

Velocity and Virtuosity: An Empirical Investigation of Basic Tempo in Contemporary Performances of Two Large-scale Works of Chopin and Liszt

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ABSTRACT: Past research suggests that exceptional speed is a salient feature in virtuoso performance. However, this claim has not yet been tested by empirical studies. This article sets out to investigate in what ways contemporary piano virtuosos play fast in their performances and how they manifest the concept of virtuosity through tempo. It achieves these goals by analyzing a set of recordings of Chopin's First Ballade and Liszt's Sonata with a view to examining the tendency of basic tempo in the performances of two pianists who are most often considered as virtuosos of our time by music critics of English-speaking countries – Kissin and Lisitsa. The results show that they do not always play faster than other selected pianists do. Rather, they tend to play with extreme tempo at the sectional level – playing exceptionally fast in fast sections and exceptionally slow in slow ones. Their performances create dramatic contrast in expression between fast and slow sections, manifesting the concept of virtuosity in both the broader sense – dazzling the audience through broadened expressive power – as well as the narrower sense – displaying of exceptional technical skills through speed, agility and accuracy. The findings provide new, albeit preliminary, insight into the performance practice of modern piano virtuosos and how performers may manifest the concept of virtuosity in their performances.

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KEYWORDS: *music performance, performance analysis, virtuosity, virtuoso, piano performance, tempo, pianist*

INTRODUCTION

VIRTUOSOS have existed since ancient times, but the concept of virtuosity and its manifestation by virtuosos have undergone subtle changes over time. In ancient Greece and Rome as well as in Medieval times, a virtuoso often referred to a widely celebrated singer, instrumentalist, or storyteller who entertained the crowds by their performances, appearances and sartorial elegance (Pincherle & Wager, 1949, p. 228). In the sixteenth and seventeenth centuries, the term 'virtuoso' was an honor reserved for a person, not just musicians, with distinguished achievement in any intellectual or artistic field (Jander, 2001). The notion of musical virtuosity has become more widely discussed by music critics and music scholars since the eighteenth century (Stefaniak, 2016), when such musicians as J.S. Bach, W.A. Mozart, M. Clementi and J. L. Dussek, were known as virtuosos for their compositional complexity and/or novel instrumental techniques embedded in their compositions (Monteiro, 2007, p. 1). It is since the nineteenth century that the term 'virtuoso' has become restricted to performers who pursued a career as soloists, stunning the public with their exceptional



technical accomplishment (Jander, 2001): the young Liszt and the ‘diabolic’ Paganini are the quintessential examples of nineteenth-century virtuosos in this sense (Gooley, 2004). The present-day notion of musical virtuosity is largely based on that of the nineteenth century: in a broader sense, it implies a concept of performance that involves dazzling the audience through personal charisma or showmanship that involves novelties of technique and broadened expressive power (Jander, 2001); in a narrower sense, it refers to a performance practice characterized by the display of technical skills through speed, agility and accuracy in performance (Samson, 2007, p. 48). For these special qualities a virtuoso is regarded to be beyond the expert or professional performer. It signifies the height of a musician’s skills. Recent scientific literature has also identified superior innate limb muscle functions as essential for virtuosic motor skills in expert musicians (Furuya et al, 2015).

Nowadays, words like ‘virtuosity’ and ‘virtuosos’ frequently appear in journalistic writings about music. However, the concept itself is rather elusive, mainly because empirical study of the notion of virtuosity remains limited despite its long history. In musicology, virtuosity has been mainly explored from historical and philosophical perspectives, with research focusing primarily on its reception (Cvejić, 2016; Stefaniak, 2016), anthropology (Gooley, 2004; Kawabata, 2007, 2013; Royce, 2004), semiotics (Bauer, 2019; Howard, 1997; Kawabata, 2004; Larkin, 2015; Parncutt, 2018) and more recently, psychology (Lisboa, Demos, & Chaffin, 2018; Rodriguez, 2018; Stachó, 2018). Yet, little scholarship investigates how virtuosity may defer from expertise and, importantly for the present study, how defining features of virtuosity may manifest in performance from an analytical perspective, which is essential for an evidence-based discussion of the concept and its manifestation in practice.

Among the salient features of virtuosity as such, a performer’s speed and technical command of execution seem to be the most widely, if not exclusively discussed properties. Jim Samson describes early nineteenth-century piano virtuosos as ‘acrobats of the keyboard aiming for speed, reach, strength, agility and endurance, and a compiler too of the technical devices necessary to the task’ (Samson, 2007, p. 71). Antoine Hennion similarly suggests that a virtuosic performance can be considered as one that ‘outwardly demonstrates exceptional agility in terms of instrumental or vocal technique, especially as related to speed of execution’ (Hennion, 2012, p. 6). Jane Ginsborg’s investigation of the concept and characteristics of virtuosity at present times also shows agreement: 34.4% of professionals and 26.5% student musicians ‘considered the principal characteristics of virtuosity to be “flawless” technique, technical ability or brilliance, demanding perfection, skill and speed, without reference to music making’ (Ginsborg, 2018, p. 462). These descriptions of the defining features of virtuosic performance, historical or modern, all point to one aspect: performing with exceptionally fast speed to showcase the performer’s technical accomplishment on the instrument. Although exceptional speed in virtuosic performances has been discussed from historical perspectives such as in the performances of Liszt (Gooley, 2004) and Paganini (Kawabata, 2013), this seemingly undisputable characteristic of a virtuoso’s performance has yet to be tested empirically.

To contribute to our knowledge of the notion of virtuosity, this article investigates the most frequently claimed feature of virtuosic performance – speed.[1] As previous studies suggest that a virtuoso generally plays with exceptionally fast speed, this empirical research sets out to investigate in what ways modern piano virtuosos play fast, if at all, when compared to other concert pianists of the same generation and how they manifest the notion of virtuosity in their performances through speed. We aim to provide preliminary answers to these questions by analyzing the basic tempo in the performances of two large-scale romantic solo piano pieces by a group of contemporary pianists to see if the selected piano virtuosos differ in their tendencies in basic tempo from their similarly expert contemporaries.

RESEARCH MATERIALS

Choice of Repertoire

The two pieces analyzed in this research are Chopin’s Ballade in G minor Op. 23 and Liszt’s Piano Sonata in B minor. They were selected for several reasons. First, they are from the canonical piano repertoire and an abundance of commercial recordings is available for comparison. Second, they are from the nineteenth century when the concept of virtuosity in its modern sense emerged. Third, the two large-scale works encompass a variety of musical contexts, including several fast and slow sections, which allows comprehensive examination and comparison of performers’ tendencies in basic tempo in different musical contexts. They are also highly expressive pieces that permit a great deal of freedom in tempo choice, and

hence much room for the performers, whether virtuoso or otherwise, to demonstrate their idiosyncratic tendencies in basic tempo. Lastly, they are compositions for solo piano and thus enable the exclusion of performance decisions or influences by accompanists, collaborative players, or recording engineers. Any decision on the basic tempo in the performance would be solely by the pianist alone.

