Webber® HearBuilder® Auditory Memory
Efficacy Studies:
Improved Auditory Memory Skills for At-Risk Students

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Purpose: These studies examined the effects of *HearBuilder® Auditory Memory*, an interactive computer program that uses a systematic approach to improving auditory memory skills of students considered to be "at-risk."

Method: Two separate studies were conducted in southeastern, suburban school districts with 90 (*Study A*) and 48 (*Study B*) participants. The students used *HearBuilder® Auditory Memory* for at least 8 weeks 2 times per week for 30-minute sessions *or* 3 times per week for 20-minute sessions. All students were pretested and posttested with an online screener created by Super Duper® Publications. In addition, students in Study A were pretested and posttested with a norm-referenced assessment, the *Test of Auditory Processing Skills–Third Edition.*

Results: There was a statistically significant improvement in scores for the whole group of students in both studies from pretest to posttest.

Conclusion: The results of these research studies show that *HearBuilder® Auditory Memory* is an effective instructional component for teaching and practicing strategies to improve the auditory memory skills of students in general and special education programs when used in a variety of settings.

Introduction

Memory is a complex biological function that impacts a person's ability to perform almost any activity. In particular, memory is prerequisite for learning new information. According to Kandel, Schwartz, and Jessell (2000), "learning is the process by which we acquire knowledge about the world, while memory is the process by which that knowledge is encoded, stored, and later retrieved" (p.1227). In an academic environment, students with memory deficits often have difficulty performing at proficient levels. Even mild memory deficits can impact a student's success.

There are various types of memory, including but not limited to long-term memory, short-term memory, working memory, auditory memory, and visual memory. *HearBuilder® Auditory Memory* was developed to target deficits in auditory and working memory by teaching the student to use research-based memory strategies. Auditory memory is the ability to take in information that is presented orally, process it, retain it in one's mind, and then recall it (Bellis, 2003; Roeser & Downs, 2004; Stredler-Brown & Johnson, 2004). Auditory memory requires working memory and also involves the skills of attending, listening, processing, storing, and recalling (Cusimano, 2001). Dehn (2008) described working memory "as the management, manipulation, and transformation of information drawn from short-term and long-term memory" (p.58).

HearBuilder® Auditory Memory is an interactive, theory-based program for auditory memory training. This intervention tool assists in improvement of auditory attention, comprehension, closure, and memory. It also provides the option of varying levels of background noise to improve auditory figure-ground skills. In addition, this systematic, multi-level approach allows the educator to consider individual strengths and weaknesses by setting appropriate levels of difficulty.

The following studies were conducted to assess the effectiveness of *HearBuilder® Auditory Memory*

in developing/improving auditory memory skills in children with and without diagnosed language and/or learning disabilities.

Method

Participants - Study A

This *HearBuilder® Auditory Memory* study was conducted in a southeastern, suburban school district from October of 2011 to February of 2012 in ten different elementary schools with one speech-language pathologist per school to administer standardized testing and oversee the implementation of *HearBuilder® Auditory Memory*. Ninety students participated in this study. Fifty-three percent (53%) of the students were male and 47% were female. There were four students in kindergarten, 14 in first grade, 20 in second grade, 21 in third grade, 14 in fourth grade, ten in fifth grade, six in sixth grade, and one in eighth grade. Fifty-six percent (56%) of the participants reportedly had Individualized Education Plans (IEPs) for special education services, with 47% of the students described as having a Learning Disability and/or a Language Impairment. Other diagnoses reported included Autism Spectrum Disorder, Articulation Disorder, Developmental Delay, and Other Health Impaired. Forty-four percent (44%) of the students did not have special education IEPs, although some of the students without IEPs had previously been or were currently included in a Response to Intervention (RTI) program. Parents of the participants were asked to indicate students' race/ethnicity with the following results reported: 65% White, 23% Black, 6% Hispanic, and 6% other. Fifty-six percent (56%) of the sample were reported to qualify for free and reduced-priced meals, and 16% of the sample reportedly received Title I support. See Appendix A for specific participant information.

Participants - Study B

This *HearBuilder® Auditory Memory* study was also conducted in another southeastern, suburban school district from October of 2011 to February of 2012 with one speech-language pathologist per school to administer standardized testing and oversee the implementation of *HearBuilder® Auditory Memory,* but in eight different elementary schools. Forty-eight total students participated in this study. Fifty-six percent (56%) of the students were male and 44% were female. There were three students in kindergarten, nine in first grade, 18 in second grade, four in third grade, one in fourth grade, three in fifth grade, six in sixth grade, two in seventh grade, and two in eighth grade. Fifty-eight percent (58%) of the participants reportedly had IEPs for special education services, with 29% of the students described as having a Learning Disability and/or a Language Impairment and another 15% of students having a diagnosis of Intellectual Impairment. Also, 10% of the students were described as having Autism Spectrum Disorder. Other diagnoses reported included Articulation Disorder and Other Health Impaired. Forty-two percent (42%) of the students did not have special education IEPs, although some of the students without IEPs had previously been or were currently included in a RTI program. Parents of the participants were asked to indicate students' race/ethnicity with the following results reported: 33% White, 29% Black, 27% Hispanic, and 11% other. Reportedly, 15% of students lived in homes where Spanish was the primary language spoken. Forty percent (40%) of the sample were reported to qualify for free and reduced-priced meals, and 58% of the sample reportedly received Title I support. See Appendix A for specific participant information.

Implementation - Studies A & B

Students used *HearBuilder® Auditory Memory* for at least eight weeks 2 times per week for 30-minute sessions *or* 3 times per week for 20-minute sessions. The software was used in a variety of settings that included classrooms, therapy rooms, and computer labs. Students performed the software tasks independently, and the speech-language pathologists were instructed to give minimal assistance. *HearBuilder® Auditory Memory* provided students with individualized practice that targeted students' abilities to recall numbers (3-7 digits), words (3-5 words), details (1-4 details), WH information (2-3 sentences/2-4 questions), as well as to perform auditory closure (sentence completion). See Appendix B for a description of the five activities as well as the variables that can be changed within each activity. The students were instructed to play one round of each of the five activities in a session and, if time remained, to go back and play any activity of their choice. Students had to demonstrate 80% accuracy on each level before advancing to the next or by answering the first six, consecutive items correctly. The last three of the 12 levels in the WH info activity were the exception to this progression as these levels

contained questions sets of 12 (instead of the standard 10), and students had to answer with 83% accuracy (10 out of 12) on these levels. If a student scored 70% or less on any level, they were required to listen to an auditory memory strategy specifically related to that activity. See Appendix C for the memory strategies taught in each of the five auditory memory activities and Appendix D for a detailed list of the learning objectives by level for each activity.

Assessment - Studies A & B

Students from *Study A* were pretested and posttested using the *Test of Auditory Processing Skills-3* (TAPS-3), which is a norm-referenced assessment for students ages 4;0 to 18;11 designed to evaluate the auditory skills necessary for the development, use, and understanding of language commonly utilized in academic and everyday activities. Five of the TAPS-3 subtests were administered: Number Memory Forward, Number Memory Revered, Word Memory, Sentence Memory, and Auditory Comprehension. These sections assess the student's ability to listen to, remember, and then repeat or answer questions about the content, which corresponds with the skills that are targeted in *HearBuilder® Auditory Memory*.

Students from *Study A* were also pretested and posttested using the online *HearBuilder® Auditory Memory Inventory* designed by Super Duper® Publications in order to mimic the tasks in *HearBuilder® Auditory Memory*. This is also the assessment used to pretest and posttest all students from *Study B*. The *HearBuilder® Auditory Memory Inventory* includes 82 test items split into two parts given 15 minutes for both parts with a brief break in between. The first part tested the students' abilities to (1) recall numbers, (2) recall words, and (3) complete sentences with one missing word. The second part tested students' abilities to (4) recall details by identifying the exact person described and to (5) listen to 2-3 sentences of information and answer 2-4 WH questions related to the information. Auditory memory parts 1, 2, and 4 were identical from pretest to posttest. Auditory memory parts 3 and 5 included different tasks from pretest to posttest but with the same type and number of tasks. See Appendix E for the pretest and posttest items included in the *HearBuilder® Auditory Memory Inventory*.

Analysis - Studies A & B

These studies employed a differential research, one-group pretest-posttest design. Data was analyzed using paired-sample t-tests in order to compare the pretest and posttest raw score totals obtained from the five subtests of the *Test of Auditory Processing Skills-3* and from the *HearBuilder® Auditory Memory Inventory*. All analyses used a p-value of 0.05 as the criterion for identifying statistical significance.

Results

Study A

There was a statistically significant improvement in scores for the whole group of students (N=88) that participated in the study from pretest (M=62.43, SD=17.09) to posttest (M=75.22, SD=18.16) using the combined raw subtest scores of the *Test of Auditory Processing Skills-3*; $t(87)$=-13.46, p<.001. As well, statistically significant results were found for the entire group of students (N=66) given the *HearBuilder® Auditory Memory Inventory* from pretest (M=35.59, SD=13.77) to posttest (M=41.32, SD=12.14); $t(65)$=-4.68, p<.001. These results suggest that the use of *HearBuilder® Auditory Memory* had an overall significant effect on the students' auditory memory skills as shown by pretest and posttest scores obtained from the five subtests of the *TAPS-3* and the *HearBuilder® Auditory Memory Inventory* (see Figures 1 and 2). In addition, Figures 3 through 8 depict the pretest and posttest data derived from *TAPS-3* raw score averages and the *HearBuilder® Auditory Memory Inventory* scores for specific subgroups (i.e., grade, race, and students with/without IEPs). Also, p-values are shown for groupings of students with an *n* greater than 13.

Study B

There was a statistically significant improvement in scores for the whole group of students (N=48) that participated in the study from pretest (M=33.67, SD=13.87) to posttest (M=38.73, SD=15.01) given the *HearBuilder® Auditory Memory Inventory*; $t(47)$=-2.85, p=.007. These results suggest that the use of *HearBuilder® Auditory Memory* had an overall significant effect on the students' auditory memory skills as shown by pretest and posttest scores obtained from the *HearBuilder® Auditory Memory Inventory* (see Figure 9). In addition, Figures 10 through 12 depict the pretest and posttest data derived from the *HearBuilder® Auditory Memory Inventory* scores for specific subgroups (i.e., grade, race, and students with/without IEPs). Also, p-values are shown for groupings of students with an *n* greater than 13.
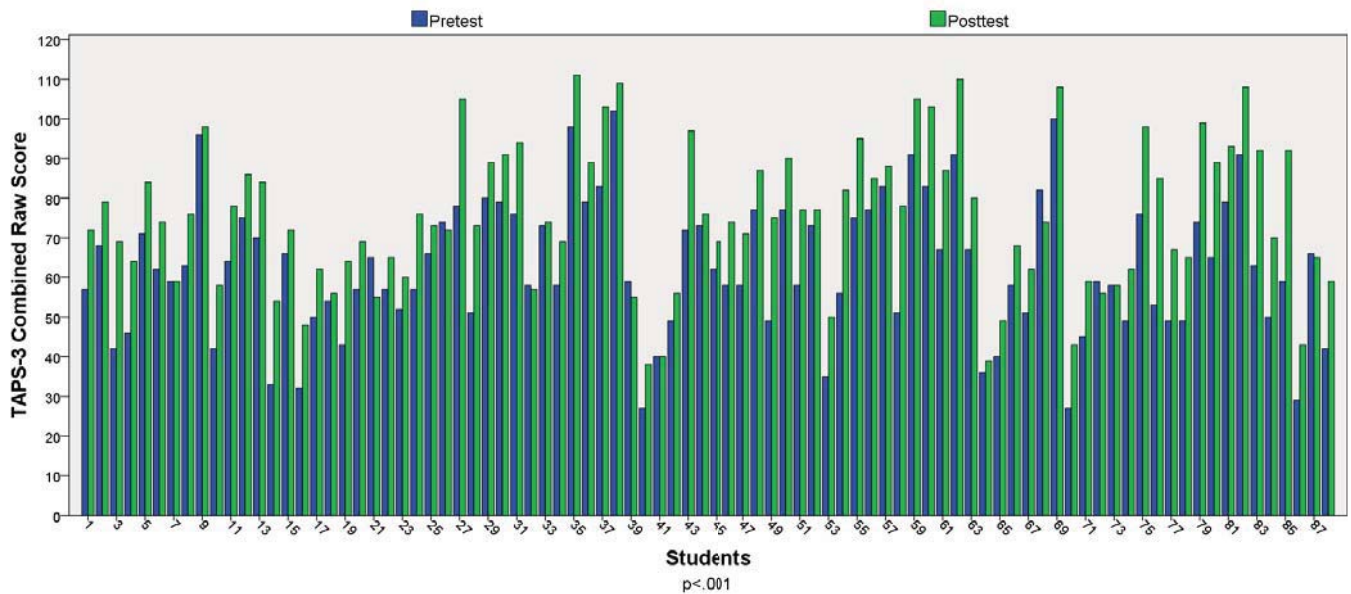
Figure 1. Statistically significant pretest and posttest data based on TAPS-3 combined raw scores representing improvement in auditory memory skills for all students administered the TAPS-3 in Study A.
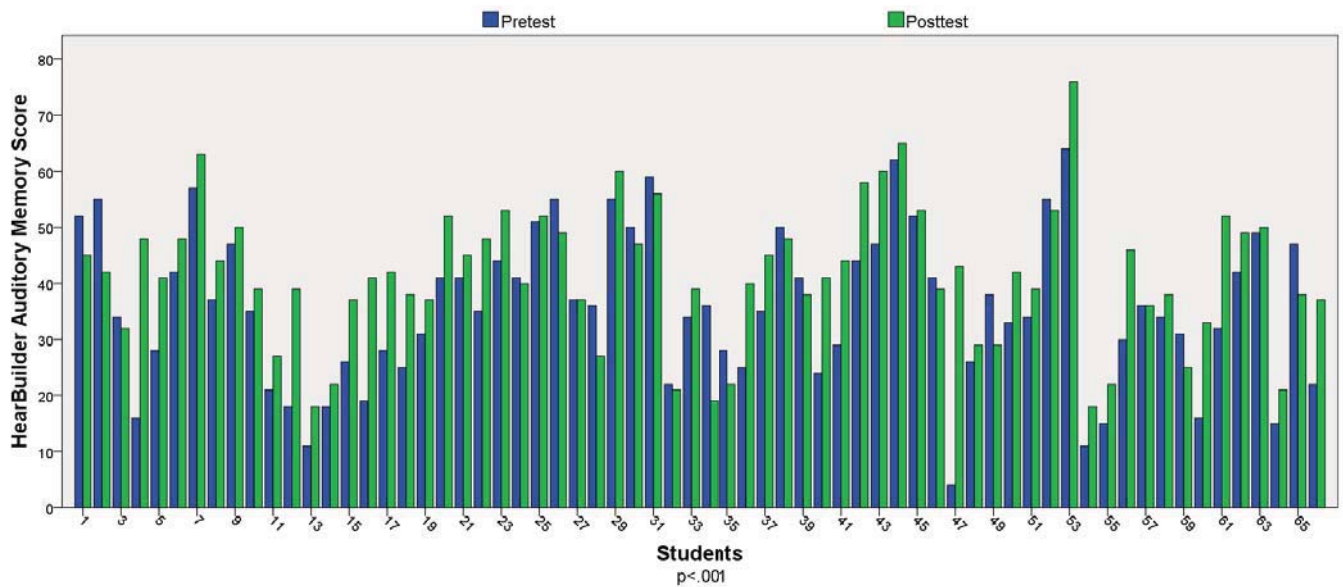

