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The Influence of Multiple Models on Imitation Learning

ABSTRACT

Variability of movement parameters during multiple repetitions of a movement structure affects learning during active practice. Does variability in multiple observations of models affect learning as well? Are the advantages of variability in physical practice obtained through variability of observed models? To begin to answer such questions, we conducted an experiment in which subjects simulated bowing a violin with an apparatus we designed specifically for this research.

Sixteen subjects learned to move a “bow” up and down, keeping it parallel to the “bridge” through the entire motion, a difficult task for beginning violinists due to physical mechanics involved. Subjects completed a total of 200 down-up cycles arranged in 20 blocks of 10 cycles each. All subjects viewed 5 life-size video presentations of a model performing 5 down-up cycles before performing their first two blocks of practice; they viewed 5 more presentations of models, each following Blocks 2, 4, 6, 8, and 10; and they performed the last 10 blocks without viewing a model. For half of the subjects, all 10 presentations of the model were of the same individual performing the task. The remaining subjects observed 5 different individuals performing the task (two presentations showing each individual). We assessed subjects’ performance skill along of five dimensions of movement in Blocks 1 and 2, Blocks 9 and 10 (after they had seen the 10 presentation of the model), and Blocks 19 and 20.

Subjects in both groups performed best in Blocks 9 and 10, directly after having viewed the tenth presentation of the model. Subjects in general showed improvement between Blocks 1 and 10, but they performed less well by Block 20. This decrement in performance may have been due to fatigue or to the time passed since last viewing a model. Although subjects who viewed multiple models tended to perform better as a group than did those who viewed a single model, the small sample and the exploratory nature of the movement analysis precluded any statistical comparisons. This research provides a framework for further evaluation of models in imitation learning in music.

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"The Effects Of Sleep, Interference, And Recall On Musicians' Performance Of Two Melodies."

ABSTRACT

Procedural memory consolidation has been shown to enhance a variety of perceptual and motor skills during sleep. Only recently has this effect been investigated in trained musicians performing music. I tested the extent to which a music performance skill benefited from sleep-based consolidation overnight and whether this process may be inhibited when musicians learn two melodies in juxtaposition. 60 experienced musicians, all nonpianists, learned to perform either one or two 13-note piano melodies during evening training sessions. The musicians practiced each melody with their nondominant hand by repeating it from beginning to end during 12 30-second practice blocks alternating with 30-second rest intervals. All participants were retested on the target melody the following morning in three 30-second retest blocks alternating with 30-second rest intervals. Participants who learned only one melody in the evening showed overnight gains in the number of correct key presses per block (CKP/B) in the target melody at retest. Participants who learned the target melody and an additional melody at training showed no overnight gains in CKP/B in the target melody. Participants who learned both melodies and then immediately were retested on the target melody at training showed overnight gains in CKP/B in the morning retest of the target melody— gains similar to those observed among the participants who learned only the target melody at training; this group showed no decrement in the performance of the target melody in the retest at the end of training, which indicates that there were no immediate interference effects apparent in the target melody after having learned the second melody. These results show that experienced learners performing a familiar type of task, and one that includes auditory processing demands, benefit from overnight consolidation of procedural memories. These benefits may be inhibited, however, when musicians learn similar, competing tasks in juxtaposition.

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Understanding How a Modified Suzuki Program Can Help At-Risk Students Succeed in Education

ABSTRACT

Since 2000, when a partnership was formed between the New Jersey Symphony (NJSO) and the Newark School System (NPS) researchers at Teachers College, Columbia University have found that the underprivileged students in a modified Suzuki violin program outscored their peers on standardized tests. In the middle of the fourth phase of a five phase study our research is working to better understand previous data collected over the last six years and why New Jersey Early Strings (NESP) violin students are significantly outperforming their peers on math and literacy standardized tests. Using qualitative and quantitative data researchers at Teachers College are working to better understand self-regulation. In particular researchers are interested in understanding the specific characteristics of the violin students, including developing a better understanding of students' experience. We expect that our increased understanding of self-regulation in NESP students will lead to a better understanding of the higher achievement test scores for NESP students.

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Body Midline Crossing in Three to Six-year-old Children

ABSTRACT

The project examines the development of manual body midline crossing and body-righting in young children for the purpose of understanding its effect on the acquisition of certain motor skills of beginner preschool violinists. Six midline crossing tasks were given to children ages 3-6 ($n=10$). Results showed that children cross the midline more often when they are seated as compared to standing. In addition, midline crossing increases with the age of the child indicating that it is dependent on maturation and development.