]

"Your task is to read one story at a time and then assign 2 ratings for each story. Please look at the second sheet in the packet [Appendix E]. This is the score sheet where you will be recording your scores.

"Each story has a story number at the top. The first thing you are to do is record the story number in the column provided.

"Next, read the first story. Considering this story as a whole, give the story a numerical rating for the overall maturity of the story itself. The question you
are answering here is, 'How well did this person tell the story?' 'Is it a good story?' This number is to be recorded in the column headed 'Story Maturity Rating.' You pick the number to stand for this rating. It can be any number you wish.

"Again, taking that same story as a whole into consideration, think about the language that was used to tell the story. How mature was that language? Give that a number, put it in the column marked 'Language Maturity Rating.' Here again you may use any number you choose. There is a fourth column on the sheet, ignore that, it is for my use later.

"When you have finished with the first story, put it aside, don't look at it again. Read the second story. Think of the second story in relation to the way you rated the first story. If you feel this story is twice as mature, take the rating you gave the first one and double it. If you feel it is only half as mature, take the rating you gave the first one and divide it in half. Do the same with language. Put that story aside.

"Read the third story. Think about the rating you gave the second story. If you think the third story is twice as mature, double the rating you gave the second story. If it's half as mature as the second story, put half the rating of the second story, or 1/3, or 1/4, or 3 times, or 4 times as mature.

"Do not try to compare all the stories with the first story. Compare each story to the one read just previously. Make the ratings in accordance with your feelings about the story. This is a purely subjective rating. There is no particular
scale that I want you to use. You pick the numbers you use. If you like big numbers, use big numbers. If you like smaller numbers, use smaller numbers. It's entirely up to you.

"The reason I am not giving you a specific scale to use is so that you have the freedom to place the stories at any level you wish and are not restricted in your rating. As an example, let's assume that I told you to use a scale from 1 to 10. You read the first story and feel it is a good story and give it a rating of 8. After reading the other stories, you discover that the first one was really the worst of the bunch. You have no place to put the rest of the stories because you have given a high rating to the first one. The same holds true for the lower end of the scale. With the method I am asking you to use, you have room to move ratings up and down as much as you feel necessary.

"Because some of these stories contain very sensitive information, please DO NOT discuss them with anyone.

"You will have one half hour to read the stories. Do not rush but don't spend a great deal of time on any one story.

"When you have completed all of the stories, return the paper clip to the top of the packet and turn it in.

"Are there any questions?

"I wish to thank you for your assistance in this project. You may begin."
Appendix D
Rater Demographics
BACKGROUND INFORMATION SHEET

Rater Id #________

Class Standing Fr. So. Jr. Sr. Gr.

Age Group 18-29 30-39 40-49 50+ Male ___ Female ___

Current Job (if any)__________________________

Recent courses in English Lit, Writing, Teaching (last 2 years)__________________________

Experience with Children

Tutoring ___ Babysitting ___
Teaching ___ Parenting ___
Other ___

I. Read first story
   A. Record "Story Number"
   B. Record "Story Maturity Rating"
      1. How well does this person tell the story?
      2. Is it a good story?
   C. Record "Language Maturity Rating"
      1. How good is the language used to tell the story?

II. Read second story
   A. Repeat above procedure

III. Read third story
   A. Repeat above procedure, etc.

IV. Record reactions on back of score sheet

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### Rater Demographics

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<td>Male</td>
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<td><strong>Age Group</strong></td>
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</tr>
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</tr>
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<td><strong>Experience with Children</strong></td>
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<tr>
<td>Other experience</td>
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Appendix E

Data Collection Form
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<th>Language Maturity Rating</th>
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Appendix F

The Group as a Whole
## Group Totals

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<td>Story #3</td>
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THE GROUP AS A WHOLE

NORMALIZED STORY AND LANGUAGE MATURITY SCORES

= Story Maturity Mean
= Language Maturity Mean

Story #1 1990
Story #2 1991
Story #3 1992

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Appendix G

The Group by Grade Level in School
Appendix H

The Group by Hearing Levels
### Story Maturity Scores by Hearing Level

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<th>Story #3</th>
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<td>SD</td>
<td>Mean</td>
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<td>Mean</td>
<td>SD</td>
<td>Mean</td>
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<td></td>
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### Language Maturity Scores by Hearing Level

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MILD-MODERATE HEARING LOSS (N = 6)

Normalized Story and Language Maturity Scores

- = Story Maturity Mean
- - = Language Maturity Mean

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SEVERE HEARING LOSS (N = 10)

