

2016

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Recommended Citation

Csíkos, Csaba and Dohány, Gabriella (2016) "Connections Between Music Literacy and Music-Related Background Variables: An Empirical Investigation," *Visions of Research in Music Education: Vol. 28* , Article 2.

Available at: <https://opencommons.uconn.edu/vrme/vol28/iss1/2>

Connections Between Music Literacy and Music-Related Background Variables: An Empirical Investigation

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Abstract

In this quantitative study, we sought to determine the connection between music literacy and music-related background variables. The sample consisted of 178 students (66 boys and 112 girls). We assessed music literacy in terms of the Hungarian National Core Curriculum objectives, which are rooted in Kodály's oeuvre. Our results suggest that overall students' music literacy is far from being satisfactory as compared to the requirements formulated in the Hungarian National Core Curriculum. Several factors affected student achievement including school type, extracurricular music education, family background, musical taste, music consumption, attitude toward music classes, and instructional methods. We also investigated the combination of these background factors and their interactions.

Keywords: music literacy, secondary schools, Kodály's approach, attitude, musical experiences

Introduction

Assessing Music Literacy

The term *literacy* originally referred to basic reading and writing skills. Similarly, *music literacy* referred to basic musical skills. Volger (1973) developed one of the standardized music literacy tests, the Iowa Test of Music Literacy, which measured music literacy, “the overall purpose of music education in the schools” (p. 5). According to Volger (1973), the fundamental components of musical achievement are “tonal and rhythmic literacy (the ability to musically hear and feel what one reads and writes in notational forms)” (p. 5). Similarly, in Lee and Downie’s (2004) work, music literacy refers to a basic musical skill, namely reading music scores.

According to Telfer (as cited in Bartel, 2006), the definition of music literacy has changed from reading the pitches and rhythms to reading the “meaning of music.” This much wider phenomenon is in line with changes in the usage of different literacies such as reading, mathematical, and scientific literacy. The New National Standards for Music Educators (Shuler, Norgaard, & Blakeslee, 2014) used the term literacy in a very broad sense; besides including the traditional learning targets such as reading and writing musical notation, it also involved the development of so-called artistic literacy. These different kinds of literacies have become widely used with the introduction of the Programme for International Student Assessment (PISA) surveys, emphasizing sociocultural determinants and the importance of these three domains. The PISA definitions of the various literacies (Organization for Economic Co-operation and Development) originated from socioeconomic considerations (e.g., what a 15-year-old student should know in order to be able to fully participate later in society). It is apparent especially in the definition of scientific literacy (Németh & Korom, 2011) that many use the term—in part due to the PISA surveys—to express “broadly based knowledge applicable in various situations” (Csapó, 2010, p. 21).

Literacy refers to knowledge of social value that has many facets, such as knowledge about everyday issues and the ability to make decisions about questions of a technological, natural-environmental, or societal nature (Csapó, 2004). The current understanding of literacy implies noncognitive components exist in connection with any given content domain, thus literacy refers to psychological constructs comprising both factual knowledge and ability components, which are developed culturally within a given social context.

In this study, the term music literacy refers to culturally determined systems of knowledge in music and to musical abilities. The assessment of such a complex phenomenon requires diverse approaches in regard to what and how to assess (a) factual knowledge and musical abilities as defined by experts in the field, (b) knowledge components determined by societal needs, and (c) the constraints imposed by the methodology of assessment. Considering the third factor, the goal of the current research program was to assess the components of music literacy that can be measured using the paper-and-pencil test and questionnaire method.

There is an ongoing debate among music educators about the relative weight or importance of written (as opposed to oral or instrumental) music literacy (Herbst, de Wet, & Rijdsdijk, 2005). Not all components of music literacy can be assessed in a paper-and-pencil test. However, as revealed in a classical empirical study (Young, 1976), the paper-and-pencil parts of the Iowa Test of Music Literacy had the same strong correlations with the Music Achievement Test as the practice-oriented listening parts.

