

Left-hand expression in cello playing: Exploring approaches to shifting

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This investigation explores aspects of musical interpretation in relation to left-hand cello technique. It focuses on how listeners, performers, and teachers approach shifting, both in terms of its functionality and its expressive use in portamenti. The method involved appraisal of five selected interpretations through listening experiments with cellists and other instrumentalists, analyses of portamenti, and interviews. The results revealed that listeners generally preferred contemporary recordings with less obvious use of portamenti and that cellists tended to rate the use of portamenti higher than other instrumentalists.

Keywords: performance; expression; string playing; shifting; preferences

During Pablo Casals's 97 years (1876-1973), the cello emerged from seclusion to take its place alongside other popular solo instruments. Major additions to the repertoire presented cellists with new challenges, and advances in recording possibilities ensured that technical proficiency became the norm. Although much has been written about string technique, there is no detailed study of the expressive characteristics of *shifting*. Pleeth (1982) suggests that the "feel" for distance in movement and the variety of tension in the left-hand are essential in creating good shifts. He also links portamenti to singing and states that "it is the notes that give birth to the slide, not the other way around" (p. 37). However the study of such a technical, yet expressive, tool can be problematic. Mantel (1975) suggests that "technique cannot be separated from the experience of making music. For practical purposes [however] we can separate technique from interpretation...a point of departure for the analyses of this technique" (p. XV). Although such separation may be possible in order to refine technique, there seems to be little point in practicing tech-

nical movements without relating them to a musical objective. Nonetheless, in the mechanical sense, musicians have been the object of study for quite some time, as examples of practitioners with highly skilled sensorimotor coordination in terms of precision, speed, and dexterity (e.g. Kay 2003). The relationship between mental representations and motor actions in pianists has also been studied (e.g. Drost *et al.* 2005). However, studies on the relationship between musical understandings and ways of shifting are nonexistent. Music performance research often considers expressive intonation, vibrato, dynamics, and timing, but with the exception of a few studies on the violin, expressive shifting is rarely mentioned.

This investigation examines expressive shifting from both technical and interpretive angles, exploring approaches to portamenti from the perspectives of the listener, the performer, and the teacher. This article reports on the first two perspectives: (1) listeners' evaluations of portamenti and impact on interpretation and (2) cellists' individual approaches to shifting and portamenti in performance.

METHOD

Participants

Thirty-eight listeners were recruited: cellists (n=27) and other instrumentalists (n=11). The 27 cellists comprised undergraduate (n=14) and postgraduate (n=8) students of the Royal College of Music and Trinity College of Music, amateurs (n=2), and professional performers (n=3).

Materials

Five recordings by distinguished cellists (see Table 1) of the *Finale* from *Don Quixote* by R. Strauss were selected. This excerpt was chosen for its extensive potential for expressive portamenti.

Procedure

All recordings were analyzed and compared focusing on portamenti. For the purposes of homogeneity, recordings were normalized and noise reduction filters were applied. The participants were asked to evaluate an extract of the *Finale* (see Figure 1), with the five recordings played in a random order, using a scale of 1 to 7 and to provide the reasons for their ratings. Subsequently, the participants were required to listen to the same extract a second time, rating the use of portamenti for the following categories: (1) quality (QP), (2) appropriateness for the interpretation (HA), and (3) overall importance (OI). Semi-

FINALE. (*sehr ruhig*)

8

14

22

28

espr.

cresc. *f*

sfz *ff*

agitato *etwas drängend* *f*

zurückhaltend *ff* *p*

Figure 1. Cello part of the extract played from the *Finale* of *Don Quixote* by R. Strauss.

Table 1. Cellists, recording labels, and dates of the five recordings, as well as the estimated onsets, offsets, and durations of the selected portamenti.

<i>Recording</i>	<i>Cellist</i>	<i>Label</i>	<i>Onset-offset (s)</i>	<i>Duration (ms)</i>
R1 (1976)	M. Rostropovich	EMI 4-76903	19.07-19.18	~120
R2 (1969)	P. Fournier	CBS 61110	16.62-16.79	~160
R3 (1938)	E. Feuermann	IGI-372	17.08-17.31	~240
R4 (1958)	P. Tortelier	HMV ASD-326	18.96-19.11	~150
R5 (1953)	G. Piatigorsky	HMV ALP-1211	18.87-19.18	~200

structured interviews were carried out with the cellists, probing their approaches to shifting, including practice strategies, decisions about choices of portamenti, relationship with stage fright, and training received.

RESULTS

In order to determine whether there were differences in the listeners' evaluations of interpretations and *portamenti*, repeated measures Analyses of Variance (ANOVA) were conducted separately for each type of rating. The within-group variable was the recording, and the between-group variable was cellist/non-cellist. Mauchly's tests of sphericity were significant for each test and, therefore, F values are reported with the Greenhouse-Geisser correction. Three main points arose.

Firstly, significant between-group differences were found. Cellists' ratings of interpretations and portamenti were generally higher than non-cellists.

The differences between the two groups were significant in QP ($F_{1,35}=8.55$, $p<0.05$) and HA ($F_{1,35}=6.57$, $p<0.015$). Since all recordings were by eminent cellists, it is perhaps expected that cellists, most of them students aiming to acquire the technical and musical skills present in the recordings, would indeed rate QP and HA higher than non-cellists. However, evaluations of OI seemed to reflect simply the amount of portamenti employed (i.e. the more portamenti, the higher the rating).

