

Impact of Sound Intervention Training on Auditory Processing Abilities in ED/LD Students

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Background

- Students with ED/LD are difficult to educate because of their behavior problems that often stem from emotional regulation issues
- Research has suggested that listening to “therapeutic music” may help calm the emotional system and lead to students being more available to hear and, thus to learn
 - Such interventions are called **Sound Interventions**

The Listening Program (TLP)

- One sound intervention is called The Listening Program or TLP
 - See www.thelisteningprogram.com
- This program requires the student to listen to acoustically modified and enhanced music for about 30 minutes a day
- Typically, this listening is done at home or in a therapist's office such as an SLP's or OT's practice

A Modified TLP

- The company that developed and produces TLP modified the program for use in a school setting (i.e., Advanced Brain Technologies)
- The modification relates to a more general program for use by all students rather than an individually fined tuned program such as used in the home or therapist's office
- Also, there are two ways to do the listening
 - Air Conduction and Bone Conduction

Research Questions in Our Study

- A number of factors are being investigated in the present study they include the following:
- Will listening to TLP using the “school modified protocol” improve the listening (auditory processing) skills of students who have been identified as having ED/LD?
 - Listening skills are measured via formal auditory processing assessments
- Is there a difference between air and bone conduction TLP listening in these students?

Research Questions Continued

- Is there a difference in listening outcomes when students listen to TLP vs. classical music similar to that used in TLP training?
- How will students with ED/LD react to listening to this classical music (TLP or non-modified/non-enhanced music)?
- These research questions will be answered in the following manner. . .

Research Analyses

- Pre- vs. Post- treatment auditory processing (APD) test results
- Qualitative analyses of student reactions and behaviors during the training period
- Qualitative analyses of feedback from teachers regarding their observations of any changes noted with the children

Methods

- Five groups of 20 subjects each will be included in the final project
- The groups are being divided as follows and all students have been and will continue to be arbitrarily placed into the four treatment groups
 - The fifth (control) group is made up of students seen just for pre- and post- testing with no treatment provided (time period about 6 months)

Methods (continued)

- Group 1 are students who will be listening to the acoustically modified and enhanced TLP protocol through air conduction headphones only (called the ACTLP group)
- Group 2 are students who will also be listening to the acoustically modified and enhanced TLP protocol through air+bone conduction headphones (called the BCTLTP group)

Methods (continued)

- Group 3 are students who will be listening to unmodified and non-enhanced classical music through air conduction headphones only (called the ACMUS group)
- Group 4 are students who will also be listening to the unmodified and non-enhanced classical music through air + bone conduction headphones (called the BCMUS group)
 - As stated earlier, the fifth group receives no treatment and is the control group

Test Procedures

- Prior to starting listening training and about one month following the completion of the training (which takes about one school year)
 - Students will be administered a battery of auditory processing tests
 - The evaluator knows the students, but does not know to which group each student belongs
 - Their data is analyzed by Dr. Lucker who did not do most of the testing and does not know the students, the groups to which they belong, or their behaviors during testing or training
 - All of the comparisons will be done within and between groups as well as between treatment groups and the control group
- Involves a double blind, placebo controlled, comparison group/control group, randomly assigned group design

Treatment Procedures

- Every school day, students will be pulled from their regular school schedule and listen to a track of music for about 30 minutes each session (some tracks are set to last 30 minutes, some last slightly less than 30 minutes such as 27 minutes)
- Student will be seen in groups in one room with each student listening to an individual iPOD
- Students will do very low cognitive demanding tasks such as coloring, stringing beads, etc.

Groups Within Each Treatment Session

- Students are chosen by class or grade to participate at any one time
- Thus, during one 30 minute listening session, some students could be from all four treatment groups or all could be from one treatment group
- Investigators and school staff monitoring the students doing the listening do not know to which group any students belong
- iPODS have been pre-set by the company that produces TLP and are labeled with letters unknown to the researchers, the students doing the listening and the staff at the school

Expected Outcomes/Results

- It is expected that all children doing the listening will make some changes in their auditory processing abilities
 - It is also expected that all treatment groups will show some improvements in auditory processing skills compared with the control group
- However, the two TLP groups are expected to perform significantly better than the two MUS groups

Expected Outcomes/Results (continued)

- It is also expected that the students using the BC units will perform better than those doing the AC only listening
- There is also expected to be a significant interaction between listening therapy (TLP vs. MUS) and headphones (BC vs. AC) with the BCTLP group performing the best followed by the ACTLP group followed by the BCMUS group followed by the ACMUS group

Observations To Date

- So far, about 65 students have received the pre-treatment auditory processing testing
- Most of these students have been engaged in TLP or MUS listening using a phase-in approach so that a few students started and more and more are added as time proceeds
- The remaining students will be evaluated and added – so that the last group added will also act as the control group (added after 6 months between the first and second APD testing)

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