

2007

Determining the efficacy of summer school on maintaining hearing-impaired children's language levels

Paula Anne Mathias

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**DETERMINING THE EFFICACY OF SUMMER SCHOOL ON
MAINTAINING HEARING-IMPAIRED CHILDREN'S LANGUAGE
LEVELS**

by

Paula Anne Mathias

**An Independent Study submitted in partial fulfillment of the requirements for
the degree of:**

Master of Science in Deaf Education

**Washington University School of Medicine Program in Audiology and
Communication Sciences**

May 18, 2007

Approved by:

Lynda Berkowitz, M.S., CED, Independent Study Advisor

***Abstract: This paper discusses the process of determining the efficacy of
summer school on maintaining Hearing-Impaired children's language levels.***

Table of Contents

| | |
|--|----|
| • Introduction | 1 |
| • Literature Review | 4 |
| • Methods | 8 |
| • Results | 11 |
| • Conclusion | 13 |
| • Recommendations | 16 |
| • References | 17 |
| • Appendix A- Permission slip | 18 |
| • Appendix B- Children's scores on language measures | 20 |
| • Appendix C- Difference Score graphs | 24 |
| • Appendix D- Average Difference Score graphs | 27 |
| • Appendix E- Raw score graphs | 31 |

Introduction

Student achievements seem to be effected by the school calendar. Studies have shown that over summer break, student achievement test scores dropped. “Also, based primarily on the existence of learning decay over the summer, court decisions have required school districts to provide summer educational opportunities for students with disabilities.” (Public 1991 Law 89-10; see Katsiyannis).

The focus of the present study was to determine the efficacy of summer school on maintaining deaf and hearing-impaired children’s language levels. I have spent two summers teaching children at the Central Institute for the Deaf during summer school, and observed that these services were beneficial to these children. However, a review of the literature showed that historically, parents had to fight for their child’s right to attend summer school programs because school personnel viewed this as an inappropriate service for the child. (Etscheidt, 2002) Extended School Year Services (ESYS) eligibility was reviewed as well, and it was found that regression/recoupment is the most commonly used standard in determining the appropriateness of ESYS. (Etscheidt, 2002) If over a break (spring vacation), a child’s skills regress and it takes a considerable amount of time to regain (recoup) them back, they are eligible for summer school services. AT CID, all children are eligible for ESYS services, however, I wanted to investigate the effect of summer school services on hearing-impaired children’s language levels.

The effects of modified school calendars on student achievement was discussed in the Review of Educational Research, Spring 2003 issue, Volume 73, No. 1 pages 1-52. In this article, it was stated, “the long summer break can have a greater negative effect on the learning of children with special needs. For example, students who speak a language other than English

at home may have their acquisition of English language skills set back by an extended period without using them.” (Pg. 5) This fact made me curious about deaf and hearing-impaired children who do not acquire language naturally and thus have to be taught it in a more structured way. I therefore asked the question, “ What effect would an extended period without intensive language instruction have on hearing-impaired children’s language levels?”

Not attending summer school has historically led to a regression of academic skills in children with various disabilities. (Etscheidt, 2002) Little research has been conducted in the area of the effects of ESYS on maintaining deaf and hearing-impaired children’s language levels. However, I believe that in the absence of intensive language instruction over the summer, deaf and hearing-impaired children’s language levels will decrease. For deaf and hearing-impaired children who attend a summer school program, I believe they will maintain their language levels.

To begin my study, I researched ESYS eligibility requirements as well as educational law (Individuals with Disabilities Education Act). I wrote a literature review that stemmed from my research and began to determine how I would conduct my study. Before testing, 20 permission slips were sent home with children who attended the Central Institute for the Deaf (CID), regardless of whether or not they would be going to summer school. Please see Appendix A for a copy of the permission slip. Nine parents gave permission for their child to be included in the study. Four of the nine children would not be attending summer school, whereas 5 would. One child was unable to be retested after summer school, therefore 8 children were included in the final study; 3 did not attend summer school and 5 did. Then, I collected language samples from these students. For this test, I utilized the Strong Narrative Assessment Procedure (SNAP), which required the children to look at pictures in a book and retell a story while I recorded what they said for later transcription. Their transcripts were analyzed using the Systematic Analysis

of Language Transcripts (SALT) Program. The children were tested before and after summer school to determine the efficacy of summer school on maintaining their language levels.

Literature Review

In 1975, Congress passed the Individuals with Disabilities Education Act (IDEA). This law gave children with disabilities the right to a free and appropriate education (FAPE) in the least restrictive environment (LRE). “Missouri House Bill 474 and later legislation make it the law of the state to provide special education services sufficient to meet the needs of all children with eligible disabilities, from the child’s third birthday to age twenty-one, at no cost to the parent.” (Missouri Department of Elementary and Secondary Education, 2002)

