

Student Musicians’ Ear-Playing Ability as a Function of Vernacular Music Experiences

Robert H. Woody¹ and
Andreas C. Lehmann²

Abstract

This study explored the differences in ear-playing ability between formal “classical” musicians and those with vernacular music experience ($N = 24$). Participants heard melodies and performed them back, either by singing or playing on their instruments. The authors tracked the number of times through the listen-then-perform cycle that each participant needed for accurate performance. Participants retrospectively reported their thoughts and provided biographical information related to vernacular music experience. Analyses indicated that singing required fewer trials than playing on instruments and that vernacular musicians required fewer trials than formal musicians. The verbally reported thoughts indicated that participants used different strategies for encoding the melodies. Vernacular musicians applied a more sophisticated knowledge base to generate accurate expectations; formal musicians used less efficient strategies. Formal musicians devoted more conscious attention to physically producing the melodies on their instruments (e.g., fingerings), a process that was executed more automatically by vernacular musicians.

Keywords

cognitive strategies, ear playing, musical memory, vernacular music

The typical experience of today’s music students in formal education is rather disparate from the way their ancestors learned music and the way that young people continue to do so in other cultures around the world (Campbell, 1991; Hargreaves &

¹University of Nebraska–Lincoln, USA

²Hochschule für Musik, Würzburg, Germany

Corresponding Author:

Robert H. Woody, 354 Westbrook Music Building, University of Nebraska, Lincoln, NE 68588
E-mail: rwoody2@unl.edu

North, 2001). In such contexts, performance skills are transmitted aurally in natural social settings through observation and imitation. Conversely, in today's traditional school music instruction, students work predominantly from the printed notation of professionally composed pieces of music, most of which are limited to classical (i.e., Western art music) styles. Especially in American schools, secondary-level music classes take the form of conductor-prescribed ensemble rehearsals.

Aspiring musicians tend to encounter two strands of learning: the formal approach and the informal or vernacular music experiences had by those outside of school (O'Flynn, 2006; Small, 1987). Many young musicians develop their skills through involvement in peer-organized garage bands that perform the popular music of their generation (Campbell, 1995; Jaffurs, 2004). Even noninstrumentalists acquire considerable vocal skills by singing along to recordings and imitating their favorite performers in karaoke activities. These include the mainstream styles of rock, country, and hip-hop, as well as more culturally tied styles such as jazz, folk, bluegrass, mariachi, and religious music (among many others). The members of vernacular music groups make heavy use of listening-copying processes and improvisation as they collaborate with peers to reproduce the sounds of their favorite music and create original compositions by ear (Davis, 2005; Green, 2001; McGillen & McMillan, 2005).

Among many formally trained musicians, ear-based musicianship is viewed as a mysterious ability, often attributed to innate talent or giftedness. An example of this is the famous anecdote of a 12-year-old Wolfgang Mozart visiting the Sistine Chapel, hearing Allegri's *Miserere* only once, and then writing out the entire piece from memory. Over the years, this and other stories of tape recorder-like memory have been debunked, and a less fantastic explanation of such abilities has emerged. Research has provided important insights into the motivational and attentional contributors to exceptional ear-based musicianship, as well as the cognitive mechanisms that support it (e.g., McPherson, 2007; Ockelford, 2007). In short, ear playing is an acquired skill with admittedly large individual differences, like many other skills in music performance. That some musicians view it with amazement likely is due to their not having had the requisite experiences to acquire it for themselves.

It is reasonable to expect that unique sets of skills are acquired by young musicians based on their varying developmental experiences. Such subskills of musicianship include sight-reading, playing by ear, improvising, and expressive performance. Many musicians are able to reach expert levels at one or a few of these skills, while these skills remain virtually inept in others. To understand performance incompetence better in skills such as sight-reading and ear playing, it is helpful to consider the underlying cognitive abilities. Lehmann and Ericsson (1997; see also Lehmann & Davidson, 2002; Woody, 2003) proposed a theoretical model of mental representations in music performance, which identifies three requisite cognitive skills. They are *goal imaging*, creating a representation of what the music should sound like; *motor production*, generating the physical movements and fine motor skills required; and *self-monitoring*, accurately hearing one's own performance of the music. Of direct relevance to the present study are goal imaging and motor production. A musician's

goal image guides performance, whether the image is built from the visual cues of printed notation (as in sight-reading) or from musical information stored in memory (as in playing by ear). Yet a goal image only results in performed music if it is coupled with proper motor production. Those psychomotor programs needed to physically execute a performance are acquired consciously when first learned but become fully automated units of motor memory in experienced performers. Baily (1985, p. 257) described an “auromotor coordination” that allows the immediate production of heard musical patterns, that is, a connection between the goal image and motor production representation.