Demonstrated by many analytical studies of recent years, performance analysis and score-based analysis can be mutually beneficial as analysis of performance can hardly be separated from analysis of the score. In our analysis of tempo in commercial recordings, we take musical structures as revealed in score-based analysis as a point of reference for discussing performers' tempo in each section and sub-sections of the two pieces. The purpose of having this structural reference is purely for examining the basic tempo at the sectional level of a piece. Performers may not conceptualize the structure of a piece in identical ways, but this is not a concern in this study as its aim is not to investigate their interpretation of structure but to analyze their tempo tendencies in each segment of the piece. The formal structures of the two pieces are shown in the tables below and are based on Jim Samson (1992) and Sharon Winklhofer's (cited in Hamilton, 1996) structural interpretations respectively.[2]

Table 1. Formal Design of Chopin's First Ballade, Op. 23 (based on Samson)

Section	Intro	ExT1	ExTr	ExT2	DeT1	DeT2	DeTr	DeT3	ReT2	ReT1	Coda
Bar	1–7	8–44	44–67	67–93	94–105	106–25	126–37	138–65	166–93	194–207	208–64

Table 2. Formal Design of Liszt's B minor Sonata (based on Winklhofer)

Formal section	Sub-section and bar
Ex (1–204)	Intro (1–7), Thematic presentation (8–17), Bridge (18–31), Tonal presentation (32–44), Tr (45–104)
	2nd-sub theme (105–119), Tonal deflection (120–152)
	<i>Cantando</i> theme (153–196), Cadenza (197–204)
De (205–452)	Thematic presentation (205–276), Tr (277–296), Cadenza (297–318), Bridge (319–330)
	Slow-mvt theme1 (331–348), <i>Cantando</i> theme1 (349–362), 2nd-sub theme (363–396), Slow-mvt theme2 (397–432), <i>Cantando</i> theme2 (433–452)
Re (453–649)	Intro (453–459), Fugato (460–508), Retransition (519–532)
	Tonal presentation (533–545), Tr1 (546–555), Tr2 (556–599)
	2nd-sub theme (600–615), <i>Cantando</i> theme (616–649)
Co (650–760)	Stretta quasi Presto (650–672), Presto (673–681), Prestissimo (682–699), 2nd-sub theme (700–710)
	Slow-mvt theme (711–728), Ending1: Allegro moderato (729–749), Ending2: Lento assai (750–760)

Choice of Pianists and Identification of Virtuosos

As many previous studies have suggested, performance conventions change over time (Bowen, 1996; Fabian, 2003; Leech-Wilkinson, 2009; Peres Da Costa, 2012; Philip, 1992). To avoid potential historical influences, the performances analyzed in this study are confined to contemporary performers (those born after 1970 and are actively engaged in performing careers). Selected recordings are also confined to those made between 2000 and 2019. They were selected from the database of Naxos Music Library[3] according to the above two criteria. The database of Naxos Music Library includes complete catalogues or selected recordings of over 800 labels, including several highly prestigious ones like the *Deutsche Grammophon* and EMI, and more than 149,540 CD-length recordings ('Naxos Music Library,' n.d.). It can therefore be considered as a comprehensive resource of recordings of the two pieces by expert pianists, some likely to be regarded virtuosos. The first ten recordings appearing in the search of the piece that fulfilled the above-mentioned criteria were chosen. This element of randomness was introduced both to control for a manageable data size (ten recordings each) and unbiased selection of pianists while maintaining the likelihood of the same pianists appearing in both datasets.

The analysis of ten recorded performances of each piece was deemed sufficient for comparison because of the large scale of the selected pieces and feasibility of data collection for an initial, exploratory study on this topic. Our aim was to select a sample of pianists of a similar age group who have recorded the selected pieces in recent times to control for sound quality as well as potential historical differences in style and recording technology. The information of the ten recordings of each piece is summarized in Table 3.

Table 3. Selected Recorded Performances of Chopin's First Ballade and Liszt's Sonata

Chopin's First Ballade	Performer (year of birth)	Year of recording	Record label	Duration	Title of recording
1	Dora Deliyska (1980)	2010	Gramola Records (Gramola98899)	8:46	Chopin & Liszt: Ballades and Waltzes
2	Irina Lankova (1977)	2008	Indesens (IL3106)	8:50	Fryderyk Chopin
3	Kotaro Fukuma (1982)	2015	Editions Hortus (HORTUS118)	9:25	Frédéric Chopin
4	Yundi Li (1982)	2016	Deutsche Grammophon (00028948124435)	9:25	YUNDI Chopin
5	Cédric Tiberghien (1975)	2007	Harmonia Mundi (HMC901943)	9:29	Chopin & Brahms: Ballades
6	Evgeny Kissin (1971)	2016	RCA Records (888880760142)	9:44	Evgeny Kissin, Frederic Chopin
7	Eugene Mursky (1975)	2004	Profil (PH04065)	10:00	Frédéric Chopin Edition Volume 1 – Ballades & Impromptus
8	Valentina Lisitsa (1973)	2016	YouTube (https://youtu.be/bvtdjIIcgWQ)	10:04	Chopin Ballade No. 1, Op. 23 G Minor
9	Helene Tysman (1982)	2013	Oehms Classics (OC894)	10:17	Frederic Chopin – Chopin: Ballades, Vol. 2
10	Lars Vogt (1970)	2014	CAvi-music (CAvi8553267)	11:09	Lars Vogt plays Chopin
Liszt's Sonata	Performer (year of birth)	Year of recording	Record label	Duration	Title of Recording
1	Barbara Moser (1970)	2013	Gramola Records	26:18	My Personal Bach
2	Fazil Say (1970)	2007	Warner Classics	28:50	Fazil Say

3	Kirill Gerstein (1979)	2010	Myrios Classics	29:22	Liszt, Schumann and Knussen: Piano Works
4	Yundi Li (1982)	2003	Deutsche Grammophon	29:52	Liszt: Piano Sonata in B minor, S178, etc.
5	Valentina Lisitsa (1973)	2015	YouTube (https://youtu.be/w65QgjWHNDA)	29:53	Liszt Sonata B Minor
6	Evgeny Kissin (1971)	2011 (Live)	Euro Arts Channel	29:55	Verbier Festival 2011
7	Paul Lewis (1972)	2004	Harmonia Mundi	30:05	Liszt: Piano Sonata in B minor, S178
8	Lars Vogt (1970)	2010	Berlin Classics	31:01	Lars Vogt plays Schumann & Liszt
9	Yuja Wang (1987)	2009	Deutsche Grammophon	31:02	Yuja Wang - Sonatas & Etudes
10	Khatia Buniatishvili (1987)	2011	SONY Classical	31:10	Franz Liszt

Once we had established the list of pianists, we searched for reviews of these recordings and of these pianists more generally to identify the most widely regarded virtuosos among this sample based on press reception. The identification of virtuosos in this study is based on critical reviews published in mass media from three major English-speaking countries across three continents: the UK, the US, and Australia. Authoritative media that frequently publish classical music reviews were selected for analysis. They include *The Guardian* and the *Gramophone* from the UK, *The New York Times* and the *Classicstoday.com* from the US, and the *Sydney Morning Herald* from Australia. Reviews of solo piano performance by the selected pianists – recital or recording – published in the past 10 years (2010-2020)[4] were included. The analysis involved counting the number of reviews that contain the words ‘virtuosity’, ‘virtuoso’, and ‘virtuosic’ in describing the performance of the selected pianists out of the total number of reviews found, provided that these words appear in the context that attributes the performer in question to virtuosic performance. The result is summarized in Table 4.

Table 4. Frequency of the appearance of ‘virtuosity’, ‘virtuoso’ and/or ‘virtuosic’ in critical reviews of 16 pianists

Ranking	Performer	Total number of articles reviewed	Total number of articles containing the selected words	Frequency of appearance (%)
1	Evgeny Kissin	13	6	46
2	Valentina Lisitsa	9	3	33
3	Khatia Buniatishvili	12	3	25
3	Kirill Gerstein	8	2	25
5	Yuja Wang	17	4	24
6	Cédric Tiberghien	14	3	21
7	Lars Vogt	9	1	11
8	Paul Lewis	24	1	4
9	Dora Deliyska	1	0	0
10	Kotaro Fukuma	5	0	0

11	Irina Lankova	0	0	0
12	Yundi Li	16	0	0
13	Barbara Moser	0	0	0
14	Eugène Mursky	2	0	0
15	Hélène Tysman	3	0	0
16	Fazil Say	8	0	0

The results indicate that Evgeny Kissin and Valentina Lisitsa have been most often hailed as virtuosos by music critics of English-speaking countries. This, however, does not suggest that the remaining pianists in the sample, all renowned in their own rights and affiliated with international labels, do not display characteristics of virtuosity in their playing at all. Instead, the reviews simply less often label them as virtuosos than they do with Kissin and Lisitsa. These seemingly 'lesser virtuoso' pianists are therefore a real sample that comprises modern pianists of diverse cultural and educational backgrounds as well as stylistic tendencies. It is against this real sample that the two alleged virtuosos – Kissin and Lisitsa – are empirically studied to test whether and in what ways their tendencies in basic tempo differ from their contemporaries.

