Expert Practice and the Technical Mastery of Individual Violinists in String Quartet Playing

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School of Music

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ABSTRACT

The string quartet as a compositional form has been central to western classical music for centuries. However, its transition to the concert hall and its viability as a full-time professional career path for violinists is comparably much more recent. Current research into the training of chamber musicians has highlighted that expert-level individual technical proficiency is a prerequisite for the development of group technique. At the same time, the literature also suggests that there are both technical and extra-musical skills unique to string quartet playing that are not specifically addressed in traditional instrumental training. With regard to violinists, pedagogical works acknowledge these unique demands but provide few viable pathways to acquire these skills. The aim of this study is to investigate this perceived lacuna in the training of individual violinists and acquisition of expertise in the string quartet setting. This study explores the nature of expertise acquisition, highlighting the learning processes and existing strategies to achieve expert practice as represented by the pedagogical and neuroscientific literature. Ševčík’s pedagogical work, J. Brahms: Konzert D-Dur, Op. 18, demonstrates Ševčík’s implicit knowledge of expert practice and its tuition. A multimethod case study is carried out using a combination of action research, reflective practice and practical analysis to identify and distill the practice processes and strategies employed by Ševčík. These findings are then applied to the composition of a set of technical exercises for the first violin part of Schubert’s String Quartet No. 15 in G Major, D887, modelled on Ševčík’s work but adapted to the preparation of the quartet part. Ševčík’s approach, despite preceding modern expertise acquisition research by a considerable length of time, has a demonstrably strong link with neuroscientific research that goes beyond much of the deliberate practice literature. The prescribed nature of exercises based on the Ševčík model allows them to function ostensibly in the role of an expert teacher, conveying expert knowledge of the piece to the performer from the initial stages of learning the work, resulting in a more streamlined preparation process of a work for performance than that discussed in traditional models. Ševčík’s process is shown to be ideally suited to the training of the individual violinist in the quartet setting, as it allows for the acquisition of expert practical executant knowledge of a piece by the performer, without the need for one-on-one lessons with a teacher. This research adapts Ševčík’s approach in new ways, including discussing its application to the exercises authored for this research focusing on promoting greater technical flexibility, identified in the literature as being crucial to successful group performance. Further, the exercises for Schubert’s quartet are not aimed at creating a definitive performer’s edition, but instead serve as a means of stimulating the individual’s ability to generate candidate solutions, thereby emphasizing the highly individual nature of expert practice and indeed expertise acquisition. The potential for Ševčík’s approach to be applied and tested in group-rehearsal settings is a particularly promising avenue for future research. In broader contexts, the adoption of Ševčík’s approach by other instrumentalists as a means for preparing challenging works for performance, in both individual and group contexts, could potentially be widely beneficial.
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Chapter 1: Introduction

The concept of a full-time, professional quartet is now centuries old. The Schuppanzigh Quartet was, according to Hanslick, ‘the first to perform string quartets in public, starting in 1804.’ The proliferation of this type of chamber ensemble as a viable career path in the 20th century has led to more specialized training at tertiary institutions around the world. However, the treatment of quartet playing in its associated body of literature does not reflect this high level of existing training courses. Rather, this body of literature is marked by a lack of meaningful treatment of the specialized and unique skills required for expert performance of string quartets. Blanche, in her own analysis of string quartet literature, asserts that ‘individual technique is a prerequisite for the development of string quartet technique.’ However, the focus of the main texts concerned with string quartet playing by Blanche, Norton and Léner have two apparent deficiencies in this regard: they deal largely with group contexts and their focus is not upon expert performance, but rather more basic levels of competency. Further, whilst this literature identifies that there are specialized skills crucial to the genre, these skills are not specifically treated in the extensive literature on violin playing.

I have trained extensively in music performance at the Australian National Academy of Music, the Victorian College of the Arts and the Australian Institute of Music, and the University of Western Australia. I have had tuition, either in a private or master-class setting, with many of the world’s leading violinists and string quartets, such as Leonidas Kavakos, Christian Tetzlaff, Ernst Kovacic, Takács String Quartet, Jerusalem Quartet, and St. Lawrence String Quartet. I have extensive performance experience, including as a soloist, chamber musician and in numerous recital settings, in addition to almost a decade of experience playing in professional orchestras. I have engaged with a varied

and extensive amount of technical repertoire including etudes, studies and exercises, and my experience playing in a string quartet ranges over almost 20 years and has involved a wide range of projects and repertoire.

Aims

This study attempts to explore this disparity through exploration of the well-established link between deliberate practice and expert performance. Much of the research detailing this link in the musical domain (such as Ericsson et al., Williamon and Valentine, Lammers, Duke et al. and Gruson) includes participants from varied levels of skill. A smaller number of studies (including Chaffin and Logan, Chaffin et al., Chaffin and Imreh and Miklaszewski) focus more heavily on the practice of concertizing musicians. There are currently no studies to this researcher’s knowledge that focus on the practice processes of an expert-level violinist. In light of these points, this study aims to probe the nature of elite forms of practice—that is, practice done by those who

have already achieved expertise in performance, and investigate whether existing strategies and models for expert practice of solo violinists can be applied to the demands of the string quartet genre.

**Research Question**

*Does the prescribed model employed by Ševčík effectively help to bridge the lacuna in individual skill training required for expert-level string quartet performance when applied to individual parts of the string quartet repertoire?*

**Methodology**

The meta-structure of this study is best categorized as a piece of educational action research, defined by Bassey as ‘an inquiry which is carried out in order to understand, to evaluate and then to change, in order to improve some educational practice.’16 The three critical processes of understanding, evaluating and changing are the pillars on which this study has been constructed.

