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Section 6.2 [text only; for illustrations, see the online version]

Recording Analysis of J.S. Bach's G Minor Adagio for Solo Violin (excerpt): a Case Study.*

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Introduction:

Recordings, which now document more than a hundred years of performance, are increasingly being understood as vitally important sources of evidence for tackling questions of the widest possible interest, whose answers draw on the history of performance and style, music perception and cognition, cultural history and discography. An increasing number of books and articles have emphasised the crucial role that recordings have played in all aspects of twentieth-century music, influencing listeners, composers and performers in unprecedented ways that are not yet understood. While recordings may be criticized as being mere representations of isolated, sterile performances[1], recording analysis still gives us exclusive insights into performers' interpretative approaches and norms of practice.

As part of a broader research investigating the recording history of J.S. Bach's Sonatas and Partitas for solo violin, I have examined the mode of execution of central musical parameters on a large number of violinists who have recorded this repertoire. Utilizing such rich source material, my aim was to trace changes in styles of performance throughout the years, and to detect mutual influences, conventions and canonic traditions. Bearing in mind the background of the performers, I attempted to correlate interpretation profiles with several categories.

The current paper presents an account of my preliminary examinations conducted as a case study, by analyzing recordings of the first nine measures of J.S. Bach's first movement (Adagio) of Sonata No. 1 in G minor (BWV 1001) for unaccompanied violin (average performance time 1:30). Focusing on this major work - the popularity of which has generated a large number of recordings - enabled me to analyze a broad

spectrum of performances representing different periods, stylistic traditions and schools of interpretation.

Existing studies of performances based on sound recordings have tended to focus on established trends and conventions as manifested in various periods. Several widely-accepted conclusions have been presented so far. Growing consent has it that early twentieth-century players portray diversity of style, whereas the second half of the twentieth- century witnessed increasing uniformity of interpretation profiles (Philip 1992 and 2004). It has also become commonplace to draw a distinction between 'mainstream' and 'historically informed' performances as separate categories (Fabian 2003, Butt 2002, Ornoy 2006 and 2007).

Little attention has been paid, however, to individual artistic profiles and idiosyncratic expression. Yet, without close scrutiny of individual differences that are strongly connected to idiomatic-technical aspects of playing, it is difficult to differentiate between general features of stylistic traditions, and those of peculiar, distinctive identities. By involving both auditory tracing and software-assisted methods, this current study seeks to identify such individual characteristics. By relating idiosyncrasies to the date of recording, as well as to the age and background of the performer, I scrutinize the assumptions presented in previous studies, and attempt to provide a step towards addressing the difference between conventions and personal traits in interpretation.

Many studies of Bach's six Sonatas and Partitas for violin solo have addressed the issue of publication sources and editions (Unverricht 1980, Sevier 1981, Stowell 1987, Field 1999), performance history and interpretation (Gerstung 1970, Efrati 1979, Sevier 1981, Lester 1999), compositional and stylistic aspects (Hofmann 1982, Bomar 1987) or recording reviews (Haylock 2000). Previous recording analyses

include a study of the G minor sonata recordings made by three prominent violinists (Cseszko 2000), and an examination of recordings of the entire set played by a large group of violinists (Fabian 2005).

My study differs from previous studies because it focuses on a much shorter musical fragment. This enables the innermost nuances of expression to be meticulously scrutinised. In addition to addressing several elements of performance that were previously neglected in recording analyses of this piece - such as phrasing, fingering and various features of articulation - I examine the relation between such data, and between the school and the date of birth of the performer. I explore this relationship alongside the more commonly addressed issue of the recording period and its implications on collected data. On a smaller scale, I also draw parallels between editorial directives and analyzed recordings.

a. Recording date:

Several aspects need to be addressed prior to analysis, not least of which is the date of recording; though here much caution must be exercised prior to consolidating any definite conclusions. Features which should be taken into account include: the limited frequency range of early technologies (affecting, for example, the ability for adequate dynamic analysis of acoustic recordings produced prior to 1925); the cut-edit process introduced in the 1940s (almost eliminating documented 'one take' single performances other than those labeled as 'live'); the gradual increase in artificial sound manipulations made in the studio (which achieved their full impact from the 1960s onwards); and other factors specifically connected to the recorded instrument at hand. For example, performers of high registered instruments were often asked to reduce dynamics or, literally, to take a step backwards in the acoustic recording studio so as not to produce distortion on the wax. Factors such as these would surely have

influenced articulation, bowing and other related features. The use of the Stroh-violin (popular around 1902-1914), where a horn was attached to the sounding board for clearer distribution of sound, is a case in point. It would have affected aspects of the performer's right-hand technique, since the horn was usually mounted on one side of the bridge. Likewise musician's of the time would have experienced a sense of discomfort relative to modern recording artists because of the small size of the recording studios that were prevalent in that era.[2] That said, the recordings I analyze here (except for Joachim's recording dated 1903) were produced during the electronic period of recording, eliminating the need to address several of these factors associated with earlier recording techniques.

b. Performer's age:

That the performer's age is an influential parameter, is premised on the supposition that performers born during the earlier decades of the last century were educated in an era when general norms of practice might not have been influenced by recordings. The invention of magnetic tape in the mid-1940s, as well as the emergence of the editing studio, brought about an unprecedented circulation of commercial recordings. Assuming that performers' average period of study encompasses at least twenty years, the year 1925 has been chosen as the point of reference. Performers born after this date are considered likely to have been exposed to recordings throughout their period of study, while those born before are considered unlikely to have had such exposure. Norms of practice, which were outmoded thereafter but discerned in the recordings of senior artists made later on, indicate the significant status of interpretive models that one consolidates during one's early artistic development. In such cases, 'archaic' elements of performance, exhibited by performers who were educated during earlier decades, prove to be unchallenged by 'modern' prevalent attitudes.

Table 1 presents performers' names, dates of birth, recording issues and labels (in chronological order).

[Table 1]

c. Performer's school:

The matter of the performer's school poses further aspects for clarification. While 'school' traditionally relates to the geographical location of a music conservatory or to a particularly authoritative teacher, the amalgamation of performance styles, pedagogic methods and technical characteristics was a dominant feature during the course of the nineteenth century; gaining full impetus in the twentieth century. Although nineteenth-century school classifications such as the 'French' (Baillot, Rode, Kreutzer), 'Franco-Belgian' (Bériot, Vieuxtemps, Wieniawski, Ysaÿe), or 'German' (Spohr, David) were commonly used in twentieth-century vocabulary, such divisions seem artificial and unrelated to the existing state of affairs vis-à-vis modern violin playing. Diffusing their methods around the world, highly-esteemed teachers of the beginning of the last century such as Joachim, Ševčík or Flesch, influenced such remote violin centers as those in St. Petersburg, Prague and Philadelphia.[3] Today the standard route taken by a modern violinist before launching a career will involve three or four major tutors of different backgrounds and styles, and a great variety of master classes taught by the best musicians.[4]

For this reason, in the present study, significance has been attributed primarily when similar traits of performance are detected among violinists who are related in some way. Violinists who have studied under the same teacher clearly belong to this category, as do performers who have been analyzed together with their pupils. In cases of congruence found among violinists who had studied at one specific school,

sub-divisions were made prior to any claims being established. Thus, general categorizations such as the ‘Russian’ or the ‘American’ school were sub-divided both geographically (St. Petersburg, Moscow, Odessa, San Francisco, Indiana, Philadelphia etc.) and personally (Auer, Stoliarsky, Persinger, Galamian etc.).

Additional categorization was applied to distinguish violinists who belong to the ‘historically informed’ style of playing. Violinists belonging to this category are those who have used period instruments during recording; however, instances where other features of ‘stylistic awareness’ were presented (such as the use of a curved bow or special rhythmic execution) were excluded from such classification.[5]

Table 2 displays performers’ main schools and teachers (names in boldface are those of teachers/performers whose recordings are analyzed in this study).

[Table 2]

d. *Performance editions:*

The source material used by the subjects could be regarded as a potential stumbling block. In most cases it is almost impossible to obtain information regarding the edition used during recording. However, since the primary concern of this study is the audible sonic evidence of the recorded raw material, the specific edition supposedly used by each performer becomes irrelevant. Although, over the years, some editions have been assumed to enjoy greater popularity than others, the current study does not trace either source identities or discrepancies, other than those found in relation to the autograph score. Nonetheless, a review of prevalent editorial directives published throughout the years might shed interesting light on their influence on performers’

technical and interpretative choices, as well as the performers' compliance with contemporary editorial suggestions.

