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THE ROLE OF SHEET MUSIC IN ADVANCED INSTRUMENTAL STUDIES

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ABSTRACT

When teaching classical beginner instrumental students, some teachers find greater success teaching repertoire by rote than with sheet music. They find that removing the aspect of sheet music frees beginners to focus on their technique and their sound. Instead of reading and playing at the same time, they can give their undivided attention to the playing. Yet, by the time these students reach advanced studies on their instrument, they will learn repertoire primarily with sheet music. If removing sheet music as a resource helps beginners focus on their technique and sound, why do we not have advanced students learning by rote? Could sheet music not be as distracting for advanced students as it could be for beginner students? Should advanced students not be allowed to freely focus on their technique and sound?

This thesis sets out to investigate the role sheet music plays in advanced musical studies. As an experiment, seven students studying instrumental music at the collegiate level will spend a summer learning two pieces (comparable in level) of their choice. One piece they will learn with the use of sheet music and the other without the use of sheet music. Based on their experiences, we will explore the roles sheet music currently plays in advanced musical studies, the roles it should play, and the roles it should not play.

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Chapter 1

Introduction

Some beginning instrumental music teachers have found greater success teaching repertoire by rote than introducing repertoire with sheet music right from the start. Teachers using the Suzuki Method are particularly known for this. According to Brathwaite (1988),

Suzuki postpones the reading of music on the grounds that removal of this challenge in the early stages of learning to play the instrument allows students to focus their attention on accurate intonation, the production of pure, full sound, and the direction and placement of the bow.

If learning repertoire without reading music does indeed free beginners to focus on their playing, could the same be true for more advanced students? Could removing sheet music from repertoire learning also free more advanced students to focus on their technique, their sound, and the music in general? Or does the success of learning with or without sheet music depend on each individual's learning style?

This thesis project will explore the questions listed above through literature review and an experiment involving music students at the collegiate level. The findings of this project will hopefully provide insights into the effectiveness of different modes of instruction in post-beginner instrumental music classes.

Chapter 2

Literature Review

Visual Vs. Auditory Modes of Presentation

Jensen (1971) asked two main questions in his study: “(a) Do people in general learn or remember more effectively when the material is presented visually or aurally? (b) Do some individuals favor one sensory modality over another in learning and remembering?” He conducted his study on 150 undergraduate students, 19 to 23 years of age. He found that in general, these students had “superior recall for auditory than for visual presentation.” He noted “no significant individual differences as a function of sensory modality.” Jensen suggested that the only source of individual differences in visual and auditory memory would be the participants’ abilities to transform visual input into an auditory memory trace. As such, he suggested that young children and the mentally disabled would show greater differences in the auditory and visual memory span. Since this study was performed on undergraduate students, Jensen cautions against generalizing the results to all age groups.

McCall & Rae (1974) investigated “the relative efficiency of learning paired-associates with auditory, visual and combined modes of presentation.” The subjects of these studies were fifty-seven female students in their second year of college. They used familiar and unfamiliar line drawings as the stimuli for this study. McCall & Rae found visual presentation to be the most effective method in this experiment and auditory presentation the second most effective. Both the visual and auditory presentations alone were significantly more effective than the

combined auditory and visual mode of presentation. They also found the students learned familiar material more efficiently than unfamiliar material. McCall & Rae concluded, “There seems little evidence to justify the claims of some audio-visual specialists that if one channel produces some learning then two channels will produce even more.”

DeBoth and Dominowski (1978) explored “the possible interaction of individual differences in learning with mode of presentation” – specifically, visual and auditory presentation. They tested college students on their ability to learn word lists under auditory and visual presentation. DeBoth and Dominowski found that individual differences in learning did not interact reliably with mode of presentation. In other words, students identified with a visual preference of learning did not necessarily learn more effectively through visual presentation, and students identified with an auditory preference of learning did not necessarily learn more effectively through auditory presentation. Through this study, they found no support for the idea that one will find visual learners and auditory learners within a given group of learners. DeBoth and Dominowski acknowledged one clear limitation of their study: the subjects were college students. They comment,

Among college students (or other fully developed learners), individual differences in learning and retention reflect differences in relevant prior knowledge, learning strategies, and depth of processing. With younger learners, in addition to these factors, there might be differences in responsiveness to material presented in different modalities.

They conclude by encouraging readers to maintain an open mind toward whether individual differences in learning interact with mode of presentation in school-age children until better methods emerge to study younger learners.

Learning Styles

According to Stahl (1999), little research supports the idea of learning styles. He lists the various names of learning styles people have proposed and explored. Among them he includes “global”, “analytic”, “visual”, and “auditory.” Stahl identifies these categories not as learning styles, but as learning preferences, cognitive styles, personality types, and aptitudes. He also believes the application of the learning styles theory is difficult and impractical: “Thoughtful educators have tried to make this work, and perhaps it is workable, but trying to meet all of the preferences of a group of children would seem to take energy that would be better spent on other things. This is especially true since no one has proven that it works.” When testing for learning styles, Stahl found two considerations often overlooked. The first consideration is the nature of the assignment. Stahl says, “Nearly everybody would prefer a demonstration in science class to an uninterrupted lecture. This does not mean that such individuals have a visual style, but that good science teaching involves demonstrations.” The second consideration is the skill level of the student. He gives this example:

Children with reading problems are more likely to answer that they do not remember phonics rules and that they sometimes mix up the letters. According to the learning styles research reports, such children are likely to be considered as having a global (or visual) preference. Actually, this may not be a preference at all, but a reflection of the child’s current level of reading ability. The potential for harm occurs when children with reading problems are classified as “global” (visual) learners and thereby miss out on important instruction in decoding, or are classified as “analytic” (auditory) learners and miss out on opportunities to practice reading in a connected text.

