

MUSIC AND WALKING SPEED

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Jean Davidson and Mary Li
West Australia College

**This paper is a fictitious account, presented solely as a model of APA style.*

Abstract

Walking speed was timed for male and female pedestrians on a public sidewalk with fast, slow, or no music playing in the background ($n = 20$ per condition). Pedestrians in the fast music condition walked more rapidly than those in the other two conditions. Slow music did not reduce walking speed, relative to the no music condition. Walking speed did not differ by gender in any of the three conditions. The findings support elements of Mayfield's organismic theory of activation effects.

Music and Walking Speed

Does ambient stimulation increase arousal? Late-night drivers often turn up radio volume in hopes of staying awake on the road. Increasing stimulation is a common response to feelings of boredom. Mayfield (1947) proposed a theory of organismic activation to explain the effects of background stimuli on arousal. According to the theory, increased arousal or activation is an adaptive response to increases in background stimuli, unless such stimuli are competing directly with the activity taking place. Considerable research has been done to test the theory in the laboratory and field situations. Garcia's (1988) review of the literature on the effects of increasing stimulation showed that research results generally support the theory.

In related research Araujo (1965) found that slow music did not increase activity levels of subjects performing mechanical tasks, and in fact had a slowing effect. In addition she reported that loud music led to a reduction in speed of solving logical and mathematical problems. Other studies have looked at the effects of social stimuli. During meals, the presence of other people at a table tends to increase eating speed, but if the other individuals deliberately eat in a slow manner, the activation effect disappears (Guenther & Stratton, 1985).

To sort out these somewhat contradictory findings, research is needed that compares the effects of differing levels of background stimuli on arousal within a single modality. Organismic theory predicts that any stimulus that is not competitive with ongoing activity will increase arousal. Araujo's inhibition theory

predicts that increased levels (levels above ongoing activity) will increase arousal only as long as they do not interfere with ongoing activity, and that stimulation lower than the current level will decrease activity.

In the present study, activation is measured by walking speed and the background stimulus condition is music level. Unlike earlier studies comparing a music with a no music condition (Becker, 1991; Remick, 1982) the present study uses three levels of the experimental variable: fast music, slow music, and no music. The effects are tested under naturalistic conditions using the procedure developed by Kinefelter (1986) for measuring walking speed on public sidewalks. Organismic theory predicts that both the fast and slow music conditions should increase walking speed, relative to the no music condition. On the other hand Araujo's inhibition theory suggests that walking speed would be increased only in the fast music condition, and that the slow music might actually reduce walking speed relative to the no music condition.

Method

Setting

The study took place in a public park in Perth, a city of 1 million population, situated in Western Australia. The park is located in a busy downtown area with considerable foot traffic on the public sidewalks bordering the park on three sides. The specific location was the north sidewalk, the same location used by Li (1995) in her study examining the effects of group size on walking speed. The distance included in the present experiment is 120 meters. Earlier research by Kinefelter (1986) showed that the

average time taken by a lone pedestrian to walk this section of sidewalk was 92 seconds, with a range from 72 to 104 seconds. The particular length of sidewalk was selected because of its public location, ease of observation from a nearby building, and the proximity of a grassy area where music could be played unobtrusively.

Participants

The participants in the experiment were 60 single adults, judged to be between 18 and 50 years of age, seen walking alone on the designated stretch of public sidewalk. Groups or parents with children were excluded from the study. Following a predetermined sampling plan, an equal number of male and female pedestrians was timed on the sidewalk.

Materials

The music selections used in the study were obtained from a list developed by Harrison and Moore (1983). These researchers had asked respondents to rate approximately 100 different musical selections as to preference (like-dislike) and activity level (fast-slow). The ratings were made on a 7-point scale with a neutral middle point. For the present study, two selections whose average ratings on the fast-slow scale that were at least 1 point above the neutral point, and two musical selections with an average rating at least 1 point below neutral. All four music selections were in the middle range of preference. The music was played on a Sony tape recorder located 2.7 meters from the sidewalk and played at moderate volume, measuring 72 decibels on a hand-held Smith Audiometer, Model C2. The volume is consistent

with that used by other people in the park with tape players or radios.