One of the greatest milestones of violin repertory, Bach's Six Sonatas and Partitas for unaccompanied violin have been printed in at least forty five different editions since Simrock's monumental work dated 1802.[6] While nineteenth-century editions (David, Hellmesbeger) are generally regarded as intended for pedagogical practices and virtuosic display, the discovery of the autograph score in 1906 has prompted a greater concern over the accuracy of origins, ushering in a new period of 'fidelity to the score'. Alterations to Bach's original score were addressed primarily by supplemental editorial annotations, usually printed beside the transcription of the autograph. However, editions made by some of the most prominent virtuosos of the day (roughly encompassing the period between Joachim and Flesch) have been additionally filled with dense markings indicating their author's taste. Bowings, fingerings, dynamics and 'character' interpretations have thus been scrupulously presented alongside the notated score. Later editions, from the late 1930s onwards, mark a new era during which attempts to implement the findings and direction of modern scholars are reflected. Generally speaking, the second half of the twentieth century has shown greater commitment towards the assumed performance conventions of the eighteenth century. Scholarly essays dealing with violin practice during the eighteenth century, and the increasing influence of 'historically informed' performances from the 1970s on, have thus been instrumental in incorporating historical scholarship into 'modern' violin vocabulary and contemporary notation. Table 3 presents the list of editions referred to during this present study.

[Table 3]

2. *Method*

Recorded performances were analyzed for their similarity as well as for their differences when executing the following elements of performance:

1. Multiple-stop progression (whether arpeggiated or broken, notes groupings within the chord, direction, emphasis of specific note/s within the chord, bass position to the beat).
2. Tempo (examined for both its average and its modifications within several examined segments).
3. Rhythmic alterations (altered note values within the written score, including inégalité, overdotting, agogic accents and other means of rubato).
4. Phrasing (notes of departure and arrival, shorter and longer lines).
5. Bowings and fingerings (performed slurs and audible bow direction as well as harmonics and position shifts which could be clearly detected).
6. Articulation (the use of tenuto, accents, spiccato etc.).
7. Portamento.
8. Dynamics.

Recordings were obtained from the collection of the British National Sound Archive. Due to copyright restrictions, all analysis was undertaken on the premises of the NSA. This restricted the measurement tools used because of the relative limitations of available computer analysis software.[7] Hence, analysis of multiple stops, phrasing, bowings, fingerings, articulation and dynamics was subject to repeated aural analysis of the relevant recordings. Each parameter was thoroughly scrutinized during extensive listening sessions which were comprised of three hours each time, and repeated twice daily over a ten-week period. The order of data was changed for each

session, allowing one daily session to be based on chronologic succession (in accordance with the recording date), and the other to be based on different random ordering of the recordings. Such method enabled examination of both synchronic and diachronic contrasts.

A spectrograph was used to help analyze the rhythmic nuance and portamento in the recordings. The spectrograph converts a soundwave into a sound spectrogram, generating a three-dimensional plot of time, amplitude and frequency. The duration of a note is represented by a ‘step-like’ change in the horizontal axis (representing time): measuring these plotted time-events allows for the identification of rhythmic nuance. Portamento is illustrated through a diagonal line in-between the ‘step-like’ events, indicating continuous variable pitch (glissando).

Tempo analysis was undertaken using a metronome and a stopwatch: while a metronome was used to obtain the overall tempo of long-line segments, the tempo of short fragments (1-2 measures) was calculated by a similar method to that presented by Katz 2003: each sample was timed twice to the thousandth-of-a-second using a stopwatch. The average time was divided by sixty and multiplied by the number of beats in the segment. This final figure was considered as the tempo rate (beats per minute).

A facsimile of the autograph score was used in all cases as a reference point.[8]

Results were compared taking into account recording dates, performers’ date of birth and schooling. In many cases this information was gathered through personal correspondence with the subjects.

The majority of acoustic, analogue or digital recordings were examined by using their CD re-issues – this enabled better scrutiny during analysis. A few recordings were

analyzed using original LPs (Schroeder, Telmányi, Martzy, Silverstein, Kremer) or 78 RPM version (Merckel).

3. Multiple-stops progression

a. Background:

The notation and manner of executing chords is an issue addressed by most writings on Bach's solo violin repertoire. Its major concerns relate to the idiomatic and physical limitations that affect proper execution of the chords' literal appearance, and their function in the overall musical context. Since this movement contains frequent triple- and quadruple-stops, early editions (Herrmann, Joachim) have taken the liberty of changing the rhythmic designation of chords' inner notes, attempting to illustrate their precise manner of execution. Others (Flesch, Galamian, Rostal) have acknowledged the need for various manners of chord-spreading (2+2, 1+3 etc.) in order to avoid creating a forced, 'scratchy' tone. Some later editions have recommended that chords be played simultaneously in seeming accord with the conventions of eighteenth-century performance (such as Hausswald or Szeryng recommending the use of the curved 'Bach-bow').[9]

While recent performance manuals have referred to the harmonic function of multiple–stops as affecting the overall interpretation of the polyphonic context of the piece (Gerstung 1970, Efrati 1979), many have pointed to the emphasis on the melodic line as being characteristic of twentieth-century editorial interpretations. Regarded as a common trend of performance, it is presented by contemporary scholars as reflecting a nineteenth-century notion of horizontal motion in a texture of seemingly chordal accompaniment.[10] Such, for example, is the common practice of placing a chord's lower notes before the beat, while accenting its higher voice on the

beat (being part of an assumed melodic line). On the other hand, arpeggiating the chord either upward (by dwelling on the lowest note), or downward, is said to portray inner lines and to reinforce the improvisational character of the piece at hand.[11] Similarly, placing the lower notes of a three- or four-part chord on the beat, and swiftly breaking it to hold its higher note apart, is seen as corresponding to historical practice when the highest note is part of a top voice melody.[12]

b. Results and Discussion:

Scrupulous attention to the various recordings has revealed a huge variety of means by which the multiple-stops were executed. Each performer has had his or her own way of producing the polyphonic chords, and any generalization appears irrelevant. For example, regarding the metric placing of the lower notes g-d' of the g minor chord of b. 1 (figure 1), it is interesting to note that performing both notes on the beat, which is featured in the more-recent recordings of the last decade, has been practiced since such early recordings as those of Kreysler and Rosé, up to and including those made in the 1970s and 1980s. As mentioned, breaking the chord in a 1+2 or 2+2 fashion and playing its bass note/s *off* the beat is regarded by several scholars as a common trend, reflecting nineteenth-century notions of emphasizing melody in a polyphonic texture. However, although such a manner clearly dominates most of the recordings examined, it seems that emphasizing the inner voices as well as the bass motion was prioritized in many of the interpretations. Similarly, while arpeggiating to the top note characterizes 'historically informed' players, it is obvious that others have been using the same practice.[13]

No direct connection was found in regards to performers' age and schooling, and there are many examples of performers who studied with the same teacher, yet executed the chords in vastly dissimilar ways. Looking at Figure 1 it is possible to

observe, for example, the different methods practiced by Kremer and his other colleagues in the Odessa/Stoliarsky school, or by Enescu and his pupils, or Shumsky and Drucker, Rosand and Shmid, or the various manners practiced among Galamian's pupils. On the other hand, similar practice was observed among several representatives of the Hungarian and Russian schools (some of Hubay, Oistrakh and Auer's direct students), yet these cases provide insufficient evidence to establish a clear connection. In several cases one could recognize the abandonment of earlier practices, or the rejection of newer ones. Such is the use of a curved bow that permits the simultaneous sounding of all notes of the chord.[14] Another example is the attack on the two consecutive g_7 and $C\#_6$ chords in bb. 4-5, which enable the simultaneous sounding of all notes of the chord. Such a manner is featured in the early recordings by Joachim and Szigeti, but has hardly found its way into general practice.[15]

Further examples of discarding early practices were found in the second chord of b. 1: attempts to use the notated bowings by which the notes g' and f'# are separated were traced in two early recordings (Merckel, Enescu) but did not become common practice (save Lubotsky, Grimal, and Szenthelyi).[16] Here, as in the previous cases, similar practices were shared by 'mainstream' performers belonging to different periods, schools and generations, while arpeggiation was carried out among most 'historically informed' performers save van-Dael and Podger.