While a wide variety of knowledge components and musical abilities can be assessed using a paper-and-pencil test, music performance (singing or playing instruments) and reading musical notes while singing them out loud cannot be assessed in this way. Since measuring music literacy as a psychological construct requires achieving high reliability, and test length directly correlates with reliability (Spearman-Brown formula), our assessment

demanded a relatively large number of test items and the use of item formats that permit objective scoring. We plan to conduct follow-up studies to cover those components of music literacy that require laboratory-based methods and individual data collection. These follow-up studies may help to validate the paper-and-pencil measures against achievement factors.

Kodály's Approach and Music Literacy in the School Curriculum in Hungary

In this section, we point out how Zoltán Kodály's oeuvre highly influenced the curricular objectives of music education in the Hungarian National Core Curriculum (The Government of Hungary, 2012), highlighting the parallels between the manifest principles in Kodály's oeuvre and the principles appearing among the NCC objectives.

Kodály's followers' writings are the primary sources for Kodály's system for music education. Bónis compiled Kodály's (2007) ideas into a three-volume set. Several articles (Sinor, 1986; Winter, 1970) provide concise introductions to the Kodály method. Barkóczi and Pléh (1977) affirmed the powerfulness of the Kodály method in Hungary, and Hallam (2010) did the same abroad.

Past research confirmed the relationships between students' musical skills and their skills in other subjects such as reading and reasoning (Weinberger, 1998) and general intelligence (Schellenberg, 2004). Pitts (2000) found that the roles of other, noncognitive effects of music learning (such as leisure and emotional development) are important. Kodály's approach to music education may also promote teachers' and policy makers' understanding of the societal usefulness of music education. The active role of individuals and classmates in making music and becoming receptive to so-called good music are means of preserving musical culture. Students' active role in making music may enhance their musical experience, which in itself has intrinsic value. According to Koopman (1996), rich musical experience alone justifies the teaching of music at schools. Although early development of good taste was among the aims of the Kodály pedagogy, preserving musical

culture does not imply the discouragement of the consumption of contemporary (popular) music. Consumption of music as a product is highly influenced by individual and social factors, and according to Edmonston (as cited in Lacher, 1989), music training seems not to interfere with music preference.

Shaping students' tastes, attitudes, and habits are all important objectives emphasized both in the Kodály oeuvre and in the NCC (2012). High school students themselves recognize their importance (Asmus, 1986). Jorgensen (2009) emphasized the importance of measuring music-related background factors, calling forth large-scale empirical research at a time when "musical tastes are shaped by various institutions and in complex ways" (p. 412).

After Kodály's death in 1967, the first large-scale impact analysis revealed positive correlations between music education and school-related achievement measures such as creativity and intelligence (Barkóczi & Pléh, 1977). Barkóczi and Pléh's (1977) research included longitudinal study among elementary school students. They carefully designed and documented the study, so the results on the positive transfer effects of music education were convincing. Consequently, no subsequent investigations have challenged the power of the Kodály method in Hungary; nevertheless, Barkóczi and Pléh's results inspired further studies on the possible role music education may play in developing students' mathematical skills (Gombás & Stachó, 2007).

In the field of music education, the NCC (2012) prescribed different components of music literacy such as history of music and music theory. History of music as taught in secondary schools covers all eras in chronological order from the prehistoric age to the 20th century. Music theory in schools covers basic systems of musical notes: intervals, common chords, tones, and rhythm. Both grammar schools and vocational schools are obligated to offer music education to their students in the form of one music class per week for at least two years.

Aims and Hypotheses

The current research is part of a broader project on music education at the Doctoral School of Education at the University of Szeged. Other investigations in the project looked at the historical aspects of Kodály's music education reform movement (Pethő, 2009), the difficulties of both the interpretation and the implementation of the Kodály heritage (Gönczy, 2009), and the role of musical skills in developing other school achievement factors like reading (Janurik, 2008). Asztalos and Csapó (2014) developed the online assessment of musical skills prescribed in the elementary school curriculum.

Music teachers in Hungary receive at least four years of high-quality college-level training. In contrast, the school system limits music education in secondary schools to only one, 45-minute music class per week. This situation generates a dilemma: Highly qualified teachers must attempt to educate students in a very tight time frame. Not surprisingly, feedback from in-service teachers indicated it was difficult to be an effective music teacher and especially to achieve the goals Kodály had proposed. Therefore, our first aim was to measure the level of music literacy achieved by the end of students' compulsory musical education, and to reveal the structure of its components that can be measured by means of the paper-and-pencil test methodology.