IDEA Part B and the Missouri state plan include children with deafness or hearing-impairment as eligible for special education services. The Parent’s Guide to Special Education in Missouri defines hearing-impairment as, “an impairment in hearing, whether permanent, or fluctuating, that adversely affects a child’s educational performance, but is not included in the following definition for deafness. Deafness means a hearing-impairment that is so severe that the child is impaired in processing linguistic information through hearing, with or without amplification, adversely affecting a child’s educational performance.” (Pg. 35) All of the children who attend the Central Institute for the Deaf are either deaf or hearing-impaired and are thus eligible for special education services in Missouri. The types of services each child will receive is determined by the child’s Individualized Education Program (IEP) team. This team may include parents of the child, the child’s regular education teacher, the child’s special education teacher, a School district representative, as well as any other professional who may be integral in the child’s educational success (Audiologist, Speech-Language Pathologist, Occupational Therapist, Physical Therapist, etc). These individuals meet to develop an IEP for the child that will include the following components:

1. Present level of performance of the child
2. Measurable annual goals including benchmarks or short term objectives
3. Special education, related services, supplementary aids, program modifications, and/or supports that school personnel will provide for your child
4. Participation in state and district-wide assessments
5. Initiation, duration, frequency and location of services and modifications
6. Procedures for evaluating progress and reporting to parents
7. Transition services
8. Transfer of rights
9. Assistive Technology
10. Behavior intervention plan
11. Extended School Year
12. Participation in regular education and placement (LRE)

(Missouri Department of Elementary and Secondary Education, 2002)

The legal basis for ESYS comes from the free and appropriate education for students with disabilities standard established by IDEA. A 1982 Supreme Court Decision stated that FAPE should “consist of access to specialized instruction and related services which are individually designed to provide educational benefit to the handicapped child.” (Etscheidt, 2002) However, these services did not have to be the best, as long as they were “appropriate.” Determining the appropriateness of ESYS has been a battle over the years. Several parents have gone to court to try to win the right for their child to be provided ESYS. The regression/recoupment standard has been an important factor in various cases for determining ESYS eligibility. Under the regression/recoupment standard, if a child’s skills were lost (regressed) over a break and took

substantial time to recoup, they were entitled to ESYS. However, they would be denied these services if they maintained their skills over a break or if they regained those skills quickly after the break. According to Julie Ann Bower, Supervisor of Special Education Compliance for the Missouri Department of Elementary and Secondary Education, there is no standard for the length of time required to recoup skills in order to qualify for ESYS services. She further explained that the requirement is based on an IEP team decision. Under this standard, ESYS eligibility had to be proven empirically by data showing children regressed without summer school. This posed a dilemma for parents “by forcing them to allow their child to regress without summer services to prove ESYS eligibility.” (Etscheidt, 2002, p. 189) Based on this dilemma, the Third Circuit Court denied the empirical data requirement. “Instead, where empirical data are not available, the need for Extended School Year Services could be proved by expert opinion based upon a professional individual assessment.” (Etscheidt, 2002 p. 189)

When IDEA was reauthorized in 1997, the Department of Education “declined to establish standards for ESYS eligibility.” (Federal Register, 1999 p. 12576) Therefore, it became each individual state’s job to determine extended school year eligibility. ESYS policies and practices were found to be variable at the local level. A Rapport and Thomas legal analysis (1993) stated that “regression/recoupment have demanded considerable attention from the judicial system when determining a child’s need for ESYS.”

The Missouri Department of Elementary and Secondary Education Division of Special Education discussed recommendations for ESYS policies.

“ESYS may be necessary to provide a particular student a FAPE as required by P.L. 94-142.” The document further stated that “ESYS be addressed in Individualized Education Programs

(IEPs) by the IEP team, in the same manner as are all other programming needs. ESYS is not a supplemental or related service, but an integral part of the student's IEP.”

In addition, the seminal extended school year case in Missouri, in *Yaris vs. Special School District 545* (E.D. MO 1983) was explained. This case determined that children with disabilities should not be limited to a typical school calendar of 180 days, and therefore regression/recoupment should be used to consider the appropriateness of ESYS. (Missouri Department of Elementary and Secondary Education, 1999)

Method

Participants:

This study included 8 hearing-impaired students ages 3:11- 9:6 years who were orally educated at the Central Institute for the Deaf in St. Louis, Missouri. Children in the study utilized hearing aids and/or cochlear implants to gain access to auditory information. The primary language of all participants was English. Three of the eight students did not attend summer school, whereas five did. All of the students were female. The length of time participants received services from CID ranged from 4 months to 9 years. Students' language abilities ranged from using primarily two word combinations to speaking in complex sentences of six or more words.

Procedures:

Although language sample analysis is more time consuming than scoring a standardized test, according to Rhea Paul, author of Language Disorders, Infancy through Adolescence, "it provides much richer and more valid information about children's language." (Pg. 319) Therefore, for this study, children's language samples were analyzed. Children were tested before summer break, on May 18, 2006. They were retested after summer break on August 22, 2006. Before and after summer school, children were tested using the Strong Narrative Assessment Procedure (SNAP), developed by Carol J. Strong, EdD. The SNAP materials are designed for individual assessment, with the child listening to a tape-recorded story and looking at one of four wordless storybooks:

Frog Goes to Dinner (1974) by Mercer Mayer

A Boy, a Dog, and a Frog (1967) by Mercer Mayer

Frog, Where Are You? (1969) by Mercer Mayer

One Frog Too Many (1975) by Mercer and Marianna Mayer

These books are similar in length, number of main characters, and theme (a boy's adventures with a frog). Their pictured stories are based on scripts that are likely familiar to school-aged students (going to dinner, finding a pet, losing a pet, expressing anger or jealousy toward a sibling). (Carol J. Strong, Ed. D.) The story presented to the students before summer school was, Frog Where Are You? After summer school, students listened to the story, One Frog Too Many.