Findings indicate overall compliance between data and editorial directives: most recordings have been found 'breaking' the chords in various manners. However, in several cases, suggestions that were made by the editors have not been incorporated into practice. This is the indication vis-à-vis simultaneously-played chords (featured by Szeryng according to his own edition, but absent among most other players), or the

practice of chord-spreading by arpeggiating to the top note, featured by performers of various periods but not indicated in any other editions, except by Babitz.

[figure 1]

4. Tempo:

a. Background:

The typical prelude-like Adagio, generally presented as a slow, 'singing' movement with its ornamental layouts, pivotal polyphonic chords and free improvisatory melody, is regarded as best-suited for tempo flexibility and rhythmic fluctuations. Early editions presented a variety of tempo indications by adding title metronome markings within the score of Bach's 'Adagio' (Herrmann), or supplementary instructions such as 'cantabile' (David, Hellmesberger) and 'espressivo' (Busch). Albeit to a much lesser extent, such instructions were also found in even later editions during the 1950s (Haber, Champeil).[17]

Previous studies on the issue have shown that tempo flexibility was recommended in many of the writings at the end of the nineteenth century, continuing well into the twentieth century. Traced through published editions, in supplementary notes written in the score by performers, in various theoretical writings and in early recordings, elasticity of tempo is suggested as representing earlier aesthetic conventions of expressivity used for delineating inner-line phrases and emotional intensity, and emerging from an overall rhetorical approach towards the musical language (Philip 1992, 2004, Bowen 1999, Lester 1999, Day 2000, Katz 1999 and 2003).

Perhaps it is the seeming decline of such norms of practice that brought about the conception by which stable tempo became a general characteristic of later twentieth-

century performances – an idea resulting in declarations regarding the 'virtually metronomic tempo' featured in most modern recordings of the Adagio.[18] Yet recording analyses of performances spanning longer historical periods have indicated a lack of general standards of practice with regard to tempo. While smaller-scale tempo fluctuations within the inner phrase or bar were found to dominate earlier practice, performances varied greatly in their choices of tempo regardless of the historical period.[19] Some recent studies have additionally questioned the sweeping conception of early recordings as representing a unified rhythmic practice. Such are the findings by which long-range tempo modifications characterized performances of the canonic, more 'classical' repertoire (such as Bach or Mozart) well into the 1950s, while small-scale tempo nuances were used in early twentieth-century performances of late romantic music (Fink 1999). Similar claims have been made in regard to ranges of tempo in early Bach recordings: while fast tempos and relatively straightforward expression have been found among early German-school-educated performers (Ochs, Weisbach, Boult and others), rhapsodic character, intense tempo fluctuations and detailed dynamic nuances have been featured by other prominent contemporaries such as Furtwängler, Mengelberg and Stokowski (Towe 1993).

b. Results and Discussion:

Tempo modifications were traced in all recordings, with differences lying both in the degree of flexibility and in the number of changes from the general tempo. Fluctuations were clearly connected to the structural layout of the segment examined, be it the use of polyphonic chords to serve as lengthened points of departure and arrival in between the ornamental layouts, phrase groupings of the melodic lines, emphasis of inner voices or cadences. Here, as well as with other factors, one is struck

by the vast range of possibilities: no single performance resembles any other in its places and modes of modification.

The findings may well permit a few standard practices to be understood. Such is the rhapsodic-like character of the opening G minor segment (bb. 1-2) which was commonly featured in a free and highly flexible manner, its vaguely-conceived pace hardly represented further on in the movement. Similarly, all performers treated the 32nd and 64th notes in an improvisatory fashion, featuring rubato throughout the melismatic passages. Another example is the closing cadence on the dominant at b. 9, highlighted by the majority of performers through either a gradual ritardando (which could sometimes start in the middle of b. 7), by a special feature of rubato made during the prevalent melisma, or by placing a fermata on the last beat.

Table 4 features tempo modifications of selected recordings, measured in segments containing melodic phrases and consecutive even-rhythm notes. Melismatic passages and multiple-stops involving all four strings were omitted for their inherently rhythmically-free nature.

Measurements showed the presence of tempo fluctuations and instability of pace among all recordings examined, although these differed in number and significance. However, in order to provide a standard for comparison, recordings considered as featuring significant tempo fluctuations were those displaying modifications exceeding 5 b.p.m. within the analyzed segment. Modifications of 3 b.p.m. or less within the analyzed segment are considered to reflect a relatively stable tempo.

[table 4]

Significant tempo modifications were found for fifteen performers belonging to different periods and schools. Recordings made in earlier decades (Joachim, Kreisler, Rosé and Szigeti) are similar in that aspect to the most recent ones (Huggett, Rosand, Grimal or Shmid).[20] Significant modifications were traced among performers belonging to the Russian, German, Hungarian and Franco-Belgian schools, as well as those from the 'historically informed' school.

Twelve recordings were found to feature a relatively-stable pace, most of them produced after the 1960s (except those made by Heifetz and Menuhin). While some performers in this category were found to be associated with one specific teacher (i.e., Enescu's pupils Menuhin, Grumiaux, Ayo, and Haendel) or school (Zivoni and Mintz of the Hungarian school, Heifetz, Drucker and Kremer of the Russian school), others represent various schools and tutors, such as the Franco-Belgian, Czech or 'historically informed' school.

60% of the performers of recordings which feature significant tempo modifications were born prior to 1925 and were educated in an era during which there is little likelihood that recordings would have influenced general norms of practice. 75% of the performers of recordings which feature a relatively-stable pace were born after 1925, and are likely to have been exposed to recordings throughout their period of study.

My findings correspond to previous studies that traced smaller-scale tempo fluctuations in older recordings. They additionally correspond to other observations made on the issue, tracing tempo fluctuations as well as their stability of use among performers belonging to different periods and different schools, but the results do not support assumptions of a general stability of tempo among twentieth-century recordings of the piece.

Certain correlations can be made with regard to the performers' dates of birth, treated here as correlating with the distribution and accessibility of recordings during early artistic studies. Comparing both groups, the findings suggest the dominance of the recording industry in shaping interpretation and style during an artist's formative years, since those who received their education in later years display a higher degree of homogeneity, with regard to tempo, than their older peers.

5. Rhythmic Alterations

a. Background:

Discussions of rhythmic alterations refer to the multitude of manners by which rhythmic flexibility, or 'rubato,' is manifested – seeking to discern whether this is presented as 'structural' or 'expressive'; divided into multiple levels representing 'sectional,' 'phrase' or 'bar' boundaries;[21] or separated into its three most common features, namely 'accelerando-rallentando', 'agogic accent' and 'melodic rubato'.[22] As previously mentioned, studies have pointed to the diversity of inner-line tempo fluctuations traced among early recordings, which has decreased since the mid-twentieth century. Flexible rhythm in the recorded Bach repertoire has been found among early twentieth-century performances and in 'historically informed' recordings made during the previous decades.[23] In addition, manipulation of dotted-figures ratio (over-dotting, under-dotting etc.) was traced in recordings among pianists made circa 1945-1975 – performances which were music-rich in such devices.[24]

Additionally, studies have linked timing variations to the physical challenges which are inherent in the stringed musical instrument. Technical limitations and idiomatic properties have been found to affect inner-line timing (rubato), and this is manifested through the mode of executing chords, position change, bow shifts etc.[25]

Although some of the later editions have specifically proposed interpretations for a variety of issues such as dotted figures, inequality or compound note-values (Champeil, Babitz, Rostal), several earlier twentieth-century editors (such as Flesch) called for literal rhythmic execution of the notated score.[26]

b. ***Results and Discussion:***

Significant rubato traced in both melismatic and consecutive even-rhythm note passages was found among early recordings (Joachim, Kreisler), as well as among later ones (Schroeder, Telmányi, Végh, Ayo and others). A similar picture was conveyed with regard to recordings featuring stable rhythm, generally accompanied by a slow-paced tempo and a general feeling of 'grandeur', as in the early electronic recordings of Heifetz or Merckel, as well as in some later ones (Martzy, Silverstein, Kagan and others).