According to the conceptual model of music education proposed by Butler, Lind, and McKoy (2007), it is important to consider several different attributes of students as music learners: age, gender, cultural values, and musical experiences. Swanwick (1999) reviewed the multifaceted relationships between social characteristics and music styles and noted that the relationships are not causal but interactional.

The second aim of our research was to identify the effects noncognitive components of music learning (taste, attitude, habits) and other music-related background factors on the level of music literacy.

The research focused on the following specific hypotheses:

1. The paper-and-pencil music literacy test developed in this research is a reliable measure of a psychological construct.
2. Students' music literacy is far from being satisfactory in terms of their results on a music literacy test covering minimal requirements of the National Core Curriculum. The empirical structure of their music literacy will reflect two clusters of curricular objectives, namely history of music and music theory.
3. Music-related background variables show significant correlations with music literacy; music literacy test results are affected by several demographic background variables including gender, level of music education, and family background.
4. Students' music literacy is highly influenced by factors outside the school.

Method

Sample

The sample consisted of 178 students (66 boys and 112 girls) of upper secondary school from grammar schools and vocational secondary schools. We tested them in their last year of formal musical education, which ranged from grades 10 to 12. Their ages ranged from 16 to 18 years.

We chose the schools for this study randomly from among the upper secondary schools in Szeged, Hungary. They comprised both grammar schools and vocational schools. Grammar school students usually plan to go to universities immediately after completing the 12th grade in their schooling, whereas vocational secondary schools usually offer 13th and 14th grade studies following a maturation exam during which vocational studies take place. Nevertheless, both types of secondary schools offer compulsory music education classes for at least two years.

Materials and Procedure

Students completed a music literacy test and filled out a questionnaire: The paper-and-pencil test measured the cognitive components of music literacy including factual knowledge and certain ability components, and the questionnaire addressed the affective dimension of music literacy and other music-related background variables. We administered both the test and the questionnaire during a 45-minute regular music class in the school. The second author of this study personally supervised this process.

The Music Literacy Test covered the learning objectives of the NCC (2012) suitable for paper-and-pencil testing. It consisted of 14 tasks and 104 items. The tasks served as markers, organizing the items into sections, and each task began with a question or an instruction. The tasks covered the content areas prescribed in the NCC (2012).

For example, the first task was a music recognition task serving both as a warm-up task and as a task that fulfils the role of assessing the practical music skill component. We asked students to listen to the first 20 seconds of the following six musical pieces played on a CD player and to write down both the title of the piece and the name of the composer:

1. “Bánk bán,” from Erkel’s Hungarian opera of the same name;
2. “Spring,” from Vivaldi’s *The Four Seasons*;
3. “Ode to Joy,” from Beethoven’s 9th Symphony;
4. “Hallelujah,” from Handel’s *Messiah*;
5. *Eine kleine Nachtmusik*, by Mozart; and
6. Hungarian Dance No. 5, by Brahms.

Most tasks contained items in an open-ended format. Some were matching type tasks (see Example 1). Different components of musical skills could also be assessed using the paper-and-pencil methodology, such as music writing in Task 9: *Place the violin key and the F# and Bb music notes on the music line.*

Example 1

Task 10

10. Define the following terms and abbreviations.
(a) Allegro:.....
(b) <i>mf</i> :.....
(c) Andante:
(d) Op.:.....
(e) A cappella:.....
(f) Rubato:.....

The questionnaire about the learning of music contained 20 questions with 120 items. Most of the questions contained items in a 5-point, closed question format. The questionnaire measured (a) demographic variables, such as gender, school type, and parents' educational level; (b) overall musical preference (whether the student preferred classical music, popular music, or both); (c) frequency of occasions for musical experience in the family (listening to music, singing, going to concerts, watching musical TV programs); (d) preference toward musical styles and genres (students indicated their preference for the following on a 5-point attitude scale: folksong-like, folksong-like in pop style, operetta, musical, folk music, opera, classical concerts, retro hits, pop, dance, rock, hip-hop, and R&B); (e) estimated time devoted to consuming types of music (divided into classical and popular music); (f) the relative importance of different sources of knowledge about music (students ranked friends, media, school, family, extracurricular music studies, and live events like concerts on a 5-point scale from the least important to the most important sources); (g) the sources of positive and memorable musical experiences (students could choose any one or more of the following ages or places: early childhood, family, kindergarten, school music class, friends,

extracurricular music class, playing music, singing in a choir, concert, or theatre); (h) attitudes towards different school subjects (measured on a 5-point Likert-type scale); and (i) attitudes towards activities during school music class.

