

A descriptive study of high school and university students' focus of attention in fast and slow orchestral excerpts

By: [Rebecca B. MacLeod](#), John M. Geringer, and Laurie Scott

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Abstract:

The purpose of this study was to investigate listener discrimination of orchestral performances and to ascertain focus of listener attention to technical and expressive music elements of those performances. High School ($n = 84$) and University ($n = 84$) music students listened to four orchestral excerpts: two slow/soft excerpts and two fast/loud excerpts. Recordings representing three levels of performance were presented: high school, university and professional. Listeners rated excerpts on accuracy and musicality, and identified the most noticeable element of each performance. Results indicated that listeners discriminated between performance levels. In the slow excerpts, university students noticed intonation and tone most frequently, while high school students noticed dynamics and tone. For the fast examples, university students noted dynamics, accuracy and articulation. High school students noticed dynamics overwhelmingly. Listeners noticed a wide variety of elements for the slow examples, whereas responses were more similar for the fast excerpts.

Key words: discrimination, focus of attention, high school, music elements, music listening, performance levels

Article:

Music listening is one of the most fundamental aspects of learning about music. How and what musicians attend to when listening to and assessing music is an important question that is of interest to performers and music teachers as well as researchers. For example, the ability to identify different timbres, isolate musical lines and detect errors is extremely consequential for a competent music teacher.

The first level of perception is whether music is being heard or not being heard (Madsen & Geringer, 2000/2001). The ability of the listener to stay on-task while attending to music seems an important prerequisite to any type of musical discrimination or aesthetic response activity. Researchers have explored listeners' ability to focus on a listening activity (Flowers, 2001) even during times when competing noises or activities are introduced (Madsen, 1987; Madsen & Wolfe, 1979). Once an individual is consciously listening and discriminating, the next question posed is, on what does the individual focus as the music proceeds temporally?

Some research has explored differences in focus of attention between musicians and non-musicians (Duke, Geringer, & Madsen, 1988; Geringer, 1982; Geringer & Madsen, 1995/1996; Madsen & Geringer, 1981, 1990; Rentz, 1992; Sheldon & Gregory, 1997). Two studies compared listening patterns of music majors and non-majors and results showed that non-music majors focused primarily on dynamics and melody (Geringer & Madsen, 1995/1996; Madsen & Geringer, 1990) while music majors attended to higher percentages of timbre than non-majors (Geringer & Madsen, 1995/1996). When listening to the musical elements of rhythm, dynamics, timbre and melody, musicians spent most of the time listening to melody, then rhythm, dynamics and timbre. Non-musicians focused on dynamics, melody, timbre and then everything, with a very low percentage of focus on rhythm (Madsen & Geringer, 1990).

Other research investigating amount of training and patterns of listening has found that listeners with more musical training seem to perceive music differently than listeners with less training (Byo, 1997; Flowers, 1985, 2000; Johnson, 1996; Johnson & Kelly, 1995; Sheldon & Gregory, 1997; Williams, 2005). Listeners with more musical training have been found to perceive tempo decreases with greater accuracy than increases (Sheldon & Gregory, 1997). As music training increases, so does harmonic focus of attention (Williams, 2005). Graduate music majors have been found to use more technical music terms to describe music than undergraduate music majors (Flowers, 1985) and spend more time listening to strings and significantly less time listening to all instrument families than do undergraduate or junior high students (Johnson & Kelly, 1995). Likewise, musicians have been found to focus on strings and multiple groups of instruments with greater frequency compared to non-musicians, who focused on brass and percussion (Rentz, 1992).

As musical training advances, musicians are required to participate in many discrimination tasks that require listener judgment regarding the performance quality of a given music example. Trained music educators and junior high band students were both instructed to evaluate a university performance and junior high performance of the same piece. Both groups were able to discriminate between performances of university and junior high students and agreed on the high- and low-quality moments in the performance. However, the music educators were more discriminating and consistently awarded a lower rating to the junior high performance than did the junior high students (Byo & Brooks, 1994). Furthermore, the performance ratings of undergraduate music education students were compared to critic ratings for inferior and superior recorded performances. Results showed that the students agreed with the critics a majority of the time in regard to the superior performances, but were not always in agreement during the inferior performances (Schleff, 1992). It seems likely that both the trained music educators and critics were more discriminating than the junior high and college students during inferior performances because of experience and training in identifying performance problems.