As for the performers' schools, certain connection could be traced between performers who used significant rhythmic alterations, and between their direct teachers. Such is the case of Joachim and Kreisler, both students of Hellmesberger who presented similar rhythmic approaches; Telmányi, Végh and Mintz, who are closely connected to Hubay's school; and Drucker and Schmid, who are indirectly related to Zimbalist and to the Auer school (the latter having himself been Joachim's pupil). A different picture emerges with regard to the group of performers who featured stable, unaltered rhythm. Looking at this group one is faced with disciples of the same teachers or schools displaying opposing rhythmic features. Such is the case with Heifetz (pupil of Auer and classmate to Zimbalist), Silverstein (a Zimbalist pupil), Zivoni and Martzy (both closely related to the Hubay school), and Haendel (former student of Enescu and the Hellmesberger school).

As for the performer's age, while the group featuring significant rhythmic modifications encompasses performers belonging to various age groups, its counterpart mostly consists of performers born prior to 1947; thus suggesting the decline of the 'grandeur' style amongst newer generations of performers. Findings indicate that the significance of interpretive attitudes are consolidated early in one's artistic development: Kagan, Zivoni or Haendel are found displaying in their contemporary recordings norms of practice that were modeled and typical in much earlier decades.

Conformity between tempo and rhythmic features, defined as a similar display of both factors, was found among many performers belonging to both groups.[27]

The general use of rhythmic devices was found to be linked not only to significant thematic, harmonic or structural events - e.g. prior to cadences or pivotal chords - but to technical-idiomatic factors as well. An example of the latter could be observed in the modifications made due to a bow-leap between several strings, manifested by a slight pause or by shortening the note prior to the leap; or in the lengthening of the structural tones f', e', d' (bb.6-7), emphasizing the melodic contour of the descending hexachord f'-a in the bass (b.6-8).[28]

Table 5 plots rhythmic alterations, found in bb. 2-3 of the examined segment, in recordings made during 1903-1983. Note that although a large range of possible rhythmic executions of these two measures could be traced - manifested in obvious alterations as well as in small rhythmic nuances - performers were found to use similar rhythmic devices in a variety of places, with only slight connection to any specific era or school.[29]

[table 5]

Apart from ‘historically informed’ players such as Luca, Wallfisch or Kuijken, inequality of note values has been used extensively in a variety of instances by several ‘mainstream’ performers.[30] A similar picture emerges with regard to manipulation of the dotted-figures ratio.

Figure 2.1 summarizes spectrographic analysis of performances featuring significant over-dotting at the end of the first beat of b. 5 (fig.2). Recordings in which the ratio between the dotted note (f’') and its consecutive short note (e’’) exceeds 4:1 belong to this category. Figure 2.2 summarizes performances by which the ratio was found to be less than 2.5:1.

[Figure 2]

[Figure 2.1]

[Figure 2.2]

The tendency towards under-dotting, found in more recent recordings, points to its interpretation as a written ‘ornament’ which could thus be performed in a flexible manner. Over-dotting occurs in relation to the cadential trill, in which the main note is followed by a clear shortening of its termination. The stable rhythmic execution, found among performers born in the first half of the last century, points to a clear connection between findings and editorial approaches, such as Flesch’s edition (1930), which was very popular at that time. The use of inequality and altered dotted figures, on the other hand, tends to feature either in very early recordings or in those made in or after the 1980s (i.e. those corresponding to the aforementioned later editions that have incorporated historical scholarship in their instructions).

6. Phrasing

a. Background:

Phrasing and inner-line divisions are conveyed by a multitude of factors. Articulation, bowing, fingering, pauses, tempo modifications, and special dynamic nuances all serve as complementary components in deciphering longer and shorter phrases.
Bach's experimentation in assimilating polyphonic texture to a melodic instrument has brought about an intensive use of concealed melodic lines. Wide-range leaps, special tone color (conveyed by open strings, harmonics, string and position shifts), rhythmic division (pauses, separation between voices through intermediate lines), chords, bowings and many other devices serve as a means of creating the polyphonic and contrapuntal illusion.[31]
Based on such compositional elements, editors' interpretations have been featured in various ways. While mainly addressing its linear melodic contour, reflections of Bach's phrasings have led to the implementation of sudden dynamic or string changes (Flesch, Hambourg), specially-implemented bowings and fingerings (Hermann, Auer, Wessely, as well as later editions made by Champeil, Galamian, Szeryng), and even to the marking of phrases by a special sign (Dounis).[32]

b. Results and Discussion:

As with the elements discussed previously, careful study has shown a vast range of possibilities with regard to the inner phrasings of the segment under examination.
As seen in Table 6, accents, slurs, bow shifts and 'leaned-on' notes are carried out in combination with tempo modifications, rhythmic alterations and dynamics in numerous configurations, resulting in each individual's expressive, personal interpretation. Nevertheless, equivalence with regard to phrasings and inner-lines division was found in several places. Such are the endings on the pivotal g minor

chord of b.2 beat 3 (as advocated by some of the editors mentioned above), and on the dominant chord of b.9 beat 1. Other commonly-featured phrase endings, however, are not so self-evident as to emerge from a clear-cut textural scheme. The phrase ending made on the d'' prior to the B♭6 chord of b.3 beat 2 and the ending on the V4-3# chord of b.4 beat 1 (ignored by other performers who chose instead to bring out the higher register voice g''-f''#-a'' as one unit of a separate melodic line) are two of many such examples.[33] In such cases, canonic tradition emerging over the course of time has remained almost unchallenged.

[table 6]

7. Bowings and fingerings[*]

a. Background:

Early editors regarded Bach's slurs as being only vaguely inscribed, irrational and un-musical in many ways - explaining that the deficiency evolved from negligent writing. Original bowings have been freely altered to include successive down-bows for consecutive multiple-stops; frequent bow-change to produce a bigger sound; legato in 'cantabile' passages; and various means of articulation. Later editors of the 1950s onwards, although still taking liberties by changing original bowings out of technical or textual considerations, have added slurs which seemed to them better suited to the 'baroque' style.[34]

Addressing several figurations where the inscribed slurs do not match equivalent places in the piece, or are contrary to technical reason, the performance manuals have

[*] While bowings could quite reliably be aurally detected, tracing fingerings has been found to be a much more difficult task, resulting in fewer trustworthy findings. Hence, in this case, only instances of clear-cut position-shifts and harmonics are reported and discussed.

acknowledged the need for modifications. Explanations as to the possible causes for such apparent deficiencies have included Bach's unintentional habit of writing slurs below the staff while leaping a bit to the right; the conventional practice of favoring down-bows on the 'good' notes for rhythmic clarification; or Bach's premeditation of hidden voices necessitating unconventional bow practices.[35]

As for fingerings, while multiple-stops require specific technique, linear contours could be executed in various manners. As in other aspects, editors of the late nineteenth- and early twentieth-century usually differ from their successors in suggesting harmonics, high positions and fingering acrobatics, used for laying-out apparent melodic voices in homogenous shadings (Herrmann, Joachim, Auer, Flesch and others). Some of the later editors, on the other hand, recommend lower, fundamental positions and open strings while tending to avoid sounded position-shifts and slides (Galamian, Babitz, Szeryng, Rostal). This was done in consideration of eighteenth-century violin practice and greater awareness of polyphonic contour.[36] Previous recording analyses found greater use of harmonics among violinists recording during the first half of the twentieth century than among those recording during later periods, thus corresponding to the general norm prevalent in nineteenth-century editions.[37] The extensive use of harmonics was suggested as being connected to the tone quality of gut strings, the use of which was widespread in earlier periods, and to diversity in the thickness of strings employed during the nineteenth century.[38]

b. Results and Discussion:

Conventional practices have also been found with regard to bowings. Alterations of the original markings were detected in several places throughout the excerpt. One is the slur made in b.1 beat 3 between the appoggiatura (g) and its consecutive note (f#), practiced as such by all performers except for several performers remotely connected

to the ‘Franco-Belgian’ school. Another is the slur made between the b’♭ of the g minor chord in b.4 beat 3 to its successive d’’, originally marked separately. This was made by the majority of players, save (mostly) players of the younger generation connected to the Galamian school. Moving away from such sweeping convention, the latter seem to advocate the notion of ‘historical awareness’ that was achieved through loyalty to the original score. Here, as in other cases, breaking away from traditional practices is greatly influenced by the agenda of the ‘historically informed movement’ that dominates the practice of the newer generations.