Figure 2. Statistically significant pretest and posttest data based on HearBuilder® Auditory Memory Inventory *raw scores representing improvement in auditory memory skills for all students who took the* HearBuilder® Auditory Memory Inventory *in Study A.*

Figure 3. Pretest and posttest data displaying TAPS-3 *combined raw score averages based on grade with* n *representing number of students in each group in Study A.*

Figure 4. Pretest and posttest data displaying HearBuilder® Auditory Memory Inventory *raw score averages based on grade with* n *representing number of students in each group in Study A.*
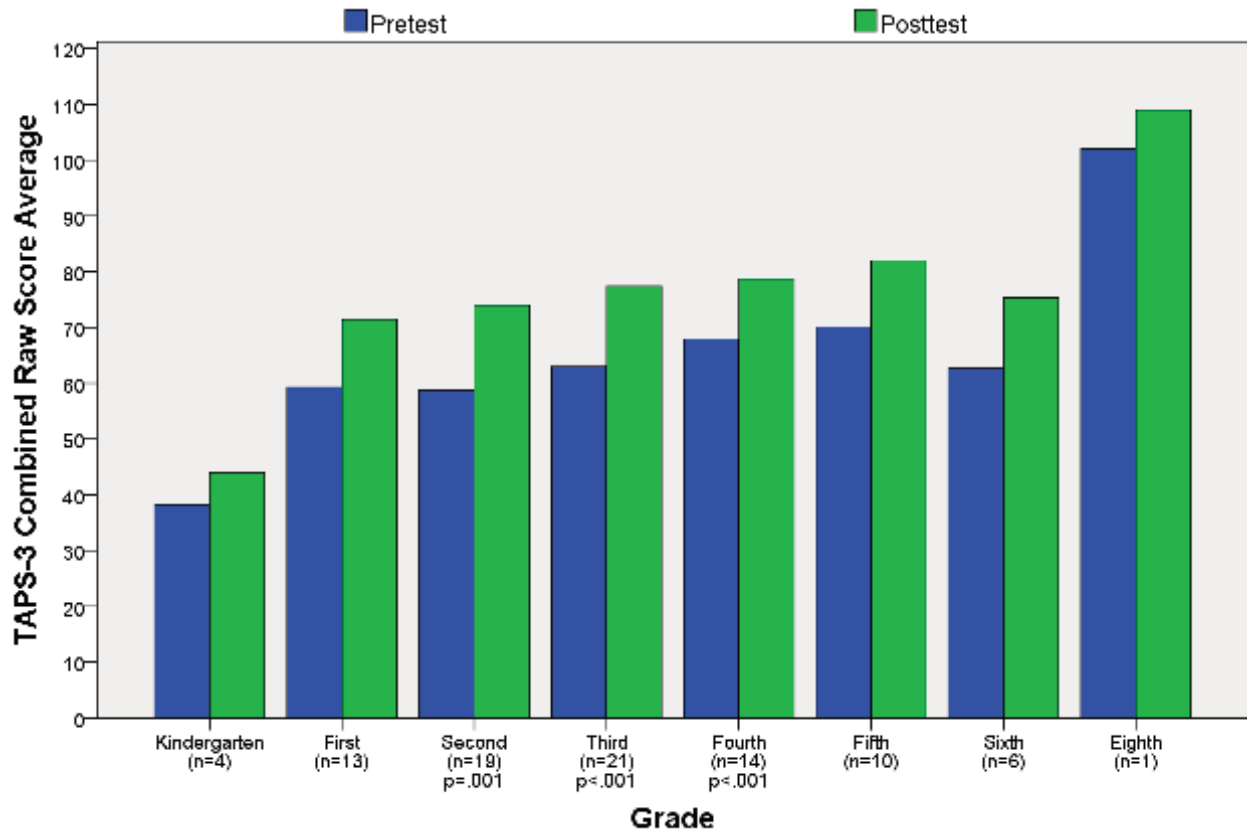
Figure 5. Pretest and posttest data displaying TAPS-3 *combined raw score averages based on race with* n *representing number of students in each group in Study A.*
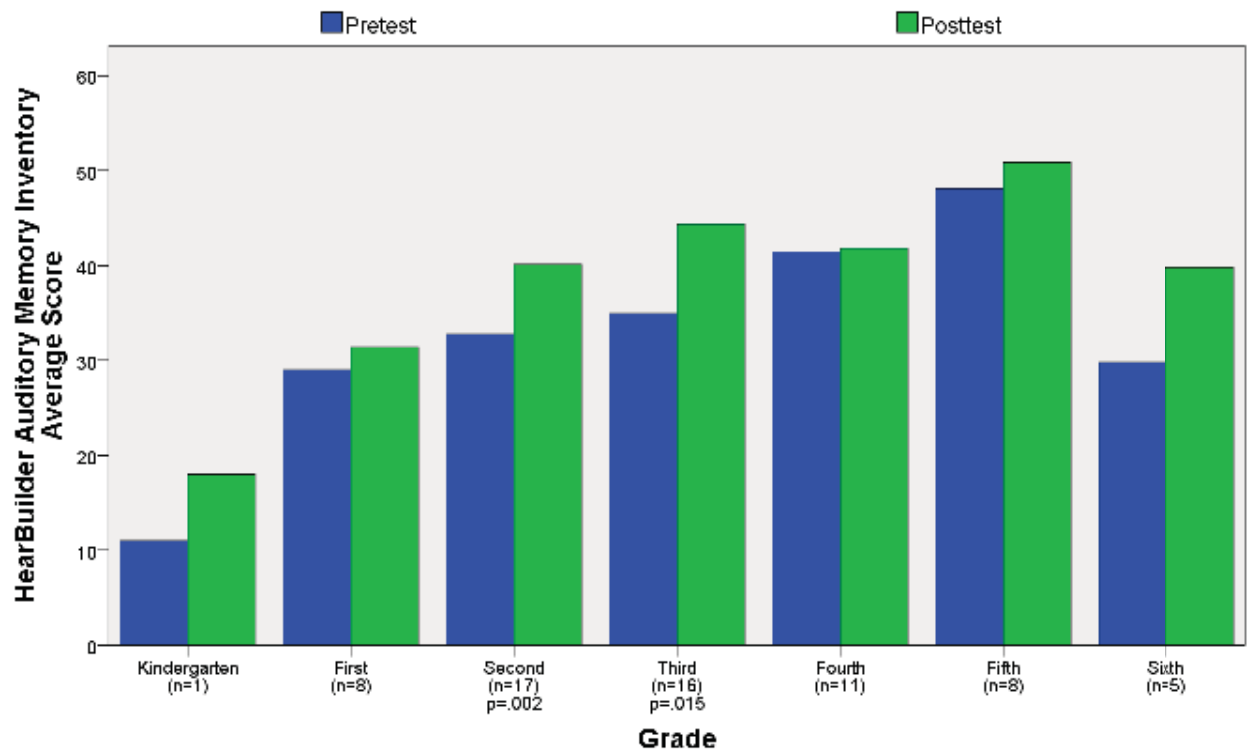

Figure 6. Pretest and posttest data displaying HearBuilder® Auditory Memory Inventory *raw score averages based on race with* n *representing number of students in each group in Study A.*

Figure 7. Pretest and posttest data displaying TAPS-3 *combined raw score averages based on students with and without IEPs with* n *representing number of students in each group in Study A.*

Figure 8. Pretest and posttest data displaying HearBuilder® Auditory Memory Inventory *raw score averages based on students with and without IEPs with* n *representing number of students in each group in Study A.*
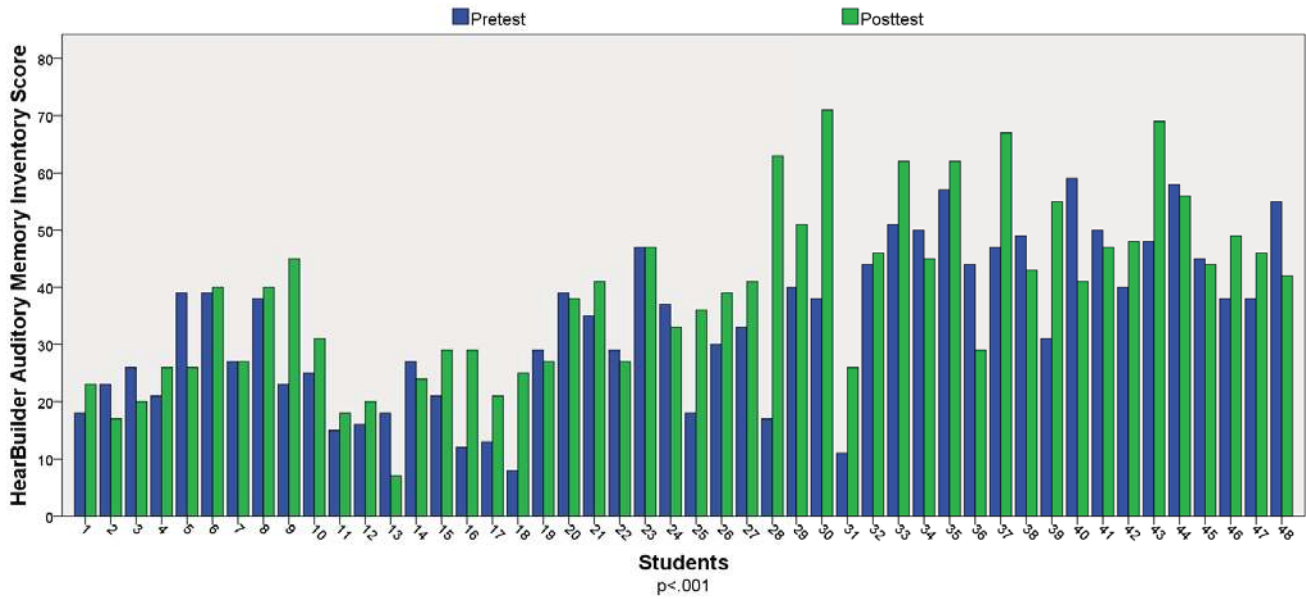
Figure 9. Statistically significant pretest and posttest data based on HearBuilder® Auditory Memory Inventory *raw scores representing improvement in auditory memory skills for all students in Study B.*

