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**Relationship of Selected
Musical Characteristics and Musical Preference
(A Review of Literature)**

by
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A review of the literature found that most published studies in musical preference tended to focus on liking for specific or broad categories of musical styles. Various researchers have proposed that musical characteristics are significant in contributing to one's musical preference (Fung, 1996; LeBlanc, 1982; Prince, 1972).

This article provides an overview of the research on the relationship between selected musical characteristics and musical preference. Of the musical characteristics commonly cited in the preference literature, research on tempo, rhythm, pitch, melody, harmony, and timbre are selected for review.

Research findings suggest that greater preference is shown towards instrumental music with fast and lively tempo, clear and defined rhythm, high pitch, clear and distinguishable melody, and consonant harmony. Implications for music educators on lesson delivery and curriculum design are highlighted.

Introduction

Music educators and psychologists have long been interested in studying factors related to musical preference (Keston & Pinto, 1955). What causes people to prefer certain pieces of music or musical styles to others? Over the years, researchers have constructed models and developed theories to facilitate the understanding and further research on musical preference (e.g. Berlyne, 1974; LeBlanc, 1982; Prince, 1972).

Wapnick (1976) published a comprehensive review of research in musical preference while Sims (1998) examined the behavior of music listeners, and Abeles and Chung (1996) reviewed the human response to music. Kuhn (1987) presented a survey of instrumentation available for the measurement of musical attitudes (preference) while LeBlanc (1984) discussed the philosophical and practical tradeoffs that a researcher has to grapple with when choosing a response mode to measure musical preferences.

Researchers who have examined musical preferences and music education have found close relationships between the two. In her review of research on musical preference from the 1960s to 1970s, Sink (1992) found that instruction could significantly influence musical preference. In addition, research on the influence of instruction on musical preference was often motivated by the common belief that a primary objective of music education was to teach pupils to 'love' music and expose them to a variety of musical styles (Olsson, 1999).

Over the years, research on musical preference has expanded to include aspects of music teaching and learning to a more holistic position involving the background of the listener, environmental variables, and the effect of mass media. Nevertheless, the purpose of most research has retained the overarching goals to provide insights into the betterment of music education.

One of the most important goals in music education is to broaden students' understanding and appreciation of various styles of music. It is often assumed that students' attitudes (preferences) toward unfamiliar styles of music will change as a result of exposure and learning about new types of music. A study by Fung (1996) showed that preference is an important mediating agent in the process of music education and a 'springboard' for further music learning. Individuals are likely to spend more time on tasks that are considered pleasant and enjoyable. Engaging in these tasks could enhance intrinsic motivation that increases the likelihood that the same tasks would be repeated. Music teachers who experience difficulties in the classroom may be dealing with a mismatch between students' listening preferences and the curriculum. One way for teachers to resolve their difficulties is by understanding students' listening (musical) preferences.

Of the factors affecting students' musical preferences, musical characteristics have formed the focus of many studies in the literature (Finnas, 1989). Some of the musical characteristics found to have significant relationship with musical preference include tempo, rhythm, pitch, melody, harmony, and timbre. The method of measuring the effect of these musical characteristics on musical preference ranged from the use of an objective measure such as defined hertz for pitch, to a more subjective measure such as the use of self-reports (e.g. a Likert scale).

Tempo

In a study of elementary students from grades four to six, Webster and Hamilton (1981) used four instrumental excerpts from each of the following styles: classical, rock, folk-country, and jazz. Three professional music educators had 100% agreement on whether each excerpt had marked rhythmic quality, which was defined as strong recurring pulse that was readily detectable

and unchanging throughout the excerpt. Subjects rated their preferences on five-point scales. The results showed that subjects significantly preferred excerpts with marked regular rhythmic pulses across all styles. Prince (1972) found that seventh graders' preference of excerpts for Western classical art music of various genres was significantly related to tempi that were perceived as fast and lively. With jazz excerpts, fifth- and sixth-graders in studies by LeBlanc and Cote (1983) and McCrary (1983) showed higher preferences for faster tempi than for slower ones. In these cases, the correlation between preference and tempo was as high as 0.78.

LeBlanc, Colman, McCrary, Sherill, and Malin (1988) administered a preference test to students from the third grade through college level and found that there was a significant preference for increasingly faster tempi at every age level. This view supported LeBlanc and McCrary's (1983) finding that preferential ratings for the faster tempo were generally higher than the slower ones. They also found that higher preference ratings correlated positively with faster tempo even though subjects had been exposed to slow musical examples.