Many have separated the eighth note e’’ of b.7 beat 4 from its successive melisma - some while changing color through shifting positions; others going further by using new fingerings on the same note e’’. Both the bow and position change - which are clearly featured in the Heifetz recording and may have been made either deliberately or out of technical compulsion - have since found their way into general practice. In that respect exceptions can be made for several recordings targeted at ‘historical awareness’, as well as among several players of the American school (Tetzlaff, Fulkerson, Grimal).[39]

A number of features have not found their way into common practice. Such is the free bow change made on two successive notes during melismatic passages (b.2 beat 1-2, b.8 beat 3). In this case, both notes protrude from the overall fragment, breaking the continuity of the ornamental layout. Featured by Kremer, Mordkovitch, Tenenbaum Rosand and others, this practice seems to be connected to the Russian school of playing. Another example is the habit of placing harmonics on the eighth note a’’ of b.6 beat 1, quite a common feature among early violinists (Kreisler, Heifetz, Oistrakh and others) but for the most part abandoned in later recordings.

Recordings have consequently been found to be in accordance with prevalent editorial directives. In many instances, additional or alternative slurs and bow changes found among players are presented by a vast majority of editors. Similarly, neglect of harmonics in later recordings complies with newer editorial trends prevalent in later decades. However, an exception is the enduring habit of avoiding the use of open strings, which is contrary to later editorial suggestions. Such, for example, could be traced in the persistence of placing any kind of fingerings on the eighth note e'' of b.7 beat 4, resulting in audible position shift on its successive melisma. Found among players of differing backgrounds, it was for the most part avoided by 'historically informed' players.

8. Articulation

a. Background:

Other than slurs, no further indication as to articulation (such as dots, stroke, wedges or other means of staccato markings) is present in the Adagio's autograph score. Later editorial annotations have included accents, portato or tenuto markings by including a series of dots or dashes under the slurs. These devices were chosen for the proper delivery of the Adagio's presumed 'cantabile' and 'grave' expressive nature. Found among many late nineteenth- and early twentieth-century editions, it is also present to a lesser extent in several editions from the latter half of the twentieth century (Haber, Champeil, Jacobsen, Galamian). However, while early editorial suggestions regarding other set movements included all sorts of virtuoso bowings (ricochet, spiccato, sautillé presented by David, Auer, Nachez and others) modern editors since the 1950s have implemented special, quasi-baroque styles of bowing. Whether erroneously presented as such (e.g. Rostals' annotation of spiccato[40]) or

advocated in seeming accord with eighteenth- century practice (such as Szeryng's indications of short and light détaché bowings), these changes in attitude reflect attempts to implement modern scholars' findings and directions.[41]

Previous studies have found a greater variety of bow strokes among early and late twentieth-century players, and among 'historically informed' performers, than in 'mainstream' recordings dated between 1950-1980. As for the latter, the modern preference for a continuous melodic line is said to have encouraged a uniform approach to bowing style, exemplified by the constant use of portato, sustained legato and broad tenuto bowings. On the other hand, agogic stresses and a variety of bow-strokes serve as a means of differentiating micro-structure, delineating inner 'germinal-phrases' and portraying the hierarchy of notes within the group (Fabian 2003 and 2005).

b. Results and Discussion:

Findings clearly show that the newer generation of players seems to display a much wider variety of articulation devices than their older peers, reflecting a more 'rhetorical' approach to music: divergence of bow pressure and width have been blended with various rhythmic or dynamic devices to create a wider range of possibilities. Supporting previous studies on the subject, the richer palette has been introduced by both 'historically informed' and 'mainstream' performers who made recordings during the last decades of the twentieth century, whereas this is absent from performances by the vast majority of intermediate players. Some features, almost sparsely presented in earlier stages, have been generally adopted or may well be implemented in future performances. Such is the execution of chords in a soft, light and 'airy' manner made in order to distinguish between inner lines. Featured by Schroeder, and to a much greater extent by Luca, the practice found its way into later

performances made by both ‘historically informed’ and ‘mainstream’ violinists recording since the 1980s. Another example is the use of spiccato or ‘chopped’ bow during the ornamental layouts. Featured by van Dael and Schmid in the late 1990s, such a device could very well appear in future recordings. Several devices, however, appear to have been widely used among players of different backgrounds. One example is the use of accents or heavy bow pressure which was traced during multiple-stops in phrase beginnings or for laying-out structural tones.[42] This has been used by many performers of different periods, connected to various schools, and of various ages.

Tenuto (i.e. the use of full length, wide bow for stressing a note) was used considerably during double-stops in order to distinguish between inner voices, as well as on single notes, enforcing the general feeling of ‘grave’ or ‘grandeur.’ In this case connections could be found between the performers’ school and between the number of times they used tenuto: extensive use of this device - defined by its implementation in ten or more notes in the excerpt examined - has been mostly traced to performers connected with the Hubai (Hungarian) and Russian school. Minimal use of tenuto (defined as such when employed in four or fewer notes in the excerpt examined) was found significantly among performers connected with Enescu and the German/Viennese school, the Oistrakh/Odessa school, and two of Hubay’s pupils who have hence been found to employ tenuto much less than their school peers (Szigeti, Végh).

A connection was also found between the use of tenuto and the recording date. As seen in figure 3.1, recordings made during the last decade make much more use of tenuto than earlier ones. Such a trend is further evidenced when examining the connection to the age of the performers. As figure 3.2 highlights, this group of

performers tends to use tenuto more than those active in the first half of the last century.

[Figure 3.1]
[Figure 3.2]

Divergence in the use of tenuto, seen as being connected to one's school, recording date and age, poses some questions about the sweeping notion of uniformity regarding the bowing style during the intermediate decades. Although pre-WWII recordings did not necessarily feature a wider variety of articulation devices than those made in the following years, findings point to the sparing use of tenuto in recordings made by players of certain schools during the years 1950-1980. These contradict the viewpoint advocating the general homogeneity of bow strokes during that era. The increase in use of the device among newer generations of players might perhaps suggest consolidation of the 'traditional' interpretation model among some (i.e. even-tone and long-line homogenous phrases). It seems that others have been using it, however, considerably for contrast amidst a highly varied articulation contour.

Recordings from earlier decades reveal numerous aspects of performance that correspond to editorial suggestions, particularly with regard to the use of accents and tenuto. Such devices, as discussed above, best serve to establish the movement's 'grave' expressive character. On the other hand, although editions from the 1950s onwards increasingly attempted to incorporate the conventions of eighteenth-century performance, only in later decades did recordings begin to reflect these directives with devices such as spiccato or differentiation of bow pressure.

9. Portamento

a. Background:

Portamento (i.e. the audible sliding between two notes) was used extensively during the nineteenth century and during the first decades of the twentieth century, although not without some criticism regarding its 'laughable mannerism' when it was implemented too often.[43] Possible suggestions as to its use have included technical limitations (when considered to be the result of audible position shifts), expressivity (regarded as imitating singing), as an attribute of a certain style of performance (as in the case of the 'style hongrois'[44]) or even as a joke.[45]

As previously mentioned, early editions extensively suggest the use of slides and position shifts, while later advocates of eighteenth-century conventions have preferred the use of open strings and fundamental positions.

Analysis of recordings has pointed to the gradual decline of portamento during the course of the twentieth century.[46] Several reasons have been suggested as causes for the decline, such as changing fingering and vibrato technique, the repeatable nature of recordings (by which such a clearly detectable device might have sounded too obtrusive), or cessation of the use of gut strings.

b. ***Results and Discussion:***

Portamento was found in recordings made during the first half of the last century among performers connected to various schools and of various ages. It gradually decreased in use until it was later abandoned.[47] As such, the results comply with period editorial trends and with previous findings about the subject. Figure 4 summarizes spectrographic analysis of the use of portamento. The implementation of this device was traced among recordings made until 1947.

[Figure 4]

Portamento was traced at b.5 beat 3 (third finger d''-f'', featured by Kreisler, Rosé, Heifetz, Oistrakh), b.5 beat 4 (second finger b♭''-g'', featured by Kreisler, Rosé, Heifetz), b.6 beat 1 (first finger e'-d'' featured by Kreisler, third finger d''-g'' featured by Szigeti, Heifetz, Oistrakh). It was used for inner ornamentation of melodic passages, and was featured on sixteenth notes for clearer audible distinction.

