

# The Effects of Marimba Ensemble on Self-Efficacy and Memory Performance in Older Adults

Jennifer Bugos, Ph.D.  
University of South Florida  
[bugosj@usf.edu](mailto:bugosj@usf.edu)

## Abstract

The purpose of this research is to examine the effects of gross motor training in percussion training (marimba ensemble) on self-efficacy and cognitive performance in aging compared with a non-musical control task (structured autobiographical recall). While we are continuing to collect data for this project, preliminary data indicate that percussion ensemble performance can enhance self-efficacy and working memory performance in older adults. This presentation will contain many implications for the development of cognitive rehabilitation, music therapy, and music education programs for older adults.

Music instruction benefits executive, spatial, temporal, and verbal memory functions in many populations, indicating transfer capabilities. Musical training is correlated with higher verbal memory performance among college students and young children (Chan, Ho, & Cheung, 1998; Ho, Cheung, & Chan, 2003). Four-year-old children receiving ten minutes of piano instruction up to twice a week performed better on spatial-temporal task performance assessments than children receiving computer training (Rauscher, Levine, Shaw, & Wright, 1997). After eight months of piano instruction kindergartners displayed greater improvements in spatial abilities than the control group (Rauscher & Zupan, 2000). Six-year-olds scored significantly higher on a Short-Term Memory subtest of the Stanford-Binet Intelligence Battery after receiving thirty weeks of music instruction (Bilharz, Bruhn, & Olson, 2000).

There is emerging evidence that musical training can transfer to cognitive performance in aging individuals. Preliminary research has shown, a multimodal intervention, individualized piano instruction (IPI), has the ability to significantly enhance some working memory and executive processes such as attention and concentration, working memory, and planning and strategy learning in older adults (Bugos, Perlstein, McCrae, Brophy, & Bedenbaugh, 2007). Results of research comparing the effects of piano instruction, percussion instruction and music listening instruction in older adults reveal significantly enhanced cognitive performance stemming from group percussion instruction (Bugos, 2011). *The purpose of this research is to further examine the effects of active music making in a mallet/marimba ensemble program on self-efficacy and working memory performance in older adults.*

Twenty-six healthy older adults were recruited and screened from the Southeastern United States. Criteria for participation consisted of being between the ages of 65-85, a native English speaker, not currently taking any medications that could adversely affect memory performance, no pre-existing cognitive impairments, no difficulty with the movement of their hands, less than four years of prior musical training, and not currently engaged in musical performance. Participants were matched for age, gender, education, and intelligence (as measured by the WASI) to two, eight-week training groups: mallet/marimba instruction (experimental group) and structured autobiographical recall (SAR) (control group). Structured autobiographical recall (journaling) serves as a control task as it provides an attentional component without any music listening or musical performance. Weekly two-hour marimba classes consisted of mallet technique, ostinato/canon exercises, music theory, and standard performance repertoire. SAR classes also met for two hours weekly and included writing technique, practice with prompts, and class discussion. Participants completed a series of standardized memory measures and a general and musical self-efficacy measure pre and post-training. Pilot data suggests that participation in a mallet-based music program will greatly contribute to increases in cognitive performance. In the pilot study, increased scores were found for verbal fluency and verbal memory performance. Data collection is currently underway. Music educational opportunities may serve as effective and enjoyable cognitive interventions that may contribute to maintaining or enhancing cognitive performance.