DATA COLLECTION AND ANALYSIS

For all the recordings analyzed in this study, tempo data were obtained through Sonic Visualiser version 4.0.1 (Cannam, Landone, & Sadler, 2010). This software allows for the visualization of sound and marking each beat onset. Since the efficacy of the automated tracking system of the software was still significantly below that of a human expert (Benetos, Dixon, Giannoulis, Kirchoff, & Klapuri, 2013) at the time of data collection, the beats in the performances were tracked and adjusted manually by the first author. The 'Time Instants Layer' function of Sonic Visualiser enables data comprised of timing relationships to be generated by tapping tempo markers while listening to audio tracks in real time. In order to improve accuracy, the procedure was re-done at a decreased playback speed (50% to 75% slower than the original, depending on the musical context). Most passages in all selected performances were marked at the beat level. Due to the scale of the piece as well as the basic tempo in some sections, Liszt's Piano Sonata was marked at the bar level instead of the beat level. The data were then exported to Excel for further calculations and graph plotting.

This study focuses on basic tempo of performance and excludes moment-to-moment timing variation from the scope. In order to examine the basic tempo of a performance and to compare the tendency of basic tempo across performers, the following items were measured in the following ways:

1. *Average basic tempo of a performance of a piece*

$$= \frac{\text{The total number of beats (Chopin Ballade) or bars (Liszt Sonata)}}{\text{The total duration of the performance (in minute)}}.$$

This item reveals how fast (or slow) a piece is performed by a performer in general. The unit is beat per minute or bar per minute (bpm).

2. *Average basic tempo of a performance of a section* = median value of all the inter-onset-intervals (IOI)s within the section in terms of beat per minute (in the case of Chopin) or bar per minute (in the case of Liszt).[5] This item reveals how fast (or slow) each section of a piece is performed by a performer in general.
3. *Average basic tempo of the sample of a piece* = mean value of the average basic tempos (i.e., item 1) of all ten performances of the piece. This item measures the basic tempo of a piece. The unit is beat per minute (in the case of Chopin) or bar per minute (in the case of Liszt). Comparison between the average basic tempo of a particular performance of a piece (item 1) and the average basic tempo of the sample of the piece (item 3) reveals whether and to what extent the performer plays the piece faster or slower than the average, and hence the general tendency of basic tempo (fast or slow) of a performer, when compared to his/her contemporaries.

4. *Average basic tempo of the sample of a section* = mean value of the average basic tempo (i.e., item 2) of all ten performances of the section. The unit is beat per minute (in the case of Chopin) or bar per minute (in the case of Liszt). This item measures sectional basic tempo. Comparison between the average basic tempo of a performance of a section (item 2) and the average basic tempo of the sample of the section (item 4) reveals whether the performer plays the section faster or slower than the average. It hence allows a clear understanding of which sections the performer plays faster or slower than the average.
5. *The extent to which a performer plays a section faster or slower than the average basic tempo of the sample* = $\frac{\text{Item 2} - \text{Item 4}}{\text{Item 4}} \times 100\%$. After knowing which sections a performer plays faster or slower than the average tempo of the sample, it is necessary to find out the exact extent to which the performer plays each section faster or slower than the average of the sample. Result of this item tells us the degree of a performer's tendency of basic tempo at the sectional level – to what extent a performer plays a section faster or slower than the average. For instance, some performers may tend to play fast sections faster and slow ones slower, but differ only in the extent of this tendency. In these cases, knowing the extent to which a performer plays each section faster or slower than the average basic tempo of the sample helps us compare and distinguish their tendencies. This item reveals this extent, indicated in percentage, in each section of the two selected pieces.
6. *The extent to which a performer tends to play fast sections with exceptionally fast tempo and slow sections with exceptionally slow tempo*. It was suggested in previous studies that virtuosos play fast music exceptionally fast to showcase their technical accomplishment. It is therefore necessary to examine whether the two alleged virtuosos always play fast sections of the two pieces in exceptionally fast tempo (i.e., consistently faster than the average tempo of the sample) and whether the faster the sections the faster they play. To achieve this goal, all the sections of each selected piece were arranged in the order of basic tempo: from the fastest section to the slowest section, according to the average tempo of the sample in each section (item 4). In this analysis, we have split each work into faster and slower sections based on the average tempo in each section, allocating half of the total number of sections to 'fast' and the other half to 'slow' sections. Accordingly, Chopin's Ballade is divided into five fast sections and five slow sections. Liszt's Sonata is divided into 17 fast sections and 16 slow sections. Having established the extent to which a particular performer plays each of these sections faster or slower than the average basic tempo of the sample (item 5) and having arranged the sections of each piece in a descending order of average basic tempo, a graph easily shows whether and to what extent a performer tends to play the fast sections faster than the average tempo of the sample, with the sections (arranged from the fastest to the slowest) on the x-axis and the extent to which the performer plays each section faster or slower than the average tempo of the sample on the y-axis. The slope of the linear regression line in the graph (i.e. the linear regression of all results of item 5) reveals this tendency of a performer. We term this tendency the '*extreme tempo tendency*' as it indicates a performer's tendency to of faster the section faster he/she plays. It is calculated using the 'SLOPE' function in Excel, covering the differences in basic tempo between the performer and the average of the sample of all sections of a piece, arranged from the fastest to the slowest: 'SLOPE(Ta:Tx,Ea:Ex)', where Ta refers to the average basic tempo of the sample of the fastest section of the piece, Tx refers to the average basic tempo of the sample of the slowest section of the piece, Ea refers to the extent to which a particular performer plays the fastest section (Ta) faster or slower than the average basic tempo of the sample, and Ex refers to the extent to which a particular performer plays the slowest section (Tx) faster or slower than the average basic tempo of the sample. A positive number indicates that a performer demonstrates extreme tempo tendency – playing fast sections generally faster than the average of the sample and slow ones generally slower. A negative number indicates that a performer plays fast sections slower and slower sections faster. The larger (more positive) the number the stronger the extreme tempo tendency; the smaller (more negative) the number the weaker the extreme tempo tendency. The unit of the slope is the percentage difference in tempo (between the performer's sectional tempo and the average of the sample) per bpm (beat per minute or bar per minute).

7. *Standard deviation of sectional tempo of a performance.* It is calculated using the ‘STDEV.P’ function in Excel, covering the average basic tempo of each section (i.e., item 2) of the performance. It measures the variability of basic tempo across sections in a performance. The unit is beat per minute (in the case of Chopin) or bar per minute (in the case of Liszt).

8. *Average standard deviation of basic tempo of the sample of a piece* = mean value of the standard deviation (i.e. item 7) of all ten performances of the piece. It measures the average value of the variability of basic tempo across sections, in beat per minute (in the case of Chopin) or bar per minute (in the case of Liszt).

RESULTS

Figures 1 and 2 show the average basic tempo (item 1) of each of the ten performances of the two pieces (indicated by the bars) as well as the average value of the sample (item 3, indicated by the horizontal dotted line). It can be seen from the two figures that the average basic tempo of both Lisitsa and Kissin in both Chopin’s Ballade and Liszt’s Sonata are a little slower than the average tempos of the samples of the respective piece. For Chopin’s Ballade, Lisitsa and Kissin are the eighth fastest (i.e., the third slowest) and the sixth fastest (i.e., the fifth slowest) respectively among the ten pianists. For Liszt’s Sonata, Lisitsa and Kissin are the fifth and the sixth fastest respectively. In these results, the main point is not the degree of difference but the fact that neither Lisitsa nor Kissin’s average overall basic tempo of the two selected pieces are faster than that of their contemporaries.

