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# The Socio-Educational Model of Music Motivation

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## Abstract

The well-established socio-educational model of second language learning motivation developed by R. C. Gardner was adapted and applied to study instrumental music learning motivation. The similarities between music and language suggested that the adaptation might lead to new insights in the study of music motivation. At the heart of the proposed model is a multifaceted description of the relationships among motivation, attitudes, anxiety, support from others, perceived competence, and achievement. A sample of 107 high school band students was selected to participate in this study. Results of a path analysis of questionnaire responses indicate that the adapted and expanded socio-educational model fit very well with the present data and described key motivational structures. The key support for motivation to learn was supplied by integrativeness (an interest in taking on the characteristics of musicians, positive attitudes toward learning instruments, and an interest in music learning), plus attitudes toward the learning situation (music teacher and course).

## Keywords

anxiety, attitudes, motivation, school band, support

It takes an enormous amount of perseverance to learn to play music well. The significant investments made by learners (e.g., time, effort, and opportunity costs to name a few) often depend on the individual's motivational supports, such as interest in becoming a musician, generally positive attitudes, a desire to learn, and inspiration from others. A diverse collection of topics can be included under the rubric of music motivation. Researchers have examined student beliefs (Asmus, 1986), aptitude (Asmus & Harrison, 1990), self-concept (Austin, 1988), goal structures (Austin, 1991), attributions (Austin &

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Vispoel, 1998), performance expectancies (Chandler, Chiarella, & Auria, 1988; Schmidt, 2005), and parental involvement (Zdzinski, 2002), among other variables.<sup>1</sup> Martin (2008) found that music and sport share common dimensions, including self-efficacy, persistence, and failure-avoidance, underlying motivation and engagement. In order to provide a different perspective, one that emphasizes the social-psychological dimensions of music learning as part of a larger theoretical framework, for the present study we adapted a well-established model from the study of second language learning motivation.

Despite some obvious differences, language learning and music learning have much in common. Music and language both are strong markers of culture and can be considered complementary aspects of the human communication toolkit (Cross, 2009). Both music and language are vehicles for self-expression that can tie strongly into a person's sense of self (Schnare, MacIntyre, & Doucette, 2010). Both music and language require a set of receptive skills, and a complex set of performance skills, that develop over a long period. Even before infants understand any language at all, they react to different music styles in their environment, such as a soothing lullaby (Trainor & Schmidt, 2003). As children grow older, both music and language systems convert complex acoustic sequences into perceptually discrete elements, for example, words or chords, organized into hierarchical structures that convey rich meanings (Patel, 2008). In music, meanings attached to particular notes hold emotional connotations, as words do in language (Dobrian, 1992). McMullen and Saffran (2004) provided a detailed analysis of the brain-based developmental similarities and dissimilarities between music and language in the areas of sound structure (including the prosodic and grammatical structures), memory systems, the process of inferring meaning from sounds, and the underlying learning mechanisms of both music and language. They suggested that the brains of infants possess shared areas of music and language processing that differentiate as people mature. Finally, McMullen and Saffran (2004) concluded that thinking about the relationship between language and music may help us better understand them as separate domains.

Second language learning motivation has been studied for well over 50 years (MacIntyre, 2010). The most influential and productive theoretical approach in the field has been Gardner's (1985, 2001, 2005, 2009, 2010) socio-educational model. The model was developed along with a measurement tool, the Attitude and Motivation Test Battery (AMTB), which has been refined over the years and applied internationally in over 75 studies with over 10,000 students (Masgoret & Gardner, 2003). For the present study, we adapted the AMTB to the study of music. This test battery helped to provide a coherent set of concepts that fit within an established theory with which to examine the motivation to learn instrumental music.

### *Model Overview*

The socio-educational (SE) model (Gardner, 1985, 2009, 2010) was designed to account for the effects of individual differences in attitudes and motivation on second language achievement. The model itself fits within a larger framework that has four

major divisions: the social milieu, individual differences, acquisition (learning) contexts, and outcomes. Each piece of the framework also can be applied to motivation for music learning.

