Learning Problems and the Left Behind

(Summary of a paper presented at the annual meeting of the National Association of Elementary School Principals, Anaheim, CA, 2003 by Dr. Cindy Cason, Ph.D. Education)

Since 1973 and the enactment of Public Law 94-142, public schools have struggled with children who learn differently. Heterogeneous classrooms automatically mean comparison between children. This comparison becomes one between those who are "on" or "above" grade level and those who are "behind." The children targeted by the No Child Left Behind (NCLB) legislation of 2002 are from disadvantaged homes and have difficulty with cognitive development, acquiring vocabulary and learning the sounds required for learning to read. In addition, over ten million of these children nationwide have no health insurance and are educated in schools that are underfunded. These children are "left behind" years before they enter the realm of public education. Compounding that is the fact that, according to data reported in 2001 by the National Institute of Child Health and Human Development (NICHD), twenty percent of all elementary school students are at risk for reading failure. Five to ten percent of those at risk for reading failure have difficulty learning to read despite receiving the kind of reading instruction that is successful for most students.

The Learning Disabilities Association (LDA) highlights the fact that one in five American adults is functionally illiterate. One cause, according to LDA, is a neurologically-based learning disability that is often not recognized and/or dealt with appropriately. However, brain research conducted during the 1980s and advances in technology that followed during the 1990s can bring about a major improvement in educating children who learn differently.

One program that shows potential is Interactive Metronome® (IM). IM is an auditory processing program developed in the early 1990s by James Cassily. IM can be used to assess and rapidly improve the core brain processes of motor planning, sequencing and timing, which are the cornerstones of reading and math fluency. IM enables children to practice rhythmicity and timing and improve these vital skills.

The program, which is somewhat like a computerized version of a metronome, provides feedback indicating how closely a person's physical performance is synchronized to a program-generated reference beat. Recent research shows that IM training produces an average two-grade-level increase in reading and math fluency. The following research model, performed on Title I students, continues to demonstrate these dramatic increases.

Research Design

The study involved fourth and fifth grade students identified as Title I eligible and scoring in the lowest three stanines on the reading subtest of Stanford Achievement Test Edition Nine. Forty of the students participated in 12 sessions of IM training. Forty other students formed the Control Group and were matched to Research Group students on the basis of School Ability Index scores from the Otis Lennon School Ability Test.

Premise

According to the NCLB legislation, all students should be reading "on grade level" by the end of third grade. Therefore, the premise of this research is if students can increase their reading fluency they will be more apt to continue to read and strive to improve. Fourth and Fifth graders who are not reading fluently or doing their math fluently as compared to their peers are likely to "shut down" to avoid subjecting themselves to the peer taunts and jeers that go with being "slow."

Interactive Metronome Training

Forty students participated in a twelve-session protocol of the Interactive Metronome Training. The control students did not. Training consisted of three to four one-hour sessions per week for three to four weeks. Students progressed through the Interactive Metronome training in a four to one student-to-trainer ratio. Research and control groups were both pre- and post-tested with reading and math fluency subtest of the Woodcock Johnson III standardized test. Additionally, the STAR reading assessment was administered pre and post training and the Stanford Achievement Test results for the testing prior to training and post training were reviewed.