After listening to the story, the children were required to retell it to a naïve listener (one who had not shared the story with the child previously). Each child was prompted to say more using one or all of the following five generic phrases:

- 1) Can you tell me the story?
- 2) Tell me what is happening.
- 3) Uh-oh, what is wrong?
- 4) What are they doing?
- 5) Can you tell me more?

The students were allowed to refer to the pictures in the storybook to assist with their retelling.

Transcribing:

Children's retellings were audio recorded for accurate transcription. Making use of computer-assisted approaches can increase the efficiency of language sample analysis (Rhea Paul, Pg. 319), therefore, for this study, language samples were analyzed using the Systematic Analysis of Language Transcripts (SALT; Miller and Chapman, 1998) Program. The children's

language samples were typed into the computer following the SALT transcript entry conventions. Examples of such conventions include:

- 1) Marking bound morphemes and verb tenses by using a diagonal slash before the bound morpheme or verb tense: look/ing
- 2) Marking unintelligible utterances using an uppercase X. One X signifies the child said one utterance, two signified more than one utterance, and three signified an utterance similar in duration to a sentence: XXX there was the doggy.
- 3) Marking when the child says an incorrect word as follows: Because he fall [EW: fell] in the water.
- 4) Marking omissions of words and/or bound morphemes or verb tenses by placing an asterix before the omission: Shh *be quiet. He want/*ed to put it XXX.

After the language samples were typed into the computer, they were analyzed in comparison to similar transcripts selected from the reference database. The following measures were obtained from the language analysis:

- 1) The mean length of utterance (MLU), which is the child's average sentence length and is a useful way to chart syntax growth.
- 2) The type token ratio (TTR), which is a measure that indicates the variety of words the child used (lexical diversity).
- 3) Number of omitted bound morphemes. A bound morpheme is a morpheme that occurs only bound to other morphemes; it cannot stand alone and has no meaning by itself (ex: the s in dogs).
- 4) Number of omitted words.
- 5) Percentage of intelligibility that rated how intelligible each child's utterances were.

Results:

Three methods of interpreting the data were used:

- 1) Difference scores
- 2) Average difference scores
- 3) Raw data

Difference Scoring:

In order to index improvement, difference scores were computed for each language measure. Difference scores were computed by subtracting before and after summer school scores in order to determine a change in the data.

Positive difference scores were indicative of improved performance for the following measures: MLU, TTR, and Percent Intelligibility. Ideally, children who attended summer school should have the same or an increased MLU, TTR, and Intelligibility score after summer school. In this instance, before scores were subtracted from after scores.

Negative difference scores were indicative of improvement for the following measures: number of omitted bound morphemes, and number of omitted words. A decrease in these measures meant improved performance. Ideally, the children who went to summer school should produce fewer omissions after summer school. In this instance, after scores were subtracted from before scores. Please see Appendix C for examples of difference score graphs for each language measure.

Average Difference Scores:

Due to the small number of subjects, difference scores were averaged to determine if there was an overall increase or decrease in the measures obtained from the transcript analysis. On average, the children who went to summer school had an increased MLU length of .6, meaning that their sentence length improved by .6. The children who did not go to summer school had an increased MLU length of .3 meaning that their sentence length also improved. For TTR measures, children who went to summer school decreased by .1, meaning that there was a decrease in the different types of words used before and after summer school. Children who did not attend summer school decreased by .1 as well. Children who went to summer school had an average of 1.4 fewer bound morpheme omissions after summer school. Children who did not go to summer school did not show any average differences in the number of omitted bound morphemes before or after summer school. The average number of omitted words for children who went to summer school decreased by 4, while the average number of omitted words for children who did not attend summer school increased by 4.3. On average, children who went to summer school had an improved intelligibility score of 16.6%, whereas children who did not go to summer school improved intelligibility by 3.7%. Please see Appendix D for average difference score graphs.

Raw Scores

Due to the large standard deviation, individual data (children's raw scores) will be discussed in the latter section. Children's raw scores are simply the true score they received on each language measure based on the SALT transcript analysis. Please see Appendix E for raw score graphs. (For a complete copy of all other raw scores, please contact the author of the study.)

Conclusions:

Results found previously in the Review of Educational Research may require large numbers of participants to replicate. The aforementioned review found that “the long summer break can have a greater negative effect on the learning of children with special needs. For example, students who speak a language other than English at home may have their acquisition of English language skills set back by an extended period without using them.” (p. 5)

I believed that in the absence of intensive language instruction over the summer, deaf and hearing-impaired children’s language levels would decrease. I also felt that deaf and hearing-impaired children who attended a summer school program would maintain their language levels.

The results from the present study should be interpreted with caution due to the low number of subjects. Although on most measures, children who went to summer school improved more than those who did not, the low number of participants in this study precludes any application of statistical analyses to these measures. Therefore, from this study alone, one is unable to determine the efficacy of summer school on maintaining hearing-impaired children’s language levels.