### *The Social Milieu*

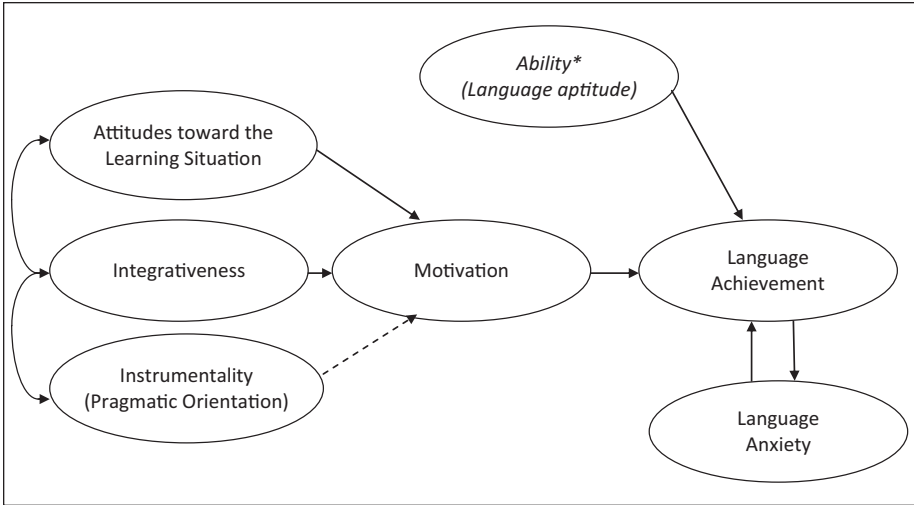
In the SE model, the social milieu is reflected in beliefs about language and other language groups. Although one might consider a very wide range of factors to be captured by the notion of social milieu (such as the languages spoken or instruments encountered in the community, patterns of conflict or disagreement, contact with language speakers or musicians, supportive or discouraging friends, and so on), those factors must be made relevant to the student in order to affect motivation; that is, they must be internalized (Gardner, 1985). Parents, teachers, and peers are key sources of beliefs about both language and music learning.

*Parental encouragement.* Support from parents has been found to contribute to both academic motivation in general (Mattanah, 2001) and music motivation in particular (Sichivitsa, 2007). McPherson (2008) argued that children hold expectations for learning music and its value that are established as a result of interactions with their parents even before children arrive at their first music lesson. In addition to expressing praise and encouragement, supportive parents provide supervision of initial practicing, a key form of support that encourages adherence to practice activities assigned by an instructor (Woody, 2001). Sichivitsa's (2007) analysis demonstrated that students with involved and supportive parents not only developed better self-concepts in music but also developed stronger motivation to participate in various music activities in the future.

*Teachers and peers.* On one hand, teachers certainly influence children's attitudes toward music. Price (1983) reported that providing positive feedback, delivering clear, comprehensible directions, and using varied techniques and approaches when instructing students worked to enhance the children's attitudes toward learning. Students seem to be more highly motivated when they perceive their teacher to be supportive, cooperative, and able to explain material well (LeBlanc, 1992; Pitts, 2004). On the other hand, it is possible that peer support (e.g., friends, siblings) can exert an even stronger effect on motivation than can teachers' support (Burnard, 2002; Hall, 2005). Supportive peers have been found to increase the willingness to speak a second language (MacIntyre, Baker, Clément, & Conrod, 2001), and shared music preferences can lead to the formation of new friendships in adolescence (Selfhout, Branje, ter Bogt, & Meeus, 2009). Although teachers might be expected to be supportive of their students, a learner's friends might not value instrumental music learning at all. At times, peer pressure can discourage participation in music class or interest in a particular instrument (Finnas, 1989; Hall, 2005).

### *Individual Differences*

Within the larger framework of the SE model, most of the research attention has been directed toward individual differences (see Figure 1). Individual difference variables



**Figure 1.** The socio-educational model of language learning  
Source: Gardner (2005).

\*Ability (language aptitude) is not included in the present study.

can be grouped into three main clusters: *Attitudes toward the Learning Situation*, *Integrativeness*, and *Motivation*. A fourth cluster, *Anxiety*, has been included in some versions of the model and not others; it will be included here because of the strong potential effects of performance anxiety on the motivation of aspiring musicians (see Kenny, 2005). A fifth type of influence, *Language Aptitude or Ability*, is acknowledged but often is not included in a test of the SE modeling and is not included in the present study.

