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Validation Evidence for the Elementary School Version of the MUSIC[®] Model of Academic Motivation Inventory

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Abstract

Introduction. The purpose of our study was to assess whether the Elementary School version of the MUSIC[®] Model of Academic Motivation Inventory was valid for use with elementary students in classrooms with regular classroom teachers and student teachers enrolled in a university teacher preparation program.

Method. The participants included 535 first- to fifth-grade students from the classes of 29 teachers from six schools. Students completed the Elementary School version of the MUSIC[®] Model of Academic Motivation Inventory, which assessed students' perceptions of empowerment, usefulness, success, interest, and caring related to their class activities. We calculated Cronbach's alpha values for each of the MUSIC Inventory scales, computed Pearson's correlation coefficients for the MUSIC Inventory scales, and conducted confirmatory factor analyses (CFAs) to examine how the items in the MUSIC Inventory fit the five-factor structure of the MUSIC model.

Results. The internal consistencies of the items within each scale were acceptable, as were the factor loadings from the CFAs. Results of the CFAs, conducted by grade level and teacher type, revealed that the data fit the five-factor structure of the inventory well for teachers and student teachers at the lower- and upper-elementary grades.

Conclusion. The results provide evidence to support the validity of the scores produced from the Elementary School version of the MUSIC[®] Model of Academic Motivation Inventory with elementary school students in first to fifth grades in the US.

Keywords: MUSIC Model of Academic Motivation Inventory, motivation, engagement, teacher evaluation, student perceptions

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Pruebas de validación para el Modelo MUSIC® de Inventario de Motivación Educativa para Escuela Primaria

Resumen

Introducción. El objetivo de nuestro estudio fue evaluar si la versión del Modelo MUSIC® de Inventario de Motivación Educativa para Escuela Primaria era válida para uso con estudiantes de primaria en aulas con maestros regulares y maestros en práctica matriculado en un programa de formación docente universitaria.

Método. Los participantes incluyeron 535 estudiantes de primero a quinto grado de 29 clases con diferentes maestros de seis escuelas. Los estudiantes completaron la versión del Modelo MUSIC® de Inventario de Motivación Educativa para Escuela Primaria que evalúa las percepciones de los estudiantes del empoderamiento (*eMpowerment*), la utilidad (*Usefulness*), el éxito (*Success*), el interés (*Interest*), y el cuidado (*Care*) en relación con sus actividades de clase. Se calcularon los valores alfa de Cronbach para cada uno de las escalas del Inventario del Modelo MUSIC, se calcularon los coeficientes de correlación de Pearson para las escalas, y realizamos un análisis factorial confirmatorio (ACF) para examinar cómo los artículos en el Inventario del Modelo MUSIC se ajustan a la estructura de cinco-factores del Modelo MUSIC.

Resultados. La consistencia interna de los artículos dentro de cada escala era aceptable al igual que el factor de cargas del ACF. Los resultados del ACF, realizado por grado y tipo de maestro, revelaron que los datos se ajustan bien a la estructura de cinco-factores del Modelo MUSIC a los maestros y a los maestros en práctica en los grados bajos y los grados superiores de la escuela primaria.

Conclusión. Los resultados proporcionan evidencia que apoya la validez de los resultados obtenidos a partir del Modelo MUSIC de Inventario de Motivación Educativa para Escuela Primaria con estudiantes de escuela primaria de primero a quinto grado en los Estados Unidos.

Palabras claves: Modelo MUSIC de Inventario de Motivación Educativa, motivación, participación, evaluación del maestro, percepciones de los estudiantes.

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Introduction

Formative and summative assessment of students' academic achievement has been a major issue for teachers, administrators, and policymakers, especially over the past two decades (Jones, Jones, & Hargrove, 2003; No Child Left behind Act of 2001). In addition to academic achievement, educators and accrediting agencies (e.g., Council for the Accreditation of Educator Preparation) in the US have been interested in assessing students' dispositions. What is less clear is *what* dispositions should be measured and *how* these dispositions should be measured. The purpose of our study was to assess whether a multidimensional measure of elementary students' motivation was valid for use with elementary students in classrooms with regular classroom teachers and student teachers enrolled in a university teacher preparation program. If the measure was found to be valid, teachers and student teachers could use these results as a measure of students' dispositions. The results from the measure could provide insights into students' perceptions of teaching, which then could be used by teachers and student teachers to design future lessons to improve students' motivation and learning.