Figure 10. Pretest and posttest data displaying HearBuilder® Auditory Memory Inventory *raw score averages based on grade with* n *representing number of students in each group in Study B.*
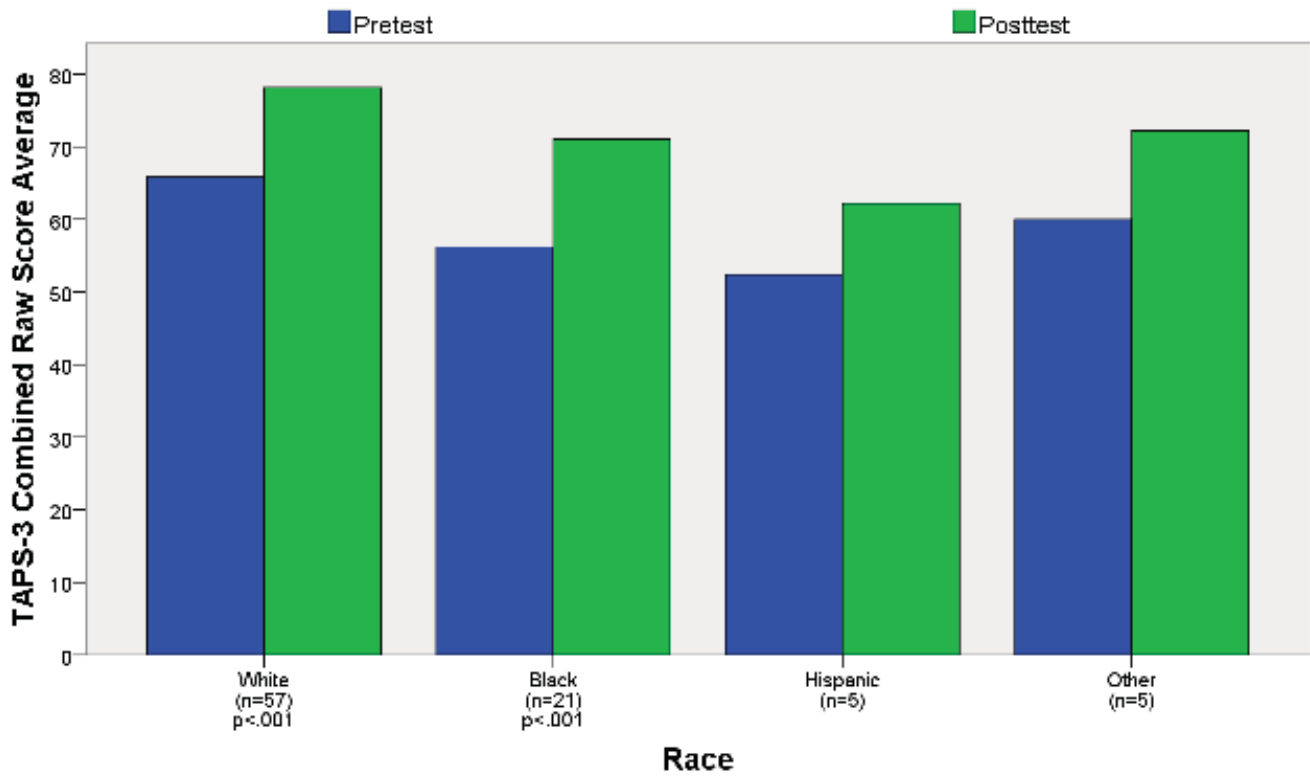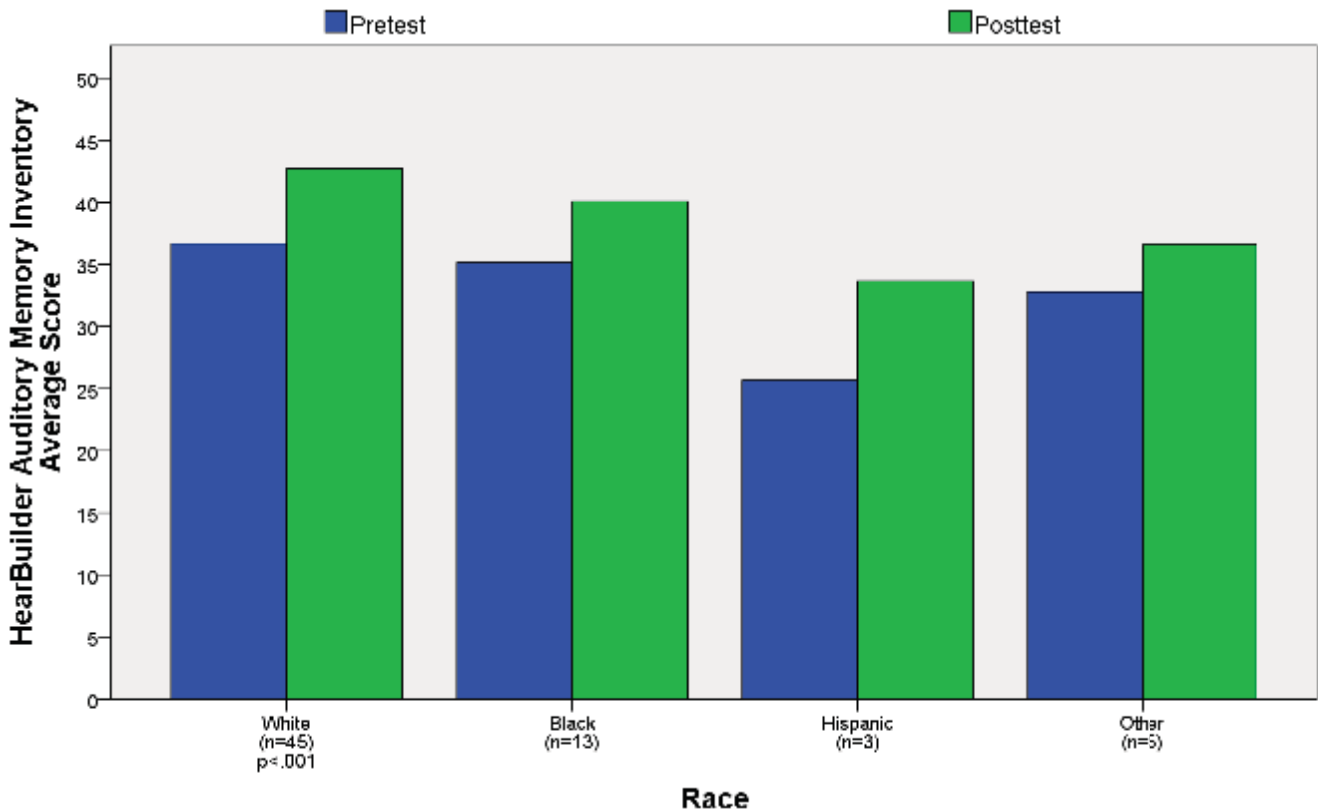
Figure 11. Pretest and posttest data displaying HearBuilder® Auditory Memory Inventory *raw score averages based on race with* n *representing number of students in each group in Study B.*
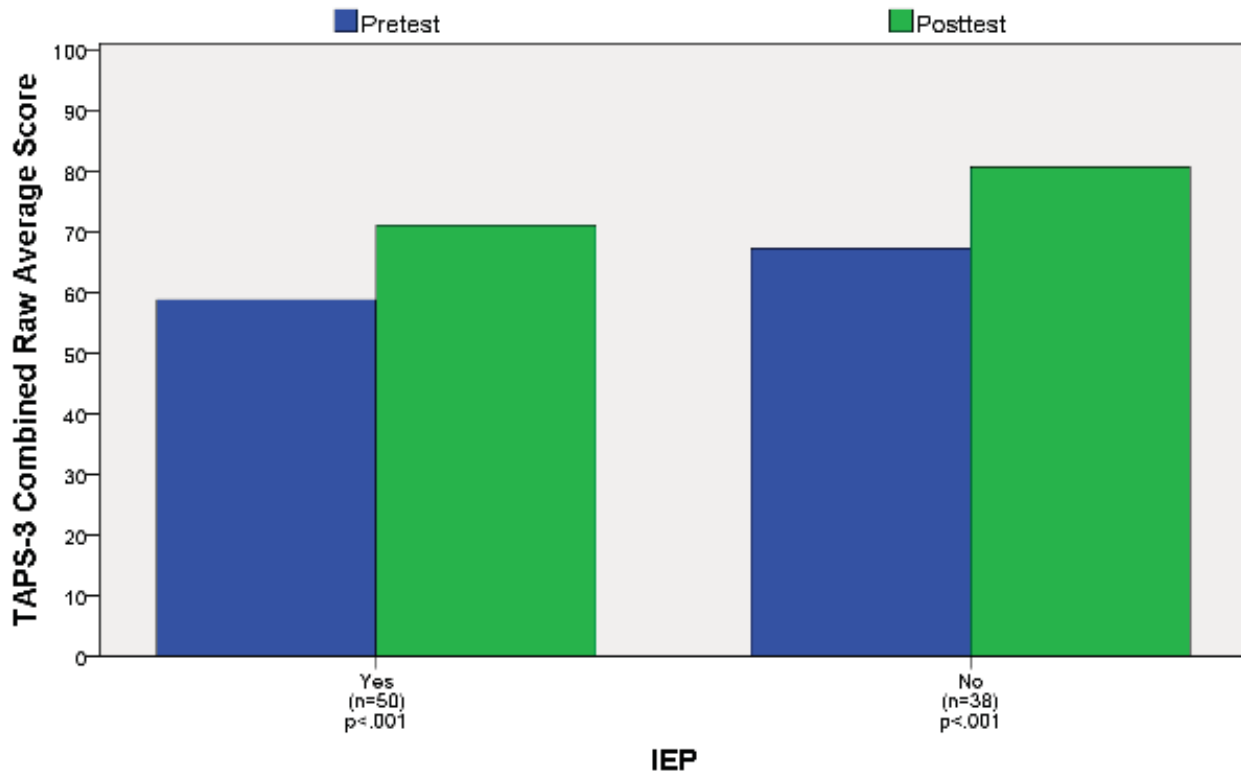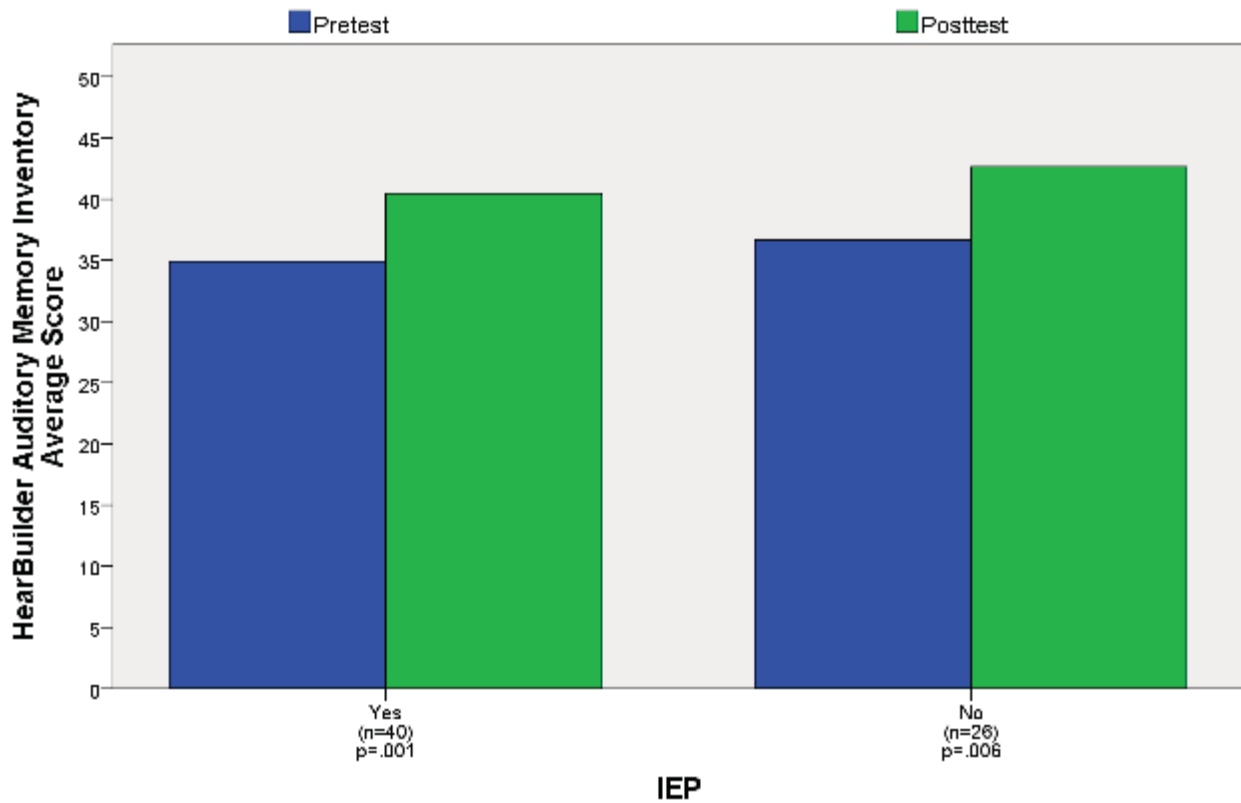

Figure 12. Pretest and posttest data displaying HearBuilder® Auditory Memory Inventory *raw score averages based on students with and without IEPs with* n *representing number of students in each group in Study B.*
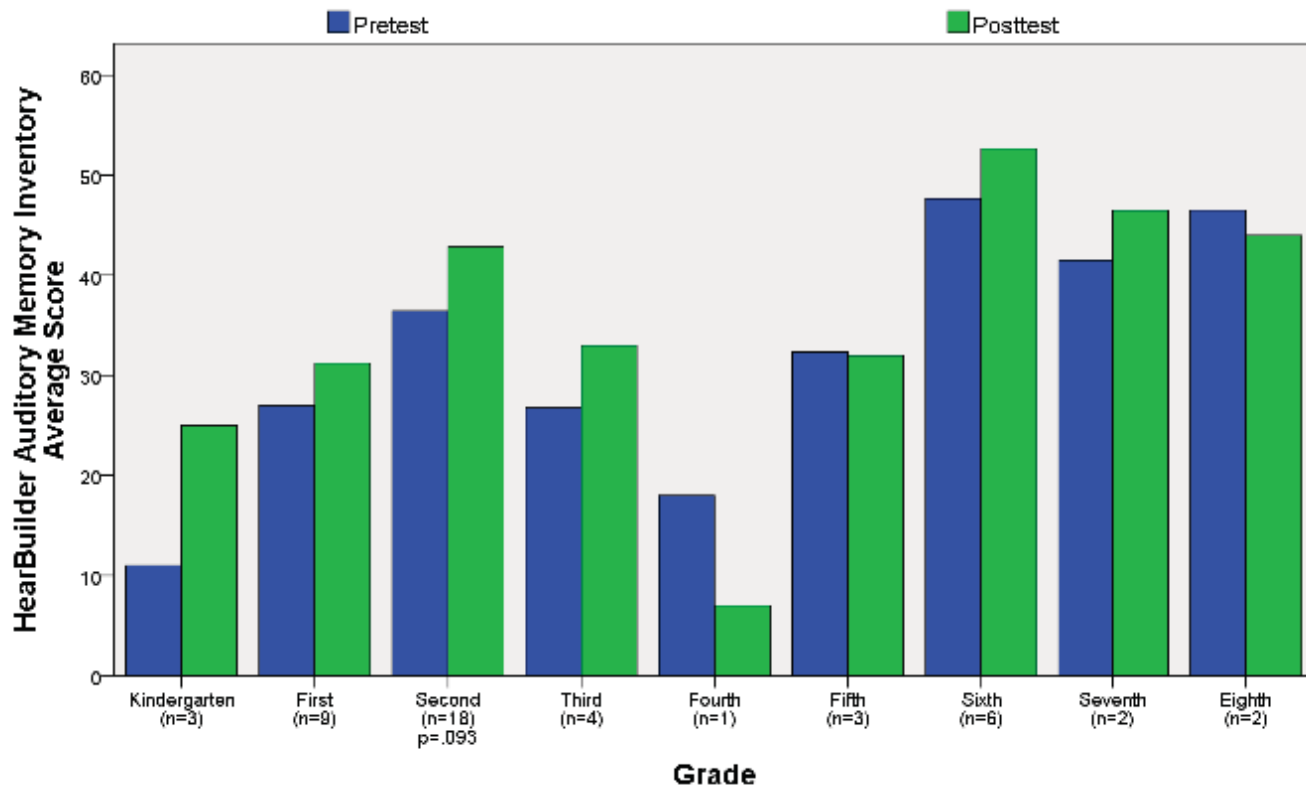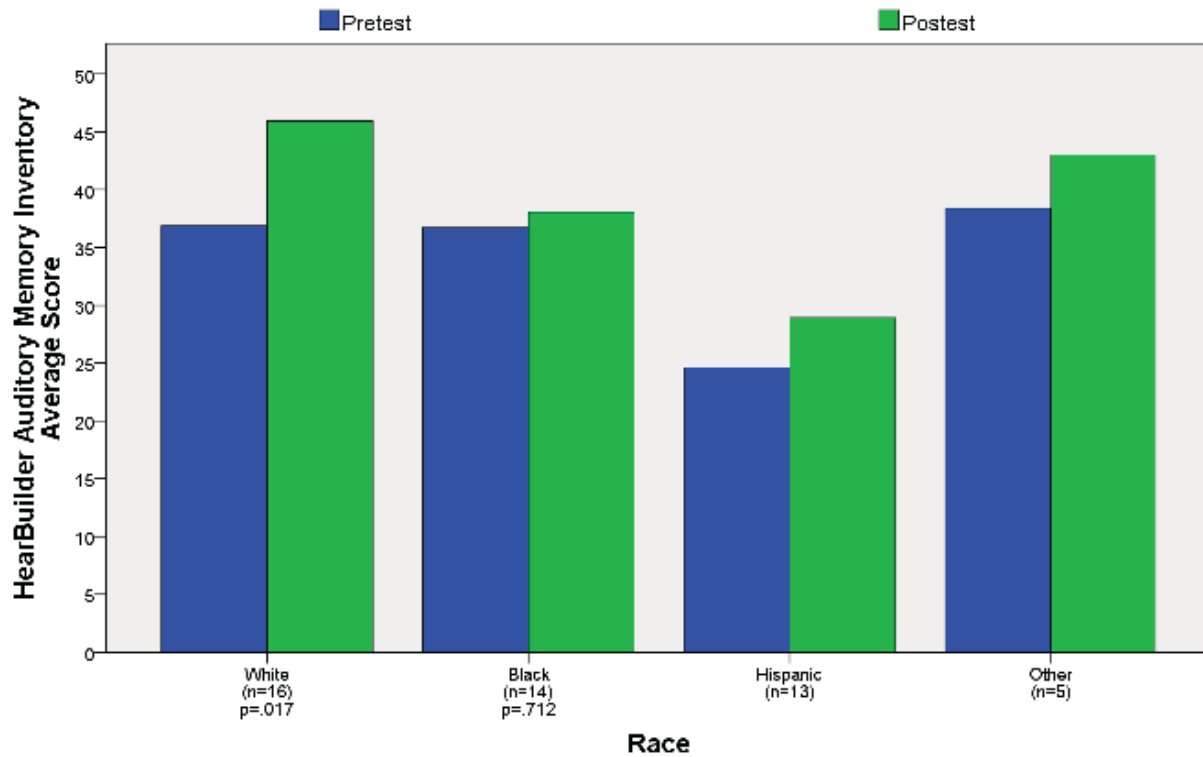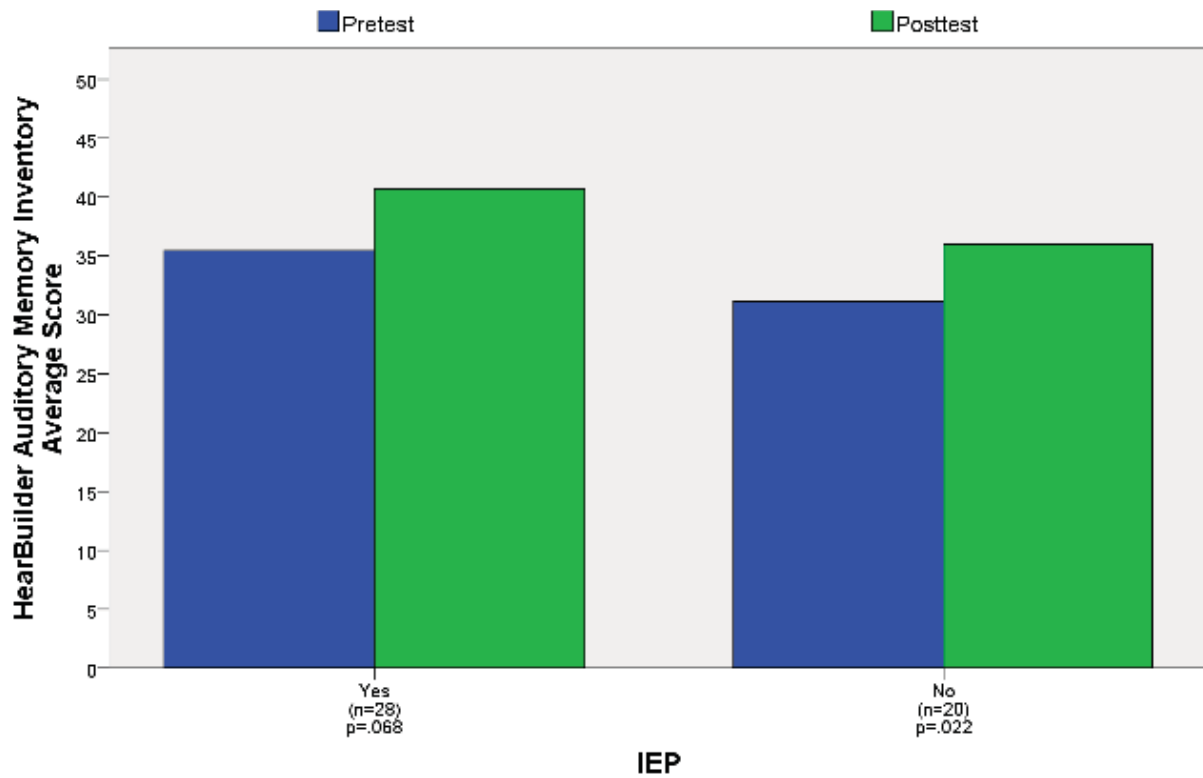
Conclusion