Reading music notation and making music by ear are but two distinct performance skills among others. Although these two skills often are cast as opposite approaches to music making, much evidence suggests that they actually are related. In fact, playing by ear may be the most foundational of musical skills, contributing to the ability to sight-read, improvise, play from memory, and perform rehearsed music (McPherson & Gabrielsson, 2002). Providing students with ample ear playing experience prior to introducing them to notation has yet to become the norm in formal instrumental education, despite music educators (e.g., Gordon, 2003; Mainwaring, 1951; Suzuki, 1986). In the best of cases, a preexisting ear-based fluency on their instruments allows musicians to understand the symbols of music notation like the reading of written verbal language (Mills & McPherson, 2006). Instead of the symbols prompting the mechanized recall of a fingering or movement on an instrument, it brings to mind a sound that already has been linked cognitively to the action needed.

Although the prominence of ear playing has been studied from an ethnographic perspective (e.g., Campbell, 1995; Lilliestam, 1996), it has received little attention from music psychologists and educational researchers. A study by Luce (1965) was one of the first to identify empirically the positive relationship between ear playing and sight-reading in instrumental music students but offered little explanation of the connection. Studies on the role of aural modeling in performance learning mainly have used recorded models as supplements to printed notation, and for the sole purpose of adding expressive qualities such as timing (e.g., Clarke, 1993; Lisboa, Williamon, Zicari, & Eiholzer, 2005) or loudness (e.g., Woody, 1999, 2003). A qualitative study by Johansson (2004) was a rare example of an investigation into musicians’ ability to learn tonal and rhythmic material by ear. In his study of rock musicians learning chord progressions by ear, Johansson concluded that his participants’ skills were constrained by those genres of music (jazz, heavy metal, 60s rock) in which they had performance experience.

For the present study we were concerned with documenting the individual differences between vernacular and formal “classical” musicians. We expected that vernacular musicians would be better ear players than their formal counterparts, but wanted to further quantify and explain that difference. We specifically sought to understand the underlying problem when performers have difficulty playing by ear. We used a qualitative analysis to arrive at the musicians’ thoughts and strategies when

playing by ear. If we assume that this type of performance is a two-step process of first remembering (encoding) the music and then performing it, there exist two possible points at which a “bottleneck” could occur. We hypothesized that the formal musicians’ ear-playing deficiencies would *not* be associated with poor aural memory (goal imaging) but would arise from an inability to generate the needed physical actions to produce the correct sounds on their instruments (motor production).

Method

Twenty-four collegiate musicians at the first author’s university served as participants in the study. All were undergraduate music majors, which ensured a basic level of consistency in musicianship across the sample. Employing a criterion group design for the study, we recruited individual music students as representatives of two groups: formal musicians and vernacular musicians. The 12 formal musician participants were students whose musical development had occurred predominantly within formal instructional settings (i.e., school ensembles, one-on-one lessons) and had focused on traditional school music styles. The 12 vernacular musician participants had significant past experiences in jazz ensembles, groups performing popular and folk styles, and church bands. Identifying students appropriate for each criterion group was accomplished through preliminary investigation of music students’ backgrounds by consulting with applied performance faculty, reviewing membership rosters of the university’s jazz and popular music ensembles (small groups and big bands), and approaching the students themselves informally. It should be noted that the vernacular musicians in the study did *not* lack formal instructional experiences in their backgrounds (these essentially are required to be accepted into the university as music majors) but had additional musical experiences with vernacular styles.

The final sample consisted of 15 men (7 formal, 8 vernacular) and 9 women (5 formal, 4 vernacular). The mean age of the 12 formal musicians was 20.8 years; the mean age of the 12 vernacular musicians was 19.5 years. We employed a matched-pairs approach regarding the instruments played in each group. Thus, each group comprised one pianist, flutist, bassoonist, hornist, and mallet percussionist; two saxophonists and trombonists; and three trumpeters. During the procedure, the musicians were asked how many years they had played their instruments. On average, formal musicians reported playing longer ($M = 9.08$ years) than vernacular musicians ($M = 7.83$ years), although the difference was not statistically significant, $t(22) = -1.08, p = .29$.