10.Dynamics

a. Background:

Although Bach indicates them only sparingly (in several movements of the second Sonata and third Partita), many editors have implemented dynamic markings throughout the solo pieces. Some editors have proposed gestures seemingly in adherence to the 'Baroque style' (such as the echo principle of repeated phrases, or 'terraced dynamics' in rising passages), others have used dynamic contrasts accompanied by expressive terminology (such as 'calmatissimo' in Wessley's Chaconne edition). Faced with the Adagio's compositional contour, many have treated quadruple stops as an indication for intensity (*forte*), hence basing dynamics on inherent idiomatic devices of the modern instrument. Increasing dynamics was a common feature prior to cadences, while soft dynamics were used to clarify seemingly melodic lines in-between the chords. The use of a 'swell' ('messa di voce') was adhered to by a few editors during the second half of the century (notably Jacobsen and Babitz; the latter argues for an intensive use of the dynamic spectrum). Prior analysis of Bach recordings observed a relatively small-range dynamic spectrum, *forte* being the most basic dynamic level. In several cases *crescendo* and *decrescendo* were found in 'mainstream' performances of Bach's vocal music

(produced circa 1950-1970), as well as in slow movements (where they were implied for long-line phrasing). More delicately-pronounced dynamic nuances, including 'special,' untraditional effects (such as the 'messa di voce'), were observed among 'historically oriented' performers of the newer generations.[48] The so-called 'echo' effect, by which *forte* and *piano* levels are consecutively contrasted, was found among harpsichordists using manual registration practices, as well as among recordings of different instrumentation.[49]

b. ***Results and Discussion:***

As mentioned, dynamic scrutiny could not be adequately achieved for early recordings. However, certain general deductions can be made with regard to this factor. Table 7 displays dynamic alterations traced in recordings made up until the 1990s. Amid a wide spectrum of individual interpretations, common practices can be outlined. Among them are the soft dynamic level with which the ascending ornamental layout g'-e♭'' of b.2 beat 3 begins, thus emphasizing inner-line phrasing; the firm emphasis on the B♭6 chord of b.3 beat 2, functioning as a dynamic peak in-between changing dynamic levels; and the general choice of soft dynamic level on the b♭'' of b. 5 beat 4, made to emphasize the newly-conceived phrase discussed earlier. While no clear connection has been found to any specific teacher or school, dynamic features seem to be linked to the age of the performer and to the recording date. A good example is the use of the 'swell' effect, by which a single long note increases or decreases in intensity. Extensive use of this device, which is regarded as such when it is implemented in five notes or more of the excerpt examined, was mostly found among younger performers of the Russian school (Ricci, Lubotsky, Mordkovitch, Drucker) as well as among Telmanyi (Hubay school), Luca and Zehetmair (Rostal's students connected to the Flesch school). Small-scale use of a 'swell,' which is

regarded as such when employed in no more than one of the notes contained in the excerpt, was evident in two of Hubay's students (Szigeti, Martzy), the older Russian school representatives (Heifetz, Oistrakh, Shumsky), Enescu's pupils (Grumiaux, Ayo) and Szeryng (Flesch school).

[Table 7]

A clear connection, however, can be found between the use of a 'swell' and the period of recording: most of the recordings that display its extensive use were made during the 1980s (save Telmanyi's), while most of those lacking the device were (with the exception of Shumsky's) recorded during earlier decades. As for the latter performer, findings once more point to the primacy of interpretive approaches that were consolidated early in his artistic development. Indeed, it seems likely that the use of a 'swell' is significantly linked to the performer's age (i.e. it is virtually absent among performers born prior to 1933 but fully exploited among the younger generations). Moreover, the age of the performer has been found to be linked to a relative absence of dynamic changes. Stable, consistent use of 'tense' or 'fierce' dynamic level throughout long lines has been prominently featured in recordings made by those born prior to 1946, its use creating a general feeling of 'grandeur'. Such a dynamic approach is not found among the younger generations.
Further instances of the intensive use of dynamics were found. Recordings from the 1980s displayed a growing spectrum of auditory detectable dynamic levels and frequent dynamic nuances. Phrasing and inner-line groupings are delivered through dynamic devices made possible by the type of technical developments associated with the digital recording studio. Kremer's pioneering display of such features was soon

matched by other recordings, such as those of Ricci, Zehetmair, Shumsky and others. This convention is rooted in earlier recordings made during the 1950s by Schroeder, Telmanyi, or Grumiaux that present ‘soft,’ ‘tender’ dynamic contours amid frequent changes in dynamic levels. In the latter case, Grumiaux presents what could be best termed ‘dynamic rubato,’ where several notes of one melismatic passage are highlighted through an abrupt, distinctive dynamic change.

Interestingly, recordings made during the 1990s utilized the technical evolution of the recording process by reverting to ‘gentle’, soft and intimate dynamic features. This is clearly detectable among recordings made by both ‘mainstream’ and by ‘historically oriented’ performers. Findings hence correspond to previous studies on the issue that found a small-range dynamic spectrum in recordings made during the early and intermediate decades. From the 1980s on, the wider variety of the dynamic spectrum resembles similar findings relating to other performance factors which are perceived to be of broader range and possibilities. As in previous instances, such evolution could be derived from the influence of both the ‘historically informed movement’ agenda and from technical improvements in the recording studio. The use of ‘tense’ or ‘fierce’ dynamic levels found in earlier recordings complies with editorial interpretations in this regard. Yet, as with previous findings, dynamic devices presented in earlier editions from the 1960s (such as the use of a ‘swell’ or the intensive exploitation of a broad dynamic spectrum) were matched in later decades.

11.Conclusion & General Discussion

Faced with such a large number of recordings, the first impression is of a remarkable diversity of interpretation throughout the years. However, careful analysis of the data permitted certain clear deductions. Conventional practices were found among

performers from highly varying backgrounds. The similarities embraced all of the performance factors examined and resulted in specific portions of the excerpt being executed in a similar manner. Standard practices were found to be related to significant thematic, harmonic or structural events, as well as to technical-idiomatic factors connected with the instrument at hand, regardless of the performers' age or school, or the date of the recording. In several cases one could trace the general abandonment of attempts to deviate from common practice: the blanket rejection of the curved bow, the relinquishment of a firm 'attack' on two successive chords resulting in the simultaneous sounding of all notes, the rejection of several notated bowings - performed by a few but avoided by the majority - or abolition of the habit of placing harmonics on certain notes. Tracing such unified approaches to many practices, an overall picture arises that is highly suggestive of the existence of what could be best termed 'performance tradition'.

In several places within the excerpt a certain connection was found between the performers' schools and the manner of execution. Congruence in that regard was traced, for example, among recordings which feature a relatively stable pace (Enescu's pupils and representatives of the Hungarian and Russian schools), in the rhythmic display of certain notes (St. Petersburg/Auer school), in the non-notated bow change made on two successive notes during melismatic passages (Russian school), or in the amount of tenuto displayed by representatives of various schools. Despite the important role that schooling has played in consolidating modes of practice, however, it has nonetheless been shown to be a factor of relatively minor influence in places highly dominated by tradition or period conventions. Performance elements such as fingerings, portamento and (especially) phrasing were displayed according to pre-

shaped common practices of the period, regardless of the performer's school or direct teacher.

Players associated with the 'historically informed' movement, which is most clearly liable to characterization in terms of the relative uniformity of interpretative profiles, constitute an exception. Examples include the general practice of arpeggiating chords, rhythmic flexibility (such as inequality of notes and the manner of executing dotted-figures), the observance of original bowing and the use of a wide spectrum of articulation features. The younger generation of the Galamian/American school were also seen to display homogeneity in several performance factors, such as the use of originally notated bowings, spare use of high positions, and a wider variety of articulation and dynamic devices.

Performers' dates of birth emerged as a factor of clear significance. Norms of practice prevalent among pre-war performers, but neglected among their younger peers (and vice versa), were here assumed to point to the influence of the recording industry on conventional trends. Such are the findings regarding the relatively stable tempo among performers born after 1925; the stable, un-altered rhythm found among players born in the first half of the last century; the varying implementation of tenuto among older and younger players; and the constant use of 'tense' dynamic level throughout long phrases traced among performers born in the first half of the last century.