Conceptual Framework

In deciding *what* dispositions to measure, we decided to measure students' beliefs related to the five components of the MUSIC[®] Model of Motivation (Jones, 2009; referred to in this paper as the *MUSIC model*). MUSIC is an acronym for the five broad categories of evidence-based teaching strategies (i.e., eMpowerment, Usefulness, Success, Interest, and Caring) and the MUSIC model can be used by teachers in any subject area or grade level. The MUSIC model was designed to provide a multidimensional framework to organize teaching strategies that have been found through research and practice to be effective in motivating students. Five key principles of the model are that instructors need to ensure students: (1) feel *empowered* by having the ability to make decisions about some aspects of their learning, (2) understand why what they are learning is *useful* for their short- or long-term goals, (3) believe that they can *succeed* if they put forth the effort required, (4) are *interested* in the content and instructional activities, and (5) believe that the instructor and others in the learning environment *care* about their learning and about them as a person (Jones, 2009, 2015; www.theMUSICmodel.com). When teachers implement instruction consistent with the five MUSIC model components, they are more likely to motivate students and engage them in the

learning activities, which can lead to increased learning and achievement (Jones, 2009, 2010, 2015). The MUSIC model is consistent with calls for more integrated and multidimensional approaches to motivation (e.g., De la Fuente, 2004; Wentzel & Wigfield, 2009, p. 6).

MUSIC® Model of Academic Motivation Inventory

To assess students' perceptions of the five MUSIC model components, Jones (2016) developed the MUSIC® Model of Academic Motivation Inventory (referred to in this paper as the *MUSIC Inventory*). Since then, the MUSIC Inventory has been shown to produce valid scores with samples of undergraduate students in the U.S. (Jones & Skaggs, 2016), in a non-U.S. culture (Mohamed, Soliman, & Jones, 2013), and with middle and high school students (Jones & Wilkins, 2013, 2015; Parkes, Jones, & Wilkins, 2015). At the elementary school level, Sigmon and Jones (2015) developed a version of the MUSIC Inventory to be used with students in first to fifth grade (the full version is presented in Jones, 2016). However, validity evidence for using the MUSIC Inventory with the elementary school students has been limited. Furthermore, the elementary school version had not been validated for use with student teachers who are enrolled in a university teacher preparation program.

Research Question

The purpose of our study was to assess whether the Elementary School version of the MUSIC Inventory was valid for use in classrooms with teachers and student teachers of elementary school students. If so, the inventory could be useful as a reflection tool to help student teachers reflect on and make changes to their instruction. Our first research question was: Is the MUSIC Inventory valid for use with students in first and second grades and in third to fifth grades? We wanted to assess the validity of the inventory for these two different levels of students because the inventory items are read aloud to students in first and second grades, whereas students in third to fifth grades read the items by themselves. We hypothesized that the inventory would be valid for students at both the lower- and upper-elementary levels. Assessing the validity of these two levels separately allowed us to determine whether there were differences in validity based on grade level.

Our second research question was: Is the MUSIC Inventory valid for use with elementary teachers and student teachers? We hypothesized that the inventory would be valid for use

with both teachers and student teachers. We reasoned that the inventory assessed students' perceptions of the learning environment regardless of the characteristics of the teacher. Therefore, the inventory should provide valid scores with any type of instructor, including student teachers.

Method

Participants

The participants included 535 first-grade to fifth-grade students from five schools in Virginia and one in North Carolina. The students were in classes taught by their regular teacher or by a student teacher who was enrolled in a university teacher preparation program. Table 1 shows the distribution of students, teachers, student teachers, and schools. All of the 29 teachers and student teachers were White women except for one teacher who was a White man.

Table 1. Study Participants

Grade level	N of students			N of teachers and STs			N of Schools
	In teacher classes	In ST classes	Total	Teachers	STs	Total	
1	73	18	91	4	1	5	2
2	90	56	146	5	4	9	3
3	38	58	96	2	4	6	3
4	61	34	95	3	2	5	3
5	61	46	107	1	3	4	3
Total	323	212	535	15	14	29	6

Note. ST refers to Student Teachers.