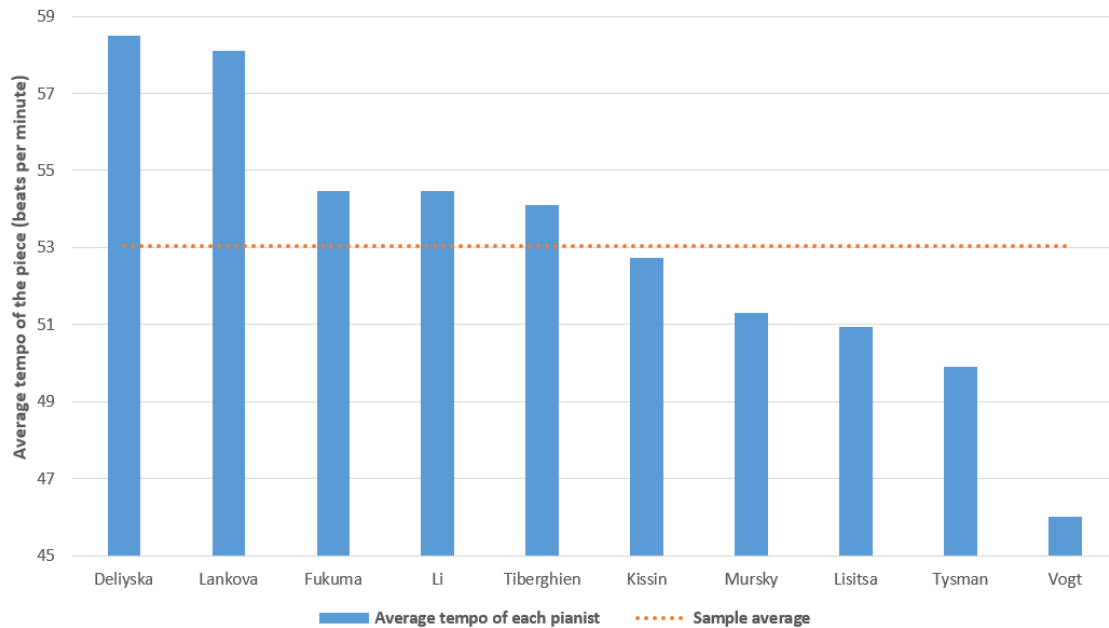


Figure 1. Average Basic Tempo in Ten Performances of Chopin’s First Ballade and their Average

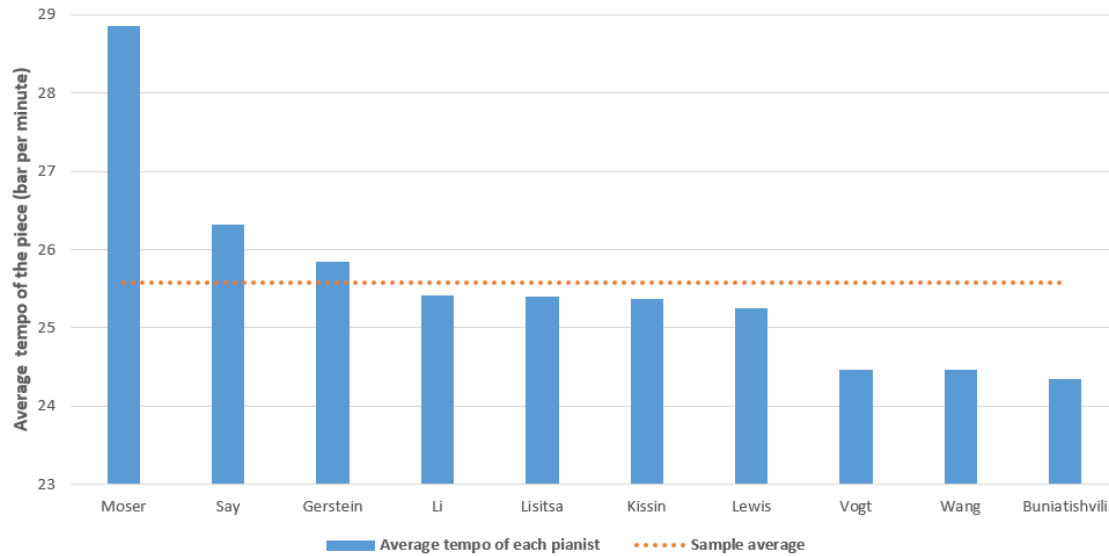


Figure 2. Average Basic Tempo in Ten Performances of Liszt's Sonata and their Average

Although their overall basic tempos are not fast when compared to their contemporaries, Kissin and Lisitsa tend to play faster than the average in fast, mostly figurative sections in both pieces. Tables 5 and 6 show each pianist's frequency of playing the fast sections faster than the average and the slow sections slower. Lisitsa ranks first in terms of the number of sections played faster than the average tempo of the sample in both Chopin's Ballade and Liszt's Sonata. In the former, she plays all fast sections (five out of five) faster than the average tempo of the sample; in the latter, she plays 16 out of 17 fast sections faster than the average tempo of the sample.[6] Kissin ranks third in Chopin's Ballade, with three out of five fast sections played faster than the average tempo of the sample. He ranks fifth in Liszt's Sonata, with five out of 17 fast sections played faster than the average tempo of the sample. In contrast, they tend to play the slow, lyrical sections of the two pieces slower than the average tempo of the sample: Lisitsa and Kissin both play four of the five slow sections of Chopin's Ballade slower than the average tempo of the sample. The two pianists also play ten of the 16 slow sections of Liszt's Sonata slower than the average tempo of the sample. In Chopin's Ballade, Lisitsa ranks second among the ten pianists in terms of the number of slow sections played slower than the average tempo of the sample. In Liszt's Sonata, she ranks equal second with Kissin. Kissin ranks equal first (with Vogt) in Chopin's Ballade and equal second (with Lisitsa) in Liszt's Sonata.

Table 5. Each Pianist's Frequency of Playing Fast Sections Faster and Slow Sections Slower than the Average: Chopin's First Ballade

Pianist	Number of fast sections (max. 5) faster than the average	Number of slow sections (max. 5) slower than the average	Total number of sections (max. 10) faster / slower than the average
Lisitsa	5	4	9
Kissin	3	5	8
Tiberghien	3	3	6
Vogt	1	5	6
Lankova	4	1	5

Tysman	1	3	4
Fukuma	2	1	3
Mursky	0	3	3
Li	0	1	1
Deliyska	0	0	0

Table 6. Each Pianist's Frequency of Playing Fast Sections Faster and Slow Sections Slower than the Average: Liszt's Sonata

Pianist	Number of fast sections (max. 17) faster than the average	Number of slow sections (max. 16) slower than the average	Total number of sections (max. 33) faster / slower than the average
Buniatishvili	14	15	29
Lisitsa	16	10	26
Li	7	9	16
Kissin	5	10	15
Moser	10	1	11**
Say	4	7	11
Lewis	2	7	9*
Vogt	0	9	9*
Gerstein	1	3	4

* = Mostly or exclusively just slower in slow sections.

** = Mostly just faster in fast sections.

In terms of the total number of fast sections played faster and slow sections played slower than the average tempo of the sample, Lisitsa ranks first in Chopin's Ballade and second in Liszt's Sonata, while Kissin ranks second in Chopin's Ballade (just behind Lisitsa) and fourth in Liszt's Sonata, as shown in the right columns of Tables 5 and 6. These results show that the two alleged virtuosos tend to play with an extreme tempo tendency – playing fast sections extremely fast and slow sections extremely slow.