Research in tempo preference has also suggested that, apart from the actual speed of the music, other variables may be involved in the subjects' perception of tempo. Studies by Wang and Salzberg (1984), and Yarbrough (1987) revealed that tempo preference was dependent on one's ability to discriminate tempo. Involving 100 musicians and 300 nonmusicians, Yarbrough found that nonmusicians preferred faster tempo. LeBlanc (1988) and Flowers (1988) claimed that children often associated fast and slow tempo with the feelings of happy and sad respectively, and that such associations might have a strong influence on their musical preferences.

Other studies have shown that subjects had different perception of tempi when presented with metronomic and actual musical examples (Flowers, 1988; Geringer & Madsen, 1987; Kuhn,

1987; Madsen, 1979). Other variables affecting the perception of tempo also included the style of musical stimuli (Wang, 1983), subdivision of beats (Wapnick, 1980), performance medium (LeBlanc & Cote, 1983; Wapnick, 1980), and melodic ornamentation (Kuhn, 1987).

Rhythm

Getz (1966) found that Classical musical excerpts with clear rhythmic emphasis were preferred by seventh-graders compared to excerpts with indefinite rhythm. Similarly, the seventh-graders in Prince's (1972) study expressed greater preference for excerpts with clearly defined meter and rhythm and Webster and Hamilton (1981) found that fourth-, fifth-, and sixth-graders showed higher preference for excerpts with an unchanging, recurrent and readily detectable pulse, rather than those with unmarked rhythms.

When studying the preferences of fourth- and seven-graders towards folk music from different parts of the world, Webster and Hamilton (1981) found that the most preferred music was characterized by regular and well-defined rhythmic patterns. This was supported by studies that found higher preferences for steady and well-defined rhythmic patterns in the musical excerpts (e.g. Boyle, Hosterman, & Ramsey, 1981; McMullen & Arnold, 1976). These studies also found that, apart from rhythmic regularity and definition, excerpts of moderately complex rhythms were preferred over those that were perceived as too simple or complex.

Pitch

The relationship between preference and pitch has traditionally been studied with single tones as stimuli. Vitz (1972) observed that frequencies of 60Hz to 5000Hz was preferred by his subjects and that the preference was found to be an inverted U-shaped function of frequency with tones in the range of 400Hz-750Hz judged to be most pleasant.

Hedden (1974) also dealt with the effect of pitch level (100Hz, 350Hz, and 100Hz) on the preference for single tone stimuli by music majors and non-music majors. No significant main effect of pitch was found but there was a significant interaction effect between pitch and loudness for non-music majors. Higher pitches (350Hz and 700Hz) were preferred at the softer loudness level (10dB). However, the lower pitch (100Hz) had very little effect on preference regardless of the loudness level.

Subjective ratings of pitch level within a musical context have also been explored in preference research. Madsen and Geringer (1976) found that sharp and in-tune intonation had exerted a stronger influence on preferences than tone quality. In their study, subjects indicated their preference for deviations in the direction of sharpness compared to flatness deviations. Research on choral balance preferences showed that subjects preferred significantly more soprano and alto and less tenor and bass although some studies have shown that most subjects had more difficulties in discriminating sharpness than they did in discriminating flatness in listening situations (Killian, 1987; Madsen, Edmondson & Madsen, 1969; Madsen & Geringer, 1976).

Despite the findings of many studies, pitch was found to be non-significant in some studies on musical preference. Using both Western and non-Western musical stimuli, Teo (1998) found that pitch did not significantly influence subjects' musical preference. Written reports from subjects showed that both high and low pitch had played a part in their musical preferences. This was consistent with Wapnick (1980), who found that his subjects, when given the opportunity to vary the pitch of taped piano excerpts, did not significantly alter the original pitch.

Melody

A study by Crozier (1974) asked music students and other adults to rate computer-generated tone sequences on a scale unmelodic-melodic. The results showed that tone sequences that were rated as melodic were clearly preferred. The important role of melody has also been illustrated by studies where people's reactions to complex music, such as modern art music, were measured. Results of two such studies showed that passages with a more coherent and clearly distinguishable melody were usually accorded higher preference rating (McMullen, 1974; Prince, 1972;).

McMullen (1974) examined the effect of melodic redundancy on preference. Melodic redundancy was defined as the frequency at which the notes in a melody are repeated. All stimuli consisted of 48-pitch melodies in which all elements were held constant except the number of different pitches and melodic redundancy. The melodies had three redundancy levels: low (7.5-9.5% redundancy), intermediate (27.7-31.9% redundancy), and high (57.5-58.5% redundancy). McMullen found that students preferred low or intermediate levels of redundancy to a high redundancy level, and an intermediate number of different pitches (i.e., pentatonic or diatonic) in a melody were preferred over a greater or smaller number of different pitches.