When music educators rate or make judgments regarding a given excerpt, what exactly is the focus of attention? Geringer and Madsen (1998) investigated listeners' focus of attention to specific musical elements while assigning ratings to good and bad performance excerpts of a soprano, tenor, violinist and cellist. Results indicated that musicians consistently discriminated good from bad performances, and that intonation was identified as the element most in need of improvement. Given a variety of changes in the good and bad versions, musician listeners tended to respond primarily to intonation and secondarily to tone quality, and relatively little to other rating categories.

The main purpose of the present study was to ascertain focus of listener attention to technical and expressive music elements while rating the performance quality and preference for orchestral excerpts. We presented three proficiency levels of orchestral performances to participants to investigate the following questions: What do listeners notice in different performances? Does music training affect what is attended to in different performances? Are there differences in focus of attention during slow/soft versus fast/loud excerpts? Do listeners notice different elements when listening to different performance levels?

Method

Participants were high school music students ($n = 84$) and university music major students ($n = 84$) sampled from three states: Florida, North Carolina and Texas. High school students volunteered to participate in the study and were recruited from their regular high school orchestra or summer music camp orchestra. All were enrolled in public or private schools; grades 9–12 were represented approximately equally. University music students were either undergraduate ($n = 42$) or graduate ($n = 42$) students enrolled in music degree programs at large state universities in one of the three states. All participants listened to music examples in group settings ranging in size from 8 to 26 students. Presentations were in their regular music classroom with the available sound equipment.

Music stimuli

We searched for representative orchestral music examples with available recordings for each of the three levels of performance proficiency that we were comparing: high school, university and professional level ensembles. The requirement of the same works available at each level of performance experience essentially meant that excerpts would be somewhat familiar in the orchestral genre. We also sought pieces that had a section with slow tempo and soft dynamics, and a separate contrasting section with fast tempo and loud dynamics. The final works selected were excerpts from the *Poet and Peasant Overture* (von Suppé) and *Night on Bald Mountain* (Mussorgsky) (see Table 1). All excerpts contained complete musical phrases, and durations ranged from 25 to 38 seconds. High school recordings were obtained from the archives of the Florida State University Summer Music Camp and the Tallahassee Symphony Youth Orchestra. College-level recordings were obtained from the archives of the Florida State University Philharmonia Orchestra. Professional recordings were from the researchers' private collections or available commercially.

Stimulus material

CDs used for the study began with two practice examples using different music from the experimental stimuli. One excerpt was a high school example and the other a professional ensemble. This was done to acquaint the participants with the procedures and response scales, and served to provide a frame of reference for the range of performances that they would hear. The practice examples were followed by the 12 experimental examples, which included high school, university and professional level ensembles performing each of the four excerpts (a fast/loud and a slow/soft example from the two works selected). Four counterbalanced orders were used in presentations to groups of listeners to distribute probable effects of presentation order. Listening orders were sequenced so that all three versions of a given excerpt (high school, university and professional) were heard consecutively.

Table 1 Music excerpts used for fast/loud and slow/soft stimuli

Recording	Measure numbers	Duration (seconds)
<i>Night on Bald Mountain</i> (Mussorgsky)		
Fast/loud example	1–35	High School: 36 University: 38 Professional: 33
Slow/soft example	384–400	High School: 36 University: 38 Professional: 30
<i>Poet and Peasant Overture</i> (von Suppé)		
Fast/loud example	78–110	High School: 25 University: 26 Professional: 25
Slow/soft example	9–16	High School: 30 University: 33 Professional: 33

Procedure

Participants were asked to listen carefully and to indicate responses on prepared forms that consisted of two 7-point rating scales for each of the 12 stimuli. Listeners gave a rating for Technical Skill, defined as note and rhythmic accuracy, and for Musicality, defined as musical expression and stylistic character. Rating scales were numbered from 1 (labeled 'good') to 7 (labeled 'outstanding'). See Geringer and Johnson (2007) for a rationale for this rating system in this context. An additional item requested listeners to specify the aspect of the performance that was noticed the most (whether performed poorly or well). For this item, respondents could choose any of 10 elements of music performance that were listed on the response sheet (accuracy, intonation, rhythm, tempo, articulation, tone, dynamics, phrasing, style and expression), or they could specify other possible aspects with an open-ended response in the space provided.

Results

Overall mean ratings from both high school and university participants for the individual performances indicated that listeners discriminated between the different performance levels of the two pieces. Standard deviations were similar across examples and levels and ranged from 1.1 to 1.5 on the 7-point scales. Mean technical (*MT*) and musical ratings (*MM*) resulted in the following order from lowest to highest rating: high school (*MT* = 4.42, *MM* = 4.55), university (*MT* = 4.91, *MM* = 5.13), and professional (*MT* = 5.44, *MM* = 5.32) (see Figure 1). Musical and technical ratings were similar across levels, although musical ratings were slightly higher than technical ratings for the high school and university level performances, whereas the technical ratings were slightly higher for professional examples.