The results of item 5 are summarized in Figures 3 to 6. These show the extent to which Lisitsa and Kissin's basic tempo in each section differs from that of the average tempo of the sample (item 5), with the sections on the x-axis arranged from the fastest to the slowest. The 0% on the y-axis indicates the average tempo of the sample in each section. In other words, a value above the y-axis shows that the performer plays the section faster than the average tempo of the sample and a negative value that they play slower.

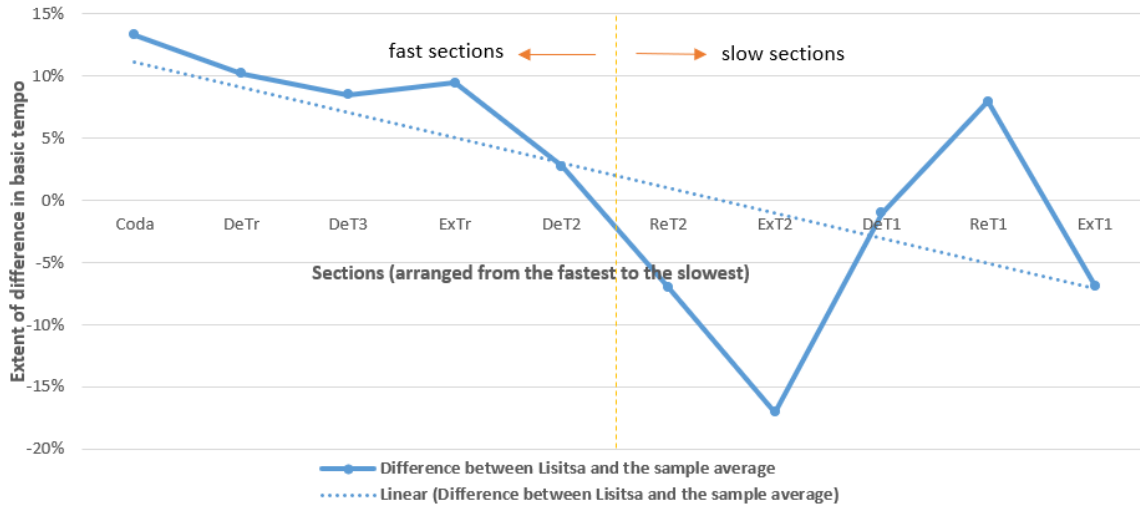


Figure 3. The Extent to which Lisitsa Plays Each Section of Chopin’s First Ballade Faster or Slower than the Average and the Linear Regression of the Extents of All Sections (Extreme Tempo Tendency)

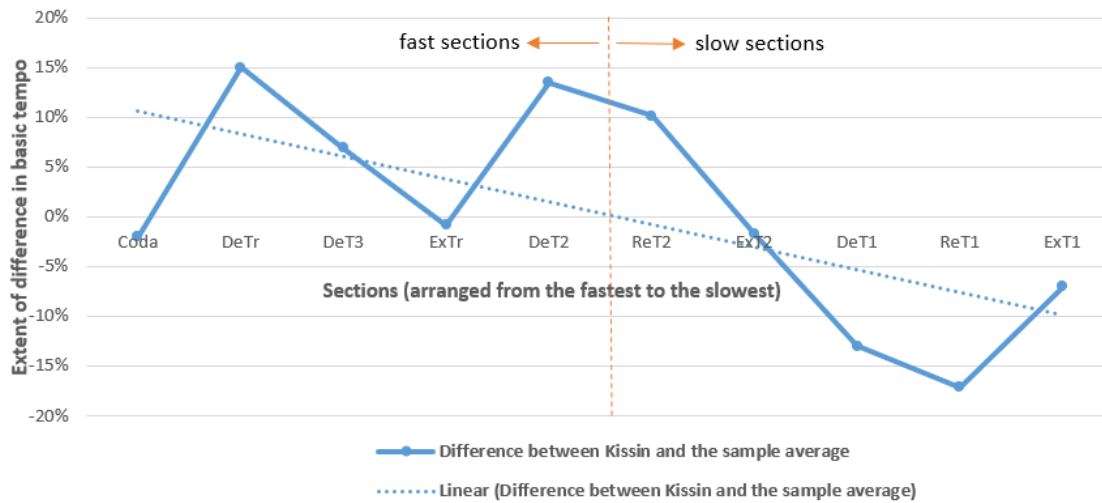


Figure 4. The Extent to which Kissin Plays Each Section of Chopin’s First Ballade Faster or Slower than the Average and the Linear Regression of the Extents of All Sections (Extreme Tempo Tendency)

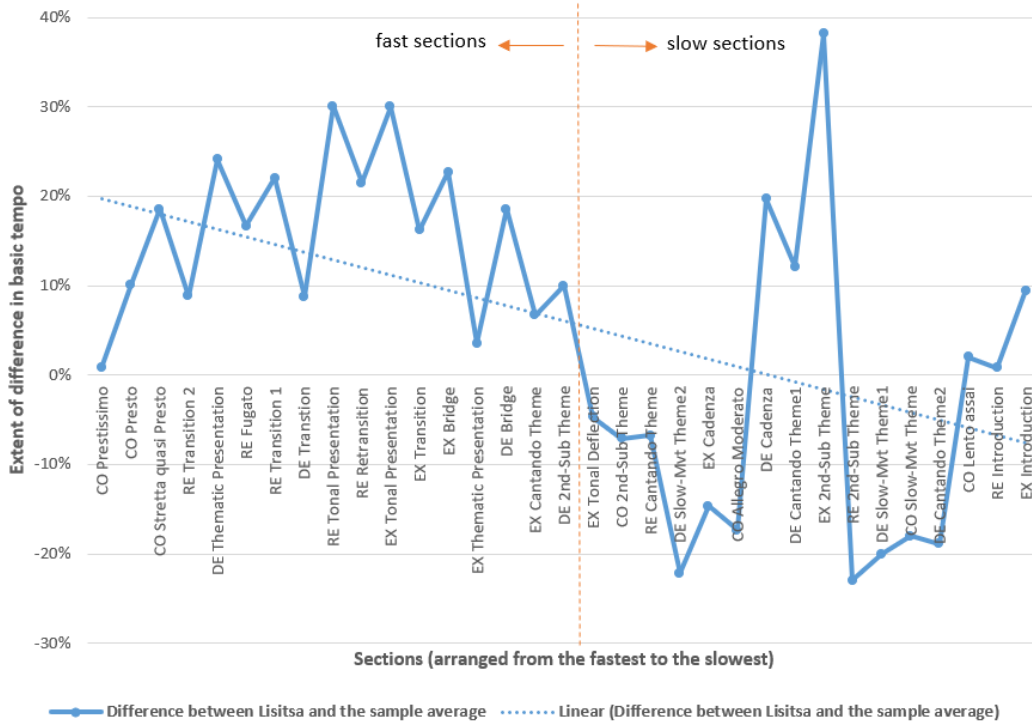


Figure 5. The Extent to which Lisitsa Plays Each Section of Liszt’s Sonata Faster or Slower than the Average and the Linear Regression of the Extents of All Sections (Extreme Tempo Tendency)