Results

Reliability

In order to use the sum of the scores obtained by students on the music literacy test, we estimated the reliability of the test by means of computing Cronbach's α coefficient, which proved to be $\alpha = .93$. This indicated high reliability for a test containing heterogeneous items with respect to both item format and the psychological components measured by those items.

Achievement With Respect to the NCC Objectives

Our music literacy covered the minimal requirements in the NCC (2012). In light of this, we labeled students' achievements appropriate if they achieved around or above 80% of the maximum score. The average score was 37.66% ($SD = 14.02$, $SEM = 1.05$), and only three students achieved at least an 80% score on the test.

The Empirical Structure of the Music Literacy Test as Revealed by Multivariate Analyses

We designed this test with high reliability to measure a psychological construct called music literacy. However, this construct has several components and it is important to reveal the empirical structure of the test. We conducted exploratory factor analysis in order to identify the structure of music literacy. Because of its variance of 0, we excluded the second item of Task 4 (no one gave the correct answer to this item, which was the title of a string quartet by Haydn, viz., "The Lark"). There were 32 factors with eigenvalues over 1, indicating that in spite of the high reliability of the test, it indeed measured many different components of music literacy. To achieve a closer look at the variable structure, we grouped

the 14 tasks according to their empirical similarities as revealed by cluster analysis. Cluster analysis is a group of multivariate methods used to cluster (i.e., identify homogeneous subsets of) variables or persons (Hubert, Köhn, & Steinley, 2009). In psychological and educational research, cluster analysis has been widely used in order to reveal the structure of knowledge-related variables (de Jong & Ferguson-Hessler, 1986). In Figure 1, the short descriptive label for each task is located on the y-axis. These labels reflect the NCC (2012) objectives the task assessed.

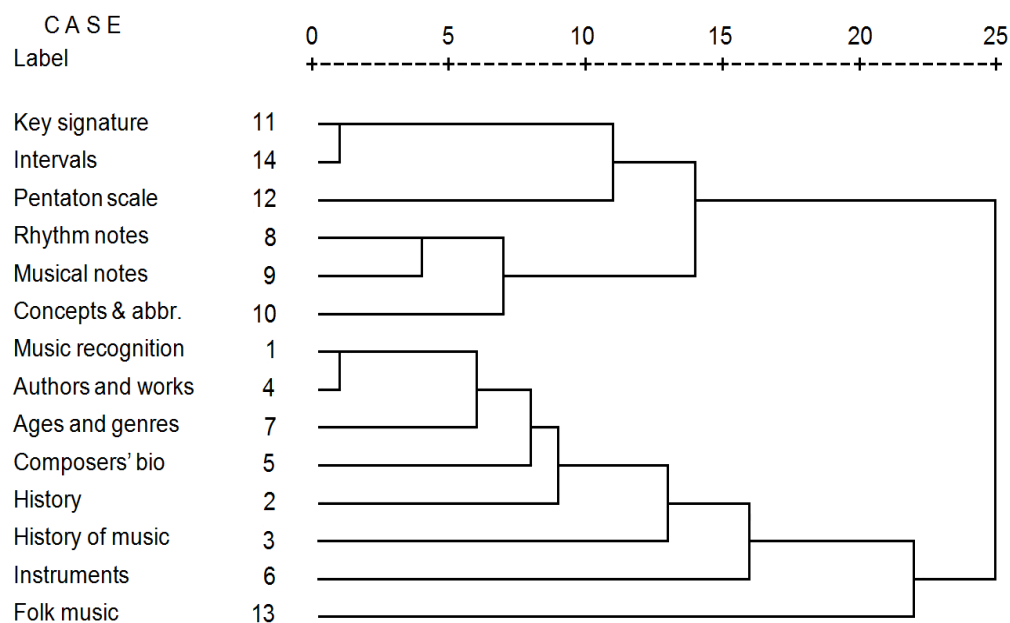


Figure 1. Empirical structure of the tasks in the music literacy test as revealed by cluster analysis (correlations, with furthest neighbour method).

