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Review by: Thomas W. Goolsby

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Thomas W. Goolsby
University of Washington
Seattle, Washington

Karin Marie Sehmman: *The Effects of Breath Management Instruction on the Performance of Elementary Brass Players*

PhD, The University of Iowa, 1990
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Abstract*

This study investigated the effects of breath management instruction on the performance of elementary brass players. The experimental group received 5, 6, or 7 minutes of instruction during 10 weekly lessons on the management or use of air during brass performance. The control group continued with instruction from their method books. Both the experimental and control groups received weekly 30-minute group lessons over the 16-week period of the study.

A sample of 64 elementary brass students took part in the study, which comprised all of the students taking brass lessons in a small urban school district: data from 61 students were analyzed. Lesson groups were randomly assigned to experimental (N=32) or control (N=29) groups. The source of the instruction was an author-designed manual. Two of the subjects' teachers were the instructors.

Three measures each for breathing (thoracic displacement, abdominal displacement, and vital capacity) and for performance (range, duration, and tone quality) were the dependent variables. Thoracic and abdominal displacement were measured using a RespiTrace respiratory function instrument. Vital capacity was measured using a RespiRadyme pulmonary function monitor. Range and duration were measured using author-designed tests. The tone quality measure consisted of judges' ratings of tape recorded etudes.

The data were analyzed using multivariate and univariate analyses of covariance. Independent variables included group (experimental and control), instrument (trumpet, horn, and trombone), and grade level (fourth, fifth, and sixth). Main effects for group showed that the experimental group had significantly higher scores on measures of abdominal displacement, range, and duration ($p < 0.05$). There were no treatment by instrument or treatment by grade level interactions.

The investigation was conducted in a public school setting, which was typical of many elementary instrumental music programs. Given the limited lesson time and total breath management instruction (65 minutes), the group setting was effective in improving the breathing and performance of elementary brass players. It would appear that the inclusion of breath management instruction would be feasible in most elementary instrumental music settings.

*Author's Abstract Adapted

Review

Sehmman has addressed systematically an important area of instrumental music that has largely been ignored for decades. Although most music educators likely would concede that the secondary level performance-based music classes are the mainstay of music education in the United States, these groups clearly depend on effective music instruction at the elementary level. As Sehmman observes in the first chapter, much

has been written about elementary instrumental music education, but little has been investigated. Further, in her introduction, she cites her own published pilot study, as well as other studies in breath management, all of which use adults as subjects. The dissertation, however, addresses fundamental issues at the elementary level. As Kratus (1992) has indicated, fewer and fewer researchers are studying music learning in the elementary and middle school levels.

Sehmann's review of literature includes a broad array of writers and researchers in the areas of brass performance and respiratory research (limiting the health science studies to those directly related to musical performance). Sources begin with Fantini's famous treatise of 1638 on trumpet playing and continue through contemporary writings of numerous brass pedagogues (including Arnold Jacobs and many of his students).

The design of the study was a pretest-posttest design that started in the middle of the school year. "Classes" or groups of students were assigned either to the experimental or control group, so n should have been the 4 groups assigned rather than the 61 students who participated in the study (Campbell & Stanley, 1963, p. 23). During a 16-week semester, students were pretested the first week and received 5 weeks of experimental instruction; this period was then followed by 4 weeks of "regular class" and an additional 5 weeks of instruction in breath management with a final week for posttesting.

The 10 lessons included in the Instruction Manual contain wonderful exercises for young wind players. One may question, however, if the allotted time of 5–7 minutes per week was sufficient for the students to receive adequate instruction or if the instructors of the experimental group ever referred to the breathing instruction during the remaining period of the class. For each of the 10 lessons, the first 2 minutes were devoted to review. The lessons were written for the band directors who received special training in their use and required demonstration rather than lectures or reading the instructions/methods to the students. The manual includes specific goals, techniques, exercises, and suggested timeline for each activity (which might have proved more beneficial if lengthened). A further strength was that Sehmann allowed each student to attempt each measure three times on both the pretest and the posttest; she then used the mean for each student's score.

Review of the tables included in the results substantiate expectations for which Sehmann controlled by using a $2 \times 3 \times 3$ MANCOVA (factors: treatment \times grade level \times brass instrument). As expected, for example, the horn players demonstrated the broadest range of pitches across fourth-, fifth-, and sixth-grade classes and the longest duration. Also, the sixth graders had the greatest lung capacity and displacement and were able to play the longest "long-tones" (duration). Among the significant results (practical as well as statistical) were the remarkable gains by the

experimental group on the dependent variable “abdominal displacement” (the expansion and contraction of the abdomen during deep breathing—a negative score indicated it moved in the wrong direction), which was reflected in their improved range and duration scores.

The only surprising result was the negative gain on “tone quality” by all subjects across treatment, grade level, and instrument. When factored out, the horns made a significant positive gain in tone quality, but this may well have been because of learning about posture and hand position rather than the breathing instruction (because the control group horns made the largest gain from pretest to posttest; p. 59). When discussing the interactions and the failure to investigate interactions, it was revealed that there were no horns in the sixth grade that could also explain this group’s being the only positive gain on tone quality.

Relatively little explanation is provided regarding the specific testing procedure. One may wonder if the etude was played at the end of the testing session. If so, fatigue would contribute to a negative score on the posttest that, undoubtedly, would have been longer and more demanding than the pretest (considering the gains in range and duration).

This study’s greatest strength is the instructional manual that comprises Appendix A. It is worthy of wide dissemination among elementary band directors and would prove useful not only for brass, but also woodwind, students. The few problems that exist in the design and statistical analysis of the dissertation itself are minor and could be eliminated with replication with a larger group of elementary students including woodwind students. A replication might also determine if a longer treatment period would result in even more benefits. One would hope to see further work by this brass expert, especially in the area of elementary instrumental music.

References

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- Kratus, J. (1992). Subjects in music education research, 1961–1990. *The Quarterly Journal of Music Teaching and Learning*, 3(4), 50–54.

Thomas W. Goolsby is associate professor of music education at the University of Washington. His areas of special interest include assessment and evaluation and instrumental music teacher effectiveness.