Instead of trying to accommodate the speculated learning styles of students, Stahl suggests teachers consider what method is appropriate for children at their stage of development. He also encourages teachers to consider their goals for their students since “Different methods are appropriate for different goals.”

Pashler, McDaniel, Rohrer, and Bjork (2008) investigated different conceptions of learning styles – their existence, definitions, and implications. If learning styles do exist, are they learning preferences or specific aptitudes? Students will have their preferences on how they would like information presented to them, but do some students, based on their natural ability, process information better through one mode of presentation than another? These researchers found some evidence that natural aptitudes may exist, but they did not find that one needed to provide different students with different modes of presenting information in order to optimize their performance on any single test. In a study involving a computer-based electronics lesson with help screens customized for either verbal or visual learners, they found no evidence supporting the idea that different instructional methods should be used to cater perceived verbal or visual learners. They concluded that students may have different learning preferences and they may have different learning aptitudes, but changing instruction to suit the perceived learning styles of students is unwarranted.

Modes of Presentation in Music

Shehan (1987) examined second- and sixth- grade students’ responses to audio-rhythm (sounding the rhythm on a woodblock), audio-mnemonics (using rhythm syllables), (audio) visual rhythm (presenting bold black notation on an 11” x 14” card while the pattern was sounded on a

woodblock), and (audio) visual-mnemonics (notation and vocalization of syllables) modes of presentation in learning rhythmic patterns. These students all had minimal note-reading experience since their school did not offer music in their curriculum. Shehan found that in general, students needed a greater number of trials in response to material presented aurally than visually. Based on these results, Shehan suggests, "For beginning musicians, the blending of visual and aural strategies may best facilitate the learning of rhythm patterns." The study also found that sixth-grade students consistently learned the patterns twice as quickly as the second-grade students in every mode of presentation. Shehan offers a possible explanation: "Despite the lack of formal music training, it may be that extensive informal exposure to music coupled with a more advanced level of cognitive processing increases the speed at which sixth-grade students learn music." Use of mnemonics decreased the number of trials in both aural and visual modes, but not significantly.

Persellin (1992) also found that performance increased with grade level. This study tested first-, third-, and fifth-graders' ability to learn rhythmic patterns through visual presentation, auditory presentation, kinesthetic presentation, and combinations of two or all of these modes. Persellin found that out of the three age groups, the first-graders struggled the most with the visual-only presentation mode. She adds that these first graders had very little instruction in reading notation and suggests the results of the testing could be different if they had more extensive previous instruction. Based on the findings of this study, Persellin advises elementary music teachers, "If first-grade children struggle when asked to read rhythm patterns, teachers may want to consider spending more of their time teaching these children rhythm patterns through auditory and kinesthetic means until the children are ready to read notation." This

background will help students “have more aural models to identify with visual icons when reading is introduced.”

Korenman and Pynircioglu (2007) tested differences between adults labeled visual or auditory learners in learning melodies and sentences through visual or auditory modes of presentation. Half of the group tested had less than two years of musical instruction and the other half had over five years and could read music. All participants were given meaningful and less-meaningful melodies and sentences to learn. As anticipated, participants labeled auditory learners learned auditorily presented sentences and melodies faster than the visual learners while visual learners learned visually presented sentences and melodies faster than the auditory learners. They also discovered that those with more musical instruction learned the meaningful melodies faster than those with less musical instruction, but those with less musical instruction learned the less meaningful melodies faster than those with more musical instruction. Based on the results of this study, Korenman and Pynircioglu suggest, “Music teachers may increase their success by concentrating initially on the type of teaching that focuses on a student’s preferred learning style.” Even though music is a primarily auditory field, auditory and visual learning still both play a role in music learning.

Kendall (1988) investigated whether introduction of music reading activities during beginning instrumental music instruction impedes students’ development of aural musicianship and instrumental performance skills. He compared the effects of using only modeling in beginning instruction to a comprehensive mode of instruction – use of modeling combined with music reading activities. He found no significant difference in ear-to-hand coordination skills and aural musicianship skills between the two groups. Students in the comprehensive group had better development of verbal association skills. Based on his findings, Kendall states, “Music

notation is an important element in music learning and one that can reinforce aural and kinesthetic learning through association.” He believes the visual mode of learning reinforced the aural and kinesthetic experiences of the students in the comprehensive group of his study.

Cudjoe (1953) describes the Ewe nation, where children learn complex rhythms without the help of written notation. He says,

With the exception of the master-drum, there is not consistent teaching of drumming. All would-be drummers must possess an exceedingly sensitive ear, a good memory and sense of timing, as well as considerable powers of observation. These qualities are very important in a society that has not reduced its culture into writing.

The children in the Ewe nation learn many games that explore compound rhythms. They also learn intricate rhythms from hearing the drums at open air dances, which they never miss. Students learn the master-drum by imitating their teachers, echoing the rhythms they hear them play.

Chapter 3

Method

Participants

A total of seven students, including myself as Participant #6*, studying instrumental music at the collegiate or graduate level, including myself, participated in this experiment. Participants #1, #2, #3, #4, #6*, and #7 played string instruments. Participant #5 played the piano. All participants typically used sheet music as their primary resource to learn repertoire.

Method

Each participant selected two musical selections from the standard repertoire for his or her instrument to use for this experiment. The selections they chose had to be appropriate for their level of playing. Each participant learned one of his or her chosen selections, Selection A, using whatever materials and learning strategies he or she typically used to learn a piece. For all, this included the use of sheet music. The other selection, Selection B, they learned without using sheet music. They were, however, allowed to use any other materials and learning techniques they might find helpful such as recordings, “The Amazing Slow Downer,” and teachers. For the purposes of this experiment, we defined sheet music as standard Western notation.