NORMALIZED STORY AND LANGUAGE MATURITY SCORES

--- = Story Maturity Mean
----- = Language Maturity Mean

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NORMALIZED STORY AND LANGUAGE MATURITY SCORES

PROFOUND HEARING LOSS (N = 5)

Story Maturity Mean

Story Language Maturity Mean

Story #1 1990
Story #2 1991
Story #3 1992

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Appendix I

The Group by Educational Placement
The Group by Educational Placement

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<th>Story Maturity</th>
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EP1 = "largely self-contained" subgroup
EP2 = "largely mainstreamed" subgroup
EP1 - LARGELY MAINSTREAMED STUDENTS

NORMALIZED STORY AND LANGUAGE MATURITY SCORES

--- = Story Maturity Mean
----- = Language Maturity Mean

Story Maturity Mean
Language Maturity Mean

Story #1 1990
Story #2 1991
Story #3 1992

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EP2 - LARGELY SELF-CONTAINED STUDENTS

NORMALIZED STORY AND LANGUAGE MATURITY SCORES

--- = Story Maturity Mean
----- = Language Maturity Mean

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Story #2
1991

Story #3
1992

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Appendix J

Individual Data
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**Hearing Loss Levels**

1 = mild-moderate Placement
2 = severe 1 = 1.0 - 0.7
3 = profound 2 = 0.6 - 0.0

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### Individual Scores

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</table>

SM = Story Maturity Score  
LM = Language Maturity Score
Student 1

This student has a profound bilateral sensorineural hearing loss with somewhat better hearing for the left ear.
Student 2

This student has a profound bilateral sensorineural hearing loss.
Student 3

No unaided results are available for this student. Assume at least severe to profound loss bilaterally since this student has a cochlear implant. Binaural aided thresholds fall into the mild to moderate range of loss.
Student 4

This student has a mild to moderate severe sensorineural loss for the right ear and a severe loss for the left ear.
Student 5

This student has mild to severe high frequency bilateral sensorineural hearing loss.
Student 6

One threshold obtained for the right ear was in the severe range of loss at 250 Hz with no response at any other frequency tested at the intensity limits of the audiometer. For the left ear, testing revealed a mild loss at 250 Hz, precipitously sloping to severe loss at 500 Hz and to profound loss for the higher frequencies at and above 1000Hz.
Student 7

This student has normal hearing through 1 kHz to moderate severe (1.5 kHz) to profound (4 kHz) bilateral sensorineural hearing loss.
Student 8

This student has mild to moderate sensorineural loss for the right ear with a moderate loss for the left ear.
This student has a severe to profound saucer shaped sensorineural hearing loss.
Student 10

This student has a profound bilateral sensorineural hearing loss.
Student 11

This student has a profound bilateral sensorineural hearing loss with better hearing for the right ear.
Student 12

This student has a mild to severe (1 kHz) sensorineural hearing loss with somewhat better hearing for the left ear.
Student 13

This student has a moderately-severe to severe loss for the left ear in lower frequencies (250-500 Hz) and profound loss in the higher frequencies (1000-2000 Hz); severe to profound loss in the right ear for lower frequencies sloping to profound loss in the middle frequencies (1000-2000 Hz) and rising to severe loss in the higher frequencies (4000-8000 Hz).
Student 14

This student has a severe to profound bilateral sensorineural hearing loss.
Student 15

This student has a severe sensorineural loss for the right ear and a severe to profound loss for the left ear.
This student has a moderately severe to severe sensorineural hearing loss for the right ear.
Student 17

This student has a severe to profound loss bilaterally with somewhat better hearing for the left ear.
This student has a severe to profound bilateral sensorineural hearing loss.
Student 19

This student has a moderately severe to profound sensorineural hearing loss bilaterally with somewhat better hearing for the right ear.
This student has a mild bilateral sensorineural hearing loss.
Student 21

This student has a moderate to moderately severe reverse curve sensorineural hearing loss bilaterally.
Appendix K

Research Protocol Clearance
Date: September 10, 1992

To: Lois A. Ketchum

From: Mary Anne Bunda, Chair

Re: HSIRB Project Number 92-05-10

This letter will serve as confirmation that your research protocol, "Maturity of Story Writing Among Hearing Impaired Students" has been approved after expedited review by a subcommittee of the HSIRB. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the approval application.

You must seek reapproval for any change in this design. You must also seek reapproval if the project extends beyond the termination date.

The Board wishes you success in the pursuit of your research goals.

xc: Nelson, Speech Pathology

Approval Termination: September 10, 1993
BIBLIOGRAPHY