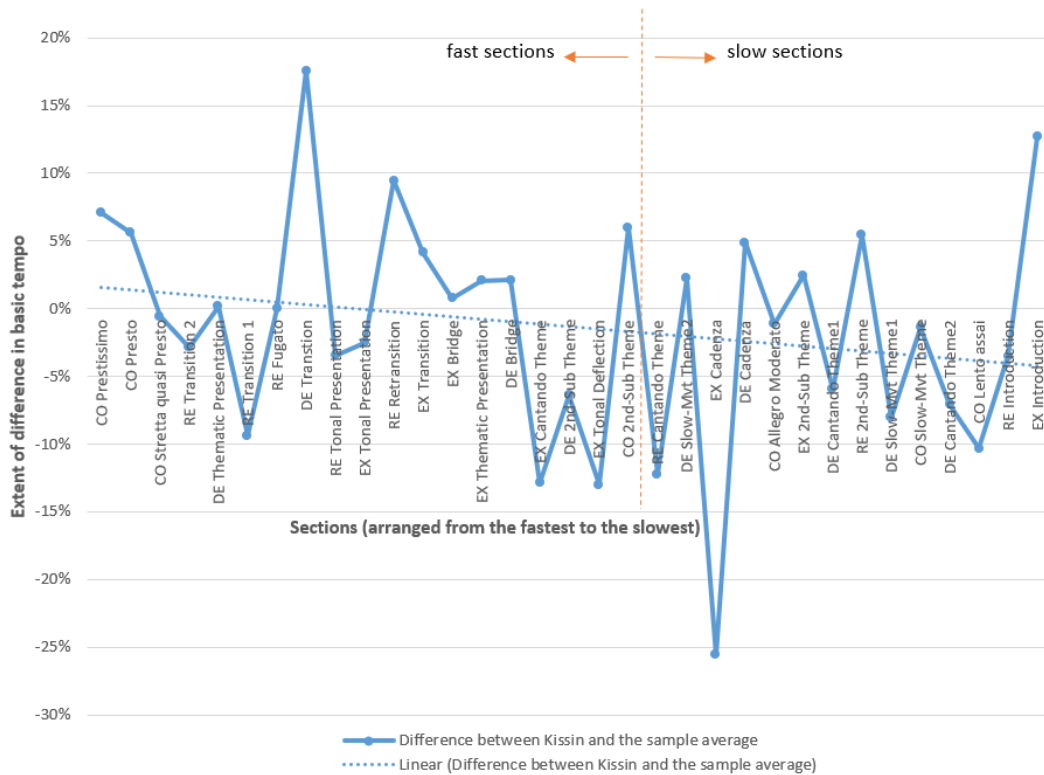


Figure 6. The Extent to which Kissin Plays Each Section of Liszt’s Sonata Faster or Slower than the Average and the Linear Regression of the Extents of All Sections (Extreme Tempo Tendency)

To further examine the extent of the extreme tempo tendency of these two pianists (item 5), the results of all the sections are averaged by simple linear regression, shown by the trend lines (the small dotted lines) in each graph. The trend line indicates the extent to which each of the two pianists plays fast sections with faster-than-the-average tempo and slow ones with slower-than-the-average tempo, that is the extent of extreme tempo tendency. The trend lines in Figures 3 to 6, all descending, indicate that both Kissin and Lisitsa play with extreme tempo tendency in the two selected pieces to a greater or lesser extent.

The results of item 6 – the comparison of the extent of this tendency among performers – are shown in Figures 7 and 8. They show the calculated value of the slope of each performance. The results demonstrate that Lisitsa’s extreme tempo tendency is the strongest among all ten pianists in Chopin’s Ballade and the second strongest in Liszt’s Sonata. Kissin’s extreme tempo tendency is second strongest in Chopin’s First Ballade (behind Lisitsa) and the third strongest in Liszt’s Sonata (behind Buniatishvili and Lisitsa).

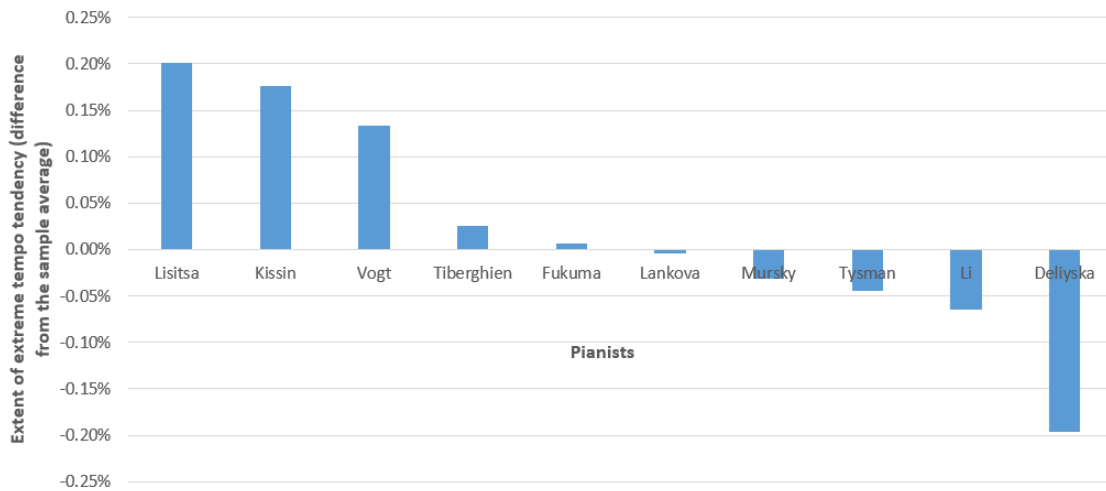


Figure 7. Each Performer’s Tendency to Play with Extreme Sectional Tempo (negative results indicate lack of such tendency): Chopin First Ballade

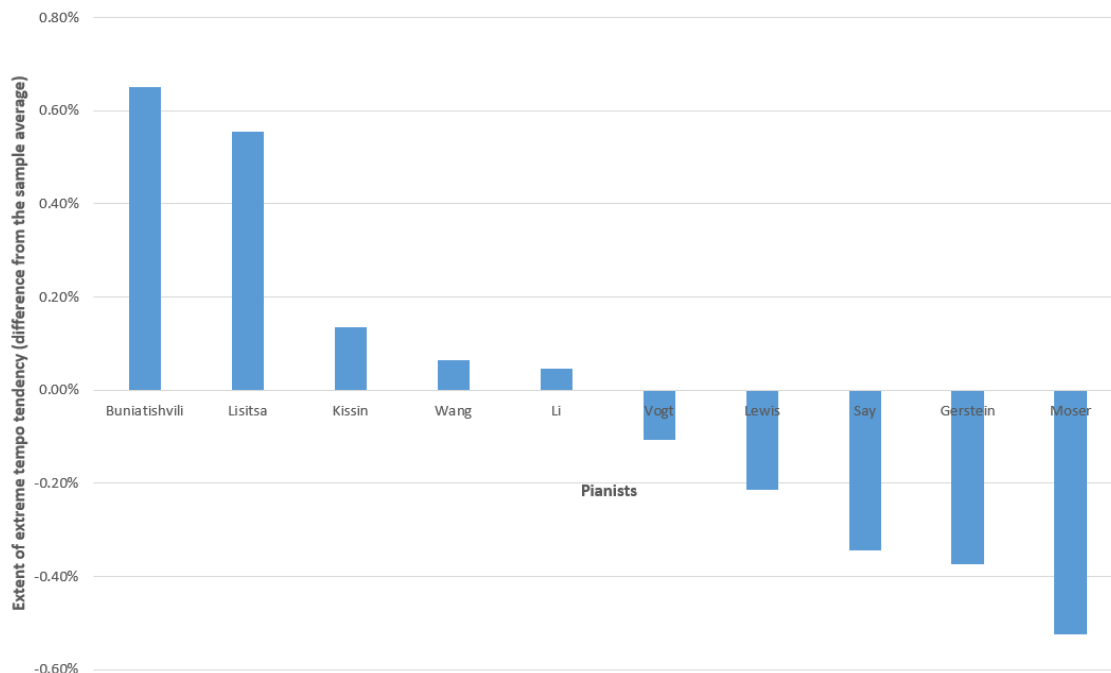


Figure 8. Each Performer’s Tendency to Play with Extreme Sectional Tempo (negative results indicate lack of such tendency): Liszt’s Sonata

There are some pianists who adopt the opposite strategy to the extreme tempo tendency, a tendency for more even tempo across sections. For instance, in Chopin’s Ballade (Figure 7), Deliyska shows the weakest extreme tempo tendency. This matches the results in Table 5 which shows that Deliyska plays none of the fast sections faster and none of the slow sections slower than the average tempo of the sample. In other words, she plays all the fast sections slower than the average and all the slow sections faster. Her tendency creates an even sectional tempo and avoids extreme tempo contrast across sections.