*Attitudes toward the Learning Situation (ALS)*. According to Gardner (2005), ALS refers to “affective reactions to any aspect of the class and could be assessed in terms of class ‘atmosphere,’ the quality of the materials, availability of materials, the curriculum, the teacher, etc.” (p. 10). The AMTB measures attitudes toward both the course that the students are taking and the teacher, attitudes that often are positively correlated (Gardner & MacIntyre, 1993). Similar results were expected with respect to music teachers and courses in the present study.

*Integrativeness*. Integrativeness reflects the quality of the affective reaction to another group. “[Integrativeness] focuses on communication with members of the other language group, a general interest in foreign groups, especially through their language, and favorable attitudes toward the target language group” (Gardner, 2005, p. 10). Students with higher levels of integrativeness are willing to take on key attributes of the target language community (Gardner & MacIntyre, 1993) and have a desire to be accepted as a member of that community (Gardner & Lambert,

1959). In the SE model, integrativeness reflects a combination of three variables: (1) an *integrative orientation*, reflecting reasons for learning that focus on meeting and communicating with members of the target language community and, to some extent, wanting to be like them. Integrative orientation can be contrasted with an *instrumental orientation*, which refers to the practical benefits of learning such as gaining a competitive advantage over other persons or getting a good job (Gardner, 1985). To avoid confusion of terminology in the music domain, we shall refer to this as a *pragmatic orientation*. (2) The *interest in foreign languages* reflects openness to other languages regardless of the specific language that a student is learning at the moment. (3) *Attitudes toward the language community* reflect a positive evaluation of people who speak the target language. Adapting and applying the concept of integrativeness to the study of music may provide access to a relatively unexplored source of music motivation. If we think of different music styles and traditions as if they were cultures, then music(s) can take the place of language(s) and musicians take the place of people who speak the language in the SE model.

**Motivation.** Gardner (1985, 2009) theorized that a truly motivated individual must have positive attitudes toward the learning process, a desire to learn, and direct effort toward learning. In the SE model, both ALS and integrativeness support motivation. However, motivation is the engine that drives behavior because positive learning outcomes require effortful behavior. Motivation is the variable that best predicts the behavior that leads to language learning and use (Masgoret & Gardner, 2003). In Gardner's model, a combination of three variables defines motivation: (a) *Attitudes toward learning the language* reflects a positive evaluation of the language learning process; (b) *Desire to learn the language* reflects wanting to learn the language, that is, an emotional investment in learning; (c) *Motivational intensity* reflects effort to learn the language. Adapting Gardner's approach and applying it to the study of music provides a new way to conceptualize music motivation in terms of an integrative motive.

**Anxiety.** Anxiety about languages has been shown to be relatively independent of other forms of anxiety (MacIntyre & Gardner, 1991) because of the unique challenges of trying to communicate using another language. The SE model identified anxiety within two broad situations: the sheltered environment of the language classroom (*Language Classroom Anxiety*) and the broader contexts of language use outside the classroom (*Language Use Anxiety*). Both classroom and use anxiety consistently have been shown to be negatively correlated with second language achievement (see MacIntyre & Gardner, 1994). Adapting these two anxiety constructs allows us to maintain the distinction between the classroom context and music outside the classroom, such as public performance.

## Acquisition Contexts

Acquisition contexts can be either formal or informal, respectively reflecting the predominance of structured or unstructured learning opportunities. Krashen (1981) differentiated conscious attempts at language *learning* in a structured context versus

less formal, somewhat unconscious *acquisition* contexts in which affective reactions including motivation play a significant role. Similarly, Green (2002, 2005) has written valuable discussions of the differences between formal and informal music learning contexts. Numerous opportunities can be found for formal and/or informal learning of both languages and music.

### Outcomes

Outcomes can be grouped into linguistic (e.g., new vocabulary, syntax, etc.) and non-linguistic (e.g., attitude change, new relationships, career advancement, etc.) categories. Linguistic outcomes include the vocabulary, grammar, and communicative capacity of the language student. Within a music context, the music outcomes include knowledge of music theory, technical skills, and the ability to create or perform music. Non-linguistic outcomes refer also to the effect that learning has on future attitudes, motivation, anxiety, and other variables included in the SE model. That is, the elements of the model, whether applied to language or music learning, are expected to change with experience. Experience gained through practice and performance feeds back into the attitude/motivation system.