This experiment took place during the summer of 2014. All participants took three questionnaires over the course of the summer to track their progress on their selections.

Hypothesis

Participants will learn the notes and rhythm of Selection A more quickly and accurately. However, participants will, by the end of the study, play Selection B at a higher level, with greater accuracy and expression.

Chapter 4

Results

Questionnaire 1

In response to Questionnaire 1, completed a few weeks into the experiment, four participants considered Selection A, the piece learned without the use of sheet music, more performance ready than Selection B, the piece learned with the use of sheet music. The reasons these participants gave for this all had to do with the number of notes they could play in each selection. Participant #2 responded, “As of now, it’s definitely the first piece (using sheet music) since I have yet to play through the second piece.” Participant #4 commented, “I am spending my time practicing instead of trying to find out what the notes are.” Participant #5 attributed his greater success with Selection A to his perceived visual learning style, “Even though [Selection A] is technically harder, I am such a visual person when it comes to learning new music. The lack of notation really gets in my way when I’m trying to the [*sic*] muscle memory from fumbling through the first time.”

Participant #1 considered her progress on both selections to be about the same, but the reasons she gave indicated more confidence in learning Selection A:

Although the first selection is more technically difficult, I am sure of all the notes because I have the sheet music as reference. The second selection was easier technically, but it is difficult to make the piece sound good, partly because of uncertain bowings, fingerings and notes.

Like many of the other participants, Participant #1 measured her success on each selection based on the amount of notes she could play in each. It seems that her success with the notes were about the same in each selection, but she attributed this to the easiness of Selection B.

Only one participant, Participant #3 indicated that her Selection B was more performance ready than Selection A. She said, “The second movement of the Suite is closer to being performance ready as I already have what I’ve learned memorized and I remember where I have to go, aurally, better than in the third movement.” Interestingly, this participant measured her progress not on the amount of notes she could play, but the amount of notes she had internalized and her confidence in her interpretation of the piece.

Questionnaire 2

Performance Readiness

Halfway through the experiment, all Participants #2, #3, #5, and #7 considered Selection A closer to performance ready than Selection B. Participant #1 considered both selections to be at the same level of performance readiness. (Participant #6* did not answer this question. Participant #4 did not complete this questionnaire.) Participant #3 who in Questionnaire 1 considered Selection B more performance ready said this in Questionnaire 2:

[Selection A] is closer to being performance ready because I’m able to learn the difficult double stop passages quicker with music. In [Selection B] many of the double stop passages are hard to figure out by ear, which is why I have started using video recordings, but at the quick tempo of these videos, many times the passages are still difficult to figure out.

Participant #2 explained,

Right now it's still the piece I'm learning with sheet music. Because I'm learning (essentially memorizing) the other piece in short phrases, it's harder right now to focus on the piece as a whole so I've spent more time on memorization, tempo, intonation, and fingers rather than character, style, and phrasing on a larger scale.

Learning Strategies

After examining the responses to Questionnaire 1, I wondered if the lack of sheet music as a resource for Selection B made the participants approach Selection B with different learning strategies. As a part of Questionnaire 2, I made a list of the learning strategies mentioned by participants in Questionnaire 1. I then asked participants to indicate the extent to which they used each strategy in learning each selection. For the most part, participants used similar strategies to prepare both selections. They all frequently worked in sections and isolated difficult passages. There were slight differences in their use of audio and video recordings. Participants used these resources more often in learning Selection B than in learning Selection A. Participant #5, who indicated "Not at all" for his use of video recordings in learning Selection B added, "A note on using video recordings: I couldn't find any video recordings so I couldn't use them. If there were video recordings I'd probably use it very often." The questionnaire reported a difference in participants' use of visual guides between learning Selections A and B. The majority of participants indicated "Very often" for their use visual guides in learning Selection A, and "Not at all" for Selection B. Another notable difference: when asked how often the participants brought their selections to others for feedback, all responded "Not at all" for Selection B while a

couple responded with “Often” for Selection A. Participants used other strategies in insignificant varying degrees for each selection.

Musical Priorities

I also wondered if the participants focused on the same musical aspects when preparing each selection. In Questionnaire 2, I made a list of musical ideas and asked participants to indicate the extent to which they focused on each in preparing Selections A and B. High in priority for both selections included note accuracy, rhythmic accuracy, tone, and intonation (excluding the response of Participant #5, a pianist, to intonation). All participants prioritized dynamics, style, and character for Selection A, but few did for Selection B. The participants prioritized memorization for Selection B, but few did for Selection A. One participant added this note: “Learning with sheet music frees my regimen to get notes and rhythms out of the way rather quickly. As I work in articulations, dynamics, phrasing, that is where memory starts—with muscle memory.”

Questionnaire 3

Performance Readiness

At the end of this experiment, I asked the participants once again which selection they considered more performance ready. Participants #1 and #7 considered Selection A more performance ready. When asked why, both participants mentioned their familiarity with the learning process used to learn Selection A. Participant #1 wrote, “My usual learning style

includes sheet music, so I was more familiar with how to practice when I had sheet music, so I feel like my time practicing with sheet music was more efficient.” Participant #7 said, “Maybe with more time and experience, it would be better for the method without sheet music, but for now, I liked the music in front of me.” Participants #3 and #6* considered Selection B more performance ready. Participant #3, who also indicated in Questionnaire 1, though not Questionnaire 2, that she considered Selection B more performance ready, commented, “By hearing the piece performed at performance tempo for so long, it seems more natural to replay the piece at the same tempo. ... [Selection B] was already memorized as I was learning it, which is not the case for the movement I was learning with sheet music.” Participant #6* had similar reasons for considering Selection B more performance ready: “[Selection B] because it’s memorized and I can play it up to tempo with clear musical decisions all the way through.” Participant #2 considered both selections equally ready.