Instrument

We used the Elementary School version of the *MUSIC[®] Model of Academic Motivation Inventory* developed by Sigmon and Jones (2015), as presented in Jones (2016). This version of the MUSIC Inventory consists of 15 items that are organized into five scales with three items in each scale. Items in each MUSIC model scale were written to align with the same constructs that Jones (2016) used in developing the college version of the MUSIC Inventory. Table 2 provides definitions for each of the five MUSIC model components assessed in the MUSIC Inventory and lists the constructs to which they align. All of the items were rated on a 4-point Likert-type scale, with 1 = *No*, 2 = *Maybe*, 3 = *Yes*, and 4 = *Definitely Yes*! An example item from each scale follows: “I could do it my way” (eMpowerment), “I can use

what I learned” (Usefulness), “I knew I could do well” (Success), “What I did was interesting” (Interest), and “My teacher cared about how well I did” (Caring).

Table 2. MUSIC Model Construct Definitions and Related Constructs

MUSIC model components	Definitions	
	The degree to which a student perceives that:	Related constructs
eMpowerment	he or she has control of his or her learning environment in the course	Autonomy (Deci & Ryan, 1991)
Usefulness	the coursework is useful to his or her future	Utility value (Wigfield & Eccles, 2000)
Success	he or she can succeed at the coursework	Expectancy for success (Wigfield & Eccles, 2000)
Interest	the instructional methods and coursework are interesting	Situational interest (Hidi & Renninger, 2006)
Caring	the instructor cares about whether the student succeeds in the coursework and cares about the student’s well-being	Caring (Noddings, 1992)

Note: This table is based on a similar table in Jones (2016).

Procedure

The teachers and student teachers asked their students to complete the MUSIC Inventory following an activity or lesson. As a result, the students responded to the inventory in a variety of classes, including math, science, social studies, and literacy. The completed inventories were returned to us and we entered the data into an electronic spreadsheet and conducted the analysis. This study was reviewed and approved by our Institutional Review Board (IRB).

Data Analysis

The first phase of our analysis involved assessing the validity of the MUSIC Inventory for the first and second grade students separately from the third to fifth grade students. The second phase of our analysis included assessing the validity of the MUSIC Inventory for elementary teachers separately from the university student teachers, regardless of the grade level of the students. In addition, we included all of the students in first to fifth grade for teachers and student teachers in one analysis. For both phases, we followed the same order of analysis that included: calculating Cronbach’s alpha values for each of the MUSIC Inventory scales,

computing Pearson's correlation coefficients for the MUSIC Inventory scales, and conducting a confirmatory factor analysis (CFA) to examine how the items in the MUSIC Inventory fit the five-factor structure of the MUSIC model.

We considered Cronbach's alpha coefficients above 0.60 to be acceptable for a couple reasons. First, Nunnally (1967) recommended .50 to .60 as acceptable for the early stages of research; however, in more recent versions of this book that value was increased to .70 (Nunnally & Bernstein, 1994). Second, Cronbach's alpha values are very dependent on the number of items in the scale, with fewer items decreasing the value (Carmines & Zeller, 1979). Because the MUSIC Inventory scales have only three items each, the Cronbach's alpha values will be lower than a scale with the same average inter-item correlations that has four or more items. Therefore, we used .60 as an acceptable Cronbach's alpha value knowing that we would also have the results from the CFA to help us interpret the validity of the scores.

For the CFA, we used a loading greater than 0.32 as indication that the item loaded well on the factor because this value is often used as a cutoff for acceptability (Tabachnick & Fidell, 1996). We used three indices of fit to assess the results of the CFA: the Comparative Fit Index (CFI), the Standardized Root Mean Square Residual (SRMR), and the Root Mean Square Error of Approximation (RMSEA). The CFI can range between 0 and 1 with values closer to 1 showing better fit (values above .90 represent reasonable fit and above .95 represent good fit; Hu & Bentler, 1999). The SRMR also ranges from 0 and 1, but values closer to 0 indicate better fit (less than .05 indicates good fit [Byrne, 2001] and less than .10 indicates reasonable fit [Kline, 2005]). The RMSEA also varies between 0 and 1 with values closer to 0 indicating better fit (values less than .08 indicate reasonable fit and values less than .05 indicate good fit; Browne & Cudeck, 1993; Byrne, 2001; Kline, 2005).