### The Present Study

We assessed an adapted and expanded SE model applied to instrumental music learning. The proposed model was tested using path analysis, which allows researchers to test whether or not correlations among a set of variables are consistent with a proposed structure (model). Path analysis is based on regression but allows variables within the model, endogenous variables, to simultaneously be predicted by, and to serve as predictors for, other variables. In this way, we can create a description of how the variables fit together and evaluate whether or not the framework is consistent with the correlations obtained.

The SE model holds that motivation will be supported by a combination of ALS and integrativeness (Gardner, 1985). Gardner (2009) included a potential influence on motivation from a pragmatic orientation, so that path also was tested in the present study. A key hypothesis is that motivation will lead to behavior that produces learning and skill development, so we link motivation to how much practice the student undertakes outside school and her or his perception of competence. Elements of the broader theoretical framework are included here as well. The social milieu is represented by *supportive others* and is defined by ratings of parental encouragement and the level of perceived support from parents, siblings, best friends, other friends, the music teacher, and other teachers. Greater feelings of support from other people, as well as seeing the pragmatic value of music learning, were expected to predict higher levels of integrativeness and more positive ALS. To complete the model, we proposed that the perception of music competence and the amount of practice undertaken outside school would predict the student's self-reported achievement level. Finally, anxiety

was included as a potential negative influence on perceived competence and achievement (see Gardner, 2005).

## Method

### Participants

Participants ( $N = 107$ ) were band students in grades 9 through 12 from 7 of the 10 classes offered by three schools.<sup>2</sup> Participants come from a rural area of eastern Canada, specifically in and around Sydney, Nova Scotia, on Cape Breton Island. Of the participants, 44 were male, 61 were female, and 2 did not state their sex. The age range of participants was 14 to 18 years; the median age was 16 years ( $M = 16.1$  years,  $SD = .77$ ). Participants came from 17 different ethnic heritage groups with most stating that they were of Scottish ( $N = 40$ ) or Irish ( $N = 12$ ) descent. Thirty-four percent (34%) of the participants described themselves as being of mixed ethnicity. Participants named a variety of instruments they played (15 in total) with some students playing as many as three instruments. In school, the most frequently played instruments were saxophone ( $N = 28$ ), flute ( $N = 23$ ), clarinet ( $N = 17$ ), and trumpet ( $N = 11$ ). Instruments played most frequently outside of school were piano ( $N = 37$ ), guitar ( $N = 23$ ), and drums/percussion ( $N = 10$ ). When asked to name their primary instrument, saxophone (24%), flute (21%), clarinet (17%), trumpet (9%), and drums/percussion (8%) were mentioned most often. A majority (61%) indicated that they began playing at either 9 or 10 years of age; this was the age at which band classes became available in the local school curriculum. The school-based instrumental band classes typically met two or three times per week, in addition to after-school rehearsals and performances. Students focused on playing classical pieces as well as popular music from Broadway and cinema. Data collection was conducted near the end of the school year when they had given several performances as a band. Over 60% of the participants stated that they had played at public events more than 20 times. Most participants described their skill level as either “high intermediate” (54%) or “mid-intermediate” (26%), with only two participants describing themselves as beginners and 11% self-rated as advanced or expert.

### Materials

Data were collected for the present study using a questionnaire, including a demographic information sheet. After giving informed consent, students then responded to items from the AMTB scales. Scales listed in Table 1 under Integrativeness, ALS, Motivation, Anxiety, and Pragmatic Orientation were adapted from measures used by Gardner and MacIntyre (1991). Parental encouragement items were adapted from Gardner (2009), perceived competence was adapted from Williams and Deci (1996),<sup>3</sup> and the social support items were adapted from Ajzen (1988). All measures were rated on a 7-point scale with the anchors *strongly disagree* and *strongly agree*. Where