Advantages

According to the participants, advantages to learning a piece without sheet music included memorization and attention to detail. Participant #1 said, “From the beginning, I was better able to pay attention to stylistic elements (articulation, phrasing, dynamics) instead of only the notes. I was also forced to start memorizing from the start, which eventually made memorization easier.” Participant #7 remarked, “It really helped make you listen to intervals and dynamics that I don’t necessarily pay as close attention to when I have music.” For Participant #3, learning a piece without sheet music freed her to experiment more: “I did not feel restricted to using fingerings and bowings put into the music by the editor. This also forced me to try a

variety of fingerings before settling on just one, which I have only done in some instances before.”

Disadvantages

All participants reported slower learning as a disadvantage to learning a piece without sheet music. According Participant #3,

The biggest disadvantage of learning a piece without sheet music was, for me, picking up all the notes in a fast passage. There would be times where I would miss a note or two, go back and listen to the passage, then try to play the passage again, only to realize that I had not actually heard every individual note in the passage. I did not have a way to slow the music I was listening to down so the fast passage work to the longest amount of time.

In relying strongly on memory to learn Selection B, Participant #1 also experienced slower learning:

Before the piece was memorized, I would have to go back to recordings whenever I forgot what came next, which was annoying, and I would have to search through the recordings for a while before finding the correct passage. ... In addition, if I figured out a good bowing or fingering, I couldn't mark them down on the music above the notes, so it generally took longer to learn the music.

The participants also mentioned the disadvantage of relying on others' interpretations to learn Selection B instead of interpreting the composers' writing for themselves. According to Participant #1, “Without sheet music, one can only rely on the interpretations of other musicians for ideas rather than looking at the composer's original markings which may sometimes better

show the composer's original intent." Participant #2 added, "I felt like I relied very much on one particular interpretation (recording)."

Chapter 5

Discussion

Benefits of Sheet Music Elimination

Brathwaite (1988) found that teaching beginner Suzuki students by rote rather than using sheet music allowed them to focus on their playing. In this experiment, we discovered that while advanced students did reap benefits from learning a piece without sheet music, they did not reap the same benefits as beginner Suzuki students. From the start of the experiment to the end, the participants focused primarily on the music – the notes, rhythms, dynamics, etc. – rather than the physical action of playing their instrument. I believe this occurred not because sheet music does not free advanced students to focus on their playing, but because they no longer need to focus on their playing. By the time students have reached the advanced level, playing their instrument has become so natural to them that they no longer need to think about their basic technique. When using sheet music, advanced students, unlike beginner students, have the ability to read the music without compromising their technique. In this experiment, we investigated where the attention advanced students typically give to sheet music would be redirected in learning Selection B.

As stated before, the participants did not redirect the attention typically given to reading sheet music to their basic playing. Rather, they redirected this attention to details in the music. Participants reported the removal of sheet music liberated them to pay attention to “more than just the notes.” They also reported feeling forced to memorize the notes, indicating a stronger

awareness of the notes themselves. Based on participants' responses, it seems that while using sheet music may allow participants to play through the notes of a piece sooner, they internalize the piece sooner and in greater detail without sheet music.

Do these results suggest that sheet music prevents advanced students from being able to focus on detail? I believe these results have to do more with habit than the presence or absence of sheet music. As a musician who learns repertoire primarily with the use of sheet music, I know one can easily fall into the trap of mindlessly reading through the notes of a piece over and over again and calling it "learning the music." I believe the greater attention to detail and stronger internalization of the music in learning Selection B largely results from the fact that participants needed to be actively engaged in learning the music. They could not simply move their fingers in correlation with notes printed on the page. They had to listen to the music, they had to think about the music, and they had to have the desired sound in mind as they played the notes. Participants indicated that they listened to and watched recordings more frequently for Selection B than they did for Selection A. Naturally, the more a student listens, the more he or she notices. The less he or she listens, the less he or she notices. Echoing passages, a popular strategy for learning Selection B, forced participants to always have the music in mind, to audiate as they play, to be internalizing the music as they practice. Learning Selection B without sheet music forced participants to always have an ideal. It forced them to continuously make and meet musical goals. By doing so, they make progress.

Interestingly, it seems that the benefits of learning Selection B, greater attention to detail and stronger internalization of the music, could be gained even if sheet music were present. The only reason these advantages had a stronger presence in learning Selection B was that participants had no choice but to learn in a way that allowed them pay attention to detail and

internalize the music right from the start. Knowing this, when teaching advanced students, teachers should find ways to continuously direct students' attention beyond reading or even playing the notes. In order to make musical progress, students need to have musical goals in mind. They need to construct a musical vision of the piece and always be working toward it. Students need to be actively engaged in their musical learning.

Modes of Presentation

In his study, Jensen (1971) found auditory presentation more effective than visual presentation. In their study, McCall & Rae (1974) found visual presentation more effective than either auditory presentation or a combined visual-auditory presentation. Stahl (1999) has the most logical explanation: the most effective mode of presentation depends on the task at hand. The subjects in Jensen (1971) likely preferred auditory presentation over visual presentation to learn series of numbers because they hear each individual number, whereas they could easily glance over a group of numbers without paying as much attention to their order. The subjects in McCall & Rae (1974) likely preferred visual presentation because their task, identifying line drawings, lent itself best to visual presentation. What then is the ideal mode of presentation for learning musical repertoire?