Figure 2 shows that the fast/loud excerpts of each piece were rated higher, both musically and technically, than the slow/soft excerpt of that same piece. Both excerpts from *Poet and Peasant Overture* (*M* = 5.21) were rated higher than the two *Night on Bald Mountain* (*M* = 4.71) excerpts. Musical and technical ratings for the excerpts were nearly identical, with the exception of the slow/soft example from *Poet and Peasant Overture*. The musicality rating was slightly higher (*M* = 5.18) than the technical rating (*M* = 4.97).

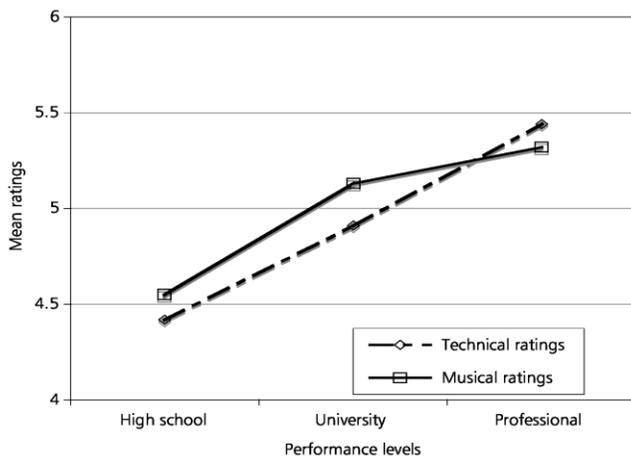


Figure 1 Listeners' musical and technical ratings for performance levels

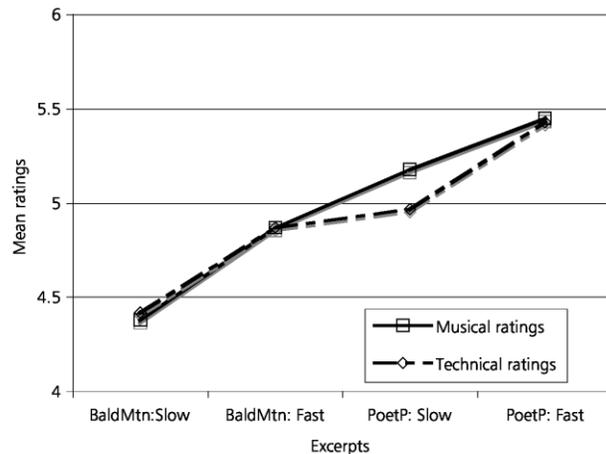


Figure 2 Listeners' musical and technical ratings for each excerpt

The frequencies of listener responses for each musical element were determined for each of the four excerpts and compared. The most noticed musical elements for the high school listeners were compared to university student responses using a chi-square analysis. There was a significant difference between the responses of college and high school students regarding the musical element that was most noticed in the slow/soft excerpts ($\chi^2(9, N = 168) = 63.52, p < .001$), as well as in the fast/loud excerpts ($\chi^2(9, N = 168) = 48.55, p < .001$). Table 2 presents frequencies of response to the most noticed element for the slow/soft and fast/loud examples. College students indicated that intonation was the most frequent reason they selected a given rating for the slow/soft passages (114), followed by tone (81). Rhythm was cited only 14 times. High school students indicated that dynamics was the most noticeable musical element (79), also followed by tone (75). However, the younger group listed intonation only 44 times. In the fast/loud examples, both university and high school students indicated dynamics as the musical element that was most noticed. However, high school students chose dynamics with greater frequency (130) compared to the university students (86), whereas university students selected accuracy (83) and articulation (77) more often than did high school students (38 and 51, respectively). High school students indicated that expression (50) was noticed twice as frequently as university students (25) in the fast/loud excerpts.

Table 3 gives frequencies of listeners' responses to the slow/soft and fast/loud examples. Listener responses for the musical element most noticed in the two slow/soft excerpts were compared to each other using a chi-square analysis, and a significant difference was found, $\chi^2(9, N = 168) = 104.84, p < .001$. Tone was mentioned 100 times in the slow *Poet and Peasant* excerpt compared to 56 times in the slow *Bald Mountain* excerpt. Dynamics (84) and expression (71) were chosen more often for *Poet and Peasant* than for *Bald Mountain* (31 and 40, respectively). Conversely, intonation (97) and tempo (81) were listed more frequently for *Bald Mountain*

compared to *Poet and Peasant* (61 and 20, respectively). Fewer differences between the two pieces were found in the fast/loud excerpts than in the slow/soft excerpts. There was not a significant difference in the elements cited between the examples, $\chi^2(9, N = 168) = 5.99, p > .74$. Respondents chose dynamics prevalently for both pieces as the most noted musical element in the fast/loud excerpts.