**Table 1.** Materials Used in the Study

Measure	Cronbach's $\alpha$	Items	Example Item
Integrativeness	.91		
Integrative orientation	.75	4 (4 & 0)	"Studying music is important because it will allow me to gain good friends more easily among musicians."
Attitudes toward musicians	.84	5 (4 & 1)	"The more I get to know musicians, the more I want to be able to play well."
Interest in music learning	.81	10 (6 & 4)	"I would really like to learn many instruments."
Attitudes toward the learning situation (ALS)	.92		
Attitudes toward the music class	.89	10 (5 & 5)	"I look forward to the time I spend in music class."
Attitudes toward the music teacher	.90	6 (3 & 3)	"I look forward to going to class because my music instructor is such a good teacher."
Motivation	.94		
Motivational intensity	.78	9 (5 & 4)	"I really work hard to learn music."
Desire to learn	.87	10 (5 & 5)	"I want to learn music so well that it will become second nature to me."
Attitudes toward learning an instrument	.89	9 (4 & 5)	"I find the study of music very boring."
Anxiety	.87		
Music classroom anxiety	.78	10 (5 & 5)	"I get nervous and confused when I am playing something in class."
Music performance anxiety	.79	10 (5 & 5)	"I would get nervous if I had to play music when a lot of people can listen."
Supportive others	.88		
Parental encouragement	.87	5 (5 & 0)	"My parents show considerable interest in anything to do with my music courses."
Social support (parents, peers, siblings, & teachers)	.81	7 (7 & 0)	"My mother wants me to learn music."
Other			
Perceived competence	.89	4 (4 & 0)	"I feel able to meet the challenge of learning my instrument."
Pragmatic orientation	.72	4 (4 & 0)	"Studying music can be important to me because I think it will someday be useful in getting a good job."

Note: The numbers in parentheses indicate the number of positively and negatively worded items, respectively.

necessary, scores on negatively worded items were recoded (1 = 7, 2 = 6, 3 = 5, and so on) so that high scores indicated positive attitudes, higher motivation, and higher anxiety (as applicable).

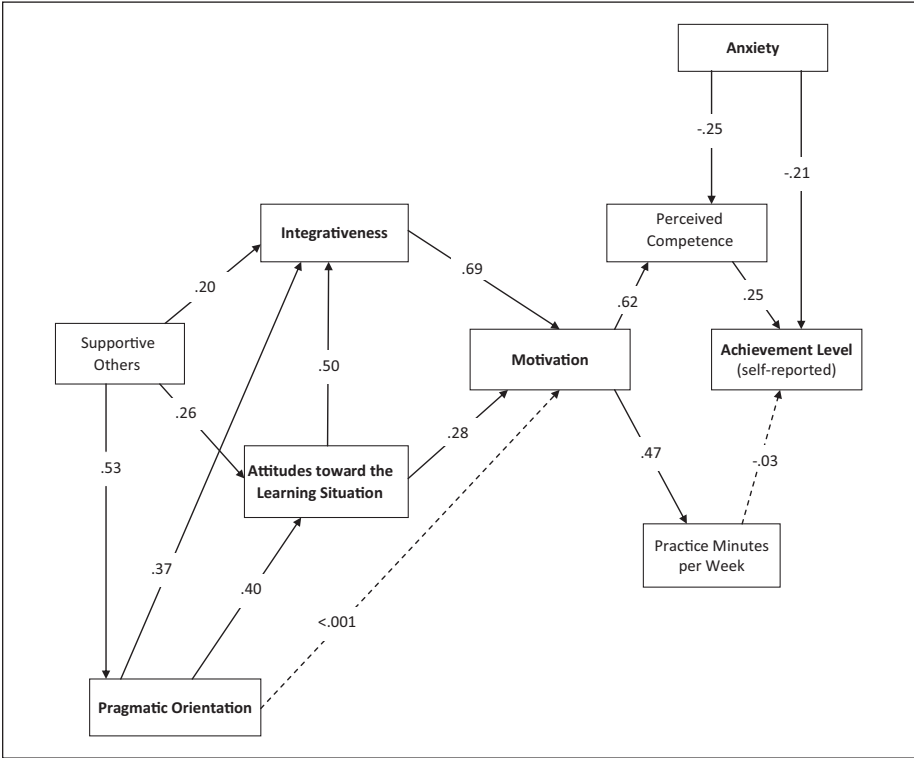
## Procedure

Three schools within the local school board were contacted. After receiving permission to conduct the study, we administered surveys to each of the music classes during the regular class time. The students were informed that their data would be kept anonymous and confidential. After reading an information sheet and giving informed consent, the participants took approximately 30 minutes to complete the survey.