Identifying one ideal mode of presentation for learning musical repertoire is, in my opinion, a waste of time. No matter how teachers present a piece of music, students will use all their senses to learn. For example, in their studies, Shehan (1987), Persellin (1992) and Korenman and Pynircioglu (2007) all used sheet music to represent visual presentation. Does this imply that in the absence of sheet music, no visual presentation occurs? Even in the Suzuki

method, where Suzuki teachers place a strong emphasis on ear training, beginner students learn visually by watching their teacher's model the repertoire. In the same way, advanced students can watch another person or a recording model the repertoire for them.

At the start of this experiment, some participants fell into a similar mindset: interpreting the absence of sheet music as “no visual presentation.” Yet the instructions said in learning Selection B, participants were not to use sheet music, but were allowed to use “any other materials and learning techniques they might find helpful.” By resorting themselves to only auditory and kinesthetic learning in learning Selection B, these participants missed out on some strong resources to their learning. While some brought Selection A to another person for feedback, none brought Selection B to another person for feedback. A participant could have asked another person to teach the notes to them and confirm whether or not they were on the right track. One participant indicated reluctance to writing anything down for fear of coming too close to notating the music. Another participant commented that he was “such visual person when it comes to learning new music” to explain why he considered Selection A closer to performance ready than Selection B. Why is there such a strong association between sheet music and visual learning?

Perhaps some advanced students (and teachers) have become so used to looking at music when making music that they forget about using their eyes to help them in other ways. Similar habits can also be formed through their other senses. A student could become so used to listening for intonation that he or she forgets to listen for expression and nuance as well. A student could become so focused on how a piece feels emotionally that he or she forgets to notice how it feels to physically play it. Teachers should encourage students to experience their repertoire in as many ways as possible. As students experience a piece of music in more and more ways, they

deepen their understanding of the piece. As they deepen their understanding of the piece, they deepen their connection with the piece.

Obstacles

Some participants did learn Selection B more effectively than others. Was this a learning style issue? Did some participants naturally learn better by ear (as most participants interpreted the task of learning Selection B) than others? The data from this experiment suggests that it was not learning style that dictated the success of a participant in learning Selection B, but their choice in strategy. Stahl (1999) stated, “Different methods are appropriate for different goals.” I would adapt this statement to say, “Different strategies are appropriate for different approaches.”

A few weeks into this experiment, most participants indicated their progress in learning Selection B was significantly slower than their progress in Selection A. Only one participant, Participant #3, considered her progress in Selection B to exceed that of learning Selection A. When I compared the questionnaire responses of Participant #3 to the other participants’ responses, I noticed a clear difference in the learning strategies they chose. Other than Participant #3, most other participants tried to learn Selection B by figuring out all the notes first. It seems that they could not allow themselves to focus on any other aspects of the music until they had accomplished learning all the notes. In contrast to this, Participant #3 worked in depth on the notes she could play. In terms of number of notes learned, Participant #3 may have been progressing at the same pace as all the other participants. However, she accomplished more than the other participants in Selection B, and also more than in her work on Selection A, because she

had internalized the parts she had already learned by working in depth. If the other participants had chosen to approach Selection B by working in depth a passage a section at a time, rather than trying to learn all the notes of the entire piece first, I believe they would have met with a greater sense of progress in learning Selection B.

Fast passages with a lot of notes presented a stumbling block for all participants. They expressed the most frustration in just figuring out the notes in their correct order even over the playing of said notes. After looking over the responses to Questionnaire 2, I realized the most popular strategy to tackle these kinds of passages was to listen to a small section, try to decipher the notes, try to play the notes, listen to the same section again, try to decipher the notes again, try to play the notes again, and so on. Why did we not think to use resources such as the “Amazing Slow Downer” which slows down recordings without altering the pitch? Why did we not choose to bring these passages to another person to teach us by rote? Why did many of us choose to rely on memory rather than writing down the note names of the notes we had already learned? Why did the participants choose to learn these passages “the hard way”? One possible reason relates to the way advanced students normally approach fast passagework. They read a few notes at a time, often at a slower tempo, and add more as they go on. From this learning background, advanced students may naturally try a similar approach to learning fast passagework without sheet music. They will try to learn a few notes at a time based on what they hear and add to that. Unfortunately, without using resources like the “Amazing Slow Downer” or a teacher, they have no way of perceiving the notes at a slower tempo, resulting in frustration. Because these participants do not typically learn without sheet music, they may never have considered seeking out other resources or other strategies to learning fast passagework. Another possibility relates to the perception of this assignment. Some may have perceived the task of learning

Selection B without sheet music as a test of their musicianship: to evaluate how well-developed their ear was by seeing how effectively they can learn by ear. Whatever the reason, the participants in this experiment limited their progress through the strategies they chose and the strategies they either did not consider or ignored.

The obstacles the participants of this experiment encountered did not result from their natural learning styles or even weaknesses in their musicianship. Rather, the obstacles resulted from their choice of strategies. Students need to learn not only the resources and strategies available for use, but also to choose the most effective resources and strategies for their learning situation. They may need to learn a piece of which no sheet music exists – can they choose the most effective strategy to learning it? They may encounter a piece of which no recording exists – can they choose the best strategy to learn it efficiently and effectively? Students need to understand how to appropriately choose from the tools they have been given.

Adaptive Learning

It is worth noting that despite frustrations encountered along the way, all participants were able to learn their Selection B! Whether or not they choose the most efficient strategies, all participants were able to figure out a way to learn effectively without sheet music. This leads me to agree with Stahl (1999) that trying to teach according to perceived learning preferences “seems to take energy that would be better spent on other things.” Those with the sense of sight can learn visually in a variety of ways. Those with the sense of hearing can learn aurally in a variety of ways. Those with the sense of feel and the ability to move can learn kinesthetically in a variety of ways. Just because a student prefers to use sheet music to learn repertoire does not

mean he or she cannot learn without it. Just because a student prefers to learn through a recording does not mean he or she cannot learn without it. Just because a student prefers a teacher to teach him or her by rote does not mean he or she cannot learn through another method of teaching.