Results

First Phase: Analysis by Grade Level

In this phase, we assessed the validity of the MUSIC Inventory for the first and second grade students independently from the third to fifth grade students.

Internal Consistency Reliability. The internal consistency of the items within each scale was acceptable as indicated by the fact that the Cronbach's alpha values were all greater

than .60 and ranged from .62 to .80 (see Table 3). These values indicate that the items within each scale are positively correlated to each other.

Table 3. Cronbach's Alpha Coefficients by Grade Level

Grade Levels	n	Empowerment	Usefulness	Success	Interest	Caring
Grades 1-2	237	.75	.63	.66	.70	.62
Grades 3-5	298	.68	.77	.64	.80	.67

Correlations Among Scales. Table 4 shows that all of the MUSIC model variables are moderately correlated, as demonstrated by correlations ranging from .23 to .54. The MUSIC Inventory scales have been shown to be moderately correlated in other studies as well (Jones & Skaggs, 2016). The strength of the correlations are similar for the lower- and upper-elementary grades.

Table 4. Pearson's Correlation Coefficients Among the Five MUSIC Constructs

	M	U	S	I
Usefulness				
Grades 1-2	.38			
Grades 3-5	.28			
Success				
Grades 1-2	.44	.39		
Grades 3-5	.42	.32		
Interest				
Grades 1-2	.36	.51	.46	
Grades 3-5	.28	.54	.43	
Caring				
Grades 1-2	.23	.40	.38	.45
Grades 3-5	.33	.50	.39	.43

Note: All correlations are statistically significant ($p < 0.001$, 2-tailed).
N = 237 for grades 1-2, N = 298 for grades 3-5. M = empowerment,
U = usefulness, S = success, I = interest, and C = caring.

Confirmatory Factor Analyses. Table 5 shows the factor loadings for the CFAs by grade level. We deemed the factor loadings to be acceptable because they were greater than .32. The values ranged from .48 to .79. The fit indices provided in Table 6 indicate that the data fit the model well at the lower- and upper-grade levels. The CFI values of .97 and .98 were exceptionally high. The SRMR and RMSEA values were about .05, indicating a good to reasonable fit.

Table 5. Factor Loadings from the CFA at Different Grade Levels

	M	U	S	I	C
M1	.66, .52				
M2	.74, .70				
M3	.71, .71				
U1		.65, .73			
U2		.52, .73			
U3		.70, .74			
S1			.70, .70		
S2			.65, .68		
S3			.58, .48		
I1				.63, .79	
I2				.61, .73	
I3				.74, .76	
C1					.59, .68
C2					.63, .61
C2					.57, .60

Note. The two numbers in each cell are the standardized coefficients from two different analyses. The first number is for Grades 1-2 and the second number is for Grades 3-5. M = empowerment, U = usefulness, S = success, I = interest, and C = caring.

Table 6. Fit Indices at Different Grades

	N	CFI	SRMR	RMSEA
Grades 1-2	237	.97	.051	.051
Grades 3-5	298	.98	.044	.049

Second Phase: Analysis by Type of Teacher

In this phase, we examined the validity of the MUSIC Inventory for elementary teachers independently from the student teachers.

Internal Consistency Reliability. The Cronbach's alpha values for the teachers and student teachers ranged from .62 to .77 (see Table 7), indicating that they were acceptable. Also shown in Table 7 are the alpha values for all of the teachers combined and these values were acceptable (ranging from .64 to .76).

Table 7. Cronbach's Alpha Coefficients by Teacher Type

Grade Levels	n	Empowerment	Usefulness	Success	Interest	Caring
Student teachers	212	.71	.71	.69	.73	.69
Teachers	323	.70	.70	.62	.77	.59
All teachers	535	.72	.71	.65	.76	.64

Correlations Among Scales. Table 8 shows the moderate correlations between the MUSIC constructs, which range from .26 to .55. Table 8 also shows the correlations for the MUSIC constructs with all of the teachers combined, which range from .27 to .52.