Although my hypothesis was not supported statistically from the present study, a look at individual subject’s scores shows some interesting findings.

The average number of omitted words for children who went to summer school decreased by 4, while the average number of omitted words for children who did not attend summer school increased by 4.3. This suggests that children who attended summer school had fewer word omissions after summer, while children who did not attend summer school had an

increase in word omissions after the summer break. This may mean that summer school attendance, or lack thereof has an effect on number of omitted words.

In the area of intelligibility, all children who attended summer school were more intelligible after summer school. Interestingly, subject 2, who did not attend summer school also seemed to have improved intelligibility. Another child who did not attend summer school (subject 1) did not show a difference in intelligibility after summer school, and another's intelligibility (subject 3) seemed to decrease significantly. This raises some questions. First, why did one of the three children who did not attend summer school improve her intelligibility at the beginning of the school year? This could be answered in various ways. Perhaps socioeconomic status played a role in improvement. Better socioeconomic status may afford the child with more opportunities to engage in language rich activities during the summer including trips to the zoo, vacations to the beach, attending book readings, etc.... Other factors that could have played a role include cognitive ability, auditory skills, ability to learn language incidentally, and family support. It should be noted that this same child had improvements in other language measures at the beginning of the school year as well (increased MLU and fewer omitted words). In fact, the only measure that seemed to show a regression was the child's TTR measure, indicating that the child's vocabulary may have decreased over the summer break. For this particular child, it seems not attending summer school had little negative effect on maintaining her language levels.

Does this mean that summer school is not an important aspect of a deaf or hearing-impaired child's education? I think that depends on the individual child, as is evident in the variability in language measures of the subjects in the present study. I certainly do not believe that summer school would be a detriment to any child's education, however,

probably for most children, a lack of these services would be. Perhaps subject 2 in this study would have shown even greater improvement had she attended the summer school program.

It is also interesting to note that the other two children who did not attend summer school both seemed to have a decrease in their MLU scores at the beginning of the new school year. This may indicate differences in cognitive abilities, socioeconomic background, family support, auditory skills, or other factors. Perhaps they would have benefited from a summer school program.

Because of the multiple variables that could contribute to maintenance or regression of language skills, it is difficult to control this study in such a way to prove that ESYS is the sole reason for such maintenance or regression. However, as a summer school employee at CID, I have observed that these services seem beneficial to the children who were receiving them. I would suggest that the use of regression/recoupment as the sole standard for determining ESYS eligibility might hinder some children's abilities to maintain or improve their speech and language levels.

Recommendations:

Suggestions for future study include using a larger number of subjects in each category. In addition, subjects should be homogenous in terms of age to ensure that different levels of maturation and learning do not affect outcome measures. Experimental conditions should be controlled as much as possible. Such conditions could include type of device, length of device wearing, age at onset of loss, socioeconomic status, gender, age, language levels, and cognitive ability.

References

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Systematic Analysis of Language Transcripts (SALT), for Windows English & Spanish Research, V9, Copyright 1984-2006 Language Analysis Lab.

Appendix A

Dear Parents,

My name is Paula Mathias, and I am a Graduate student in the Program in Audiology and Communication Sciences at Washington University School of Medicine in St. Louis. As part of my degree requirements, I am currently working on an independent study to determine the effectiveness of summer school on maintaining children's current language levels. In order to conduct this study, I will be collecting language samples from students at CID who will and will not be attending summer school. This testing procedure will require your child to look at pictures in a book and tell a story while I record what they say. The participant's names and any other identifying information will be kept confidential. This study will be conducted during school hours; however, your child will not miss any important class time. I will test your child within the next two weeks and then once again in the fall during the first week of school. I would greatly appreciate your consent for your child to participate in this study. Please fill out the bottom portion of this form and return it to your child's classroom teacher as soon as possible. Thank you so much for your time and consideration.

Sincerely,

Paula Mathias

Lynda Berkowitz, MS, CED, Independent Study Advisor

Child's name: _____

Parent/Legal Guardian Name: _____

_____ Yes, I will allow my child to participate in this study

Signature: _____

Appendix B

Children's scores on Language Measures

Did Not Go to Summer School

| Subject 1 | Before summer measure | After summer measure |
|----------------------------------|------------------------------|-----------------------------|
| MLU | 4.4 | 4.1 |
| TTR | .38 | .41 |
| # Omitted bound morphemes | 2 | 2 |
| # Omitted words | 18 | 13 |
| % Intelligibility | 66% | 66% |

| Subject 2 | Before summer measure | After summer measure |
|----------------------------------|------------------------------|-----------------------------|
| MLU | 3 | 4.65 |
| TTR | .61 | .25 |
| # Omitted bound morphemes | 0 | 0 |
| # Omitted words | 9 | 7 |
| % Intelligibility | 67% | 95% |

| Subject 3 | Before summer measure | After summer measure |
|----------------------------------|------------------------------|-----------------------------|
| MLU | 3.8 | 3.4 |
| TTR | .55 | .65 |
| # Omitted bound morphemes | 0 | 0 |
| # Omitted words | 13 | 1 |
| % Intelligibility | 71% | 32% |