The clusters shown in Figure 1 are statistically significant except for connections 2 and 3: Knowledge about the history of music and about history in general are not significantly connected to the other 12 tasks. Figure 1 reveals three big similarity groups in the tasks. The upper six tasks (11, 14, 9, 8, and 12) in Figure 1 required students to activate their music reading and writing knowledge. The next six tasks (4, 10, 7, 5, 1, and 6) referred to the verbally expressed music literacy knowledge; however, music recognition and students' knowledge about grouping instruments (string, wind, and percussion instruments)

also belonged to this cluster. While knowledge about the instruments may be considered verbally-recalled, factual knowledge, music recognition (though perhaps intrinsically practical knowledge) is part of this same cluster of tasks.

Regression analysis revealed that all 14 tasks had a significant contribution to the explained variance of the test score. Furthermore, step-wise regression analysis showed that six tasks out of the 14 explain 95% of the test score variance. This group of six tasks contains tasks from all three big clusters in Figure 1, thus providing further evidence on the well-balanced content validity of the test.

Relationships Between Music Literacy and Music-Related Background Variables

School type and gender. Both in-school and out-of-school factors strongly influenced students' results on the music literacy test. We analyzed the relationships between school type and gender and music literacy. A 2×2 ANOVA with school type as one factor and gender as the other revealed a significant main effect of school type and a significant interaction between school type and gender: Grammar school students outperformed their vocational secondary school contemporaries, and the difference was even more remarkable among boys (43.70 points versus 31.30 points on average) than among girls (41.30 versus 31.36). The main effect of gender was not significant (for the effect of the school type, $F = 27.06, p < .001, \eta^2 = 13.5\%$). Comparing the two types of schools, grammar school students outperformed their vocational school peers on the test overall. We observed their advantage for all individual tasks except for rhythm notes, key signatures, and intervals, which correspond to the tasks of the first cluster revealed in Figure 1. Since the average scores were rather low for both groups, the results suggest there are great reserves in grammar school music teaching: The lack of significant advantage may point to the lack of focus on the theoretical parts of music literacy. Although there was no significant difference between the genders on the test as a whole, five tasks showed much better achievement for girls. These

tasks all belong to the theoretical chapters of music literacy (drawing a treble-clef and F# and B b musical notes or naming solmization notes from a verbal description like *move upwards a true quint* [a perfect fifth] *from Re*).

We compared those who had had an extracurricular musical education for at least one year with those who had not. The effects of out-of-school, extracurricular music learning were significant to the test as a whole (Welch's *t*-test, $t = 5.05$, $p < .001$), but for five of the tasks there were no significant differences. These tasks all belong to the historical cluster of music literacy. On the positive side, this result might reflect the relative effectiveness of the history of music subject in regular classroom music education. However, this may indicate that history of music is not an important subject in extracurricular music activities.

Other factors. Further analyses of the relationships between music literacy and various background variables revealed the importance of the following factors: parents' education level, preference of popular music, frequency of occasions for musical experience in the family, preferred music styles, consumption of popular music, sources of musical experience, memorable musical experiences, attitude toward music as a school subject, and enjoyment of music class activities.

The students ranked their parents' education levels on a 5-point ordinal scale. Both the mothers' and fathers' education levels showed a significant correlation with music literacy (correlation coefficients are .28 and .27, respectively).

Responses to the question on the preference of popular or classical music indicated that those who preferred both popular and classical music ($N = 57$) outperformed their peers on the music literacy test and on all but two tasks: musical notes and folk songs. Only two students stated that they preferred classical music, while 119 students marked only pop music as their preferred style.

The frequency of occasions for musical experience in the family had positive effects on students' musical literacy. Two events, singing together and going to concerts, showed significant correlations with the test scores ($r = .38$ and $r = .46$, respectively), while the other two activities, listening to music and watching musical TV programs, did not. Singing and attending concerts are active musical activities, whereas listening to music and watching musical TV programs are passive musical activities.