Table 8. Pearson's Correlation Coefficients Among the Five MUSIC Constructs by Teacher Type

	M	U	S	I
Usefulness				
Student teachers	.51			
Teachers	.28			
All teachers	.33			
Success				
Student teachers	.52	.45		
Teachers	.39	.28		
All teachers	.42	.35		
Interest				
Student teachers	.42	.48	.53	
Teachers	.32	.55	.38	
All teachers	.32	.52	.44	
Caring				
Student teachers	.41	.49	.45	.44
Teachers	.26	.41	.34	.41
All teachers	.27	.45	.39	.43

Note: All correlations are statistically significant ($p < 0.001$, 2-tailed).
 N = 212 for student teachers only, N = 323 for teachers only, N = 535 for all teachers combined. M = empowerment, U = usefulness, S = success, I = interest, and C = caring.

Confirmatory Factor Analyses. Table 9 shows the factor loadings for the CFAs by grade level. The factor loadings were acceptable because they were greater than .32 and ranged from .49 to .78. Table 9 also shows the factor loadings for the scales with all of the teachers combined (ranging from .52 to .75). The fit indices provided in Table 10 indicate that the data fit the model well for both teachers and student teachers. The CFI values of .97 and .98 were exceptionally high. The SRMR and RMSEA values indicated a good fit for both the teachers and student teachers, although the RMSEA was a little higher (.056) for the student teachers which indicated a reasonable fit.

Table 9. Factor Loadings from the CFA by Teacher Type

	M	U	S	I	C
M1	.61, .56, .60				
M2	.68, .75, .72				
M3	.75, .67, .71				
U1		.66, .72, .68			
U2		.70, .55, .62			
U3		.67, .77, .73			
S1			.76, .67, .71		
S2			.71, .64, .67		
S3			.53, .51, .52		
I1				.75, .70, .72	
I2				.63, .71, .68	
I3				.70, .78, .75	
C1					.70, .60, .65
C2					.59, .62, .62
C2					.66, .49, .57

Note. The three numbers in each cell are the standardized coefficients from three different analyses. The first number is for student teachers only, the second number is for teachers only, and the third number is for student teachers and teachers combined. M = empowerment, U = usefulness, S = success, I = interest, and C = caring.

Table 10. Fit Indices by Teacher Type

	N	CFI	SRMR	RMSEA
Student teachers only	212	.97	.049	.056
Teachers only	323	.98	.042	.041
All teachers	535	.99	.034	.038

The fit indices for the model with all teachers included was very good given that the CFI was .99, the SRMR was .034, and the RMSEA was .038. The results of the final model, that included all students and teachers, is shown in Figure 1.

