

Statement by

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before the

Subcommittee on Labor, Health and Human Services, Education and Related Agencies

Committee on Appropriations

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Mr. Chairman and Members of the Subcommittee:

I very much appreciate the opportunity to appear before you to discuss the research that Dr. Gordon Shaw, University of California, Irvine, and I have conducted demonstrating the causal link between music training and intelligence in children. I am here on behalf of the National Association of Music Merchants (NAMM), which represents over 6,000 manufacturers and retailers in the music products industry. NAMM and other private organizations have generously supported our research because they recognize its implications for enhancing early childhood development and for reforming our education system, both of which are stated priorities of this Congress and the Administration.

Congress certainly faces a daunting challenge in the area of education. While the federal role in education is a limited one, the fact that our system seems to be failing so many young students places increased pressure on scarce federal dollars and demands that we focus our attention and resources on ideas and reforms that hold the most promise. You may be surprised to learn that recent scientific studies have consistently demonstrated the powerful and positive impact of music instruction on a child's ability to reach his or her full potential in math and science.

Math and science are two subjects where American children are lagging behind their foreign counterparts. It has been documented that young students have difficulty understanding the concepts of proportion (heavily used in math and science) and that no successful program has been developed to teach these concepts in our school system. When Dr. Shaw and I provided a group of preschoolers with eight months of weekly keyboard lessons, we found that these children displayed dramatic improvement in spatial-temporal reasoning, the very skills necessary for mastering math and science. We tested the children's spatial intelligence using a standard IQ test before instruction was started, and again at two four-month intervals after instruction began. For comparison, we also tested demographically-matched children who were not provided lessons.

The results were remarkable. The spatial-temporal IQs of the children who received music training were 35% higher than the children who did not study music. When we compared their scores before music instruction to eight months after, we found that their scores had improved by 46%. Meanwhile, the scores of the children who did not have music lessons improved by only 6%.

In a follow-up study published in the February 1997 issue of *Neurological Research*, we compared the effects of musical and non-musical training on intellectual development. One group of preschoolers received keyboard lessons; a second group received private computer lessons; and a third group received no training. The results were no less remarkable than those from the first study. The children who received keyboard training performed 34% higher on tests measuring spatial-temporal ability than the others, this time after only six months of training.

We have long known of the cultural and social benefits of school-based music programs. But we now have scientific evidence, both behavioral and neurophysiological, that music does so much more. It generates neural connections, uniquely enhancing higher brain functions that enable a child to reason abstractly in subjects such as math, physics, and engineering.

The hypothesis that generated these findings with preschoolers is now being tested in a public school district. Four Wisconsin Kindergarten classes are involved in a pilot study to test the effect of classroom keyboard lessons versus no lessons on spatial reasoning. The results so far are truly impressive. After only four months of bi-weekly lessons, the children who received the keyboard lessons are scoring 36% higher on abstract reasoning tests than the children who did not have the lessons. This shows that Kindergarten children can reap the same benefits from music training that preschoolers do, even when the lessons are provided in a classroom setting.

In the Fall of 1997, I will begin a five-year program of research with economically disadvantaged children. Four Head Start preschools will participate in a series of studies designed to examine the benefits of music-making for at-risk children.

Enrichment programs have traditionally been aimed at exposing children to a wide range of almost every type of stimulation deemed beneficial. While total enrichment is not without value, it does not address the key deficits of the at-risk child. Researchers have found that the failure to develop abstract reasoning represents the most glaring deficit of deprived children—and abstract reasoning is the very skill that is positively affected by music training. I expect that providing music lessons to these children will produce measurable academic benefits and will enable them to compete on a more equal basis with their middle-income peers.

Mr. Chairman, I respectfully request that Members of the Subcommittee consider this research as you determine the scope and character of federal support for education programs and science research. While our research has been made possible through the generosity of private organizations like NAMM, it is only a beginning and cannot have the necessary impact on our education system without Congressional support.

We urge the Subcommittee in its deliberations to include specific report language that directs the Department of Education to fund continuing research in this important field at up to \$2 million so that we might improve upon the education our children receive. In the long run, these funds will certainly produce national benefits far beyond the initial cost of the research for which we are seeking your support.

Moreover, if Congress and the Administration can use their respective bully pulpits to begin a public dialogue about the significance of music instruction to learning, it may cause school boards across the country to re-evaluate unfortunate decisions to eliminate school music programs. It actually may prompt them to strengthen these programs and develop innovative ways to teach music with a view towards improving learning in all subjects. Children-at-risk, whose parents have neither the time nor the money to invest in formal music training, are particularly dependent upon such a dialogue and the positive outcomes it can produce.

Mr. Chairman, that concludes my testimony. Thank you for this important opportunity. I would be pleased to answer any questions you may have.