Secondly, the analysis revealed significant within-group effects across all performances for all four outcome measures: PE ($F_{2,86,99,95}=4.32$, $p<0.05$), QP ($F_{3,06,106,92}=2.98$, $p<0.05$), HA ($F_{2,68,93,87}=7.20$, $p<0.05$), OI ($F_{3,16,110,8}=9.45$, $p<0.05$). Although the exact pattern of differences varied between the four outcome measures, inspection of the marginal means (see Figure 2) suggested that R3 was generally least preferred in terms of PE, QP, and HA. However, the profile for OI was reversed, indicating that the importance of portamenti was high in R3. This seems to suggest that participants found the portamenti particularly striking in R3, but they did not generally like it. The preferred interpretations (PE) were R4 and R5, and the highest ratings for QP and HA were for R1.

Thirdly, the only significant interaction between recording and group was for PE ($F_{2,86,99,95}=3.48$, $p<0.05$). As can be seen in Figure 3, while the general between group effect (cellists rating higher than non-cellists) was maintained for recordings 1, 2, and 4, the difference disappeared for R3 and R5. This may be due to the fact that most cellist participants are students used to contemporary styles and, hence, more biased in their appreciation of interpretations set in a different era than other instrumentalists (i.e. the lower ratings may reflect their lack of familiarity with older styles of interpretation).

A preliminary analysis of the recordings was also carried out, and as expected, a variety of approaches to portamenti was found. For example, the number of portamenti heard varied considerably for each recording (R1 $n=22$, R2 $n=18$, R3 $n=28$, R4 $n=22$, R5 $n=16$), and there were only two places where all cellists commonly produced portamento (see Figure 4): third to fourth beat of bar 4, and last beat of bar 15 to first beat of bar 16.

The analysis of shifts in bar 4 also highlights the individual approaches adopted. Although spectrograms cannot offer a clear representation of portamenti due to the presence of orchestral accompaniment, it is still possible nevertheless to identify some of the partials of the most salient pitches (F# and D) as well as changes in frequency. Spectrograms were, therefore, created using 512 points Fast Fourier Transforms with 87.5% overlap. The approximated durations (see Table 1) are based on the steady state of pitches since the presence of vibrato and interference of orchestral sounds hindered the

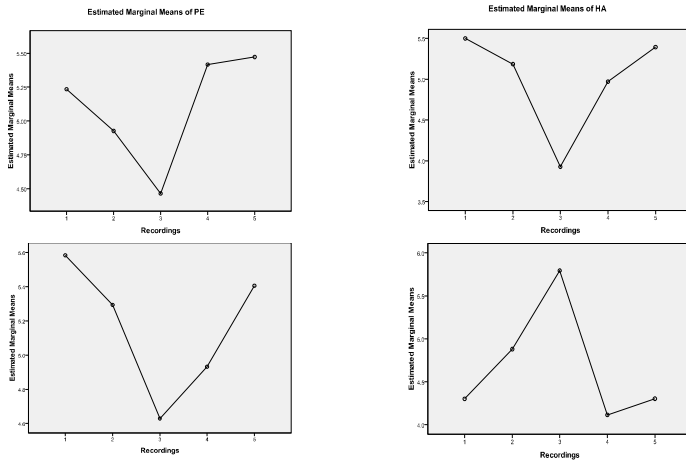


Figure 2. Listeners' mean ratings (cellists and non-cellists) for PE (top left), HA (top right), QP (bottom left), and OI (bottom right).

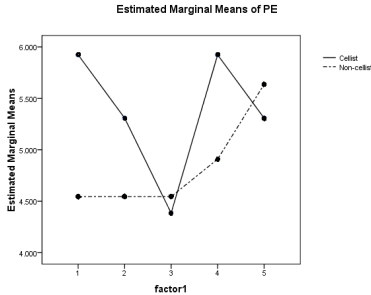


Figure 3. Graph of interactions (mean ratings for cellists and non-cellists) for PE.

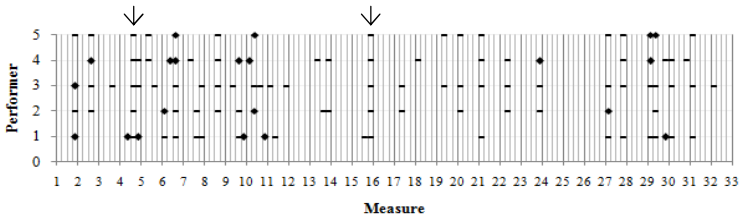


Figure 4. Places of portamenti in each recording. Pronounced portamenti are shown by the segmented lines and less pronounced portamenti shown by the diamond shapes. Arrows indicate common places of portamenti for all cellists.

precision of the estimation of onsets and offsets. The spectrograms showed that portamenti differed not only in their duration but also in the vibrato employed at the beginning of the shift; their speed from the departure to the arrival pitch, and the changes in loudness.

DISCUSSION

This exploratory study shows that (1) approaches to portamenti are highly individual and (2) this plays an important role in listeners' preferences for certain interpretations. The results of the evaluations highlight the preferences for contemporary styles with fewer expressive shifts as well as the higher ratings by cellists when asked to focus upon specific technical and musical aspects of shifting.

This preliminary study will be further developed by focusing on teaching. Observations, interviews, and intervention studies will provide insights into contemporary and artistic approaches involved in shifting that may have an impact on how cellists prepare for performance. In these ways, the continuation of the research will have implications for performing, teaching, and learning, stimulating performers toward more creative and artistic approaches to the role of the left-hand in cello playing.

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