The results of item 7– standard deviation of the ten performances of each piece – also confirm these observations and are summarized in Table 7. This shows that Lisitsa’s standard deviation in both pieces are the highest in each of the samples. Kissin’s standard deviation is the second highest in Chopin’s Ballade and the third highest Liszt’s Sonata. Deliyska, who demonstrates an even tempo tendency, ranks last in Chopin’s Ballade. The results are another indicator of the extent of extreme tempo tendency in each performance.

Table 7. Average and Individual Standard Deviation of the Basic Tempo across the Sections of the Two Selected Pieces

Pianist	Standard Deviation in Chopin's First Ballade	Pianist	Standard Deviation in Liszt's Sonata
Lisitsa	39.25	Lisitsa	16.56
Kissin	36.87	Buniatishvili	15.99
Lankova	35.11	Kissin	14.02
Tiberghien	34.33	AVERAGE OF SAMPLE	13.44
Fukuma	33.47	Wang	13.40
AVERAGE OF SAMPLE	33.43	Li	13.22
Vogt	33.11	Moser	12.52
Tysman	31.66	Vogt	12.40
Li	30.82	Say	12.34
Mursky	30.78	Lewis	11.96
Deliyska	28.87	Gerstein	11.95

DISCUSSION

Four findings regarding the tendency of basic tempo in the performances of the two alleged virtuosos emerged from the results. First, in terms of the general duration of the two selected pieces, it is found that the two alleged virtuosos do not always play faster than their contemporaries: the average basic tempo of both Kissin and Lisitsa are in fact somewhat slower than the averages of two sets of samples (see Figure 1 and Figure 2). In other words, their performances of the two selected pieces do not have the shortest durations in the sample (see Table 3). This may seem, to certain extent, unexpected given the general emphasis on speed in previous literature on virtuosity. Perhaps more importantly, it indicates that in large-scale sectional pieces overall duration and average tempo of the piece may not be particularly telling data for revealing a performer's stylistic tendency. Average tempo at the sectional level may yield more meaningful results.

Second, the two alleged virtuosos tend to play fast sections of the two selected pieces in faster-than-average tempo. This finding is largely in line with what has been observed in psychological literature (Ginsborg, 2018) on the one hand, and in historical studies about the characteristics of virtuosic performances (Gooley, 2004; Samson, 2007) on the other. Both research perspectives have suggested that one of the main goals of virtuosos' exceptionally fast tempo is to display their outstanding technical accomplishment. Performing fast, figurative passages extremely fast will no doubt dazzle the audience.

Third, the two alleged virtuosos tend to play slow sections of the two selected pieces in slower-than-average tempo. This finding seems to be a novel insight into the concept of virtuosity as there is very little, if any, discussion about virtuosos' performance of slow, lyrical music in existing literature. Furthermore, past research almost unanimously suggests that fast speed characterizes virtuosic performances. This finding therefore sheds new light on our understanding of how the concept of virtuosity is manifested in modern performance and may not have been proposed without the empirical analysis presented in this research.

Lastly, based on the first three findings, this research suggests the two alleged virtuosos demonstrate an extreme tempo tendency in their performances: playing fast sections faster than their contemporaries and slow ones slower in general. As a result, they demonstrate a high level of variability of basic tempo at the sectional level. This vivid contrast in tempo between fast and slow sections is particularly prominent in Lisitsa's performance of Liszt's Sonata, in which she plays all of the fast sections faster than the average (in many cases the fastest) and many slow ones slower than the average. The extreme tempo tendency, potentially a quintessential characteristic of piano virtuosos, supports the widely held view that a virtuoso performer dazzle the audience by showcasing technical brilliance through extraordinary speed and at the same time astound the audience by expressive rapture and deeply felt emotions heightened by slower-than-average tempo.

According to these four findings, it can be concluded that instead of a fast average speed in general, the extreme tempo tendency found in the performances of Kissin and Lisitsa seems to be a paramount feature of the two contemporary pianists who are most often hailed as piano virtuosos by music critics of English-speaking countries. This finding is underscored by the opposite examples of Deliyska and Moser, whose performances show extreme tempo on the one end but not the other (see Figure 1 and Figure 2). Deliyska plays the fast sections of Chopin's Ballade in tempos that are comparable to the average tempos of the samples, but her tempo in the slow sections is consistently faster than most other pianists (Table 5). Moser's performance of Liszt's Sonata, lasting for 26 minutes and 18 second, is more than three minutes shorter than that of Lisitsa and Kissin respectively (Table 3). She plays the fast sections consistently faster than the average tempo of the sample, but her tempo in the slow sections is also consistently faster than the average of the sample (Table 6), resulting in the short duration of her rendition. However, in the examination of press reception (Table 4), these two pianists have barely drawn the attention of music critics of the English-speaking countries. This seems to indicate that the extreme tempo tendency – playing exceptionally fast in fast sections *and* exceptionally slow in slow sections – may be considered a more important manifestation of the notion of virtuosity than playing a piece exceptionally fast *or* slow throughout. In other words, it may be the stark emotional contrast brought by the extreme tempo tendency, instead of fast speed itself alone, that strikes the music critics and gives rise to their perception of virtuosity.

Apart from the four major findings mentioned above, there are two noteworthy observations from the results that deserve to be highlighted and discussed in great detailed. First, in Liszt's Sonata, neither Kissin nor Lisitsa shows the strongest tendency of extreme sectional tempo. It is Khatia Buniatishvili who shows the steepest slope, that is the highest extent of faster-than-the-average and slower-than-the-average sectional tempo (see Figure 8). At the same time, Buniatishvili's standard deviation of sectional tempo in Liszt's Sonata is the second highest, just behind Lisitsa (see Table 7). In terms of the number of fast sections played faster than the average tempo of the sample, Buniatishvili also ranks second, just behind Lisitsa again. For the number of slow sections played slower than the average tempo of the sample, Buniatishvili ranks first, ahead of Lisitsa. It makes her the pianist with the highest number of faster-than-the-average fast sections and slower-than-the-average slow sections, as shown in the last column of Table 6. All this means that based on the results of this empirical analysis of sectional basic tempo alone, Buniatishvili's tendency to showcase virtuosity is similar to, or even stronger than, that of Kissin and Lisitsa. Our review of press reception indicates that Buniatishvili is also a pianist who has often been labelled a virtuoso by music critics (ranked third in Table 4, just behind Kissin and Lisitsa). She is perhaps not yet considered a virtuoso as widely or frequently as Kissin and Lisitsa are because of her young age. While she is in her mid 30s and has established her career for about a decade, the other two are in their early 50s, and have been highly acclaimed pianists in the international music scenes for many more years, especially Kissin who was first known as a piano prodigy in the 1980s. It might be the more long-lasting careers of Kissin and Lisitsa instead of the features in their performance alone that leads to their fame as virtuosos. If our preliminary analytical results have identified key tendencies of virtuosos as we would like to claim, then Buniatishvili will increasingly be assessed as a contemporary virtuoso in the coming years, unless she dramatically changes her style.

Second, when we compare Figure 3 to Figure 4 and Figure 5 to Figure 6, we can see that the trend lines of both Kissin and Lisitsa are descending in both works whereas the shapes of their tempo curves in each pair of graphs are strikingly discrepant. This similarity-discrepancy shows that the extreme tempo tendency found in their performances is only a general tendency. Virtuosos may demonstrate a great deal of individuality as individual differences in tempo can be significant and manifest in many aspects of the parameter of tempo (Zhou & Fabian, 2021). For instance, Kissin tends to play the transitional passages in exceptionally fast tempo, such as the transitions in the developments of both works respectively (Figure 4 and Figure 6). This imbues the preceding and ensuing main themes with extra 'weight', enhancing the sectionalization of the work. Lisitsa tends to play themes with heroic and brilliant characters faster, such as the third theme (DeT3) of Chopin's Ballade and the second subject theme in the exposition of Liszt's Sonata. This creates a strong sense of urgency and drama. Overall, the performances of the two pianists show similar properties on the one hand and create, to a greater or lesser extent, different expression on the other. Empirical analysis of the features of local timing variation and other parameters in their performances may further enhance our understanding of the concept of virtuosity. These features are, however, not within the scope of the current study.