## Results

A path analysis was conducted in order to judge how well the model accounts for the correlations among the variables (see online supplemental material Appendix A at <http://jrme.sagepub.com/supplemental>). The results of the path analysis support the adapted SE model. First, we examined the indices of model fit. According to Byrne (2009), a good model will result in a non-significant chi-square test and a root mean square error of approximation (RMSEA) less than .08, indicating that there is not a significant amount of correlation left unexplained by the model. In our case, the chi-square test is not significant,  $\chi^2(21) = 22.5$ ,  $p < .37$ , and the RMSEA coefficient (<.03) is acceptable. In addition, various fit indices should exceed .90 if the proposed paths account well for the correlations. In our case, all of the fit indices are well above .90, including the goodness-of-fit index (GFI = .96) and the comparative fit index (CFI > .99). We also examined the modification indices associated with each of the paths that were not included in the model. None of the modification indices exceed 4.0, indicating that the model is not missing a major path.

We next examined the relationships between variables by examining the size of the standardized path coefficients. Results show that 12 of the 14 path coefficients are significant at  $p < .05$  (see Figure 2). The strongest standardized path coefficients were observed from integrativeness to motivation (.69), and from motivation to both perceived competence (.62) and the number of minutes of practice per week (.47). Furthermore, ALS predicted both integrativeness (.50) and motivation (.28). These are the core hypotheses of the socio-educational model and are well supported in the present data. The anxiety measure was significantly, negatively related to both the students' perceived competence (-.25) and self-reported level of achievement (-.21). The variable supportive others strongly predicted a pragmatic orientation (.53) and significantly predicted both integrativeness (.20) and ALS (.26). The pragmatic orientation in turn predicted both ALS (.40) and integrativeness (.37) but did not predict motivation directly (<.01). Finally, the students' perceived level of achievement was predicted by perceived competence (.25) but not by the number of minutes of practice (-.03).



**Figure 2.** The socio-educational model of music motivation  
 Note: The standardized path coefficient is shown for each path; the two nonsignificant paths are shown with dashed lines. Concepts also shown in Figure 1 are bolded.

## Discussion

At the core of the socio-educational model is motivation. The present data indicate that motivation predicted both students’ perceived competence and the reported number of minutes of practice (replacing the direct link between motivation and achievement in Figure 1). These latter two variables are key to producing the feelings of accomplishment and the practice behavior underlying the self-reported achievement level and together reflect the outcomes portion of Gardner’s framework. The result that higher levels of motivation lead to music achievement via practice and perceived competence parallels and extends results in the second language domain (see Masgoret & Gardner, 2003). Future research that includes other indicators of achievement and a variety of assessments of music aptitude, competence, and/or performance are likely to lead to an expanded understanding of music motivation.

The two key variables that support motivation also show the expected paths in the present data. Consistent with prior research in second language acquisition (Gardner, 2009), both ALS and integrativeness are predictive of higher levels of motivation. That is, the motivation required to learn to play an instrument is supported by positive attitudes toward musicians, the teacher, the course, and music in general. Further, we obtained a strong path between ALS and integrativeness. In the second language context, the teacher can sometimes be the only representative of the second language community present in the classroom. In the case of music education, the teacher is very likely to be the most accomplished musician in the classroom. It makes sense that students with positive attitudes toward the teacher and course might also feel a stronger sense of integrativeness with musicians and their music. We hasten to note that integrativeness and ALS also are supported by other significant persons in the students' social milieu (peers, siblings, parents, and teachers), as well as pragmatic reasons for learning. Pragmatic reasons did not, however, have a direct relationship with motivation in the present sample. Although one can never fully explain a nonsignificant result, perhaps this reflects the absence of employment opportunities in the local area for the primary instruments being studied in class (saxophone, flute, and clarinet). In this case, the more active supports for motivation appear to stem from positive attitudes toward musicians and the learning context. Pragmatic orientations were predicted by supportive others, and both variables played an indirect role in the motivational system of the high school band students. Future research in other contexts, for example with new professionals, seems likely to find a different pattern of results. Nevertheless, the finding of a strong connection between integrativeness and motivation suggests that there is a promising avenue for future research to study the integrative motivation of aspiring musicians. The integrative motive provides a unique way to conceptualize the psychology of music learning.