Table 2 Frequency of most noticed musical element by university compared to high school students in the fast/loud excerpts and slow/soft excerpts

	University fast/loud	High school fast/loud	University slow/soft	High school slow/soft
Dynamics	86	130	36	79
Accuracy	83	38	27	28
Articulation	77	51	30	44
Tone	55	49	81	75
Tempo	54	60	50	51
Intonation	38	20	114	44
Rhythm	34	35	14	38
Style	36	48	47	49
Expression	25	50	53	58
Phrasing	16	23	52	38

Listener responses were compared also between university and high school participants across the three performance proficiency levels (see Table 4). The most noticed musical elements for the three performance levels (high school, university and professional) were different, as were elements listed by the listener experience groups (university and high school). For example, university and high school students indicated that different musical elements were noticed most frequently for 9 out of the 12 excerpts. Further, different musical elements were noticed during the high school performances from during the university and professional performances. High school students selected dynamics as the most noticed element in 8 of the 12 excerpts, whereas university students selected a much wider range of musical elements. The most noticed elements of the university listeners varied across excerpts and performance levels (intonation 4, dynamics 3, tempo 2, tone 2, accuracy 1, articulation 1, and phrasing 1, including ties).

Table 3 Frequency of listener responses to *Poet and Peasant Overture* slow/soft compared to *Night on Bald Mountain* slow/soft and to *Poet and Peasant Overture* fast/loud compared to *Night on Bald Mountain* fast/loud

Excerpt	<i>Poet and Peasant</i> slow/soft	<i>Bald Mountain</i> slow/soft	<i>Poet and Peasant</i> fast/loud	<i>Bald Mountain</i> fast/loud
Dynamics	84	31	107	109
Tone	100	56	47	57
Expression	71	40	38	37
Intonation	61	97	31	27
Style	53	43	46	38
Articulation	39	35	70	58
Phrasing	37	53	23	16
Accuracy	24	31	55	66
Tempo	20	81	53	61
Rhythm	15	37	34	35

Comparison of responses between the performance levels revealed that during the high school performances, university students selected intonation as the most noted feature for 3 of the 4 excerpts, while high school students indicated dynamics as the most noted feature for 3 out of the 4 excerpts (Table 4). During the university performances, university students selected intonation, dynamics, tone, accuracy, tempo and phrasing, while high school students selected dynamics for 3 out of 4 of the selections. University and high school students had the highest rate of agreement in musical elements most noticed for professional performances. Both groups selected dynamics for the *Poet and Peasant* fast/loud excerpt and tempo for the *Bald Mountain* slow/soft excerpt.

Table 4 Frequency of listener responses for most noticed musical element by listener group and performance level

Performance level	High school responses	University responses
High school		
<i>Poet and Peasant</i> fast/loud	Dynamics (20)	Dynamics (16)
<i>Poet and Peasant</i> slow/soft	Dynamics (28)	Intonation (21)
<i>Bald Mountain</i> fast/loud	Dynamics (23)	Intonation (18)
<i>Bald Mountain</i> slow/soft	Rhythm (16)	Intonation (59)
University		
<i>Poet and Peasant</i> fast/loud	Dynamics (21)	Intonation/dynamics (15)
<i>Poet and Peasant</i> slow/soft	Dynamics (24)	Tone (22)
<i>Bald Mountain</i> fast/loud	Dynamics (29)	Accuracy (21)
<i>Bald Mountain</i> slow/soft	Tone (17)	Tempo/phrasing (16)
Professional		
<i>Poet and Peasant</i> fast/loud	Dynamics (14)	Dynamics (21)
<i>Poet and Peasant</i> slow/soft	Articulation (15)	Tone (26)
<i>Bald Mountain</i> fast/loud	Dynamics (23)	Articulation (20)
<i>Bald Mountain</i> slow/soft	Tempo (16)	Tempo (26)

Discussion

Participants were able to discriminate between the different performance levels of the two pieces and fast excerpts were rated higher than the slow excerpts from the same piece. There was a significant difference between the focus of attention of university and high school students in regard to the musical element that was most noticed in both slow/soft and fast/loud excerpts. Significant differences were also found between the slow/soft excerpts and fast/loud excerpts in regard to most noticed musical element.