In a similar study, Smith and Cuddy (1986) examined the effects of repetition and familiarity on the 'pleasingness' of 20 melodic sequences that were varied in complexity of contour and harmonic structure. In other words, the more complex the melodic sequence, the more it violated the rules of tonal harmonic structure. Their data showed that subjects rated the more complex harmonic structures as less pleasing (preferred) than the more simple structures.

The effect of redundancy on melodic preference was summarized by Radocy and Boyle (1997) who suggested that

"The meaning an individual receives when listening to a melody is a function of the uncertainty reflected in the information present in the melody. The amount of information an individual receives depends on both the structural and cultural redundancy of the melody, i.e., the extent to which the melody reflects a particular melody style and the degree to which the individual is familiar with and has developed expectation within that style. The greater the perceptual redundancy, the combined effect of structural and cultural redundancy, the more likely the melody is meaningful, and hence 'good' for (preferred by) the individual" (p.221).

Using subjects from grade five to college level, Boyle, Hosterman, and Ramsey (1981) found that preferences of higher-level students were more likely to be affected by melody than those in the lower grades. This finding was supported by Kulka (1981) who found that older subjects were more affected by the meaningfulness of the melodic structures and predictability in the succession of notes than younger subjects.

Four experiments were conducted by Cross, Howell, and West (1983) using undergraduates and staff as subjects to investigate the judgment of adult listeners for melodies that conform to the Western music tonal scale structure in differing degrees. Results indicated that both musicians and non-musicians gave higher preference ratings to melodies containing a high numbers of consecutive notes conforming to the tonal scale structure.

Although the importance of the melody in music has been established by research, an early study by Mursell (1948) found that most listeners were able to feel and enjoy the expressive characteristics of a melody without an exact grasp of the finer details. According to Mursell, melody was generally the most appealing structural element in music, partly because we could apprehend it despite our individual differences and still continue to enjoy its aesthetic characteristics.

Harmony

Davies and Barclay (1977) reported consistent findings that the octave, perfect fifth, and perfect fourth were perceived as the most consonant intervals and that seconds and sevenths were the most dissonant intervals. Two studies have examined the relationship between consonance and preference utilizing electronic sine tones (Gibson, 1987; Martindale & Moore, 1990). Gibson (1987) used a 300-point scale on the computer screen to measure non-musician adults' (age 18-59) preferences for all chromatic harmonic intervals within an octave (from minor second to an octave). Results showed that the preference ratings from the least preferred to the most preferred interval were as follows: Major 7th, minor 2nd, Major 2nd, minor 7th, Perfect 5th, minor 6th, Major 6th, Major 3rd, minor 3rd, Perfect 4th, and Perfect 5th. This indicated subjects' relative preference for consonance; a definition adopted for harmony that is used in the present review.

Unlike Gibson (1987), Martindale and Moore (1990) asked subjects to rate both preferences and consonance on a seven-point scale. In addition, they used A=440 Hz as a fixed lower note on all 17 harmonic tone pairs, and a second tone that had a range of A=440 Hz to A=880 Hz. Subjects' mean rating for consonance was in the following order (from most dissonant to most consonant with A=440 Hz as the lowest note): A=460, A=453, A=447, A#=466, A#=481, B=494, G#=825, C=523, D#=740, D'=616, A=880, F=698, F#=733, D=587, C#=554, E=659, and A=440. Results showed that the relationship between preference and perceived consonance level was U-shaped. That is to say, there were higher preference ratings for the most and the least consonant intervals.

Using harmonic progressions, Rosner and Narmour (1992) found that the V-I cadence was significantly preferred by subjects in their study. They also noted that root positions were

preferred over inversions within cadences, and first inversion over second inversions; supporting Schenker's view on the prominent status of the perfect cadence in western music.

It should be noted that the above-mentioned studies had used Western music exclusively. Many concepts such as harmonic progressions and cadences in western music do not apply to non-Western music. In addition, the stimuli used in these studies examining harmony and musical preference was usually generated specifically for those studies instead of actual musical excerpts.

Timbre

Some researchers have examined the differences between preferences for instrumental and vocal timbres. Findings have been consistent across studies using Western music excerpts (Darrow, Haack, & Kuribayashi, 1987; LeBlanc, 1981; LeBlanc & Cote, 1983) and non-Western musical excerpts (Shehan, 1981) in that instrumental timbre was generally preferred over vocal timbre. These findings were consistent for fourth through seventh grade students and among college students. However, an exception was found for the current popular musical style for which vocal timbre was preferred by fourth- and seventh-graders (Shehan, 1981).