Design and Procedure

The tape player was placed about mid-block, alongside the co-investigator, a young woman sitting on a blanket facing away from the sidewalk. The conditions (2 fast music selections, 2 slow music selections, and no music) were presented in random order, with the pattern and times noted by the co-investigator. Using a prepared list of the music selection order, she noted the gender and identifying attire of each passerby. Sessions were conducted on Tuesday, Wednesday, and Thursday, from 1:30-4:30 p.m. The weather was warm and sunny on all three days.

Walking speed of pedestrians, coming from either the east or west, was timed by observers stationed on the roof of a 3-story building across the street. They were unaware (blind) as to the presence or absence of music, or the type of music played. Once it was agreed by the two observers that the pedestrian met the conditions of the study (alone and between the ages of 18 and 50), the pedestrian was timed as to how long he or she took to cover the designated section of sidewalk. While one observer timed each individual, the other observer wrote down identifying information (gender and attire) to be matched with the on-site record of which type of music was being played. Interobserver reliability was established by a correlation of .94 ($p < .001$) between the times recorded independently by the two observers in a trial sample.

A total of 63 participants were observed in the study, but three had to be excluded from the sample. In one case the person

stopped midway along the sidewalk, turned around, and walked back in the original direction. The other two excluded cases were individuals walking in opposite directions who stopped in the middle of the sidewalk for an extended conversation. The sampling period of the study was increased to include additional cases to make up for the three who were excluded. The final sample size was 60, equally divided over the three experimental conditions with an equal number of men and women in each condition ($n = 10$).

Results

Table 1 shows the walking speed results for women and men in each of the three music conditions. As there were no significant differences by gender in any of the three conditions, the times were combined for further analysis.

When the results were combined across gender, Table 2 shows that music type had a significant effect on walking speed [$F(2, 57) = 3.97, p < .05$].

To find out which specific differences were significant, t -tests were done for the possible comparisons (no music vs. slow music, no music vs. fast music, and slow music vs. fast music). The fast music produced faster walking times than either slow music [$t(38) = 2.61, p < .01$], or no music [$t(38) = 2.31, p < .05$]. The difference between mean pedestrian speed for slow music and no music was not significant.

Figure 1 shows the number of pedestrians in the fast and slow music conditions who walked either faster or slower than the mean speed for the no music group.

Discussion

The findings support a modified version of Mayfield's organismic activation theory. Only the more active background stimuli (fast music) significantly increased walking speed of pedestrians. Neither a speeding up nor slowing down of activity was associated with the slow music, relative to no music.

There was no confirmation of a Araujo's inhibitory effect although the mean difference was in that direction. Other studies have found inhibition effects when the music interferes with the task or distracts from the activity, as in the case of loud music which can reduce problem solving efficiency (Araujo, 1965; "Loud Music Kills," 1989) or when the music is extremely liked or disliked (Teen Tips, 1994). The present study did not test possible interference effects as there is no indication that music would interfere with an activity as fundamental as walking. The music selections used in the present study were all in the middle preference range. Preference might be a confounding variable in that liked music might engage the attention of the passerby leading to a slower walking speed. In contrast, disliked music might serve as an aversive stimulus and quicken departure from the scene. Further research is needed to determine how preference interacts with music type (fast vs. slow) as an influence on activation level.

References

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Table 1

Walking Speed by Music Type, for Women and Men

| Music type | Women | | | Men | | |
|------------|----------|-----------|----------|----------|-----------|----------|
| | <i>M</i> | <i>SD</i> | <i>n</i> | <i>M</i> | <i>SD</i> | <i>n</i> |
| No music | 98.18 | 11.95 | 10 | 98.52 | 15.67 | 10 |
| Slow | 98.82 | 16.75 | 10 | 101.91 | 14.52 | 10 |
| Fast | 90.45 | 11.39 | 10 | 87.14 | 14.06 | 10 |

Table 2

Walking Speed by Music Type

| Music type | <i>M</i> | <i>SD</i> | <i>n</i> |
|------------|----------|-----------|----------|
| No music | 98.35 | 13.56 | 20 |
| Slow | 100.36 | 15.34 | 20 |
| Fast | 88.79 | 12.57 | 20 |

Figure Captions

Figure 1. Number of people by music type who walked faster or slower than the No Music mean (98.35 seconds).

