Chapter 19
The Effect of Music Listening, Personality, and Prior Knowledge on Mood and Work Performance of Systems Analysts

Teresa Lesiuk
University of Miami, USA

Peter Polak
Vrije Universiteit, Netherlands

Joel Stutz
University of Miami, USA

Margot Hummer
University of Miami, USA

ABSTRACT

This research examined the effect of music use, personality and prior knowledge on mood and work performance of 62 Systems Analysts. Although the quality of the data modeling task did not appear to be affected by the experimental treatment of 10 minutes of music listening, the level of extraversion, modeling proficiency, and theoretical knowledge related to modeling showed significant effects. Nevertheless, the effects of music were demonstrated on several mood measures. The effect of music on negative and positive affect, along with their subscales, are presented. Finally, changes in the mood of participants who listened to the music are examined in the light of various demographic and personality variables.

INTRODUCTION

Early studies demonstrated an interest in increasing employees’ attentiveness during tedious, but important work tasks. Introducing music to the work environment was seen as a possible solution to alleviate attention lapses. Wokoun (1969) carried out three experiments in which he found that a music program, based on an increasing tempo set against employee fatigue times, produced the best alertness results. Conversely, an early study (Kirkpatrick, 1943), entitled Take the Mind Away, showed that music listening had a favorable influence on the productivity of light repetitive mechanical operations. Kirkpatrick suggested that
the increase in productivity was a result of the music providing “mind-imagery” to the worker.

The earlier studies tended to focus on the effect of music on carrying out monotonous, simple tasks requiring high vigilance. These types of tasks are still relevant in today’s advanced technological companies and information age. A few studies examined the effect of music listening while employees were engaged in complex tasks (Smith, 1961) with narrative results reported as improved mood and self-perceived productivity.

As the computer industry grew out of the industrial age and was advanced substantially with the internet and e-commerce, different types of demands on employees arose. The information age currently demands its computer information systems developers to acquire new languages in a short amount of time, meet tight deadlines, and do so with creative solutions (Longenecker, 1999; Wastell, 1993). Thus, the effect of music on behavior and productivity in the workplace must be understood within the complexity of the person-environment fit. An examination, as such, should include possible contributing factors such as personality and gender differences, prior work knowledge and experience, and, as well, underlying psychological mechanisms of mood. Moreover, with the advent of brain-imaging studies, cognitive neuroscience may help explain the underlying cognitive mechanisms during music listening and work.

**Music-Mood as Mediator to Work Performance**

Music enhances mood, and in turn, positive moods facilitate cognition (Ashby, Isen, & Turken, 1999). Preferred music listening, as compared to sitting in silence, was shown to significantly improve spatial reasoning ability (Thompson, Schellenberg, & Husain, 2001). Enjoyable stimuli induce positive affect and heighten arousal, and that in turn, has been reported to lead to moderate improvements in task performance. Indeed, mild positive affect states have been found to enhance performance of creative problem-solving tasks (Isen, 2005) and to positively influence work-related behaviors (Forgas, & George, 2001; Estrada, Isen, & Young, 1997; Mano, 1992).

Brain imaging studies of music listening help explain the influence of positive music-mood experiences on cognition. Preferred music listening activates pleasure centers of the brain and deactivate areas associated with negative emotions. Using neuro-imaging techniques, including Positron Emission Tomography (PET) and Functional Magnetic Resonance Imaging (fMRI), researchers examined changes in cerebral blood flow changes as subjects experienced the “chills” of their self-selected music (Blood & Zatorre, 2001). The researchers concluded that the neural areas activated in chill responses to music are the same neural areas associated with brain reward circuitry. Specifically, those areas include the dorsal midbrain, ventral striatum (which contains the nucleus accumbens, the main site for processing emotions), insula and orbitofrontal cortex. These same regions are those shown to respond to highly rewarding stimuli such as food and sex. The participants’ preferred music also de-activated the brain structures associated with negative emotion. Lastly, the neurotransmitter dopamine, which is released as a result of reward or pleasantness, was found to facilitate flexibility in thinking (Ashby, Isen, & Turken, 1999).

The neuroanatomical findings may be foundational to the behavioral studies of music and work performance. For example, use of preferred music and radio by way of headsets, was reported to improve work performance in an office environment (Oldham, 1995). The study was conducted over a 12-week period with the middle four weeks as the period in which music was heard. An analysis of listening habits such as music type selection, duration of listening, and shifting from one music type to another revealed little relation to outcomes such as employees’ moods and productivity, job satisfaction and turnover intentions. However,