The role of anxiety in the motivation system is shown in the model at the outcome stage. The present results suggest that the measure of anxiety significantly (negatively) predicted both perceived competence and the students' reported level of achievement. In the literature on second language learning, research indicates that anxiety arousal can play a role in reducing the quality of learning and performance (e.g., MacIntyre & Gardner, 1994). Our data are consistent with the idea that anxiety is associated with lower levels of achievement and perceived competence among young musicians (see Kenny & Osborne, 2006).

The path analysis reported here also is an extension of the socio-educational model (Gardner, 1985, 2009). One extension, on the left-hand side of Figure 2, included "supportive others" as a key indicator of the social milieu. On the right-hand side of Figure 2, another extension is the use of three variables reflecting outcomes of motivation (perceived competence, level of achievement, and minutes spent practicing per week). One effect of these extensions is to change integrativeness, pragmatic orientation, and ALS from exogenous to endogenous variables in the model. Whereas Gardner's model typically used these variables as the first elements to be tested in the model, and he found them to be correlated (see Figure 1), we proposed directional paths. In path analysis, correlations are not permitted among endogenous variables, and bidirectional path

arrows can cause the model to become unidentified. In practice, this requires the designation of one variable as dependent on the other, in the sense that it is serving as a criterion variable in a regression analysis (i.e., one is designated to predict the other). We decided to test a path from ALS to integrativeness, based on the idea that among young musicians, attitudes toward the music teacher might influence attitudes toward musicians in general, with the teacher serving as a role model. The reverse path, from integrativeness to ALS, also is a plausible hypothesis and might be preferred among more experienced musicians. Further, among school-age, nonprofessional musicians, we designated the pragmatic orientation toward music as supportive of both an interest in musicians (integrativeness) and positive ALS because the pragmatic implications of music learning (e.g., employment) are not likely to be directly relevant to motivation within this age group.

As with virtually all analyses based on correlation, the paths presented here reflect one of the potential models of the relationships among the variables. The directional arrows suggest that increases (or decreases) in one variable predict increases (or decreases) in another. In addition to the interpretive caveats that accompany path analysis, other limitations of the study include the use of self-report for all of the measures. Although the teachers confirmed that students should be considered middle-to-high intermediate learners with some performance experience, there was no test of actual performance or objective measure of music competence. The sample obtained was fairly homogeneous, which affects generalizability of the results but avoids interpretive difficulties of mixing a wide variety of different music genres or learning contexts. Further, the sample size of 107 might be too small to allow for a more sophisticated test of the socio-educational model using structural equation modeling, although that technique has been used in the language studies (e.g., Gardner, 1985). Finally, the students were taught by a small number of teachers. The music teachers in the present study were rated by the students as being very supportive ( $M = 6.54$  out of 7). A larger sample of students, influenced by more teachers, might reveal a wider dispersion of attitudes toward the learning context. In addition, the model might be tested in less formal learning contexts, although some changes would have to be contemplated (e.g., how to define the learning situation outside the classroom).

Future research might examine the concept of integrativeness as applied to different music genres (e.g., a classical orchestra vs. a rock band) or in different cultural settings around the world to explore different effects of the social milieu. Overall, the adaptation of the socio-educational model to the music learning context appears to be a success. In particular, the strong connection between integrativeness and motivation observed in the present study points to new avenues of understanding the motivation of aspiring musicians. Just as second language learning motivation is facilitated by positive attitudes toward languages and the people who speak them, so it would appear that motivation to learn music is facilitated by positive attitudes toward music and musicians. Joining a valued group, and taking on some of their characteristics, is the core idea underlying the integrative motive and is the core of the socio-educational

model. By adapting the model to the study of music learning, over 50 years of research insights emerging from studies of second language acquisition are available for use in music research and education.

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### Notes

1. Recent reviews (Austin, Renwick, & McPherson, 2006; Hallam, 2009) provide a more comprehensive overview of the literature than space permits in this article.
2. The other three classes agreed to participate but were not tested because of scheduling problems.
3. The four perceived competence items were obtained from the Self-Determination Theory website at the University of Rochester, [http://www.psych.rochester.edu/SDT/measures/PCS\\_description.php](http://www.psych.rochester.edu/SDT/measures/PCS_description.php).

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