Auditory memory is essential for academic success (Bellis, 2003; Roeser & Downs, 2004; Stredler-Brown & Johnson, 2004). As children use *HearBuilder® Auditory Memory* and are actively engaged in listening, recalling information, and answering questions, they are able to enhance their auditory processing/memory skills. The results of these research studies show that *HearBuilder® Auditory Memory* is an effective instructional component in improving the auditory memory abilities of students in general and special education programs when used in a variety of settings. In addition, all of the students in this study were considered to be "at-risk" based on having a diagnosed disability; enrollment in Title I/free and reduced meals program; limited English proficiency; and/or low standardized/online test scores, and in eight weeks time, as indicated by pretest/posttest scores, there was an overall significant improvement in the students' auditory memory abilities.

Future research regarding *HearBuilder® Auditory Memory* should include alternate pretest and posttest assessments, control groups, greater sample sizes, and varied demographics from across the country in order to increase validity of all results obtained. As well, pretest and posttest measures should be taken for recall of the memory strategies taught in *HearBuilder® Auditory Memory*.

References

Bellis, T. J. (2003). *Assessment and management of central auditory processing disorders in the educational setting: From science to practice* (2nd ed.). Clifton Park, NY: Delmar Learning.

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Demographics - Study A

Gender

	Male (n=48)	Female (n=42)	
Eighth	1		Eighth
Sixth	2	4	Sixth
Fifth	5	5	Fifth
Fourth	8	6	Fourth
Third	12	9	Third
Second	11	9	Second
First	5	9	First
Kindergarten	4		Kindergarten

Grade — **Number of Students** — **Grade**

Demographics - Study A

Race

- White (n=59)
- Black (n=21)
- Hispanic (n=5)
- Other (n=5)

65.56%
23.33%
5.56%
5.56%
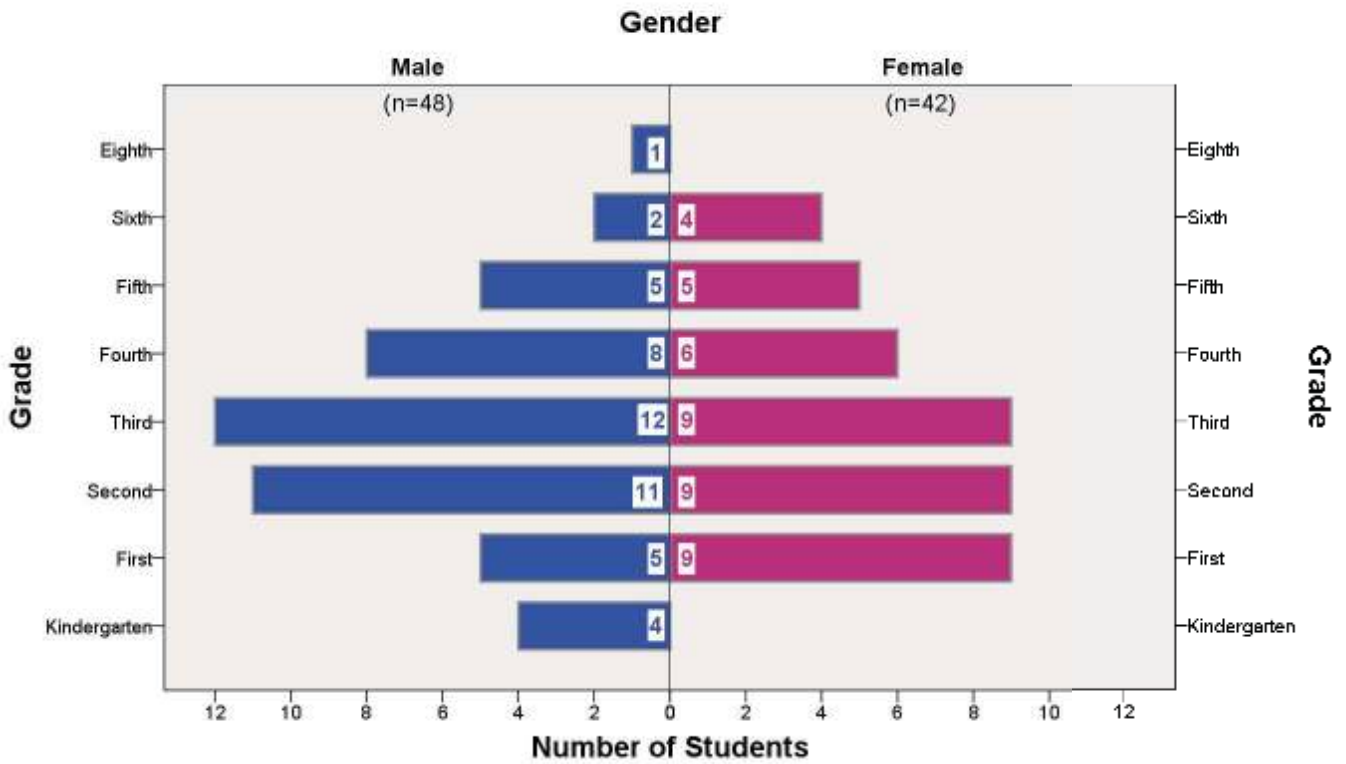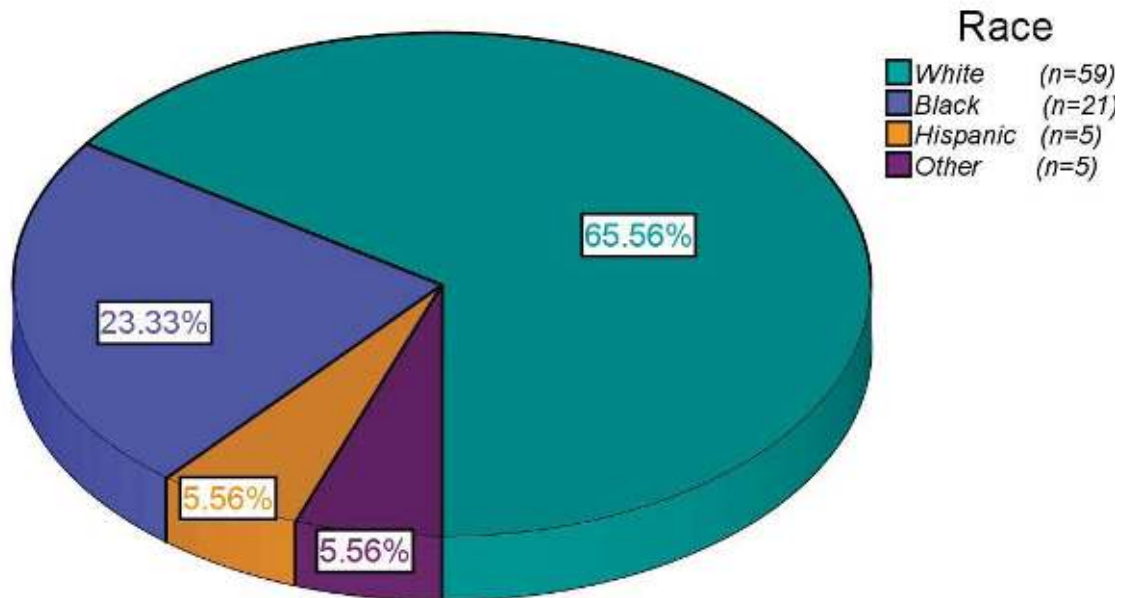
Total Number of Students = 90

Diagnoses - Study A

Diagnoses

■	No diagnosis	(n=39)
■	LD	(n=19)
■	LI	(n=12)
■	LD and LI	(n=11)
■	ASD	(n=3)
■	Speech	(n=3)
■	DD	(n=1)
■	ADD	(n=1)
■	OHI	(n=1)

Pie chart values: 43.33%, 21.11%, 13.33%, 12.22%, 3.33%, 3.33%, 1.11%, 1.11%, 1.11%
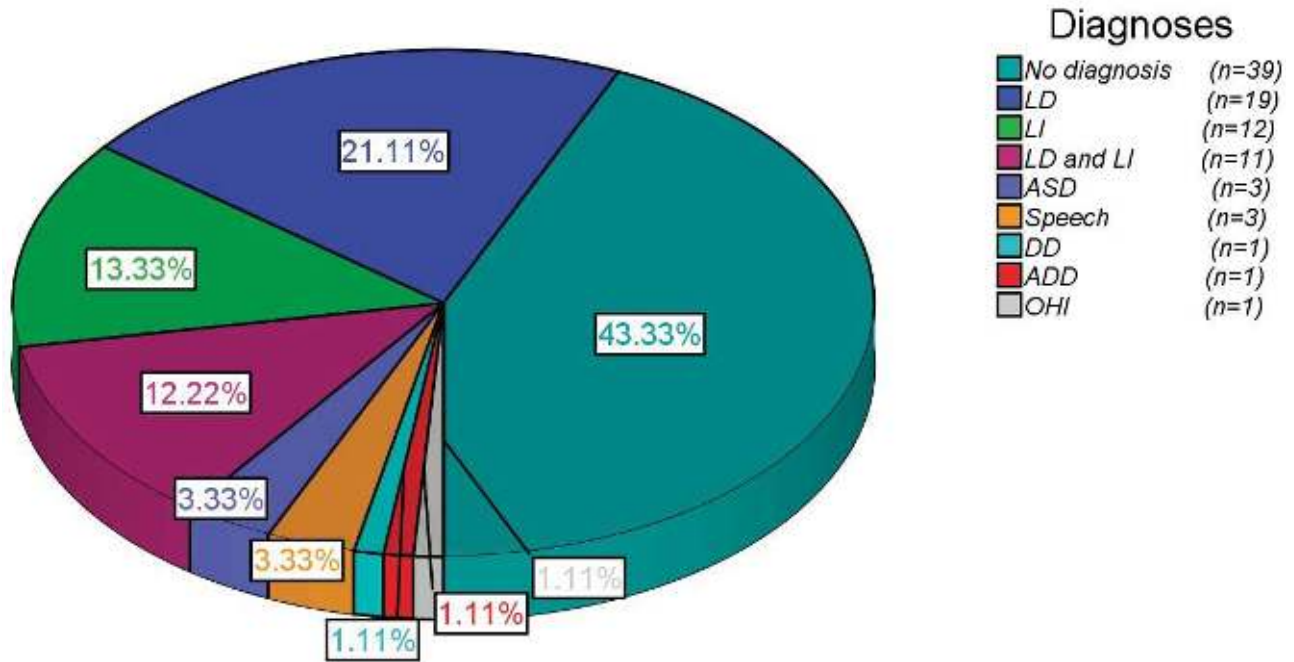
Total Number of Students = 90