In examining the cross-cultural effects on instrumental timbre preference, Cutietta and Foustalieraki (1990) used excerpts performed on band instruments (trumpet, clarinet, and bassoon) and non-band instruments (violin, guitar, and piano) to examine the preferences of fourth-graders in the United States and in Greece. Results showed that fourth-graders in the United States significantly preferred the timbres of band instruments, while fourth-graders Greece significantly preferred the timbres of non-band instruments, suggesting the influences of culture on timbre preferences.

When preferences for male and female vocal timbres were compared, LeBlanc and Sherrill (1986) found that upper elementary students of both genders significantly preferred male singers. The researchers also found that students generally preferred singers who performed with a relatively low level of vibrato.

Using electronically generated tones (sine, square, and synthesized string) and involving musicians and non-musicians, Hedden (1974) found a significant correlation in preferences between timbre and loudness. Subjects preferred sine tones and string tones with a lower intensity level (10dB), but preferred square tones with higher intensity level (30dB).

As far as can be determined, researchers have investigated the relationship between preference and timbre in the following aspects: (1) instrumental versus vocal, (2) male vocal timbre versus female vocal, (3) preference for specific timbres such as band instruments and sine tones and (4) preference for the quality of certain timbres. However, no preference studies have dealt with some specific quality of timbre beyond good/bad timbre.

Summary

The musical characteristics that have been used as independent variables in studies on musical preference include tempo, rhythm, pitch, melody, harmony, and timbre.

Tempo: This review of the literature indicates that I have found that fast and lively tempi are preferred by subjects across a wide range of ages (grade four to college students) and for a range of musical styles such as Classical, Jazz, Popular, and Folk. Tempo preference has also been found to interact with other variables such as subjects' ability to discriminate tempo, affective association of tempo, musical styles, sub-division of beats, performance medium, and whether the metronomic or actual musical examples are used.

Rhythm: The research reviewed for this article indicates that musical examples with rhythm that is well defined, with a clear and regular meter, with an unchanging, and readily detectable pulse are preferred to those with unmarked and irregular rhythm. In addition, it was also found that music containing moderately complex rhythms was preferred over those perceived as too simple or too complex.

Pitch: In the studies reviewed, preference of pitch correlates significantly with the ability to discriminate pitch. There was a significant relationship between pitch preferences and intensity. For example, higher pitches were preferred at the lower intensity level. However, lower pitch was not significantly related to intensity level.

Melody: In the studies surveyed, there was clear preference for melodies that were perceived as clear, distinguishable, predictable, and conforming to scale structures by subjects at the grade and college levels. Also found was a direct relationship between higher preference and the degree of melodic redundancy. Low and intermediate levels of melodic redundancy and a moderate number of different pitches were preferred to high level of redundancy and high number of pitches.

Harmony: The review of the literature indicated that there was a clear preference for intervals perceived as consonant. In studies using either tone intervals or chord progressions, the relationship between preference and harmony was represented by a U-shape, indicating that the most and least consonant intervals were preferred to the moderately consonant intervals.

Timbre: Among the studies reviewed, there was clear preference for instrumental to vocal timbre across the grade to college levels. This was especially pertinent to the preference for the Classical art music and non-Western traditional music. An exception was found for the Popular style where listeners had indicated higher preference for vocal timbre to instrumental timbre. In

cases where vocal timbres was used as variable, male voices with low level of vibrato were preferred over female voices with high level of vibrato.

Conclusion

It should be noted that nearly all of the studies have been conducted in the United States (except Teo, 1998, which was conducted in Singapore). In all the studies, both male and female subjects were used and these came from the grade schools and colleges. In other words, interpretations of the findings should be not be extended to the extreme age groups, namely the very young and very old.

The perception of musical characteristics was heavily dependent on the actual musical examples used in the studies reviewed. The majority of the studies relied on Western Art music (e.g. Classical music) and Popular music (e.g. rock, jazz, folk). It could be possible that musical characteristics could be perceived differently when subjects are presented with non-Western music (e.g. Japanese, Chinese, Malay) or a combination of both Western and non-Western musics in the same study.

The study of music preference has given rise to much interest among researchers. Very often, educators subscribe to a long-term goal of broadening students' musical preferences (Hicken, 1992; LeBlanc, 1983; Shehan, 1986). In so doing, they lead students to engage in music away from their preferred styles thereby expanding students' horizons. To this end, an understanding of students' preferences provides insights for sequencing of music learning and curriculum design.

The musical characteristics mentioned in the above review have accounted for some variance in musical preference. Of interest to music educators are findings that suggest that students need to be exposed to a wide variety of musical experiences to be acquainted with both

conventional and unconventional uses of musical characteristics in various compositional processes. Not only will this practice widen students' musical horizons, it will motivate them to seek out 'new' and unknown music, thereby internalizing the music learning processes.

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