

The Effects of Constant and Variable Practice on the Acquisition,  
Retention, and Transfer Performance of Complex Music Literature Tasks  
Among Seventh-Grade Instrumental Music Students

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The purpose of this research was to determine if constant (uniform) or variable (multiform) music literature practice significantly affected instrumental performance proficiency ( $p \leq .05$ ). The study was conducted over 45 days during the fall semester of the academic school year. Students in two intact seventh-grade middle school band classes adhered to a practice regimen of five different literature tasks at nine-day intervals (Constant Class,  $n = 14$ ) or 15 different literature tasks at three-day intervals (Variable Class,  $n = 25$ ). Band instrumentation in each class was a heterogeneous grouping of woodwind, brass, and percussion. Of the 15 tasks practiced under the variable condition, five were the same as the tasks practiced under the constant condition and the common tasks. Treatment practice made up approximately 37% of all rehearsal time and occurred during regular 50-minute band classes. The remaining 63% of the rehearsal period was common to both classes and allowed for the practice of posttest tasks, concert music, and scales. All student performances were recorded individually in a private room at the school site using a Superscope CD Recorder System PSD300. Peak (2.10) digital audio software was then used to edit the recorded audio files eliminating verbal instructions and isolating specific excerpts. Audio track order was randomized (Urbaniak & Plous, 2003) for each dependent measure and files were burned to CD using Apple iTunes2 (2.0.4, 2002) before being distributed to the judges. Two pilot tests were used to test inter- and intrajudge (test- retest) reliability of three judges using a rhythm and global facet assessment instrument specifically designed for use in the current study. The pilot test of assessment instrument reliability was acceptable ( $r = .98$ ), as was the individual reliability of each of the three judges ( $r = .85$ ;  $r = .92$ ;  $r = .90$ ). Two pretests were necessary to determine performance ability levels of the two classes and provide a basis for the data analyses strategy. Pretest data revealed the dissimilar student ability levels of the two classes. To overcome class equality problems that resulted from an imbalance in the number of percussionists, as well as general disparate performance abilities, a matched pairs sample was used to test the five null hypotheses instead of using analysis of covariance. To exemplify the disparity between classes, only seven pairs of students were able to be matched within plus or minus seven points, the stipulated criteria of one half standard deviation, of each individual's score. Treatment of the data was conducted at Western Carolina University employing the Paired-Samples t Test in the Statistical Package for the Social Sciences for Macintosh (version 10.0.7a, 2000). The confidence level was set at  $\alpha \leq .05$  for all statistical analyses. Five posttest measures provided

quantitative data across three forms of learning: skill acquisition (Posttests 1 and 2), skill retention (Posttests 3 and 4), and skill transfer (Posttest 5). Data were obtained from three judges who rated the recorded instrumental music performance of each participant in the areas of rhythmic and global (i.e., facets related to tone quality, correct notes, intonation, articulation, and musical expression) proficiency. Data from seven pairs of students who were matched on the basis of their comparable pretest performance scores were used to test five null hypotheses. There were no significant differences ( $p > .05$ ) between seventh-grade band students' (a) moderately rehearsed, (b) well rehearsed, (c) recalled moderately rehearsed, (d) recalled well rehearsed, and (e) sight reading, task performance mean scores as a result of constant and variable practice. Although not statistically significant, the composite performance proficiency means of students in the Constant Class matched pairs sample were higher than those of the Variable Class in four out of five posttest measures. Results from the retention tests provided support for the value of variable practice over constant practice. Variable practice generally has been shown to be superior to constant practice in adult motor skill retention (Hall, Domingues, & Cavazos, 1994; Landin & Hebert, 1997; Shea & Kohl, 1991; Shea & Morgan, 1979) and transfer (Catalano & Kleiner, 1984) research. The nonsignificant findings of this study support research on music and motor learning regarding skill learning enhancement through the use of constant and variable practice (Green, Whitehead, & Sugden, 1995; Kerr & Booth, 1978; Owen, 1988; Welch, 1985; see also Green, 1989; Long, 1993; and Pacey, 1992).