Demographics - Study B

Gender

Grade	Male (n=27)	Female (n=21)
Eighth	2	
Seventh	1	1
Sixth	2	4
Fifth	3	
Fourth		1
Third	4	
Second	10	8
First	3	6
Kindergarten	2	1

Number of Students

Demographics - Study B

Race

White	(n=16)	
Black	(n=14)	
Hispanic	(n=13)	
Other	(n=5)	

- 29.17%
- 33.33%
- 27.08%
- 10.42%
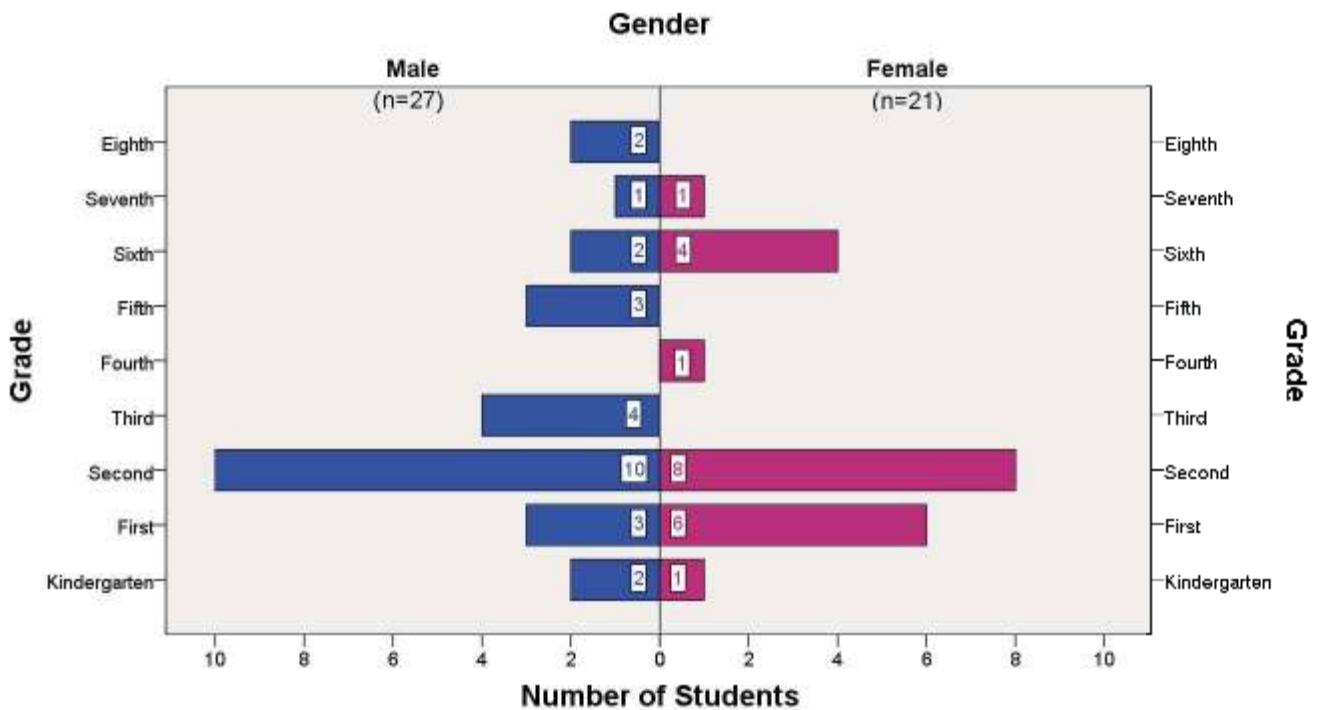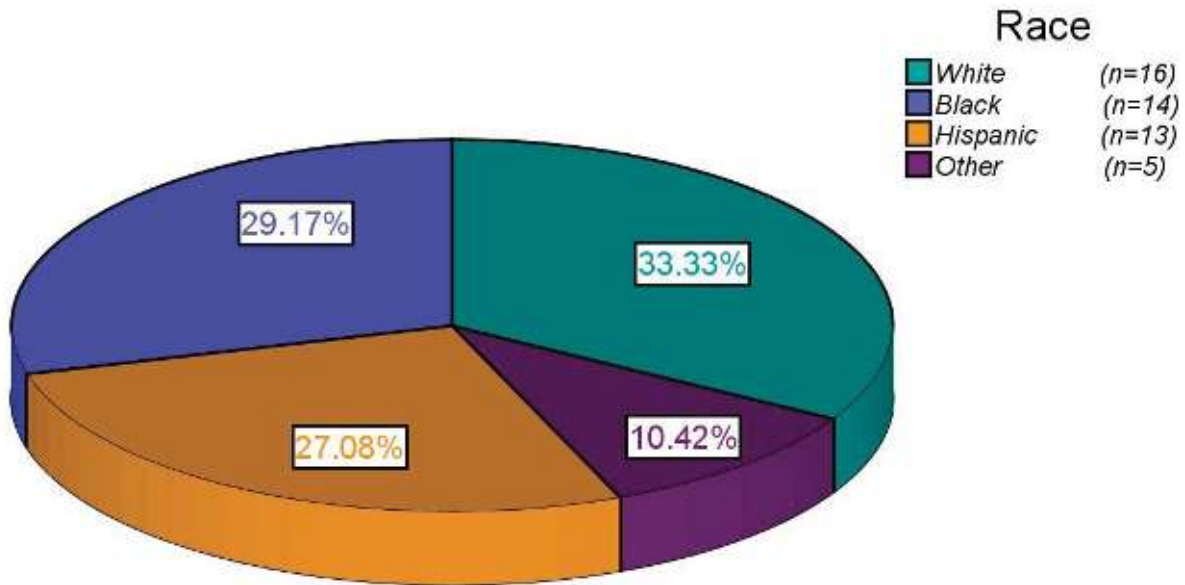
Total Number of Students = 48

Diagnoses - Study B
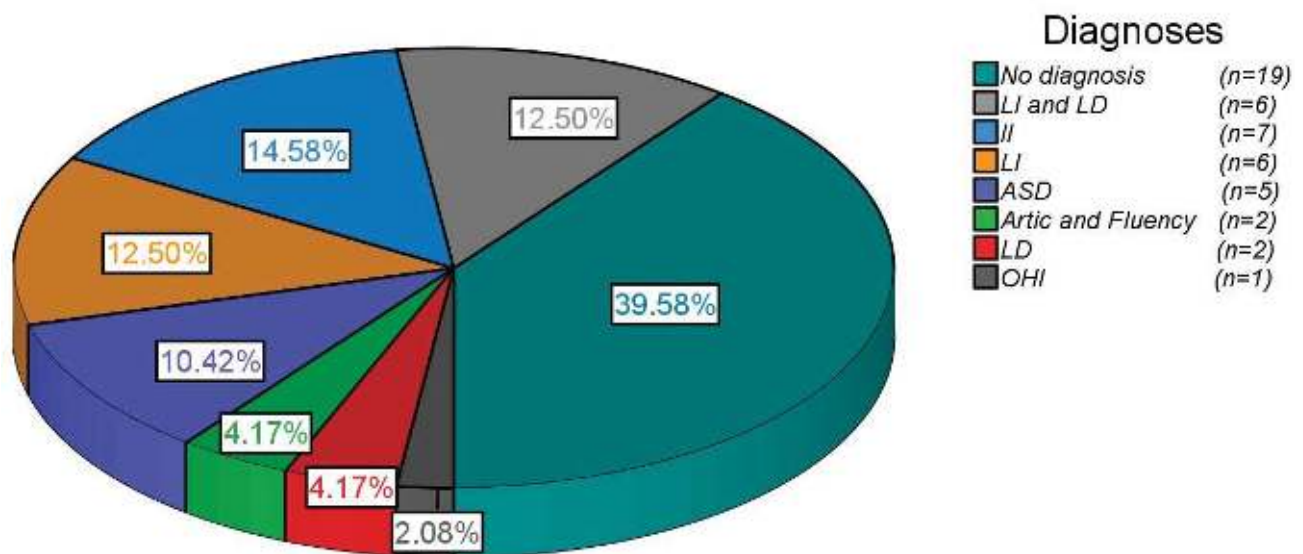
Diagnoses

No diagnosis	(n=19)
LI and LD	(n=6)
II	(n=7)
LI	(n=6)
ASD	(n=5)
Artic and Fluency	(n=2)
LD	(n=2)
OHI	(n=1)

- 12.50%
- 14.58%
- 12.50%
- 10.42%
- 39.58%
- 4.17%
- 4.17%
- 2.08%

Total Number of Students = 48

Memory for Numbers

   This activity includes seventeen levels targeting a student's ability to recall three to seven digits in a sequence with and without visual cues and/or delays.

Objective Variables

- Number of digits
- Delay (the number of seconds between the presentation of a stimulus item and when the student can enter it)
- Visual Cues (whether or not the student can see the keypad during the presentation of the stimulus items)

Memory for Words
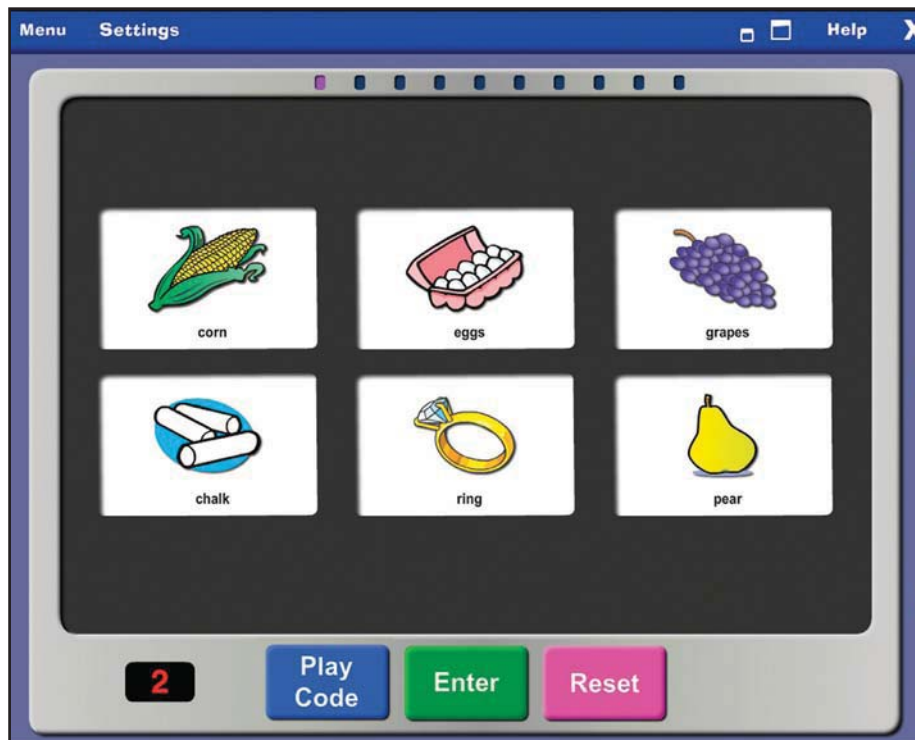
This activity includes eighty-four levels targeting a student's ability to recall a list of three to five related or unrelated words with and without visual cues and/or delays.

Objective Variables

- Number of words

- Relationship (whether or not the words are semantically related)

- Number of syllables

- Intervals (the number of seconds between the stimulus picture-words)

- Foils (how many pictures appear in addition to the stimulus picture-words)

- Delay (the number of seconds between the presentation of a stimulus item and when the student can enter it)

- Visual Cues (whether or not the student can see the picture-words during the presentation of the stimulus items

Memory for Details

   This activity includes sixty-four levels targeting a student's ability to recall up to four details in a sentence with and without visual cues.

Objective Variables

- People (number of "Recall Agents" in the scene)

- Details (number of descriptive elements)

- Visual cues (whether or not the student can see the people during the presentation of the stimulus items)

- Delay (the number of seconds between the presentation of a stimulus item and when the student can enter it)

- Distractions (whether or not there are visual elements moving in the background of the scene to distract the student)

Auditory Closure
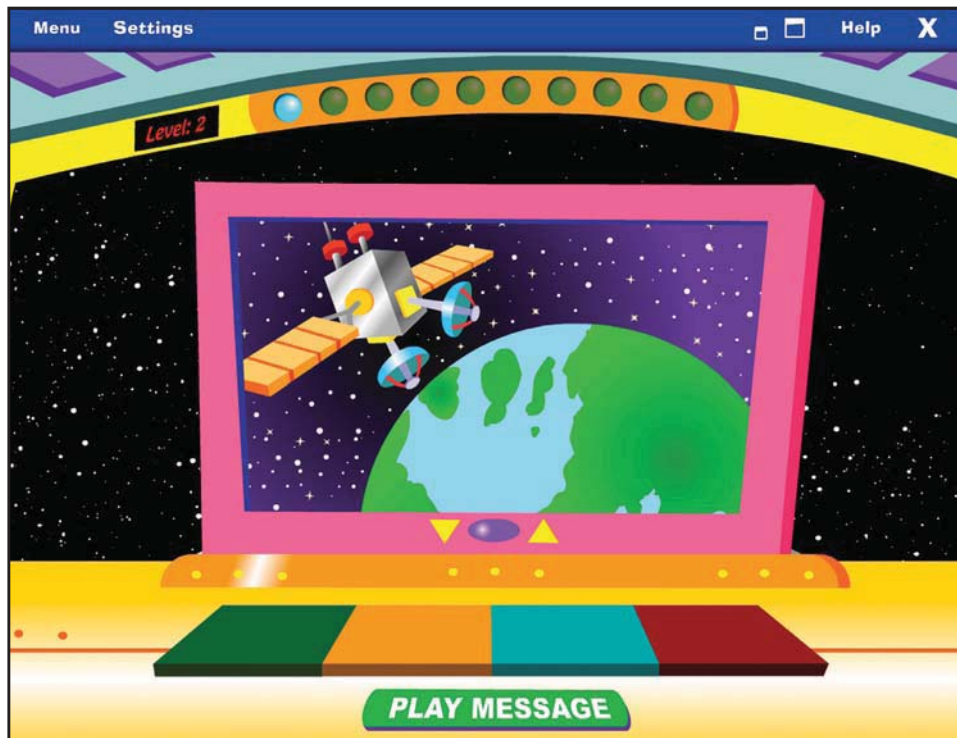
This activity includes twenty-two levels targeting a student's ability to complete sentences with high, moderate, and low predictability with one word.