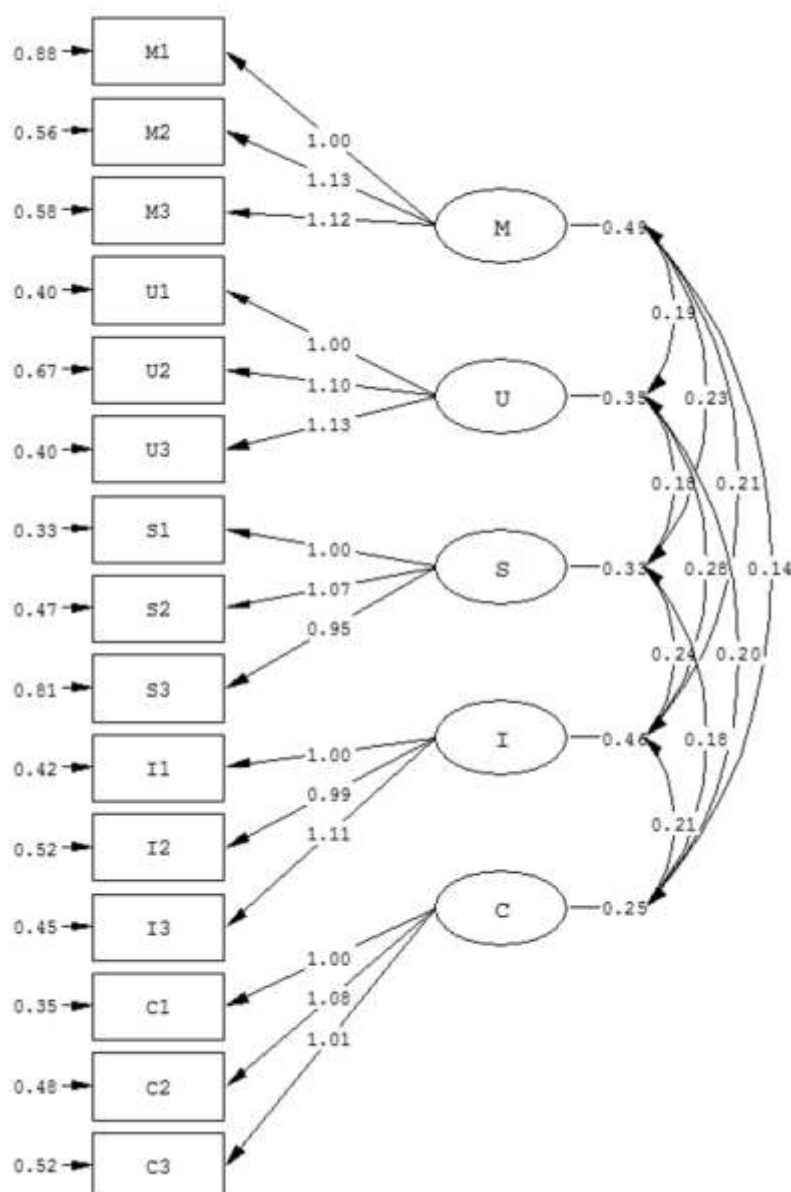


Figure 1. The items in the Elementary School version of the *MUSIC® Model of Academic Motivation Inventory* shown as a hierarchical intercorrelated five-factor structure comprised of empowerment, usefulness, success, interest, and caring. The analysis shown includes all 535 students from all grade levels (1 to 5) who were taught by teachers and student teachers.

Discussion and Implications

The purpose of our study was to assess whether the Elementary School version of the *MUSIC® Model of Academic Motivation Inventory* was valid for use in elementary school classes with teachers and university student teachers. We found that the inventory produced valid scores regardless of grade level or type of teacher, as evidenced by acceptable

Cronbach's alpha values and the results of five CFAs. A strength of the study design was that we included many teachers, from several schools, whose students responded to a variety of lessons in several subject areas. These findings indicate that the results should generalize to many other types of elementary school classes and teachers. A limitation of this study is that all of the teachers were White and mostly women. Researchers in the future could examine more fully whether or not the inventory was valid across a variety of races/ethnicities and gender.

By demonstrating that the five-factor structure of the MUSIC Inventory fit the data well, we can also conclude that the MUSIC[®] Model of Motivation (Jones, 2009, 2015) effectively captures five distinct perceptions that students have about a learning environment. In other words, in a classroom setting, students form distinct perceptions about empowerment, usefulness, success, interest, and caring. This finding is important because it suggests that teachers need to consider teaching strategies related to each of these five MUSIC model components. To summarize, students form perceptions in their class related to each MUSIC component and these perceptions can be measured using the MUSIC Inventory. Teachers can intentionally select strategies to affect students' perceptions of the MUSIC components. Although evidence for the five-factor structure of the MUSIC model had been documented with middle/high school students (Jones & Wilkins, 2013, 2015; Parkes, Jones, & Wilkins, 2015) and with college students (Jones & Skaggs, 2016), this is the first study to document the validity of the five-factor structure with first- to fifth-grade students. In the remainder of this section, we discuss some ways in which the inventory can be used by teachers and student teachers.

The MUSIC Inventory can be used as a tool by teachers and student teachers to help them reflect on their teaching, which may allow them to design more effective lessons that better meet the needs of their students. Teachers could administer the inventory after implementing new lesson plans to gauge students' perceptions of the lessons. This could be especially useful for student teachers because they are usually new to teaching and do not have the experiences needed to estimate the efficacy of a lesson as accurately as more experienced teachers. University faculty supervisors could require their student teachers to administer the MUSIC Inventory several times during a semester to assess the effectiveness of their lessons. Administering the inventory over the course of a few months would allow student teachers to assess changes in their instruction over time, and make adjustments as needed. The scores

could also be used as a discussion point between the university faculty supervisor, regular classroom teacher, and the student teacher. However, what may be more important than the actual inventory scores is using the scores as a way to initiate student teachers' reflections about their lessons. The scores, whether high or low, could lead to student teachers thinking about questions such as: "Why did students rate the lesson that way on the usefulness component?" and "How could I give the students even more empowerment?" Thus, the process of reflection can be reinforced by using the inventory scores as part of an overall teaching assessment strategy that likely includes other measures as well.