Went to Summer School

| Subject 4 | Before summer measure | After summer measure |
|----------------------------------|------------------------------|-----------------------------|
| MLU | 6.24 | 7 |
| TTR | .42 | .4 |
| # Omitted bound morphemes | 3 | 3 |
| # Omitted words | 5 | 9 |
| % Intelligibility | 61% | 90% |

| Subject 5 | Before summer measure | After summer measure |
|----------------------------------|------------------------------|-----------------------------|
| MLU | 7.3 | 6.35 |
| TTR | .46 | .34 |
| # Omitted bound morphemes | 6 | 4 |
| # Omitted words | 5 | 3 |
| % Intelligibility | 57% | 90% |

| Subject 6 | Before summer measure | After summer measure |
|----------------------------------|------------------------------|-----------------------------|
| MLU | 9.9 | 11.73 |
| TTR | .4 | .4 |
| # Omitted bound morphemes | 0 | 1 |
| # Omitted words | 1 | 0 |
| % Intelligibility | 87% | 100% |

| Subject 7 | Before summer measure | After summer measure |
|----------------------------------|------------------------------|-----------------------------|
| MLU | 2 | 2.58 |
| TTR | .77 | .55 |
| # Omitted bound morphemes | 0 | 0 |
| # Omitted words | 6 | 12 |
| % Intelligibility | 57% | 44% |

| Subject 8 | Before summer measure | After summer measure |
|----------------------------------|------------------------------|-----------------------------|
| MLU | 6.52 | 7.15 |
| TTR | .29 | .33 |
| # Omitted bound morphemes | 0 | 8 |
| # Omitted words | 4 | 17 |
| % Intelligibility | 94% | 96% |

Appendix C

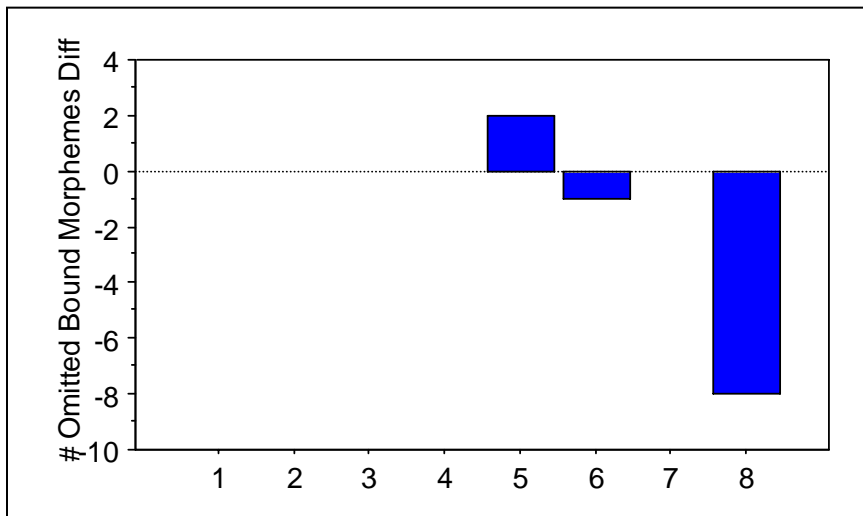
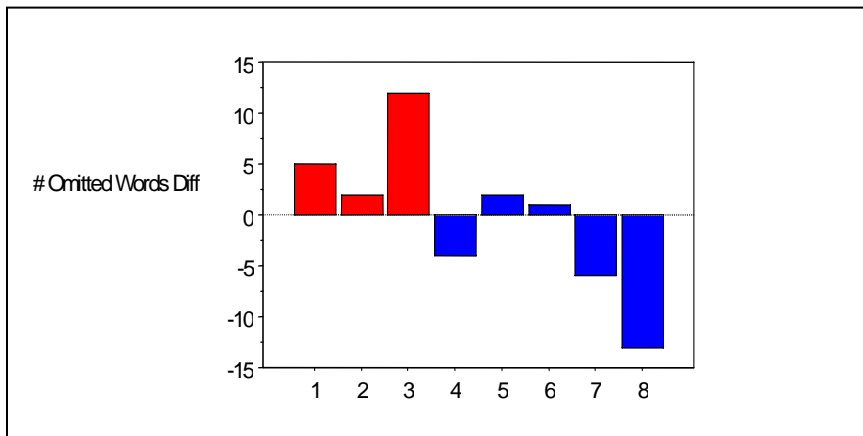
Difference Score Graphs for Language Measures:

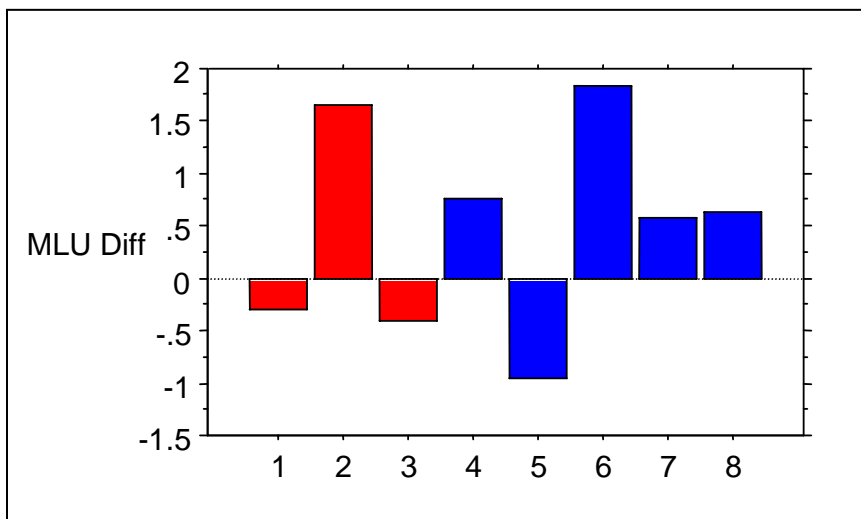
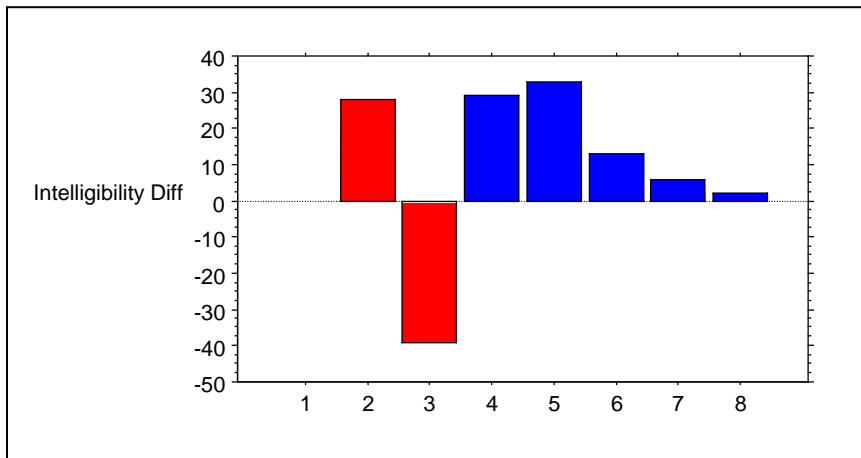
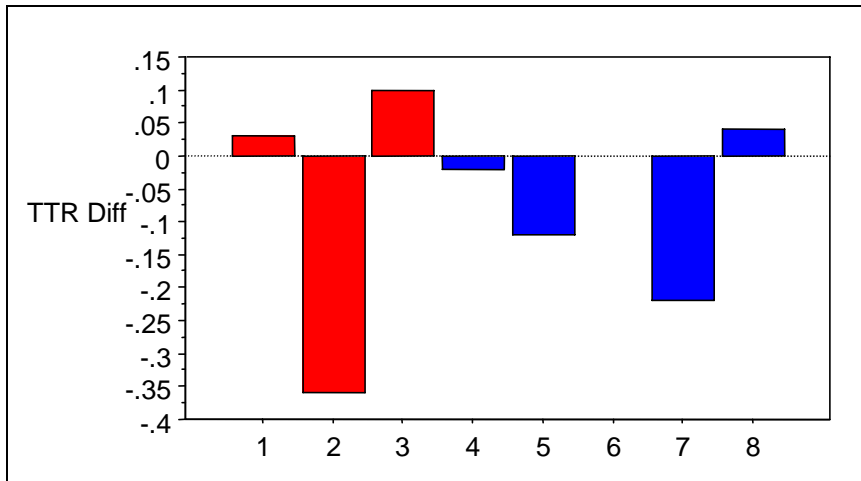
For all difference graphs, red colored bars represent those students who did not attend summer school, while blue bars represent those students who did attend summer school.

Bars below zero indicate a regression in the language measure after the summer break.

Bars above zero indicate an improvement in the language measure after the summer break.

The absence of a bar indicates that the child’s language measure was maintained, that is, it did not get better or worse, but stayed the same.