Objective Variables

- Phonemic cue (the first sound of the target word is given)

- Predictability (whether or not the answer is easily identified based on rest of the sentence)

- Position (where the word falls in the sentence)

- Part of speech (of the answer choice)

- Length (of the sentence)

Memory for WH Info
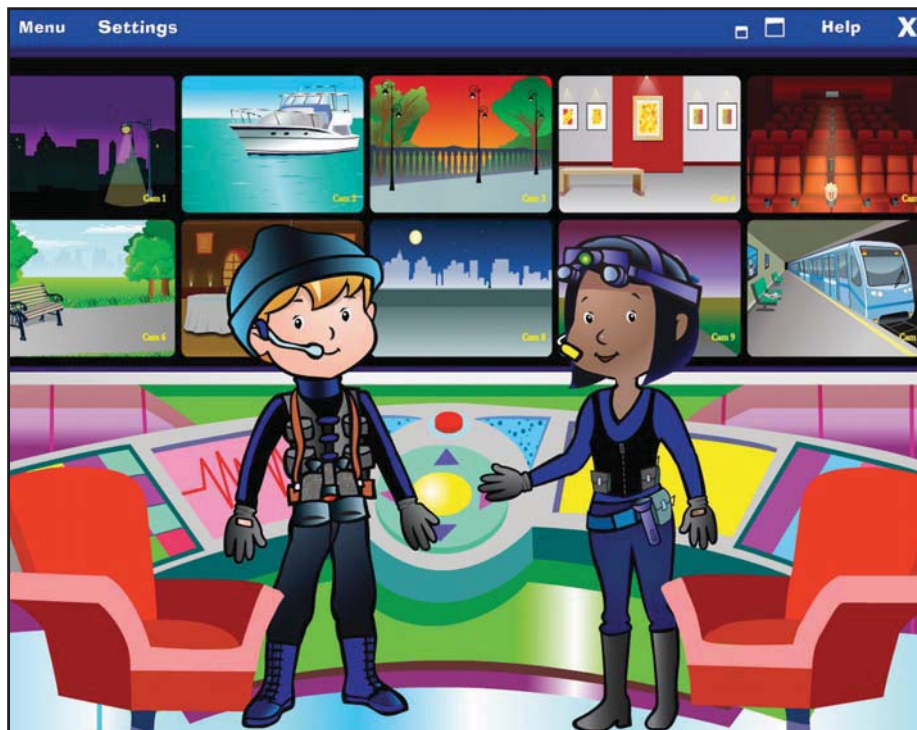
This activity includes twelve levels targeting a student's ability to answer WH questions after listening to up to three sentences with multiple details.

Objective Variables

- Number of sentences

- Number of questions

- Repeat (whether or not the student may hear the information presented again)

- Noise (contextual background noise is on or off)

- Number of items (there are either ten or twelve items in a level)

APPENDIX C: Memory Strategies

There are memory strategies for each of the activities. The strategies vary based on the activity. The strategies will appear automatically if a student misses three or more items in a set of ten (< 70% accuracy). The student must choose a strategy and listen to it before attempting the level again. You may review the strategies before the student begins an activity by clicking on the briefcase to the right of the mission.

Memory Strategies for Numbers

Repeat It - Try saying the numbers over and over, like this: 2, 7, 5; 2, 7, 5; 2, 7, 5.

Group It - Think of the numbers in groups. So if you hear 5, 3, 7, 2, 4, 6—think 5 3 7, 2 4 6.

Chunk It - Try putting the numbers together. So if you hear 2, 4, 8, 3—think 24, 83.

Sing It - Try putting the numbers to a rhythm or song, like: 5-8-6, 7-4-1.

See It - Try picturing the numbers in your head as you hear them.

Memory Strategies for Words

Repeat It - Try saying the words over and over, like this: key, pig, hat; key, pig, hat; key, pig, hat.

Sing It - Try putting the words to a rhythm or song, like this: star-book-shoe-key.

See It - Try to picture the words in your head as you hear them, like: moon, rug, book.

Say It - Try to make a simple sentence using the words you hear. If you hear dog, hat, bed, make a silly sentence like, The dog found a hat under the bed.

Memory Strategies for Details

Repeat It - Try saying the words over and over, like: blonde hair, hat, phone; blonde hair, hat, phone; blonde hair, hat, phone.

See It - Try to picture the details in your head as you hear them, like: brown hair, blue shirt, long pants, walking a dog.

Sing It - Try putting the details to a rhythm or song, like: black hair-long pants-walking dog, black hair-long pants-walking dog.

Memory Strategies for Auditory Closure

Predict It - Listen for key words in the sentence and try to think of a word that goes with it. If you hear shoes, think of what would go with shoes—socks.

Repeat It - Try to repeat the sentence in your head and think of each answer option in the place of the jumbled word. Then pick which one makes the most sense.

Memory Strategies for WH Info

See It - Try to picture the details in your head as you hear them, like: Go to the library on 4th Street, bring 3 chocolate donuts and a watch.

Repeat It - Try repeating the details over and over to yourself, like: 4th street, 3 chocolate donuts, watch; 4th Street, 3 chocolate donuts, watch.

Who, What, Where, When - Try to remember who the story is about, what they are doing, where they are, and when they are doing it.

APPENDIX D: Activity Learning Objectives

Memory for Numbers — 17 Levels

Level 1 – Recall 3 digits with a 0 second delay with visual cues with 80% accuracy.

Level 2 – Recall 3 digits with a 0 second delay without visual cues with 80% accuracy.

Level 3 – Recall 3 digits with a 3 second delay without visual cues with 80% accuracy.

Level 4 – Recall 3 digits with a 10 second delay without visual cues with 80% accuracy.

Level 5 – Recall 4 digits with a 0 second delay with visual cues with 80% accuracy.

Level 6 – Recall 4 digits with a 0 second delay without visual cues with 80% accuracy.

Level 7 – Recall 4 digits with a 3 second delay without visual cues with 80% accuracy.

Level 8 – Recall 4 digits with a 10 second delay without visual cues with 80% accuracy.

Level 9 – Recall 5 digits with a 0 second delay with visual cues with 80% accuracy.

Level 10 – Recall 5 digits with a 0 second delay without visual cues with 80% accuracy.

Level 11 – Recall 5 digits with a 3 second delay without visual cues with 80% accuracy.

Level 12 – Recall 5 digits with a 10 second delay without visual cues with 80% accuracy.

Level 13 – Recall 6 digits with a 0 second delay with visual cues with 80% accuracy.

Level 14 – Recall 6 digits with a 0 second delay without visual cues with 80% accuracy.

Level 15 – Recall 6 digits with a 3 second delay without visual cues with 80% accuracy.

Level 16 – Recall 6 digits with a 10 second delay without visual cues with 80% accuracy.

Level 17 – Recall 7 digits with a 0 second delay with visual cues with 80% accuracy.

Memory for Words — 84 Levels

Level 1 – Recall 3 related, 1 syllable words presented at .5 second intervals when given a 0 second delay, visual cues, and 0 foils with 80% accuracy.

Level 2 – Recall 3 related, 1 syllable words presented at .5 second intervals when given a 0 second delay, visual cues, and 3 foils with 80% accuracy.

Level 3 – Recall 3 related, 2 syllable words presented at .5 second intervals when given a 0 second delay, visual cues, and 3 foils with 80% accuracy.

Level 4 – Recall 3 unrelated, 1 syllable words presented at .5 second intervals when given a 0 second delay, visual cues, and 3 foils with 80% accuracy.

Level 5 – Recall 3 unrelated, 2 syllable words presented at .5 second intervals when given a 0 second delay, visual cues, and 3 foils with 80% accuracy.

Level 6 – Recall 3 unrelated, 1-3 syllable words presented at .5 second intervals when given a 0 second delay, visual cues, and 3 foils with 80% accuracy.

Level 7 – Recall 3 unrelated, 1-3 syllable words presented at .25 second intervals when given a 0 second delay, visual cues, and 3 foils with 80% accuracy.

Level 8 – Recall 3 related, 1 syllable words presented at .5 second intervals when given a 0 second delay, no visual cues, and 0 foils with 80% accuracy.

Level 9 – Recall 3 related, 1 syllable words presented at .5 second intervals when given a 0 second delay, no visual cues, and 3 foils with 80% accuracy.

Level 10 – Recall 3 related, 2 syllable words presented at .5 second intervals when given a 0 second delay, no visual cues, and 3 foils with 80% accuracy.

Level 11 – Recall 3 unrelated, 1 syllable words presented at .5 second intervals when given a 0 second delay, no visual cues, and 3 foils with 80% accuracy.

Level 12 – Recall 3 unrelated, 2 syllable words presented at .5 second intervals when given a 0 second delay, no visual cues, and 3 foils with 80% accuracy.

Level 13 – Recall 3 unrelated, 1-3 syllable words presented at .5 second intervals when given a 0 second delay, no visual cues, and 3 foils with 80% accuracy.

Level 14 – Recall 3 unrelated, 1-3 syllable words presented at .25 second intervals when given a 0 second delay, no visual cues, and 3 foils with 80% accuracy.

Level 15 – Recall 3 related, 1 syllable words presented at .5 second intervals when given a 3 second delay, no visual cues, and 0 foils with 80% accuracy.

Level 16 – Recall 3 related, 1 syllable words presented at .5 second intervals when given a 3 second delay, no visual cues, and 3 foils with 80% accuracy.

Level 17 – Recall 3 related, 2 syllable words presented at .5 second intervals when given a 3 second delay, no visual cues, and 3 foils with 80% accuracy.

Level 18 – Recall 3 unrelated, 1 syllable words presented at .5 second intervals when given a 3 second delay, no visual cues, and 3 foils with 80% accuracy.

Level 19 – Recall 3 unrelated, 2 syllable words presented at .5 second intervals when given a 3 second delay, no visual cues, and 3 foils with 80% accuracy.

Level 20 – Recall 3 unrelated, 1–3 syllable words presented at .5 second intervals when given a 3 second delay, no visual cues, and 3 foils with 80% accuracy.

Level 21 – Recall 3 unrelated, 1–3 syllable words presented at .25 second intervals when given a 3 second delay, no visual cues, and 3 foils with 80% accuracy.

Level 22 – Recall 3 related, 1 syllable words presented at .5 second intervals when given a 10 second delay, no visual cues, and 0 foils with 80% accuracy.

Level 23 – Recall 3 related, 1 syllable words presented at .5 second intervals when given a 10 second delay, no visual cues, and 3 foils with 80% accuracy.

Level 24 – Recall 3 related, 2 syllable words presented at .5 second intervals when given a 10 second delay, no visual cues, and 3 foils with 80% accuracy.

Level 25 – Recall 3 unrelated, 1 syllable words presented at .5 second intervals when given a 10 second delay, no visual cues, and 3 foils with 80% accuracy.

Level 26 – Recall 3 unrelated, 2 syllable words presented at .5 second intervals when given a 10 second delay, no visual cues, and 3 foils with 80% accuracy.

Level 27 – Recall 3 unrelated, 1–3 syllable words presented at .5 second intervals when given a 10 second delay, no visual cues, and 3 foils with 80% accuracy.

Level 28 – Recall 3 unrelated, 1–3 syllable words presented at .25 second intervals when given a 10 second delay, no visual cues, and 3 foils with 80% accuracy.

Level 29 – Recall 4 related, 1 syllable words presented at .5 second intervals when given a 0 second delay, visual cues, and 0 foils with 80% accuracy.

Level 30 – Recall 4 related, 1 syllable words presented at .5 second intervals when given a 0 second delay, visual cues, and 5 foils with 80% accuracy.

Level 31 – Recall 4 related, 2 syllable words presented at .5 second intervals when given a 0 second delay, visual cues, and 5 foils with 80% accuracy.

Level 32 – Recall 4 unrelated, 1 syllable words presented at .5 second intervals when given a 0 second delay, visual cues, and 5 foils with 80% accuracy.

Level 33 – Recall 4 unrelated, 2 syllable words presented at .5 second intervals when given a 0 second delay, visual cues, and 5 foils with 80% accuracy.

Level 34 – Recall 4 unrelated, 1–3 syllable words presented at .5 second intervals when given a 0 second delay, visual cues, and 5 foils with 80% accuracy.

Level 35 – Recall 4 unrelated, 1–3 syllable words presented at .25 second intervals when given a 0 second delay, visual cues, and 5 foils with 80% accuracy.

Level 36 – Recall 4 related, 1 syllable words presented at .5 second intervals when given a 0 second delay, no visual cues, and 0 foils with 80% accuracy.

Level 37 – Recall 4 related, 1 syllable words presented at .5 second intervals when given a 0 second delay, no visual cues, and 5 foils with 80% accuracy.

Level 38 – Recall 4 related, 2 syllable words presented at .5 second intervals when given a 0 second delay, no visual cues, and 5 foils with 80% accuracy.

Level 39 – Recall 4 unrelated, 1 syllable words presented at .5 second intervals when given a 0 second delay, no visual cues, and 5 foils with 80% accuracy.

Level 40 – Recall 4 unrelated, 2 syllable words presented at .5 second intervals when given a 0 second delay, no visual cues, and 5 foils with 80% accuracy.

Level 41 – Recall 4 unrelated, 1–3 syllable words presented at .5 second intervals when given a 0 second delay, no visual cues, and 5 foils with 80% accuracy.

Level 42 – Recall 4 unrelated, 1–3 syllable words presented at .25 second intervals when given a 0 second delay, no visual cues, and 5 foils with 80% accuracy.

Level 43 – Recall 4 related, 1 syllable words presented at .5 second intervals when given a 3 second delay, no visual cues, and 0 foils with 80% accuracy.

Level 44 – Recall 4 related, 1 syllable words presented at .5 second intervals when given a 3 second delay, no visual cues, and 5 foils with 80% accuracy.

Level 45 – Recall 4 related, 2 syllable words presented at .5 second intervals when given a 3 second delay, no visual cues, and 5 foils with 80% accuracy.

Level 46 – Recall 4 unrelated, 1 syllable words presented at .5 second intervals when given a 3 second delay, no visual cues, and 5 foils with 80% accuracy.

Level 47 – Recall 4 unrelated, 2 syllable words presented at .5 second intervals when given a 3 second delay, no visual cues, and 5 foils with 80% accuracy.

Level 48 – Recall 4 unrelated, 1–3 syllable words presented at .5 second intervals when given a 3 second delay, no visual cues, and 5 foils with 80% accuracy.

Level 49 – Recall 4 unrelated, 1–3 syllable words presented at .25 second intervals when given a 3 second delay, no visual cues, and 5 foils with 80% accuracy.

Level 50 – Recall 4 related, 1 syllable words presented at .5 second intervals when given a 10 second delay, no visual cues, and 0 foils with 80% accuracy.

Level 51 – Recall 4 related, 1 syllable words presented at .5 second intervals when given a 10 second delay, no visual cues, and 5 foils with 80% accuracy.

Level 52 – Recall 4 related, 2 syllable words presented at .5 second intervals when given a 10 second delay, no visual cues, and 5 foils with 80% accuracy.

Level 53 – Recall 4 unrelated, 1 syllable words presented at .5 second intervals when given a 10 second delay, no visual cues, and 5 foils with 80% accuracy.