Another idea is for teachers to administer the inventory following a lesson in which they had purposefully incorporated strategies related to one or more of the MUSIC model components. The scores on the inventory would allow them to assess whether their new strategies were affecting students' perceptions in the manner in which they intended. Take, for example, a teacher who has a lesson that he uses every year to introduce a grammar concept in which students search for the concept in nursery rhymes. This time, the teacher decides to change the lesson slightly by using recent hit songs instead of nursery rhymes and by giving students a choice between three songs. As a result, he might expect to see an increase in students' empowerment scores on the MUSIC Inventory because he provided choices. He might also expect to see an increase in students' interest scores because students are more familiar with and enjoy current music. Thus, the MUSIC Inventory scores would allow him to assess the efficacy of his revised lesson plan. Again, this could be especially effective for student teachers as they gain more experience in using and considering different instructional approaches.

Another possibility is that university faculty supervisors could require student teachers to compare the efficacy of two or more different teaching approaches by comparing the scores after each approach using the MUSIC Inventory. For example, vocabulary is a concept taught in all disciplines. There are multiple ways of introducing and practicing new vocabulary terms with students. A student teacher could choose four different teaching methods for vocabulary instruction and focus on one method for a week and then switch to one of the other methods for the next week until all four methods had been implemented. At the end of each week, the student teacher could administer the MUSIC Inventory by instructing students to complete the inventory with respect to their work with vocabulary during that week. After the four weeks, the student teacher could determine which teaching methods were perceived as more motivat-

ing to students by comparing the averages across the four methods. The university faculty supervisor could ask the student teacher to reflect on the findings and/or connect the findings to theories and research in that subject area. This would allow student teachers to think about whether their findings were consistent or inconsistent with theories and research, and then consider why.

Teachers could also ask their students to help them interpret the MUSIC Inventory results, either in a class meeting format (e.g., a morning meeting) or individually. During this time, teachers could ask students why they responded the way they did. This feedback could help teachers have a better understanding of what their students were thinking about the instruction. Gaining these insights could be particularly useful to student teachers. Teachers could also use the inventory scores to begin a conversation with students about what they could do differently to make a class more motivating and engaging. Not only would this feedback be useful to the teachers, but it might also make students feel more empowered, which could motivate them in the future.

In addition to using the MUSIC Inventory, teachers and student teachers can ask students open-ended questions and/or interview questions to gather qualitative data from them. Examples of potential questions are provided in the *User guide for assessing the components of the MUSIC[®] Model of Academic Motivation* (Jones, 2016) and include questions such as, “What did you find useful about this activity?” and “What could be changed in this course to make it more interesting?” Responses to these types of open-ended questions can be used to complement the results obtained from the quantitative MUSIC Inventory.

Limitations and Future Directions

One of the limitations of this study was that it was conducted with students from only six schools in two U.S. states. Future studies could include samples of students from other parts of the world to assess whether or not the statistical properties of the Elementary School version of the MUSIC Inventory are similar across cultures. Another limitation is that all of the teachers were White and all but one of them was female. It is possible that students perceive teachers of different ethnicities or male teachers in ways that differ from how the teachers in our current study were perceived. Further research is needed to assess how students’

perceptions differ across teachers and whether or not these differences diminish the validity of the MUSIC Inventory for use with elementary school students.

Conclusion

The results we presented in this study provide evidence to support the validity of the scores produced from the Elementary School version of the *MUSIC® Model of Academic Motivation Inventory* with elementary school students in first to fifth grades. This study is another step in providing validity evidence for the use of this inventory. We believe that the inventory could be especially useful to student teachers by providing them feedback about students' perceptions of instruction. It could also serve as a model for student teachers as one way that they can collect data to reflect on and improve instruction, which is important in an era of evidence-based decision making.

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