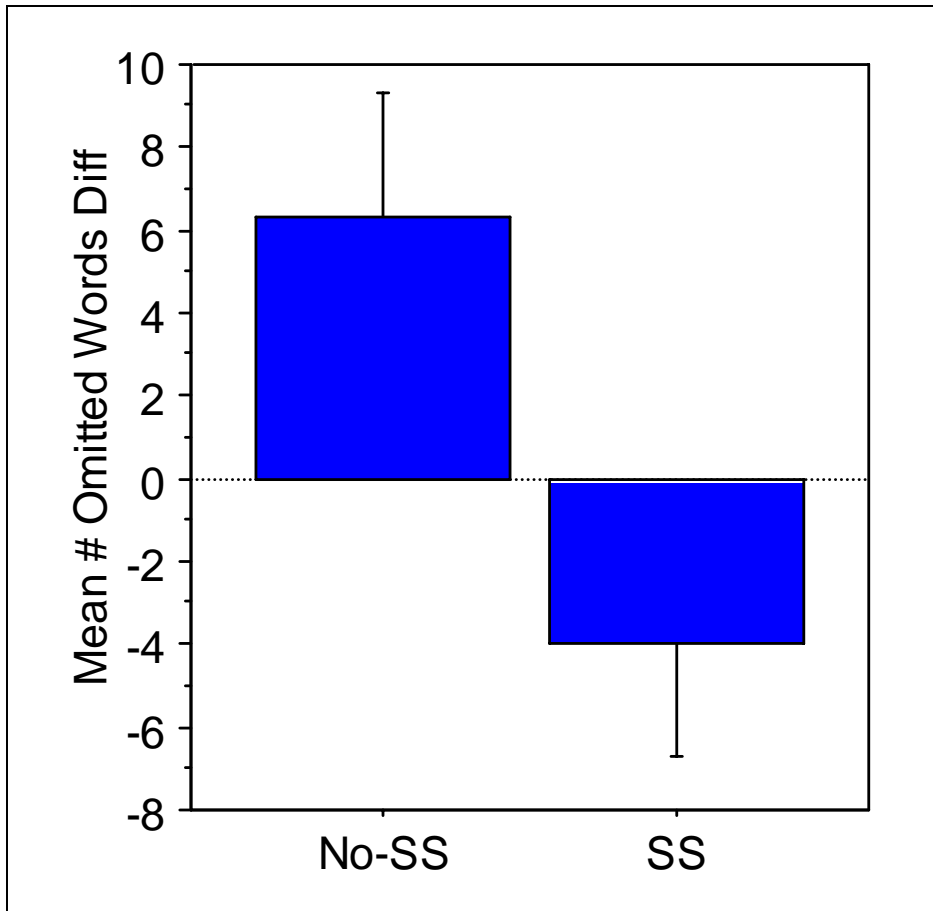


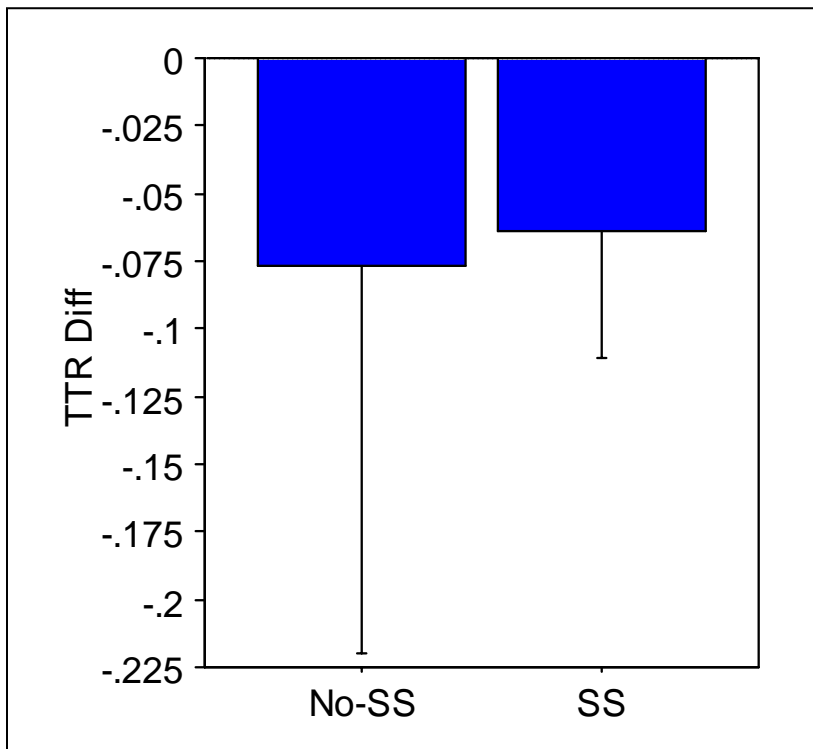
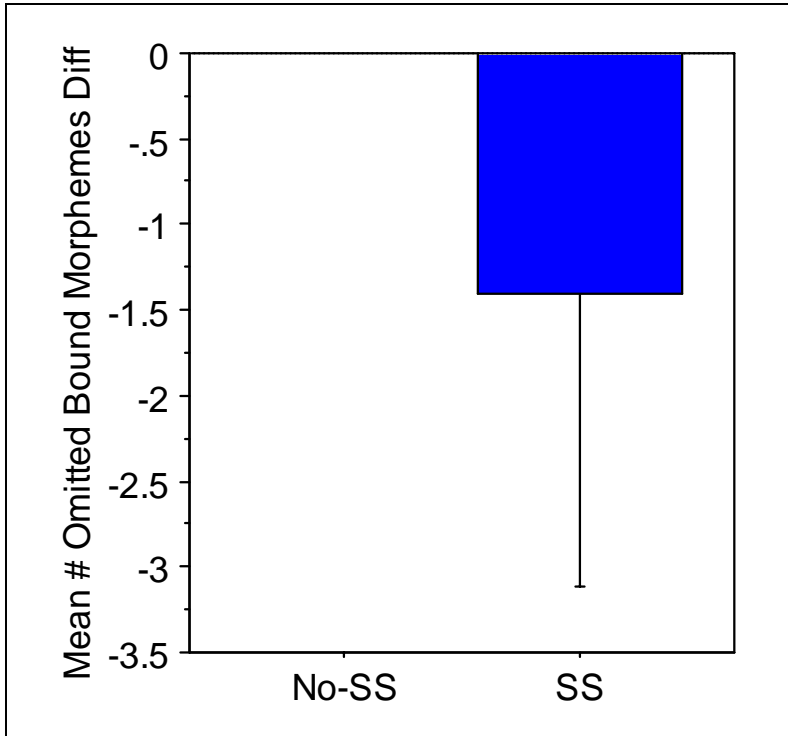