Level 54 – Recall 4 unrelated, 2 syllable words presented at .5 second intervals when given a 10 second delay, no visual cues, and 5 foils with 80% accuracy.

Level 55 – Recall 4 unrelated, 1–3 syllable words presented at .5 second intervals when given a 10 second delay, no visual cues, and 5 foils with 80% accuracy.

Level 56 – Recall 4 unrelated, 1-3 syllable words presented at .25 second intervals when given a 10 second delay, no visual cues, and 5 foils with 80% accuracy.

Level 57 – Recall 5 related, 1 syllable words presented at .5 second intervals when given a 0 second delay, visual cues, and 0 foils with 80% accuracy.

Level 58 – Recall 5 related, 1 syllable words presented at .5 second intervals when given a 0 second delay, visual cues, and 4 foils with 80% accuracy.

Level 59 – Recall 5 related, 2 syllable words presented at .5 second intervals when given a 0 second delay, visual cues, and 4 foils with 80% accuracy.

Level 60 – Recall 5 unrelated, 1 syllable words presented at .5 second intervals when given a 0 second delay, visual cues, and 4 foils with 80% accuracy.

Level 61 – Recall 5 unrelated, 2 syllable words presented at .5 second intervals when given a 0 second delay, visual cues, and 4 foils with 80% accuracy.

Level 62 – Recall 5 unrelated, 1–3 syllable words presented at .5 second intervals when given a 0 second delay, visual cues, and 4 foils with 80% accuracy.

Level 63 – Recall 5 unrelated, 1–3 syllable words presented at .25 second intervals when given a 0 second delay, visual cues, and 4 foils with 80% accuracy.

Level 64 – Recall 5 related, 1 syllable words presented at .5 second intervals when given a 0 second delay, no visual cues, and 0 foils with 80% accuracy.

Level 65 – Recall 5 related, 1 syllable words presented at .5 second intervals when given a 0 second delay, no visual cues, and 4 foils with 80% accuracy.

Level 66 – Recall 5 related, 2 syllable words presented at .5 second intervals when given a 0 second delay, no visual cues, and 4 foils with 80% accuracy.

Level 67 – Recall 5 unrelated, 1 syllable words presented at .5 second intervals when given a 0 second delay, no visual cues, and 4 foils with 80% accuracy.

Level 68 – Recall 5 unrelated, 2 syllable words presented at .5 second intervals when given a 0 second delay, no visual cues, and 4 foils with 80% accuracy.

Level 69 – Recall 5 unrelated, 1–3 syllable words presented at .5 second intervals when given a 0 second delay, no visual cues, and 4 foils with 80% accuracy.

Level 70 – Recall 5 unrelated, 1–3 syllable words presented at .25 second intervals when given a 0 second delay, no visual cues, and 4 foils with 80% accuracy.

Level 71 – Recall 5 related, 1 syllable words presented at .5 second intervals when given a 3 second delay, no visual cues, and 0 foils with 80% accuracy.

Level 72 – Recall 5 related, 1 syllable words presented at .5 second intervals when given a 3 second delay, no visual cues, and 4 foils with 80% accuracy.

Level 73 – Recall 5 related, 2 syllable words presented at .5 second intervals when given a 3 second delay, no visual cues, and 4 foils with 80% accuracy.

Level 74 – Recall 5 unrelated, 1 syllable words presented at .5 second intervals when given a 3 second delay, no visual cues, and 4 foils with 80% accuracy.

Level 75 – Recall 5 unrelated, 2 syllable words presented at .5 second intervals when given a 3 second delay, no visual cues, and 4 foils with 80% accuracy.

Level 76 – Recall 5 unrelated, 1–3 syllable words presented at .5 second intervals when given a 3 second delay, no visual cues, and 4 foils with 80% accuracy.

Level 77 – Recall 5 unrelated, 1–3 syllable words presented at .25 second intervals when given a 3 second delay, no visual cues, and 4 foils with 80% accuracy.

Level 78 – Recall 5 related, 1 syllable words presented at .5 second intervals when given a 10 second delay, no visual cues, and 0 foils with 80% accuracy.

Level 79 – Recall 5 related, 1 syllable words presented at .5 second intervals when given a 10 second delay, no visual cues, and 4 foils with 80% accuracy.

Level 80 – Recall 5 related, 2 syllable words presented at .5 second intervals when given a 10 second delay, no visual cues, and 4 foils with 80% accuracy.

Level 81 – Recall 5 unrelated, 1 syllable words presented at .5 second intervals when given a 10 second delay, no visual cues, and 4 foils with 80% accuracy.

Level 82 – Recall 5 unrelated, 2 syllable words presented at .5 second intervals when given a 10 second delay, no visual cues, and 4 foils with 80% accuracy.

Level 83 – Recall 5 unrelated, 1–3 syllable words presented at .5 second intervals when given a 10 second delay, no visual cues, and 4 foils with 80% accuracy.

Level 84 – Recall 5 unrelated, 1–3 syllable words presented at .25 second intervals when given a 10 second delay, no visual cues, and 4 foils with 80% accuracy.

Memory for Details — 64 Levels

Level 1 – Identify a person from a field of 3 given 1 detail, visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 2 – Identify a person from a field of 4 given 1 detail, visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 3 – Identify a person from a field of 5 given 1 detail, visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 4 – Identify a person from a field of 5 given 1 detail, visual cues, a 0 second delay, and distractions with 80% accuracy.

Level 5 – Identify a person from a field of 3 given 2 details, visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 6 – Identify a person from a field of 4 given 2 details, visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 7 – Identify a person from a field of 5 given 2 details, visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 8 – Identify a person from a field of 5 given 2 details, visual cues, a 0 second delay, and distractions with 80% accuracy.

Level 9 – Identify a person from a field of 3 given 3 details, visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 10 – Identify a person from a field of 4 given 3 details, visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 11 – Identify a person from a field of 5 given 3 details, visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 12 – Identify a person from a field of 5 given 3 details, visual cues, a 0 second delay, and distractions with 80% accuracy.

Level 13 – Identify a person from a field of 3 given 4 details, visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 14 – Identify a person from a field of 4 given 4 details, visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 15 – Identify a person from a field of 5 given 4 details, visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 16 – Identify a person from a field of 5 given 4 details, visual cues, a 0 second delay, and distractions with 80% accuracy.

Level 17 – Identify a person from a field of 3 given 1 detail, no visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 18 – Identify a person from a field of 4 given 1 detail, no visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 19 – Identify a person from a field of 5 given 1 detail, no visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 20 – Identify a person from a field of 5 given 1 detail, no visual cues, a 0 second delay, and distractions with 80% accuracy.

Level 21 – Identify a person from a field of 3 given 2 details, no visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 22 – Identify a person from a field of 4 given 2 details, no visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 23 – Identify a person from a field of 5 given 2 details, no visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 24 – Identify a person from a field of 5 given 2 details, no visual cues, a 0 second delay, and distractions with 80% accuracy.

Level 25 – Identify a person from a field of 3 given 3 details, no visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 26 – Identify a person from a field of 4 given 3 details, no visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 27 – Identify a person from a field of 5 given 3 details, no visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 28 – Identify a person from a field of 5 given 3 details, no visual cues, a 0 second delay, and distractions with 80% accuracy.

Level 29 – Identify a person from a field of 3 given 4 details, no visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 30 – Identify a person from a field of 4 given 4 details, no visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 31 – Identify a person from a field of 5 given 4 details, no visual cues, a 0 second delay, and no distractions with 80% accuracy.

Level 32 – Identify a person from a field of 5 given 4 details, no visual cues, a 0 second delay, and distractions with 80% accuracy.

Level 33 – Identify a person from a field of 3 given 1 detail, no visual cues, a 3 second delay, and no distractions with 80% accuracy.

Level 34 – Identify a person from a field of 4 given 1 detail, no visual cues, a 3 second delay, and no distractions with 80% accuracy.

Level 35 – Identify a person from a field of 5 given 1 detail, no visual cues, a 3 second delay, and no distractions with 80% accuracy.

Level 36 – Identify a person from a field of 5 given 1 detail, no visual cues, a 3 second delay, and distractions with 80% accuracy.

Level 37 – Identify a person from a field of 3 given 2 details, no visual cues, a 3 second delay, and no distractions with 80% accuracy.

Level 38 – Identify a person from a field of 4 given 2 details, no visual cues, a 3 second delay, and no distractions with 80% accuracy.

Level 39 – Identify a person from a field of 5 given 2 details, no visual cues, a 3 second delay, and no distractions with 80% accuracy.

Level 40 – Identify a person from a field of 5 given 2 details, no visual cues, a 3 second delay, and distractions with 80% accuracy.

Level 41 – Identify a person from a field of 3 given 3 details, no visual cues, a 3 second delay, and no distractions with 80% accuracy.

Level 42 – Identify a person from a field of 4 given 3 details, no visual cues, a 3 second delay, and no distractions with 80% accuracy.

Level 43 – Identify a person from a field of 5 given 3 details, no visual cues, a 3 second delay, and no distractions with 80% accuracy.

Level 44 – Identify a person from a field of 5 given 3 details, no visual cues, a 3 second delay, and distractions with 80% accuracy.

Level 45 – Identify a person from a field of 3 given 4 details, no visual cues, a 3 second delay, and no distractions with 80% accuracy.

Level 46 – Identify a person from a field of 4 given 4 details, no visual cues, a 3 second delay, and no distractions with 80% accuracy.

Level 47 – Identify a person from a field of 5 given 4 details, no visual cues, a 3 second delay, and no distractions with 80% accuracy.

Level 48 – Identify a person from a field of 5 given 4 details, no visual cues, a 3 second delay, and distractions with 80% accuracy.

Level 49 – Identify a person from a field of 3 given 1 detail, no visual cues, a 10 second delay, and no distractions with 80% accuracy.

Level 50 – Identify a person from a field of 4 given 1 detail, no visual cues, a 10 second delay, and no distractions with 80% accuracy.

Level 51 – Identify a person from a field of 5 given 1 detail, no visual cues, a 10 second delay, and no distractions with 80% accuracy.

Level 52 – Identify a person from a field of 5 given 1 detail, no visual cues, a 10 second delay, and distractions with 80% accuracy.

Level 53 – Identify a person from a field of 3 given 2 details, no visual cues, a 10 second delay, and no distractions with 80% accuracy.

Level 54 – Identify a person from a field of 4 given 2 details, no visual cues, a 10 second delay, and no distractions with 80% accuracy.

Level 55 – Identify a person from a field of 5 given 2 details, no visual cues, a 10 second delay, and no distractions with 80% accuracy.

Level 56 – Identify a person from a field of 5 given 2 details, no visual cues, a 10 second delay, and distractions with 80% accuracy.

Level 57 – Identify a person from a field of 3 given 3 details, no visual cues, a 10 second delay, and no distractions with 80% accuracy.

Level 58 – Identify a person from a field of 4 given 3 details, no visual cues, a 10 second delay, and no distractions with 80% accuracy.

Level 59 – Identify a person from a field of 5 given 3 details, no visual cues, a 10 second delay, and no distractions with 80% accuracy.

Level 60 – Identify a person from a field of 5 given 3 details, no visual cues, a 10 second delay, and distractions with 80% accuracy.

Level 61 – Identify a person from a field of 3 given 4 details, no visual cues, a 10 second delay, and no distractions with 80% accuracy.

Level 62 – Identify a person from a field of 4 given 4 details, no visual cues, a 10 second delay, and no distractions with 80% accuracy.

Level 63 – Identify a person from a field of 5 given 4 details, no visual cues, a 10 second delay, and no distractions with 80% accuracy.

Level 64 – Identify a person from a field of 5 given 4 details, no visual cues, a 10 second delay, and distractions with 80% accuracy.

Auditory Closure — 22 Levels

Level 1 – Determine the missing word in the final position of a phrase or sentence that has a high predictability (i.e., song, sayings, pairs) given a phonemic cue with 80% accuracy.

Level 2 – Determine the missing word in the final position of a phrase or sentence that has a high predictability (i.e., songs, sayings, pairs) given no phonemic cue with 80% accuracy.

Level 3 – Determine the missing word in the final position of a sentence that has a high predictability (i.e., clue within the sentence) and is < 4 words given a phonemic cue with 80% accuracy.

Level 4 – Determine the missing word in the final position of a sentence that has a high predictability (i.e., clue within the sentence) and is < 4 words given no phonemic cue with 80% accuracy.

Level 5 – Determine the missing word in the final position of a sentence that has a high predictability (i.e., rhyming cue) and is < 10 words given a phonemic cue with 80% accuracy.

Level 6 – Determine the missing word in the final position of a sentence that has a high predictability (i.e., rhyming cue) and is < 10 words given no phonemic cue with 80% accuracy.

Level 7 – Determine the missing word in the final position of a sentence that has a moderate predictability (i.e., clue within the sentence) and is 5-10 words given a phonemic cue with 80% accuracy.

Level 8 – Determine the missing word in the final position of a sentence that has a moderate predictability (i.e., clue within the sentence) and is 5-10 words given no phonemic cue with 80% accuracy.

Level 9 – Determine the missing word in the medial position of a sentence that has a moderate predictability (i.e., clue within the sentence) and is 5-12 words given a phonemic cue with 80% accuracy.

Level 10 – Determine the missing word in the medial position of a sentence that has a moderate predictability (i.e., clue within the sentence) and is 5-12 words given no phonemic cue with 80% accuracy.

Level 11 – Determine the missing noun in any position of a sentence that has a low predictability and is < 9 words given a phonemic cue with 80% accuracy.

Level 12 – Determine the missing noun in any position of a sentence that has a low predictability and is < 9 words given no phonemic cue with 80% accuracy.

Level 13 – Determine the missing noun in any position of a sentence that has a low predictability and is < 13 words given a phonemic cue with 80% accuracy.

Level 14 – Determine the missing noun in any position of a sentence that has a low predictability and is < 13 words given no phonemic cue with 80% accuracy.

Level 15 – Determine the missing verb in any position of a sentence that has a low predictability and is < 9 words given a phonemic cue with 80% accuracy.

Level 16 – Determine the missing verb in any position of a sentence that has a low predictability and is < 9 words given no phonemic cue with 80% accuracy.

Level 17 – Determine the missing verb in any position of a sentence that has a low predictability and is < 13 words given a phonemic cue with 80% accuracy.

Level 18 – Determine the missing verb in any position of a sentence that has a low predictability and is < 13 words given no phonemic cue with 80% accuracy.

Level 19 – Determine the missing adjective in any position of a sentence that has a low predictability and is < 9 words given a phonemic cue with 80% accuracy.

Level 20 – Determine the missing adjective in any position of a sentence that has a low predictability and is < 9 words given no phonemic cue with 80% accuracy.