I believe learning preferences and perceived learning styles result more from previous experience than natural tendencies. Most participants in this project would probably prefer to learn with the visual guide of sheet music not because they are all visual learners but because they have become familiar with this way of learning. They have spent years learning this way, refining the process each time they go through it. In the same way, the children of the Ewe nation described in Cudjoe (1953) can learn complex rhythms effectively without written notation because they have become familiar with that way of learning. They have refined the process of learning in this way through time and opportunity. Many participants in this experiment struggled when they chose to rely on recordings to learn Selection B, not because they are not auditory learners, but because they have not had previous experiences to inform this learning process. They had not had the opportunity to refine the process of learning primarily by ear. They also never had the opportunity to explore other ways of learning without sheet music. At the end of the experiment, one participant commented, "Maybe with more time and experience, it would be better for the method without sheet music." I agree with this statement completely. With more time and experience, I believe each of these participants could learn without sheet music just as effectively as they learn with sheet music.

Given this information, should music teachers be encouraging their advanced students to learn in different ways using different resources? For the participants in this experiment, I believe they would have learned Selection B much more efficiently and effectively had their

teachers prepared them to learn in this way. On the other hand, all were able to independently figure out a way to successfully learn Selection B without previous experience. The answer to this question will depend on each individual teacher's values and beliefs. My suggestion, regardless of the teacher's choice, is to keep music as the goal. If a teacher encourages a student to learn a piece by ear, learning by ear can be one objective, but it should not be the primary purpose. The primary purpose should be to learn the music. If a teacher encourages a student to learn a piece with only sheet music, note reading should be only the secondary objective. Learning the music should be the primary one. When advanced students see music as the goal, they will figure out a way of getting there.

The Purpose of Sheet Music

If advanced students can learn effectively whether or not sheet music is present, why use it at all? First, sometimes only sheet music is present. Second, we should use music for independent interpretation. The fact that they could not create a personal interpretation of Selection B was the one disadvantage of learning without sheet music that could not be replaced by other resources. Whether they chose to learn Selection B through a recording or by rote, participants could only view the piece through another person's interpretation. They could have another person tell them exactly what was printed in the music, but this is still not the same as interpreting the composer's writing on their own. This is the real purpose of teaching or learning with sheet music: allowing a person to develop his or her own interpretation, an important aspect of being an independent musician.

Conclusion

Sheet music can be a powerful learning tool, but it is only a tool. Alone, it cannot produce music, it cannot teach about music, and it cannot enable a person to make music. Like with any other resource, music educators need to make sure their students use sheet music appropriately in their music learning. Students should not feel like they need sheet music to learn music, and they certainly should not feel like they need it to make music. When students rely too heavily on sheet music, it can become a poor substitute for other resources equally powerful in different ways. Sheet music cannot replace a teacher's instruction. It cannot replace the experience of listening to recordings. It cannot replace the importance of using one's ears and movements to learn.

When using sheet music to learn repertoire, the goal remains to make music. As such, music educators should use the sheet music as one way to point to the music itself. They should not be satisfied when students read notes, rhythms, dynamics, etc. correctly. Rather, they should be satisfied only when they *play* these notes, rhythms, dynamics, etc. musically. Just as students should not merely read what is printed on the page, teachers should not merely teach what is printed on the page. No amount of black ink can teach a student to play in tune, to play with good tone, to play with expression, to play from the heart. Music educators, make sure sheet music does not replace *you*.

Appendix A

Questionnaire 1 and Responses

Note: Participant #7 did not complete Questionnaire A.

What learning strategies have you used to learn Selection A?

Participant #1	I listened to recordings, looked at sheet music, practiced sections slowly over and over again, practiced shifts and double stops for intonation, used a metronome, ran through the piece in my head for memorization purposes
Participant #2	This is the piece I'm playing with sheet music. I've been mainly focused on intonation, rhythm, and phrasing. For intonation, I start by playing the scale of the key the piece is in. Then I mark spots in the music where I have trouble with intonation and focus on those areas. I also play around with bowings and fingerings if changing them helps the intonation. For phrasing, I usually mark dynamics or directions on my sheet music, and I work with the metronome to help with rhythm consistency.
Participant #3	I've been learning this movement with music.
Participant #4	Looking at the music Metronome practicing - slow to fast Listening for stylistic corrections
Participant #5	Mostly between metronome and rhythmic practices and a little bit of listening to recordings. Breaking it into small chunks, isolating small movements. My practice routine is pretty sophisticated/adaptive so I don't really know how much detail you want here.
Participant #6*	<ul style="list-style-type: none"> - Reading music - Listening/watching recordings and imitating dynamics, character, etc. - Passively and actively - Bring to teacher for feedback

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What have been the results of these strategies so far? (Selection A)

Participant #1	I used my usual learning routine for this selection and it seemed to work. I can play through the entire movement and can pretty much memorize the whole thing, though not up to tempo.
Participant #2	This piece is not very technically challenging so I've been able to work fairly quickly. I've been able to learn all the notes and play it through "accurately" (with regards to playing the right notes and rhythms) so now I'm focusing on phrasing and sound.
Participant #3	While I can play longer passages without stopping, the notes do not stick with me as well as they do when learning by ear.
Participant #4	I am achieving the progress I want.
Participant #5	It's going typically fine. A few technical roadblocks--especially repeated notes, but I do not feel like they will be challenges in the long term.
Participant #6*	<ul style="list-style-type: none"> - Easy to get notes, fingerings, rhythm, dynamics down - Finished learning notes in about a week and a half - Teacher's feedback: <ul style="list-style-type: none"> - need to show meter more -- where are the heavy beats? - make more decisions on character - dotted-ish part: less lyrical, more march-like - what do these markings actually mean? - repeated sfz's = grow? - rit.'s = where start and how much to do? - Need to make more musical decisions - dynamics: where are high points? Are all p's created equal? - phrasing?