Data collected from newly-recorded performances made by older players additionally suggest the primacy of interpretive models shaped early in one's artistic development. This was the case with regard to the 'grandeur' style of rhythmic shaping, neglected in later decades of the century but still displayed by Kagan, Zivoni or Haendel in their contemporary recordings. Another example was identified in the use of a 'swell,'

found to dominate recordings made during the last decades but lacking in Shumsky's recording from that period.

A significant connection was found between the date of recording and the features of the performance. Practical conventions and models of interpretation underwent vast changes during the decades under examination, affecting most of the parameters observed. They include the relatively-stable pace which appeared mainly after the 1960s; the use of harmonics characteristic of earlier periods; the extensive use of tenuto as well as a broad palate of articulation devices in recordings made during the last decades; the neglect of portamento in the second half of the twentieth century; and the special dynamic features of the 1980s and 1990s.

Nevertheless, the findings also pointed to the limitable effects and restricted significance of this factor. Canonic conventions unaltered by time and current fashion, as well as early representation of the full palate of certain features of performance, reflect the moderation of boundaries in that regard. Among them are the various manners of executing multiple stops that are exhibited throughout all of the examined periods; standard practices with regard to tempo and rhythm found unrelated to any specific period; or the sweeping uniformity displayed among recordings of various periods with regard to phrasing and inner-line groupings.

A correlation was found between editorial directives and recordings. Parallels include the various manners presented in both the editions and the performance data when executing multiple stops; the use of alternative bowings by the vast majority of players; the disappearance of harmonics and portamento made in accordance with changing fingering trends suggested through the years; the conventional use of accents and tenuto found in early and intermediate decades; and the use of a uniformly 'fierce' dynamic level found among earlier recordings.

Other editorial indications, however, failed to be accepted by performers. Simultaneously played chords were generally rejected. Chord arpeggiation appears in performances of all periods but remains virtually unmentioned in the most prominent editions. The continuing habit of avoiding the use of open strings persisted, contrary to editorial suggestions made during the last decades. In several cases one could observe the belated acceptance of editorial approaches presented some twenty to thirty years earlier. They include the use of inequality and altered dotted figures, and the use of a wide spectrum of dynamic devices. Featured extensively in recordings from the 1980s on, they appeared in editions published several decades earlier by Babitz, Champeil and Jacobsen. An interesting picture thus arises that indicates the important, yet limited influence of editorial interpretations on performance. The issue of the relation between the editor and performer, however, clearly merits future work on a much expanded repertoire far beyond the scope of this paper.

Perhaps the most interesting finding is the variety of styles manifested throughout the years: the overall, striking picture is that of divergence and individual idiosyncrasy revealed among all performances. Infinite ways of executing the tiniest of notes have been exploited to present a huge palate of nuances embracing all musical parameters. The compound mosaic of performance patterns highly questions the validity of the traditional assumption, regarding ‘mainstream’ violinists of the second half of the century as portraying a unified, homogenous style of performance. While conventional practices were certainly found, players of the intermediate decades (encompassing the period between, say, Enescu and Kremer) have certainly featured individuality as well as variety of syntax and style. Moreover, existing canonical practices have been seen as dominating recordings of all periods, eradicating the conception by which early twentieth-century players are found to be more varied in

style than their younger peers. The rise and influence of the HIP movement certainly gave birth to exciting new features, but even the most revolutionary interpretations were soon assimilated and incorporated into changing yet well-defined conventional trends.

Why, then, did the myth of homogeneity during the intermediate decades even emerge? One possible reason is connected to the limited number of recordings made in earlier periods. In an arid environment, any scarce existence is considered a unique archetype, while in a period of inflation prototypes are judged according to their status among assumed authoritative entities. While early violinists have hence been regarded as demonstrating highly individual styles, mass production was bound to obscure divergence, idiosyncrasy and particularization, bringing about artificial generalizations that might only be questioned within the emergence of scholarly pursuit.

The relatively limited repertoire of recorded music made during the aforementioned decades is yet another reason for this false view: canonizations of compositions that have been brought into the forefront of the collective musical pantheon have led to numerous recordings of the same pieces over and over again. Excessively recorded performances of relatively few works have brought about rigid listening habits and conceptions, forming false conceptualizations with regard to performance styles. It is the growing attention to scholarly findings, and the emergence of the HIP movement, which have led to new releases of long forgotten repertoires during the last decades, stimulating changes in listening habits by encouraging distinction and differentiation of the innermost performance parameters.

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[1] In his introductory notes to the 1999 spring volume of *The Musical Quarterly*, Botstein has warned against the supremacy given to discography as a reliable source for deciphering interpretation: "Recordings rarely are documents of concert programs but are, from the perspective of live performance, stand-alone items in unnatural isolation". See Botstein 1999, p. 4.
[2] For further details regarding the deficiencies of early recording technologies see Culshaw 1980, Millard 1995, Day 2000, Johnson 2002. For information regarding the Stroh violin see Pilling 1975, Davies 2005.
[3] For a review of migration and influences of prominent Russian violinists on the 'American' school see Schwarz 1977.
[4] A typical example among the group analyzed can be seen in Benjamin Shmid's background: taught by violinsts Irmgard Gahl, Sandor Vegh, Felix Galimir and Aaron Rosand, he has pointed to Heinrich Schiff, Johann Sonnleitner, Nikolaus Harnoncourt and Friedrich Gulda as musicians who have greatly influenced his formative years (e-mail correspondence, 2004).
[5] Addressing the complex issue of 'historically informed' performances is beyond the scope of this paper. However, it should be mentioned that this categorization was based on previous studies which have pointed to the eminence of period instruments among performers connected with the 'early music movement' agenda. See Fabian 2000 and 2003, Ornoy 2006 and 2008.
[6] Simrock's edition was the first complete publication of all six solo pieces, preceded by the publication of certain movements from among the set. See Sevier 1981, pp. 12-13.
[7] Although previous equivalent studies have used aural analyses (Philip 1992, Towe 1993, Fink 1999, Bellman 2003), deductions based on such measurements should be taken with care and are bound, as in the case of this current study, to the analyst's proficiency and full acquaintance with the recorded instrument. The use of computer-assisted devices has been increasingly put into the forefront, yet many have pointed to its limitations in measuring tempo, intonation or various other performance factors (Cohen 1969, List 1974, Moore 1974, Bowen 1996, Muller 2002). Recent scholars have also questioned the ability for 'objectivity' or clear-cut annotations of the recordings where analysis is solely based on computerized measurements, and pointed to the analyst's listening habits and experiential judgments as a crucial factor of his interpretation (see Donin 2004 and 2007).
[8] The autograph, known as the Rust-Prieger manuscript, was discovered in 1906 and published as facsimile by Bärenreiter in 1958. Its copy, included at the back of Galamian's edition of 1971, has been used here.
[9] See Stowel 1987, pp. 251-252, Field 1999, pp. 54-64.
[10] See Efrati 1979, p. 133, Field 1999, p.47, Lester 1999, p. 37. Many have quoted Joachim-Moser's edition introduction, suggesting that during ones' practice the chords should be done without double stops so as not to 'disturb' the melody. See for example Rostal 1973.
[11] See Boyden 1965, pp. 435-441, Efrati 1979, p. 207, Lester 1999, p. 39. Babitz was the first to have introduced the idea of chord arpeggiation. His recommendations, however, have not gained support in any of the editions so far. See Field 1999, pp. 55-58.