Consistent with previous research, the results of this study showed that listeners with more training perceived music differently from those with less training (Byo, 1997; Flowers, 1985, 2000; Johnson, 1996; Johnson & Kelly, 1995; Sheldon & Gregory, 1997; Williams, 2005). University and high school students differed in focus of attention to music elements from each other for 9 out of 12 excerpts. The majority of high school students selected dynamics for 8 out of 12 excerpts, whereas university students selected a much wider range of musical elements that varied for each excerpt. Based on the results of this study, it seems that increased training allows listeners to focus on a more extensive range of musical elements that are specific to that particular excerpt or that increased training increases the number of musical terms with which one is familiar.

Researchers investigating listening patterns of musicians and non-musicians found that non-musicians frequently selected dynamics and melody as the most noted feature of a musical performance while musicians focused on elements such as timbre (Geringer & Madsen, 1995/1996) and that when discriminating performance quality, musicians focused primarily on intonation and secondarily to tone quality (Geringer & Madsen, 1998). University students in this study indicated that intonation was the reason they selected a given rating for the slow/soft passages (114) followed by tone, while high school students indicated that dynamics was the most noticeable musical element (79).

During the fast/loud passages, both college and high school students cited dynamics as the musical element that was most noticed. It may be that intonation, good or bad, is more easily focused upon during slow/soft passages or that perhaps in fast/loud passages it is not as important to play in tune and consequently dynamics become a more salient feature. It should be noted that high school students chose dynamics in fast/loud examples with greater frequency (130) compared to the university students (86).

No significant difference was found in listener focus of attention between the fast/loud excerpts of the two pieces. Respondents overwhelmingly chose dynamics as the most noted musical element in the fast/loud excerpts (see Tables 2 and 3). However, a significant difference was found between the soft/slow excerpts of the 2 pieces. Participant responses were more varied during the slow/soft excerpts and different elements were noted for each piece.

It has been proposed that the most important task concerning music listening is to keep the listener on-task to the music (Madsen & Geringer, 2000/2001) and to teach appropriate labeling as suggested by Flowers (1983, 1984). The task of attending to music seems to be the most difficult to teach as most people, in particular adolescents, often seem to be bathed in sound continuously without regard to active focused listening. Indeed, when listeners are asked to attend to something in the music (almost anything) they do stay on-task (Madsen & Geringer, 1983). Because listening is such a fundamental aspect of virtually all music activity, it seems important to continue research concerning listener focus of attention within specific music contexts.

The results of this study have multiple applications for music educators. If musicians attend primarily to intonation when judging the performance quality of soft/slow excerpts and primarily to dynamics when judging fast/loud excerpts, music educators might consider focusing on those elements in rehearsal during concert and festival preparation. Concentrating primarily on tone and intonation during slow/soft passages might contribute to a higher rating given that listener focus of attention appears to be on intonation rather than dynamic level. It also seems logical to use soft/slow excerpts in order to teach intonation and tone if those features are more apparent to a young listener in that type of excerpt. Likewise, fast/loud passages could be used to teach

dynamics, articulation and tempo, as intonation appears to be less of an issue, or more difficult to distinguish in passages such as these.

It is very possible that the musicians in this study with less training did not know the meaning of all of the musical terms that were included. This study did not assess the participant's knowledge of musical terminology prior to the listening task. If young musicians are not taught to pay attention to intonation or articulation in rehearsal, then their ability to assess these elements will be less developed than more experienced musicians. Music educators might consider incorporating listening activities in the rehearsal process that would teach young musicians to attend to various musical elements. It also seems important to compare professional musicians' responses to that of the university and high school musicians' responses. Investigating the listening patterns of professionals might help guide our training of young musicians' listening skills. More research investigating listener focus of attention when judging performance quality is needed to provide insight that may guide music educators' listening and rehearsal process.

Caution must be used when generalizing the results found in this study. Participants were students who had elected to participate in classical music training with a focus on western art music. The musical selections included in this study were orchestral excerpts. Results may have been different if the listener population were more diverse or if the music examples were drawn from a wider range of styles and cultures. Listeners may attend differently to musical elements when listening to string orchestra, choir or wind ensemble, let alone to ensembles outside of the western art tradition. Furthermore, less familiar styles that may include polyrhythms or quartertones would also affect listeners' focus of attention and ability to discriminate. Additional research that compares different genres including orchestra excerpts, wind band excerpts and music from other cultures is needed.

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