What learning strategies have you used to learn Selection B?

Participant #1	I listened to recordings and played them at half speed to learn the notes. I learned the piece slowly, piece by piece, starting at the beginning and working to the end. I also named each phrase to aid in memorization.
Participant #2	This is the piece I'm learning without sheet music. I've been trying to learn this without writing or drawing anything because I'm afraid I'll get too close to notating it. I'm relying heavily on one recording on Youtube (because it's easy to access), but I've also listened to other versions. Right now I'm learning this phrase by phrase by playing the recording and then repeating what I hear on the violin. I've also tried to memorize it through singing. So essentially, I'm trying to memorize each phrase and then play it.
Participant #3	I've been learning this movement by ear with a recordingade by Janos Starker
Participant #4	Listen and repeat section by section
Participant #5	Audio recordings, basically bit by bit, trying to imitate the recording as closely as possible. I did have to make sure I found a reputable recording. I'm also looking into finding a midi file of this composition.
Participant #6*	<ul style="list-style-type: none"> - Listen/watch recordings and imitate - Also passive listening - Bring to teacher for feedback - Give someone else the score for note check - A couple parts: write down note names (syncopated part with repeated notes- note names and # of times play each, really fast passage with lots of notes) - Sing along with recording, then play

What have been the results of these strategies so far? (Selection B)

Participant #1	I am able to play through the piece with my written notes, though I am not sure
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	of a few notes...
Participant #2	This is definitely going a lot slower than the other piece. I still haven't gone through the entire piece yet. However, I think I'm paying more attention to the details. Whereas in the first piece, I kind of could start working on a lot of different things pretty quickly, here, I'm still trying to first get the notes and rhythms right.
Participant #3	I've noticed that I've been able to memorize the opening of this movement quickly since I am learning it without music. The harmonic passage has taken a lot of time to work out and still needs work. It's been the hardest part to learn by ear.
Participant #4	I'm getting most of the notes, but it's really annoying to have to play some of the harder parts over and over again
Participant #5	<p>This is much more frustrating, actually. Especially because no one makes recordings at slower tempos; my practice routine revolves basically around practice at all different tempi.</p> <p>I chose it because it was mainly tonal, but some of the figurations are hard to make out in the recording, especially accompanimental figures, which are played appropriately softly.</p>
Participant #6*	<ul style="list-style-type: none"> - Slow learning at first - Double/triple-stops hard to hear in recordings - Listen to small part, play small part, etc. - Easy to get stuck on parts (syncopated parts with repeated notes, really fast passages) - Freedom to come up with own fingering and bowing, also flexible with these - Ask self, "What fingering/bowing to use to make it sound like recording?" - Each part learned already memorized - Phrasing and character apparent right from the start, but flexible with these too - Very focused practicing (listening and playing) - Because of listening, already know how violin part fits in with piano part -- no need to count measures, just sing piano part in head

Which selection do you consider more performance ready and why?

Participant #1	They are about the same. Although the first selection is more technically difficult, I am sure of all the notes because I have the sheet music as reference. The second selection was easier technically, but it is difficult to make the piece sound good, partly because of uncertain bowings, fingerings and notes.
Participant #2	As of now, it's definitely, the first piece (using sheet music) since I have yet to play through the second piece.
Participant #3	The second movement of the Suite is closer to being performance ready as I already have what I've learned memorized and I remember where I have to go, aurally, better than in the third movement.
Participant #4	Spring I am spending my practice time practicing instead of trying to find out what the notes are
Participant #5	Definitely the Ravel. Even though it's technically harder, I am such a visual person when it comes to learning new music. The lack of notation really gets in my way when I'm trying to the muscle memory from fumbling through the first time.
Participant #6*	<p>First movement?</p> <ul style="list-style-type: none"> - Notes already learned up to tempo: can get through a performance with no problem - Not completely memorized - But musically? May have plateaued. - Need to make more musical decisions and play them with conviction before really performance ready - Not completely familiar with piano part yet <p>Third movement?</p> <ul style="list-style-type: none"> - Notes not completely learned: about 2/3 learned - Of notes learned - musically already performance level--phrasing, dynamics, etc. - performance tempo

	<p>- ensemble probably performance level? Know how my part fits with piano</p>
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	<p>Once finish learning third movement, predict will be more performance ready than first movement. Right now, first movement more performance ready because all notes learned.</p>
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Appendix B

Questionnaire 2 and Responses

Note: Participant #4 did not complete Questionnaire B.

How often did you use each of these learning strategies or tools?*

	SELECTION A				SELECTION B			
	Very Often	Often	Once in a While	Not at all	Very Often	Often	Once in a While	Not at all
Audio recordings								
Video recordings								
Work in sections								
Isolate difficult passages								
Metronome								
Experiment with fingerings/bowings								
Sing								
Make visual guides (mark sheet music, write out note names, etc.)								
Play for others (feedback)								
Other strategies or tools?	Recorded myself.				<p>A note on using video recordings: I couldn't find any video recordings so I couldn't use them. If there were video recordings I'd probably use it very often.</p> <p style="text-align: center;">-</p> <p>I did find a MIDI file and used Synesthesia, a piece of software which basically tells you whether or not you've hit the notes accurately. Still, I find this much less efficient than reading music.]</p>			

		<p>I've also used Reaper (a digital audio workstation) to change the tempo of the recording. This has noticeable artifacts (degraded audio quality), so I try to do this as little as possible.</p> <p>-</p> <p>Recording myself</p>
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How often did you focus on the following?