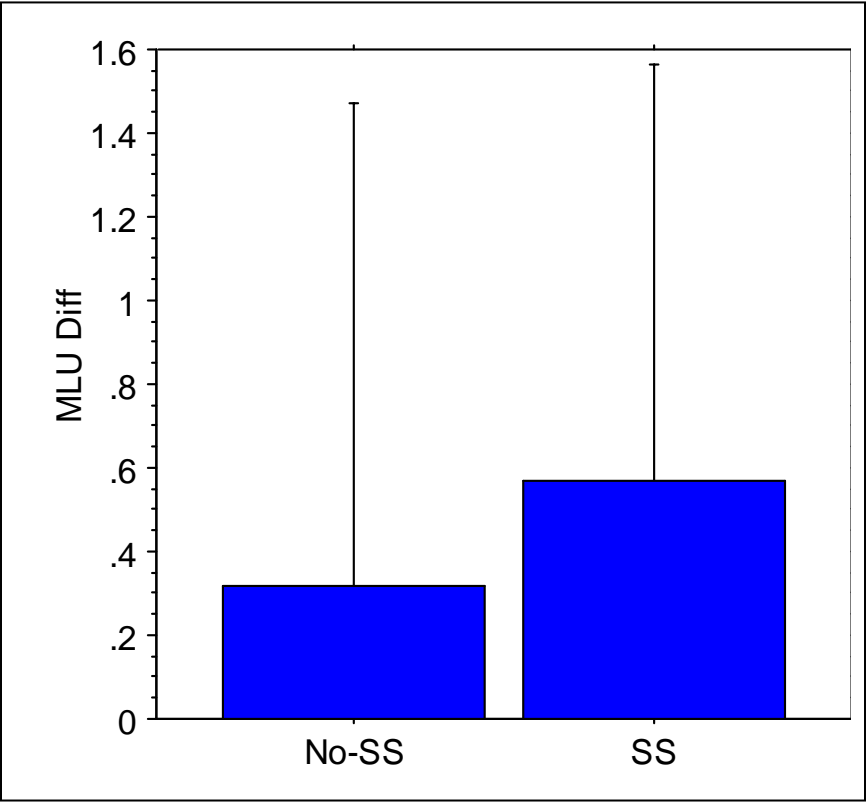
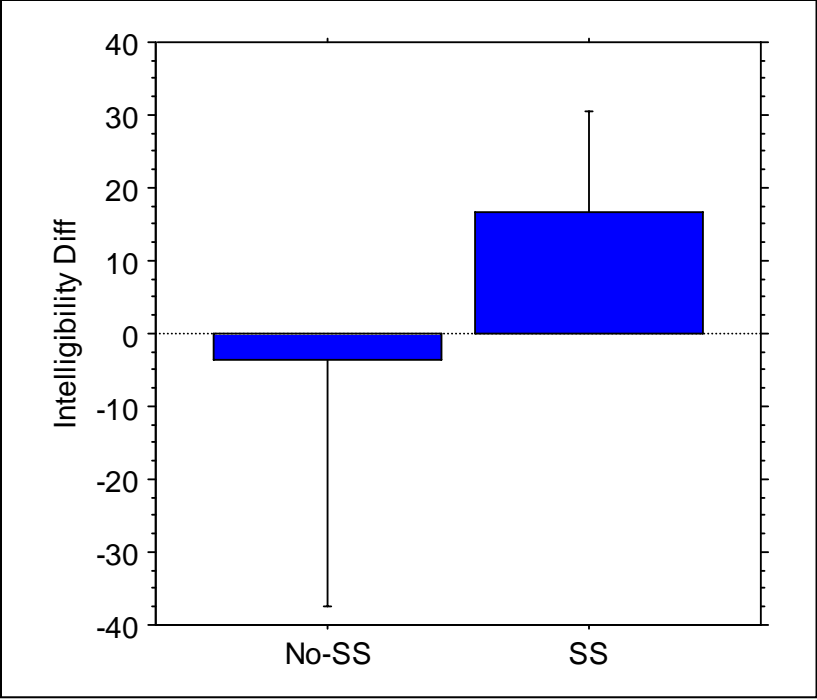
Appendix D

Average Difference Score Graphs for Language Measures:

For all average score graphs, bars above zero indicate overall improvement of the no-summer school, or summer school group as a whole. Bars below zero indicate an overall decrease in performance of the no-summer school or summer school groups as a whole. The absence of a bar indicates the entire group maintained the language measures they had before the summer.







Appendix E

Raw Score Graphs:

For all raw score graphs, each bar indicates the actual score a child received on the language measure. The first set of bars represents each subject's scores before summer school and the second set of bars represent each subject's scores after summer school. The first three bars in each before and after set represent subjects 1-3 who did not attend CID's summer school program. The remaining five bars in each before and after set represent subjects 4-8 who did attend CID's summer school program. An absence of a bar indicates the child did not omit any words or bound morphemes.