CONCLUSIONS AND FUTURE RESEARCH

Current consensus holds that one of the most important strategies of virtuosos or characteristics of virtuosic performance is to exhibit technical excellence via fast speed of execution. This widely held view is based mostly on historical and anthropological studies and has not been empirically tested or analyzed, as far as we could ascertain. This preliminary study provides a step forward to fill this gap by marshalling some empirical evidence on modern pianists' tendency of tempo choice in performances of two large-scale pieces by Chopin and Liszt. The results show that the two alleged piano virtuosos of our time – Kissin and Lisitsa – and a third emerging virtuoso – Buniatishvili – tend to play fast sections faster and slow sections slower than most of the other pianists of the sample. As a result, they exhibit an extreme tempo tendency in their performances. In fast-paced and figurative sections, the alleged virtuosos tend to play with tempo that is generally faster than that of their contemporaries to showcase their technical prowess. Nevertheless, fast speed alone does not demonstrate their virtuoso personas in full. In slow-paced and more lyrical sections, they tend to play with tempo that is generally slower than that of their contemporaries, which may in turn further strengthen the sense of fastness in the fast passages. The extreme tempo tendency potentially creates enormous and dramatic contrast in mood and expression within a large-scale piece, enhancing the urgency of the fast sections on the one hand and the lyricism of the slow ones on the other. It might be what prompted the Russian critic Vladimir Stasov to describe Liszt's first concert in St. Petersburg in April 1842 thus: '... we had never been in the presence of such a brilliant, passionate, demonic temperament, at once moment rushing like a whirlwind, at another pouring forth cascades of tender beauty and grace. Liszt's playing was absolutely overwhelming...' (cited in Walker, 1983, p. 376). In any case, the findings of this study suggest that the two pianists who are most often hailed as piano virtuosos by music critics of English-speaking countries do not merely achieve virtuosity through exceptional speed of execution. Instead, velocity is only one aspect of their virtuosic performances. The two other aspects regarding tempo choice that clearly emerged in our empirical analysis, yet hitherto not recognized, are the exceptionally slow tempo in slow sections of a piece and the extreme contrast in basic tempo between fast and slow sections.

Emery Schubert and Dorottya Fabian (2014, p. 298) propose that it might be the large-scale variability in tempo rather than the overall tempo in a performance that contributes to listeners' perception of expressiveness. In this study, we also posit that this large-scale variability in tempo seems to capture what might be the salient features of virtuosity. The results suggest that it may be the combination of technical display and immense expressivity that manifests the concept of virtuosity in Kissin and Lisitsa's performances. We therefore argue that the two alleged piano virtuosos tend to manifest the concept of virtuosity both in the broader sense – dazzling the audience through personal charisma, novelties of technique and broadened expressive power (Jander, 2001) – as well as in the narrower sense – displaying of exceptional technical skills through speed, agility and accuracy in performance (Samson, 2007). If 'the true virtuoso has always been prized not only for his [technical] rarity but also for his ability to widen the technical and expressive boundaries of his art' (Jander, 2001), the extreme tempo tendency as well as the expressive drama engendered by this tendency may indeed be some of the key strategies modern pianists adopt to establish themselves as the true virtuosos of our time.

The Lisitsa-Kissin ranking found in the empirical results as opposed to the Kissin-Lisitsa order found in the press reception, as well as the Buniatishvili case mentioned above all show that critical reviews in mass media may not always be a reliable indicator for identifying virtuosos (and non-virtuosos). This preliminary study hypothesized virtuosos based exclusively on their press reception. The analytical results indicated that the identified pianists showed tendencies in basic tempo that partially supported generalist claims of prior research on virtuosity, justifying the label. However, the results also showed differences in the ways of delivering the extreme tempo tendency. To more comprehensively and accurately understand the perception and identification of performance as virtuosic, the variability among virtuosos' performances could be investigated in comparison to other expert or emerging pianists, and listening experiments could be conducted to examine how audience's perception and reception of virtuosity might match the features of virtuosic performance as identified by analytic studies such as this one.

Another limitation of this preliminary study is the sample size, the number of pianists and pieces analyzed. A larger number of performances would increase the reliability of the results. It would also be worth exploring whether the findings of this study can be replicated in other repertoires or in performances of different generations of musicians. Although the sampling in this study may seem small, it has been purposefully controlled (confined to contemporary pianists and recent recordings) and provides the first step towards gathering and analyzing empirical data regarding tempo in large-scale sectional works. To our

knowledge, this is the first study that involves the analysis of entire pieces of a scale like Liszt's Sonata. Most previous research focused on short and relatively slow pieces or just sections of them (e.g., Chopin's mazurkas, preludes, and selected etudes). Current technology does not enable accurate automation of beat onset data collection, certainly not in romantic music performance with all its micro-variability. The necessity in such repertoire to manually track each beat considerably hampers efficacy of data collection. Available datasets such as the Maestro on Google contain youth performances at piano competition and as such might be useful for a comparative study of alleged/established virtuosos and emerging expert performers. In this exploratory study we wanted to focus exclusively on well-established and highly regarded concert pianists with recordings released by major labels. Our results are preliminary yet worth noting as they provide new insights as well as much needed empirical evidence for generalized claims about the nature of virtuosity in music performance. To further deepen our understanding of tempo tendencies of virtuosos and increase reliability, future research should be directed towards expanding the database, including more performances of virtuosos and a larger repertoire from more diverse musical styles. Analysis of a larger number of performances and further aspects of their tendencies can test the validity of these preliminary results and foster a deeper and more comprehensive knowledge of virtuosos' performance practice.

In this research, we analyzed the basic tempo at the piece and the sectional levels. Another potentially important aspect of virtuosic performance may lie in expressive timing, manifested in terms of local timing variation. To better appreciate tempo and timing tendencies of virtuosos, future studies need to expand the scope of investigation by analyzing tempo and timing variation at both the global and the local levels. This will offer insights into whether and how virtuosos may play more expressively than their counterparts, especially in the slower-than-the-average slow sections, or whether they are merely 'empty virtuosos' manipulating affect purely through extreme tempo at the sectional levels. It will offer a more holistic understanding of the concept of virtuosity, its manifestation in performance, as well as expression and expressiveness in virtuosic performance.

NOTES

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[2] Accuracy (control and precision alongside speed) is not examined here as the analytical data is collected from studio recordings that contain no errors. Furthermore, we assume that the pianists' choice of tempo is influenced by their thresholds of maintaining accuracy.

[3] In these tables, Intro refers to introduction, Ex refers to exposition, De to development, Re to recapitulation, Tr to transition, mvt to movement, sub to subject T1 to theme one, T2 to theme two and T3 to theme three.

[4] Accessed at naxosmusiclibrary.com on 13 August 2019.

[5] When the date of the review article is unknown, the date of the release of the recording was used.

[6] Median value of IOIs is preferred to mean value when measuring section tempo because the former reduces the influence of very long and very short beats on the ultimate result. Since performers may, for example, employ exceptionally long pauses between phrases or exceptionally lengthen the beat under a fermata sign, it is considered likely that the mean value may underestimate the basic tempo of the performance (Repp, 1998, p. 1088).

[7] The only fast section that Lisitsa does not play faster than the average tempo is the *Prestissimo* passage in the coda, in which her tempo is neither faster nor slower than the average (0% difference).

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APPENDIX

Reviews of the Selected Pianists (all accessed on 14 September 2020)

Khatia Buniatishvili

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