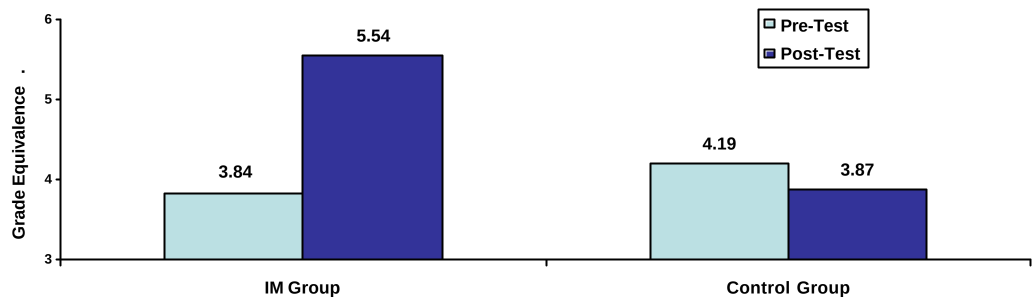
Results – Reading

Comparison of the IM trained group's pretest results with those of the control group reveals that both groups began the study with statistically equal performances on the reading fluency test ($p = .132$). After IM treatment, the IM group (mean = 5.54 GE) showed significantly higher posttest reading fluency performance (comparison $p < .000$) than did the control group (mean = 3.87 GE). Additionally, the IM group significantly increased its posttest performance (mean = 5.54 GE) over its pretest performance (mean = 3.84 GE), an increase of 1.71 grade equivalents ($p < .000$).

Interestingly, the control group experienced a significant decline in reading fluency from the pre- to post-testing ($p = .0001$).

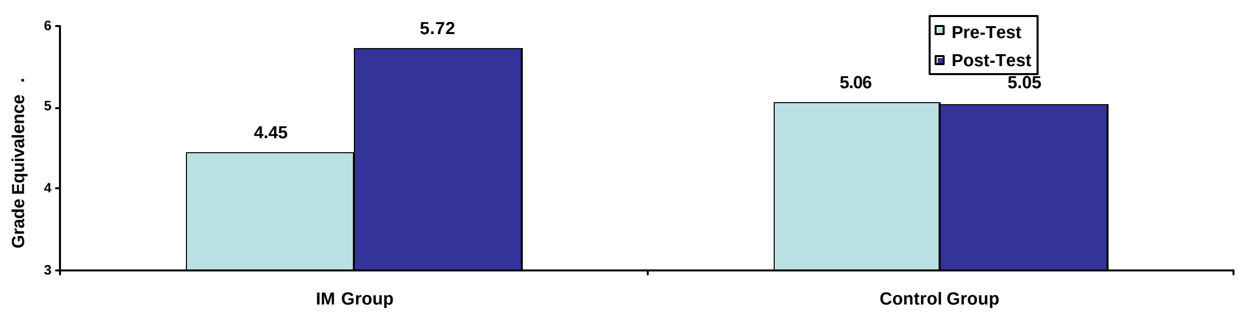
The STAR results showed that the students increased from an average of one to two grade levels. Students who received the IM training achieved a strong result in their fluency and comprehension during STAR testing. As a group, the students who received the IM intervention increased their Ability-Achievement Comparison (AAC) range on the Stanford Achievement Test from Low (below average) to Middle or High (above average). The control group, on the other hand, either remained at the Low or Middle range or decreased from Middle to Low (below average)

These results strongly support the conclusion that IM training significantly influences improvements in subjects' reading fluency performance.



Results – Mathematics

Comparison of the IM trained group's pretest results with those of the control group again reveals that both groups began the study with statistically equal performances on the mathematics fluency test ($p = .086$). After IM training, the IM group (mean = 5.72) showed a non-significantly higher posttest math fluency performance ($p =.072$) compared with the control group (mean = 5.05). However, the IM group significantly increased its posttest performance (mean = 5.72) over its pretest performance (mean = 4.43), an increase of 1.29 grade equivalents ($p < .000$). In fact, at the start of the study the IM group was 0.63 grade equivalent below the control group, but finished the study 0.67 grade equivalent higher than the control group. The control group showed no change in mathematics fluency from pre- to post-test ($p = .935$).



As a group, the students who received the IM intervention remained stable in regards to their Ability-Achievement Comparison (AAC) Range on the Stanford Achievement Test. The overall group result was in the Middle range both pre- and post- IM training. The control group, on the other hand, either remained at the Low or Middle range or decreased from Middle to Low (below average). These results strongly support the conclusion that IM training significantly influences improvement in subjects' mathematics fluency performance.

The results of this study indicate that powerful new interventions, such as Interactive Metronome, are now available that have a significant positive impact on students' academic development. These interventions, based on the latest technology, fundamentally improve students' cognitive capacity and performance. Educators should become knowledgeable of these tools and use them aggressively to reclaim the largest possible portion of their "at risk" student population.