	SELECTION A				SELECTION B			
	Very often	Often	Once in a while	Not at all	Very often	Often	Once in a while	Not at all
Note accuracy								
Rhythmic accuracy								
Tone								
Intonation				1 (pianist)				1 (pianist)
Articulation								
Appropriate tempo/pacing								
Phrasing								1
Dynamics								
Style								1
Character								1
Memorization				1				
Focused on other musical aspects?	<p>Learning with sheet music frees my regimen to get notes and rhythms out of the way rather quickly. As I work in articulations, dynamics, phrasing, that is where memory starts—with muscle memory.</p>							

Which selection do you consider more performance ready and why?

Participant #1	They are about the same. The piece I am learning without sheet music is technically easier, but the style is very difficult to catch. The piece I am learning with sheet music is somewhat more technically challenging, and so the intonation is still an issue. I would not perform either of these pieces at their current state.
Participant #2	Right now it's still the piece I'm learning with sheet music. Because I'm learning (essentially memorizing) the other piece in short phrases, it's harder right now to focus on the piece as a whole so I've spent more time on memorization, tempo, intonation, and fingers rather than character, style, and phrasing on a larger scale.
Participant #3	The third movement of the Cassado Suite is closer to being performance ready because I'm able to learn the difficult double stop passages quicker with music. In the second movement many of the double stop passages are hard to figure out by ear, which is why I have started using video recordings, but at the quick tempo of these videos, many times the passages are still difficult to figure out.
Participant #5	Still the Ravel. The why should be rather clear.
Participant #6*	<i>[Did not respond to this question.]</i>
Participant #7	The Lalo Cello Concerto First Movement is more performance ready. Using the music to help me learn the piece is much more helpful for me

Appendix C

Questionnaire 3 and Responses

Note: Participants #4 and #5 did not complete Questionnaire 3.

What were the advantages of learning a piece without sheet music?

Participant #1	From the beginning, I was better able to pay attention to stylistic elements (articulation, phrasing, dynamics) instead of only the notes. I was also forced to start memorizing the piece from the start, which eventually made memorization easier.
Participant #2	I knew the piece better because I had to completely memorize it. I also was forced to think about rhythm, intonation, and phrasing in a different way.
Participant #3	When learning without sheet music I did not feel restricted to using fingerings and bowings put into the music by the editor. This also forced me to try a variety of fingerings before settling on just one, which I have only done in some instances before. Learning a piece without sheet music also forced me to memorize the piece right away, combining the steps of learning a piece, then memorizing the piece, which I usually do.
Participant #6*	<ul style="list-style-type: none"> - I had to think outside the box. (Learning strategies, fingerings, bowings) - Relied more on my ear. - Forced me to make decisions based on what I wanted to sound like, not what was written on the page. - Good ear-training exercise. - Memorized as I went. - Forced me to listen to and watch a lot of different recordings. - Listened to recordings more carefully (for phrasing, dynamics, piano part, pacing, etc.)
Participant #7	It really helped make you listen to intervals and dynamics that I don't

	necessarily pay as close attention to when I have music
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What were the disadvantages of learning a piece without sheet music?

Participant #1	It was difficult to learn all the notes in more difficult passages, as it was difficult and more time-consuming to figure out the notes from recordings. Secondly, before the piece was memorized, I would have to go back to recordings whenever I forgot what came next, which was annoying, and I would have to search through the recordings for a while before finding the correct passage. Also, without sheet music, one can only rely on the interpretations of other musicians for ideas rather than looking at the composer's original markings which may sometimes better show the composer's original intent. In addition, if I figured out a good bowing or fingering, I couldn't mark them down on the music above the notes, so it generally took longer to learn the music.
Participant #2	The process took a lot longer. Also, I felt like I relied very much on one particular interpretation (recording).
Participant #3	The biggest disadvantage of learning a piece without sheet music was, for me, picking up all of the notes in a fast passage. There would be times where I would miss a note or two, go back and listen to the passage, then try to play the passage again, only to realize that I had not actually heard every individual note in the passage. I did not have a way to slow the music I was listening to down so the fast passage work took the longest amount of time.
Participant #6*	<ul style="list-style-type: none"> - I had to remember all my mistakes and fix them--wasn't at liberty to circle them in the music. - Slower because I'm not used to learning a piece this way--also easier to get stuck. - Couldn't interpret the composer's writing for myself--rely on others' interpretation and choose from those. - Harder to get an overall feel before working on details.

Participant #7	It was harder to understand different articulations since each performer interprets it differently.
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Which of your selections do you consider more performance ready and why?

Participant #1	I feel like the piece I learned with sheet music is more performance ready. Although both pieces I learned are pretty much memorized, I am not confident that all the notes in the piece I learned without sheet music are correct. My usual learning style includes sheet music, so I was more familiar with how to practice when I had sheet music, so I feel like my time practicing with sheet music was more efficient. I was able to pay attention to style in both the pieces I learned, since I listened to many recordings of both pieces, since recordings were not prohibited for either piece.
Participant #2	I think both are equally ready.
Participant #3	I feel the movement that I learned without sheet music is closer to performance ready. First, by hearing the piece performed at performance tempo for so long, it seems more natural to replay the piece at the same tempo. The second reason is because the piece was already memorized as I was learning it, which is not the case for the movement I was learning with sheet music.
Participant #6*	Third movement (no sheet music) because it's memorized and I can play it up to tempo with clear musical decisions all the way through.
Participant #7	The selection with the music. Maybe with more time and experience, it would be better for the method without music, but for now, I liked the music in front of me.

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