We grouped the music styles students preferred into three categories according to whether they had positive, neutral, or negative effects on the level of music literacy. Significant positive correlations existed between music literacy and the enjoyment of urban Hungarian folk song ($r = .29$), operetta ($r = .31$), musical ($r = .33$), folk music ($r = .53$), opera ($r = .51$), classical concerts ($r = .59$), and rock ($r = .16$) genres. Folksong-like music in a pop style ($r = -.07$), retro hits ($r = .04$), and pop ($r = -.04$) did not seem to be related to musical literacy. Significant negative correlations existed between music literacy and dance ($r = -.26$), hip-hop ($r = -.24$), and R&B ($r = -.17$).

Students ranked the frequency of popular music in their music consumption between 0% and 100%. With a mean value of 84%, this background variable had a strong negative correlation with music literacy ($r = -.40$). Since correlations do not imply causality, there are at least two possible explanations. First, it is possible that increasing the consumption of popular music resulted in a decrease in music literacy, as measured by the test. Second, it may be that the development of music literacy implies an increase in the consumption of classical music. In other statistical terms, the absolute value of the correlation $r = -.40$ shows that the share of popular music in someone's music consumption explains 16% of the variance of the music literacy score.

All the sources of musical experiences (ranked on a 5-point scale) proved to have a significant role in music literacy. Friends and media had negative correlations, but school, family, extracurricular music studies, and live events like concerts had positive correlations.

The place or age that was a source of positive and memorable musical experience might indicate one's attitude towards music. We compared students who selected a given option with those who did not choose that option. Hence, five out of the nine options indicated significantly higher achievement on the music literacy test: family, extracurricular music class, playing music, singing in a choir, and concert/theatre. The other four items did not have a significant effect on music literacy: early childhood, kindergarten, school music class, and friends.

Students' attitudes toward music as a school subject had a significant correlation of $r = .36$ with music literacy. Notably, attitude towards history has a similarly high correlation with music literacy, $r = .37$. Here again, at least two different directions of causality are feasible: Positive attitude towards school subjects may have a role in the development of music literacy, or perhaps music literacy had a causal effect on attitudes.

The specific activities of the school music class students enjoyed most did not have a notable connection with music literacy. Indeed, all five music activities (singing folk songs, learning new songs, learning the theory and history of music, listening to music, and solfège), ranked on a 5-point scale, showed significant positive correlations with music literacy. This indicates that children more literate in music are fond of every activity that usually occurs in music classes.

Combining several background variables within one model, we conducted regression analyses in order to reveal to what extent each of these background variables explains the level of music literacy. Four factors were involved in the analysis, and each of them can be considered an interval-scale measure: mother's level of education, percent of classical music

in music consumption, attitude toward music as a school subject, and attitude toward the classroom activity of singing folk songs. We chose the final factor for two reasons: First, since the five activities are inter-correlated, it is enough to select one of them for regression analysis and second, singing folk songs is the focus of Kodály's approach. Table 1 shows the variances attributed to each independent variable.

Table 1

The Effects of Four Background Variables on Music Literacy as Revealed by Linear Regression Analysis.

Independent variables	r	β	$r \cdot \beta$ (%)
Mother's education level	.28	.19	5.4
Classical music consumption	.40	.27	10.7
Attitude towards music class	.36	.18	6.5
Attitude towards singing folk songs	.38	.17	6.6

Note. The dependent variable for this data was music literacy ($N = 178$, list-wise). r = correlation coefficient; β = regression coefficient; $r \cdot \beta$ = explained variance

The model fit proved to be significant ($F = 17.92$, $p < .001$), i.e. the independent variables selected explains significant part of the variance. The sum of the explained variances is 29%, so these four background variables have a substantial contribution to music literacy.

Discussion and Conclusion

The results suggested that we succeeded in developing a highly reliable paper-and-pencil test assessing music literacy at the end of secondary students' compulsory music studies (Hypothesis 1). On the basis of the NCC (2012) objectives, we developed a highly reliable paper-and-pencil test that can be used in further studies either as a dependent variable (measuring the effectiveness of school intervention programs), or as an independent variable providing information on the music literacy level of different populations.