[12] With reference to Quantz, such practice is said to have been initially executed by using down- bow strokes. See Boyden 1965, pp.440-441.
[13] Cseszko additionally points to occasional arpeggio-style chords exhibited by Grumiaux in later places throughout the movement. See Cseszko 2000, p. 39.
[14] The 'Vega' (also 'Bach') bow has a round shape and an easily maneuvered mechanism of hair tautness that enables the simultaneous projection of a multiple-stop chord. Such bow was vehemently praised by Albert Schweitzer upon hearing it played in 1933, yet its use has never gained real popularity amongst later performers save a few. See Schweitzer 1950, Spivakovsky 1967, Schroeder 1970, Haylock 2000. Boyden, one of its many opponents, has vehemently argued that its use lacks any historical evidence. See Boyden 1965, pp. 431-435.
[15] Such attack, which is made to enable the simultaneous sounding of all notes of the chord, has been featured by Végh, Kremer, Zehetmair, and Haendel. In this case one could trace certain school connections: Szigeti and Végh having studied with the same teacher (Hubay); Haendel and Zehetmair being connected to the same school (German).
[16] This chord is one of several examples in the movement for a passage of harmonic tension (tritone c''-f'#) that poses some technical problems to the performer: if the second finger is used for the upper note c'' throughout its notated duration, a different finger should be used for the f'#. Moreover, Bach has chosen to omit the slur between the appoggiatura and its consecutive note, marked as such in other equivalent figures (bb. 3, 4, 7 etc.). A similar example could be found in b. 2, where there remains no finger available for the b♭ if the f# is played for its full duration. See Lester 1999, p. 47.
[17] See Stowel 1987, p. 253, Field 1999, pp. 46-51.
[18] See Lester 1999, p. 48.
[19] See Bowen 1996, pp. 113-118, Fabian 2003, pp. 102-124.
[20] In their study of Bach's recordings, both Towe and Cseszko have traced similar findings regarding Joachim and Szigeti's tactus ranges. See Towe 1993, p. 226, Cseszko 2000, p. 34.
[21] Bowen argues for the independence of each variable of these three categories from its counterparts. According to his findings, small-scale tempo changes do not necessarily influence large-scale tempo modifications or the piece's overall duration. See Bowen 1996, pp. 134-148.
[22] See Philip 1992, pp. 39-44. The term 'melodic rubato' refers to the rhythmic independence of a melody from its accompaniment.
[23] Such are findings regarding the use of 'inégalité' in early twentieth-century recordings. See Philip 1992, pp. 70-93, Katz 1999, p. 153. For information regarding its use among 'historically informed' players of the last decades see Fabian 2003, pp.182-185, Ornoy 2006.
[24] The general use of overdotting by both 'mainstream' and 'historically informed' performers was found in Bach's 'Aria' from Vierter Teil der Klavierübung, BWV 988 ('Goldberg variations') and in variation 7 and 16 of this piece. See Fabian 2003, pp. 174-179, Ornoy 2006.
[25] See Johnson 1999, pp. 67-70.
[26] See Stowel 1987, p. 253.
[27] Such compliance was found in the recordings made by Joachim, Kreisler, Végh, Zehetmair or Shmid who have displayed significant tempo and rhythmic modifications; in Heifetz, Silverstein, Zivoni and Haendel's recordings displaying a relatively-stable tempo and a general feeling of 'grandeur.'
[28] Emphasizing the melodic contour of the descending hexachord f'-a (bass line, bb.6-8) was done while taking advantage of the instruments' reverberating strings. The open d string (b.7, beat 1) has been particularly lengthened by all.
[29] Similarities could be found for the fermata placed on the E♭7 chord (b.3 beat 3), stressing its harmonic function as leading to the dominant key (D); the lengthening of the appoggiatura e♭' amid a specially treated melisma (b.3 beat 4), leading toward the key-area that follows; the pause placed between e♭'' and the double stop g'-b♭' of b.2 beat 4, made to emphasize the division between the two voices. In the latter case similarities were found among performers directly connected to one teacher (Heifetz/ Shumsky; Silverstein/Shumsky; Szigeti/Telmányi; Enescu/Haendel) or a local school (Heifetz/ Silverstein/Shumsky/Ricci of the St. Petersburg/Auer school).
[30] The use of inequality among 'mainstream' performers was traced in the recordings made by Joachim, Rosé, Schmid (b. 3 beat 1), Mordkovich (b. 3 beat 3) and Ricci (b.3 beat 4).
[31] Examples of Bach's methods of portraying polyphony while exploiting idiomatic aspects of the violin are presented in Hofmann 1982.
[32] See Stowel 1987, pp. 250-252, Field 1999, p.53.

[33] Other examples could be traced in the phrase ending on the VII7-6# chord of b.1 beat 3. This is clearly audible throughout a large group of performers belonging to different schools, periods and generations who thus relinquish the possibility of a continuous line between the f'# and its consecutive melisma. Another example is the ending on the root e"♭ (VI6♭) of b.5 beat 3 made by the vast majority of players who have placed a clear pause before the next beat although no change of key is involved. Since the repeated bass g' forms part of the descending bass line g', b.5→ g, b.10 such a pause distracts attention from the bass line by forming a newly conceived phrase. This phrase-ending certainly evolves out of the practice of emphasizing the melodic upper line in a polyphonic texture, and has become conventional. A similar example is the phrase ending on the II7# chord of b.8 beat 1, made although no change of key is involved throughout the ornamented cadential bar.
[34] An example of alternative slurs that evolve out of technical or textual considerations is the bow change prescribed by editors in the Adagio's ornamented figure of b.2 beats 1+2. This is made to enforce dynamics and for easier bow-distribution (Haber, Wronsky, Galamian). Another example is the slurring of the two groups of semiquavers in b.6 beats 3+4, made to avoid an accent on the originally separated sixteenth- note (e) as well as to avoid awkward bow direction. An example for added slurs made in order to fit Bach's seemingly intended meaning is the slur added on the appoggiatura of the Adagio's b.1 beat 3 (discussed in the multiple-stops chapter above) by all editors except Simrock and Dörffel. See Stowel 1987, p. 251, Field 1999, pp. 58-61.
[35] See Lester 1999, pp.18-19, Stowel 2001, p. 123-126, Efrati 1979, pp. 167-168.
[36] See Stowel 1987, pp.252-253. For editors' fingering suggestions regarding the Adagio see Field 1999, pp. 64-66.
[37] Katz reported finding greater use of harmonics in earlier recordings of Beethoven's Violin Concerto than in later ones. See Katz 2003, pp.52-53.
[38] See Dann 1977, p.70. Brown mentioned that the use of a thin gut string facilitated harmonics. See Brown 1988, p. 98.
[39] Other bow changes made contrary to the original marking have been traced in various places, such as during melismatic passages (b.2 beat 1-2, b.3 beat 4, b.8 beat 3); following a multiple stop (b.5 beat 1); and during successive sixteenth notes (b.4 beat 3, b.6 beat 3-4). For most such events it seems that technical considerations involving sound production, preferable bow direction, desired bow division and other idiomatic devices were put at the forefront.
[40] Rostal included such articulation devices as martelé and spiccato strokes in his 1982 edition. Boyden, however, has argued in his discussion of eighteenth- century bowing practice that in 'staccato' fragments (notated as such with a specific sign) the bow usually remained on the string. The term *Absetzen* (used by Quantz) as well as other specific terms and signs were used to specifically indicate the off-string 'bouncing' bow for which the modern term 'spiccato' refers to. See Stowell 1987, p. 251, Boyden 1965, pp. 411-416.
[41] See Stowel 1987, p. 251, Field 1999, pp. 62-63.
[42] The use of accents during multiple-stops was traced in b.1 beat 1; b.3 beat 3; b.4 beats 1, 3, 4; b.5 beat 1; and b.8 beat 1. It was traced at phrase beginnings (such as in the note a'' of b.4 beat 2), during double-stops (b'♭-g' of b.2 beat 4, b'♭-f' of b.3 beat 1, a'-c' and a'-b♭ of b.7 beat 2-3), and was used for laying out the structural tones f', e', d' at bb.6-7.
[43] Warnings against the constant use of portamento have been presented in several early writings. For an extensive discussion of the issue, see Brown 1988, pp.119-128, Philip 1992, pp. 143-155.
[44] Bellman suggested that Joachim's use of portamento in his recording of Brahms 'First Hungarian Dance' derives from the 'crying' violin style of the 'style hongrois'. See Bellman 2003, p. 331.
[45] Antonio Salieri mentioned Lolli as being responsible for the practice of portamento. Lolli apparently imitated a cat in one of his concerts for the general amusement of his audience. However, the joke eventually became a common practice, adopted by singers and string players alike. See Brown 1988, pp. 122-123.
[46] See Dann 1977, pp.69-70, Philip 1992, pp. 143-179, Katz 1999 and 2003, pp. 163-183, 48-51 (respectively), Fabian 2005, p.82.
[47] Although Joachim does not display portamento in the specific bars examined, it is used in later stages of the movement (bb. 17-18) and reported to have been considerably found in other recordings of his. See Brown 1988, pp.127-128, Bellman 2003, p.331, Katz 1999, pp. 174-178, Philip 1992 p.158, Fabian 2005, p.80.
[48] See Fabian 2003, pp.127-133.
[49] See Fabian 2003, pp. 128-129, Ornoy 2006.