Level 21 – Determine the missing adjective in any position of a sentence that has a low predictability and is < 13 words given a phonemic cue with 80% accuracy.

Level 22 – Determine the missing adjective in any position of a sentence that has a low predictability and is < 13 words given no phonemic cue with 80% accuracy.

Memory for WH Info — 12 Levels

Level 1 – Answer 1 WH question given 2 sentences with repetitions and no background noise with 80% accuracy (8/10 items).

Level 2 – Answer 1 WH question given 2 sentences with no repetitions and no background noise with 80% accuracy (8/10 items).

Level 3 – Answer 1 WH question given 2 sentences with no repetitions and background noise with 80% accuracy (8/10 items).

Level 4 – Answer 2 WH questions given 2 sentences with repetitions and no background noise with 80% accuracy (8/10 items).

Level 5 – Answer 2 WH questions given 2 sentences with no repetitions and no background noise with 80% accuracy (8/10 items).

Level 6 – Answer 2 WH questions given 2 sentences with no repetitions and background noise with 80% accuracy (8/10 items).

Level 7 – Answer 2 WH questions given 3 sentences with repetitions and no background noise with 80% accuracy (8/10 items).

Level 8 – Answer 2 WH questions given 3 sentences with no repetitions and no background noise with 80% accuracy (8/10 items).

Level 9 – Answer 2 WH questions given 3 sentences with no repetitions and background noise with 80% accuracy (8/10 items).

Level 10 – Answer 4 WH questions given 3 sentences with repetitions and no background noise with 83% accuracy (10/12 items).

Level 11 – Answer 4 WH questions given 3 sentences with no repetitions and no background noise with 83% accuracy (10/12 items).

Level 12 – Answer 4 WH questions given 3 sentences with no repetitions and background noise with 83% accuracy (10/12 items).

APPENDIX E: HearBuilder Auditory Memory Inventory

I. Numbers

Pretest & Posttest

Recall three to six numbers given visual cues (able to see the number pad) and no delay.
1. 1-8-7
2. 2-0-1-1
3. 1-6-0-5-0
4. 1-3-8-5-9-1

Recall three to six numbers with no visual cues (unable to see the number pad) and no delay.
5. 3-8-2
6. 5-1-9-7
7. 8-9-3-0-2
8. 6-4-3-2-5-7

Recall three to six numbers with no visual cues and a three-second delay.
9. 7-9-1
10. 0-9-5-8
11. 8-0-7-4-9
12. 0-9-4-5-4-8

Recall three to six numbers with no visual cues and a 10-second delay.
13. 1-6-5
14. 8-8-6-5
15. 5-6-9-4-9
16. 2-2-5-1-7-6

II. Words

Pretest & Posttest

Recall three to five one- or two-syllable words given eight pictures with no visual cues and no delay.
1. Clock – jar – cake
2. Pizza – camel – paper
3. Pear – cake – queen – salt
4. Flowers – paper – balloon – jelly
5. Pear – cake – salt – queen – clock
6. Balloon – camel – chicken – garden – pizza

Recall three to five one- or two-syllable words given eight pictures with no visual cues and a three-second delay.
7. Frog – milk – clock
8. Garden – chicken – paper
9. Cake – queen – frog – salt
10. Garden – balloon – camel – paper
11. Frog – cake – jar – milk – pear
12. Paper – chicken – camel – jelly – pizza

Recall three to five one- or two-syllable words given eight pictures with no visual cues and a 10-second delay.
13. Salt – pear – clock
14. Camel – jelly – balloon
15. Pear – cake – salt – milk
16. Garden – balloon – camel – pizza
17. Jar – milk – queen – pear – clock
18. Balloon – paper – garden – jelly – pizza

III. Closure

<u>Pretest</u>

(Note: Underlined word is correct answer. Choices were presented in random order.)

Choose the correct missing noun given a phonemic cue.

1. I will put my brother's b_____ in the garage.
   Choices: <u>bicycle</u>   basement   pedaling   riding

2. Yesterday I had a s_____ and an apple for lunch.
   Choices: <u>sandwich</u>   sandcastle   lunchroom   dinner

Choose the correct missing noun with no phonemic cue.

3. Janice dropped her new _____ in the deep end of the pool.
   Choices: <u>phone</u>   find   swim   shallow

4. The brown horse likes to eat _____ from Becky's hand.
   Choices: <u>apples</u>   able   chew   gallop

Choose the correct missing verb given a phonemic cue.

5. Mary s_____ along while Dion played his new guitar.
   Choices: <u>sang</u>   sink   trumpet   piano

6. Jonathan always j_____ over the puddles on the sidewalk.
   Choices: <u>jumps</u>   just   mud   water

Choose the correct missing verb with no phonemic cue.

7. Every night, Kelly _____ her face before she goes to bed.
   Choices: <u>washes</u>   wishes   hair   head

8. In the summer, Uncle Joe _____ the lawn every Saturday.
   Choices: <u>mows</u>   may   grass   Sunday

Choose the correct missing adjective given a phonemic cue.

9. Alexandra could not stop crying after watching the s_____ movie.
    Choices: <u>sad</u>   side   show   see

10. Martin was a_____ of the big dog his neighbor brought home.
    Choices: <u>afraid</u>   friend   hide   frown

Choose the correct missing adjective with no phonemic cue.

11. The magician performed some _____ tricks for the crowd.
    Choices: <u>amazing</u>   ambulance   act   quickly

12. Patrick had to walk because his motorcycle had a _____ tire.
    Choices: <u>flat</u>   float   wheel   car

Posttest

Choose the correct missing noun given a phonemic cue.

1. Please put the s_____ in the trunk of the black car.
    Choices: <u>suitcase</u>   second   travel   packing

2. Molly wore her pink b_____ to school every day last week.
    Choices: <u>boots</u>   bats   walk   snow

Choose the correct missing noun with no phonemic cue.

3. I see a white _____ sleeping on the sofa in the den.
    Choices: <u>cat</u>   couch   napping   kitchen

4. The children saw many little _____ hopping around the pond.
    Choices: <u>frogs</u>   freeze   lizards   lake

Choose the correct missing verb given a phonemic cue.

5. Before the game, Jasmine th_____ the soccer ball onto the field.
    Choices: <u>threw</u>   think   caught   game

6. Did you wr_____ the story about the hot air balloon?
    Choices: <u>write</u>   rude   sky   book

Choose the correct missing verb with no phonemic cue.

7. Who _____ this beautiful picture of the flower garden?
    Choices: <u>painted</u>   paid   pretty   rose

8. Darryl _____ the dog right after he gets home from school.
    Choices: <u>feeds</u>   first   puppy   bowl

Choose the correct missing adjective given a phonemic cue.

9. After everyone ate pancakes for breakfast, the table was <u>s</u>_____.
    Choices: <u>sticky</u>   steak   waffle   syrup

10. The <u>l</u>_____ cat stayed under the porch and slept all day.
    Choices: <u>lazy</u>   lose   sleep   sat

Choose the correct missing adjective with no phonemic cue.

11. Daniel wore a _____ costume to the Halloween party.
    Choices: <u>scary</u>   score   mask   treat

12. Alyssa read a _____ story to her younger sister.
    Choices: <u>funny</u>   phone   told   brother

IV. Details

Pretest & Posttest

Identify a person from a field of five given one to four details with visual cues, no delay, and no visual distractions in the background (unless indicated).

1. Find the girl who is wearing a green hat.

2. Find the girl who is not walking a dog and has black hair.

3. Find the girl who is wearing long pants, not wearing glasses, and is wearing a blue shirt.

4. Find the boy who is talking on the phone, is wearing shorts, is wearing a red shirt, and is wearing a blue hat.

5. (With visual distractions.) Find the boy who is not talking on the phone, is wearing a green shirt, has a backpack, and is wearing a blue hat.

Identify a person from a field of five given one to four details with no visual cues, no delay, and no visual distractions in the background (unless indicated).

6. Find the boy who is not walking a dog.

7. Find the boy who is wearing long pants and is wearing a yellow shirt.

8. Find the boy who is wearing glasses, is wearing a blue shirt, and has black hair.

9. Find the girl who has a backpack, has brown hair, is wearing a yellow shirt, and is wearing glasses.

10. (With visual distractions.) Find the boy who is wearing a yellow hat, is wearing shorts, is wearing a yellow shirt, and is not wearing glasses.

Identify a person from a field of five given one to four details with no visual cues, a three-second delay, and no visual distractions in the background (unless indicated).

11. Find the girl who is not talking on the phone.

12. Find the boy who is wearing a red shirt and is wearing shorts.

13. Find the girl who is wearing a yellow shirt, has brown hair, and is talking on the phone.

14. Find the girl who does not have a backpack, is not talking on the phone, is wearing long pants, and is wearing a green shirt.

15. (With visual distractions.) Find the boy who is not wearing glasses, has brown hair, is wearing a blue shirt, and is wearing shorts.

Identify a person from a field of five given one to four details with no visual cues, a 10-second delay, and no visual distractions in the background (unless indicated).

16. Find the girl who is not walking a dog.

17. Find the girl who is not walking a dog and is not wearing glasses.

18. Find the girl who is walking a dog, has a backpack, and has brown hair.

19. Find the boy who has red hair, is wearing a red shirt, is wearing shorts, and has a backpack.

20. (With visual distractions.) Find the boy who is not wearing glasses, is wearing shorts, is wearing a green hat, and has a backpack.

V. WH Info

Pretest

Answer two or four WH questions after listening to two to three sentences of information with no repetitions and no background noise.

(Note: Underlined word is correct answer. Choices were presented in random order.)

1. *Go to the old movie theater that is downtown. Buy two tickets and a large bucket of popcorn.*

   a. Where is the movie theater?
Choices:	<u>downtown</u>	next door	in the mall	on New Street

   b. How many tickets will you buy?
Choices:	<u>two</u>	three	four	twenty

2. *Go to the bowling alley at 4:00 PM. Ask the manager for red bowling shoes in size 7. You will find a secret message inside the left shoe.*

   a. What size bowling shoes?
Choices:	<u>7</u>	10	13	11

b. What is in the left shoe?
Choices: <u>secret message</u>   sock   ring   cell phone

3. *On Tuesday, walk to the soccer field at McNamara Park. Look for the soccer team wearing green jerseys. The team's coach will give you the secret code.*

 a. Where is the soccer field?
  Choices: <u>McNamara Park</u> Mitten Street Polar Park Tuesday Street

 b. What day will you go?
  Choices: <u>Tuesday</u>   Monday   Thursday   Sunday

 c. What will the soccer team be wearing?
  Choices: <u>green jerseys</u> red jerseys green socks white shorts

 d. Who will give you the secret code?
  Choices: <u>coach</u>   players   referee   parents

Answer two or four WH questions after listening to two to three sentences of information with no repetitions and background noise.

4. *Ride your bike to McIntosh Farms in Pleasantburg. Look for the yellow wagon taking children on hay rides. You'll find a secret message written on the back of the wagon.*

 a. What is the name of the farm?
  Choices: <u>McIntosh Farms</u> McDonald's Farm Hay Ride Farm Friendly Farm

 b. What color wagon will you look for?
  Choices: <u>yellow</u>   green   red   brown

5. *Take a taxi to the sports store on Maple Avenue. Ask the sales clerk for a pair of blue socks and three baseballs.*

 a. Where is the store?
  Choices: <u>Maple Avenue</u> Sugar Street Tree Street Morton Avenue

 b. What color socks?
  Choices: <u>blue</u>   black   red   white

6. *Ride your bike to the library on 43rd Street. Ask the librarian for the children's book about tigers. Inside the book you will find a postcard with an address to the secret house.*

 a. Where is the library?
  Choices: <u>43rd Street</u> 50th Avenue Book Street Postcard Avenue

b. What will you ask the librarian for?
  Choices: <u>a book about tigers</u>   a story about bears   a DVD about lions   a book about dogs

c. What is inside the book?
  Choices: <u>a postcard</u>   a picture   a stamp   a bookmark

d. What is on the postcard?
  Choices: <u>an address</u>   a picture   a phone number   a tiger

<div align="center">Posttest</div>

Answer two or four WH questions after listening to two to three sentences of information with no repetitions and no background noise.

1. *Buy a plain bagel from Barry's Bagels on Pratt Street. Ask the baker if anyone found a green cellphone.*

   a. Where is Barry's Bagels?
     Choices: <u>Pratt Street</u>   Prince Avenue   Broad Street   Brighton Road

   b. What color is the cell phone?
     Choices: <u>green</u>   gray   blue   black

2. *Walk to the radio station beside Betty's Steakhouse. Go in the radio station and find studio 31. Under the microphone in the studio you will find a yellow paper with a phone number on it.*

   a. Where is the radio station?
     Choices: <u>beside Betty's Steakhouse</u>   near State Street   in Studio 13   downtown

   b. What is under the microphone?
     Choices: <u>a yellow paper</u>   a table   a wire   a phone

3. *Ride your bike to the library on 43rd Street. Ask the librarian for the children's book about tigers. Inside the book you will find a postcard with an address to the secret house.*

   a. Where is the library?
     Choices: <u>43rd Street</u>   50th Avenue   Book Street   Postcard Avenue

   b. What will you ask the librarian for?
     Choices: <u>a book about tigers</u>   a story about bears   a DVD about lions   a book about dogs

   c. What is inside the book?
     Choices: <u>a postcard</u>   a picture   a stamp   a bookmark

   d. What is on the postcard?
     Choices: <u>an address</u>   a picture   a phone number   a tiger

Answer two or four WH questions after listening to two to three sentences of information with no repetitions and background noise.

4. *At 5 o'clock, go to the computer store in the mall. Ask the sales person to show you a brown laptop computer. Read the secret message that the sales person types on the computer.*

    a. Where is the computer store?
        Choices: <u>in the mall</u>   on Market Street   at the airport   downstairs

    b. What color laptop computer will you ask the sales person to show you?
        Choices: <u>brown</u>   black   pink   white

5. *Walk to the swimming pool on 5th Street. Put a red towel on the chair closest to the diving board.*

    a. What street is the swimming pool on?
        Choices: <u>on 5th Street</u>   on 50th Avenue   on H Street   on 1st Street

    b. What color towel will you put on the chair?
        Choices: <u>red</u>   yellow   orange   brown

6. *Saturday morning, walk to the diner on Creek Road. Sit in the booth that has three red roses on the table. The waitress will bring you a menu with the secret phone number on it.*

    a. When will you go to the diner?
        Choices: <u>morning</u>   afternoon   evening   midnight

    b. Where is the diner?
        Choices: <u>on Creek Road</u>   on Rose Road   on Diner Drive   on Cook Drive

    c. What is on the table?
        Choices: <u>three red flowers</u>   three pink flowers   two red flowers   two pink flowers

    d. Where is the secret phone number?
        Choices: <u>on the menu</u>   in the booth   on the waitress   in the flowers