The empirical structure of the test reflected three large pillars of music literacy as measured by a paper-and-pencil test: music reading and writing, verbally recalled factual knowledge, and history of music (Hypothesis 2). A follow-up validation study may reveal how and to what extent these knowledge clusters relate to musical skills not measurable by a paper-and-pencil test (e.g., repeating and sustaining a sound on a given pitch or deciding whether the piano chord just heard is a major or minor triad).

We found that the relationships between music literacy test results and music-related background variables (Hypothesis 3) were significant: Musical taste, musical experiences, family background, school type, and attitudes all have important roles in music literacy. The directions of such correlations, however, are not clear or definitive. Theoretically, there are at least three possible patterns in the directions of the causal relationships. Most obviously in many cases the background variables clearly affect, indicate, and sometimes predict the level of music literacy. The family background, for instance, may have several positive effects on gaining musical experiences. In other cases the level of music literacy may affect musical preference; the more someone knows about the history or theory of music the stronger his or her musical preference may be. The third type of relationship is the indirect causality between the measures investigated here. In some cases, further factors (e.g., general intelligence) might mediate the correlations between music literacy and music-related background variables.

These research results may improve the quality of music education by means of providing information to stakeholders at various levels in the educational systems. Teachers and parents often possess strikingly marked beliefs about the role music (or music education) should play in childhood and in the life span. These beliefs are often stereotypes and need refinement. Curriculum developers and textbook writers may find useful insights about the role different music styles and attitudes towards those styles play in fostering children's

music literacy. Another factor that calls for caution in the interpretation of our results is the cultural dependence of not only the music literacy components but of the way the background variables affect it. How students perceive themselves as learners in music or in other subjects is highly culture-dependent (McPherson & O'Neill, 2010).

Our fourth hypothesis concerned the importance of out-of-school factors in shaping students' music literacy. The data revealed that social and sociometric status largely determine preferred music style. Parents' educational attainment may partly define social status, and we found clear correlations between music literacy, musical taste, and parents' education. In contrast, sociometric status (Johnstone & Katz, 1957), specifically peer conformity in musical taste, may lead to poorer music literacy. Tepper and Hargittai (2009) highlighted the important role of peer opinion even in the digital age. All these varied factors point to the importance of further large-scale investigations focusing on both cognitive and affective factors of music literacy.

The implications of the current study for classroom music education involve some considerations on the methods of instruction. Since important attitude variables proved to be relevant predictors of music literacy, using instructional methods that shape students' attitudes can be a powerful means of fostering music literacy. Besides the positive effects singing folk songs may have on music literacy (see Table 1), the overall attitude toward music classes plays a significant role in music literacy. Given the narrow time frame of 45 minutes per week, and taking the empirically revealed knowledge clusters of music literacy into account, teachers should try to provide a diverse range of musical activities in their lesson plans. From history of music to music reading, writing, and recognition, each student may find his or her favorite classroom activity, and thus the attitude towards music classes may be enhanced.

Sibbald (1993) presented practical suggestions on how to conduct classroom discourse leading to explorative criticism of musical taste. Tomer (1996) went beyond this concept, exploring changes in metapreferences. While actual musical preferences may change over time, metapreferences, or preferences one has for one's preferences, remain stable. In Georgii-Hemming and Westvall's (2010) study, preservice teachers expressed the importance of collaborative projects in music education because they may awaken an interest in music.

The most powerful means of shaping musical taste and attitude may be maximizing students' musical experience in the classroom (Lamont, Hargreaves, Marshall, & Tarrant, 2003). For example, students' aversion to solfège as a classroom activity led to the development of a nonsolfège system for improving music literacy skills (Brown, 2003). This and other pedagogical ideas may corroborate empirical results on the potential for shaping students' attitudes toward music.

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Acknowledgments

A grant from the Hungarian Scientific Research Fund (OTKA 81538) awarded to the first author, and by the MTA-SZTE Research Group on the Development of Competencies, supported this research. Thanks are due to Jerry Thékes and Anna Babarczy for their comments on an earlier draft of this paper.

Parts of the present study have been presented by the second author at The Seventh International Research in Music Education Conference held in Exeter, UK, April 12–16, 2011.

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