As the focus of this study is expert string quartet performance, the key components needing to be understood in this study are considered to be:

- Skills critical to string quartet performance,
- Expert practice, expert performance and expertise acquisition research
- Performance-based knowledge of the central works of the study, which are Otakar Ševčík’s *J. Brahms: Konzert D-Dur*, Op. 18 (and by extension Johannes Brahms’s *Violin Concerto in D Major*, op. 77) and Franz Schubert’s *String Quartet No. 15 in G Major*, D887.

The evaluation aspect of this research deals primarily with Ševčík’s op. 18, which is concerned with facilitating expert performance of Brahms’s op. 77. As this study deals with music performance, this analysis is similarly based upon extensive engagement with the work itself. This practical approach is considered to be central to the research as a whole, as this not only informs the evaluation of Ševčík’s method, but also serves as the foundational knowledge and experience required to create exercises aimed at facilitating expert performance of the first violin part of Schubert’s quartet. As is the

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case with much action research, this will eliminate the objective boundary that traditionally separates the researcher and subject, potentially leading to subjectivity in the data and any consequential results. In order to mitigate the potential of such subjectivity, the evaluation of Ševčík’s method employs triangulation. As well as lessening the reliance on one set of data, this helps to shift the focus towards relevant and useful information, rather than methodological zeal. As such, in addition to experiential knowledge of Ševčík’s work, the evaluation deconstructs the methodology utilized by Ševčík through the use of reflective practice, and more specifically the use of grounded theory construction. These results are also further scrutinized against existing research dealing with expertise acquisition. Thus, the evaluation is ultimately focused towards determining whether Ševčík’s model resonates with expertise acquisition research and can therefore be viewed as an expert-level teaching model, rather than focusing on how effective it may or may not be in my own experience.

Evaluation was also undertaken during the creation of the exercises created as part of this research, but this was done mainly to ensure that the effects experienced in my own engagement with Ševčík’s work had similar results on others. It was deemed out of the scope of this research to meaningfully assess the effectiveness of my own exercises.

It is in terms of change where this research aims to have the most impact, in shifting the level of discussion of chamber music training towards the realm of expert performance. In relation to the overall structure of the research, change is represented by the adaption and application of Ševčík’s existing model to chamber music repertoire, something which Ševčík did not do. This also represents the original aspect of the research. However, in order for the central aim of the research to be met, a change in role has to occur, from investigator during the evaluation of Ševčík’s method to expert coach/teacher for the creation of an original set of exercises. It is in understanding the nature of coaching expertise that the overall structure of this research gains its context. Firstly, coaching expertise is not something that can be formally instructed but requires

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coaches to develop and refine their own practice methods.\textsuperscript{19} Secondly, expert coaches have extensive practical knowledge (both explicit and implicit) of the field in which they teach, which allows them to adapt to new and unexpected challenges.\textsuperscript{20} Ultimately, ‘all expert coaches are experienced.’\textsuperscript{21} Considering that the recital programs of this research contained the major works focused upon in the study, the above criteria for expert coaching are specifically addressed by the structure of the study. Further, the implicit and explicit knowledge critical to coaching expertise has been sought in multiple dimensions. This knowledge base includes challenges associated with chamber music performance, expertise acquisition (and by association expert practice and expert performance), the methodology behind Ševčík’s op. 18 and intimate performance-based knowledge of the central works associated with this study (the importance of which has been articulated by Doğantan-Dack).\textsuperscript{22} It is from this knowledge base that the exercises were created.

\textit{The Music:}

Ševčík’s \textit{J. Brahms: Konzert D-Dur}, op. 18 was chosen as a case study for the acquisition of expert performance skill as it informs the process of gaining technical mastery for one of the most challenging works of the core violin repertoire, Brahms’s \textit{Violin Concerto in D Major}, op. 77. The challenge that the Brahms violin concerto represents is formidable, as ‘the solo part is not only a virtuoso showpiece encased in the wrappings of Classical concerto form but also takes its place in a totally integrated composition of symphonic breadth and character.’\textsuperscript{23} Brahms’s concerto consists of three movements, 1034 bars, with a duration of approximately forty minutes. Ševčík’s \textit{Analytical Studies} comprises 86 pages of technical studies, which are based on the solo violin part of Brahms’s concerto, accompanied by the solo violin part in full that has been edited by Ševčík.

\textsuperscript{21} Ibid.
Schubert’s *String Quartet No. 15 in G Major*, D.887 was chosen for its close relation to Brahms’ work that exists on many levels. It is considered by elite string players as being among the most challenging in the string quartet repertoire, both in terms of individual challenge of the first violin part and group challenges, as well as in its length and musical complexity. Perhaps even more significant is that, like the Brahms Violin Concerto, it was symphonic and large-scale in its conception, a point Schubert made very clear in writing to his friend Leopold Kupelwieser in 1824:

> Of songs I have not written many new ones, but I have tried my hand at several instrumental works, for I wrote two Quartets for violins, viola and violoncello and an Octet, and I want to write another quartet, in fact I intend to pave my way towards grand symphony in that manner.²⁴

This research offered an opportunity to apply this research methodology in acquiring the information, expert skills and knowledge needed to prepare these works for performance, unbiased by past practical experience, as I had never learned the solo/first violin parts before.

Procedure:

The overall procedure of the study can be summarized in the following diagram:

After highlighting the lacuna in the chamber music literature and exploring the nature of expert practice, the first phase of this research consists of a case study, comprising of Ševčík’s work. The practical work was undertaken using Ševčík’s work as the central focus in the technical preparation for the performance of Brahms’ own work. As such,
time constraints were placed on the first part of the case study, in order to simulate the real-world time a soloist might have had to prepare Brahms’ work for performance. The total practice time allocated to studying Ševčík’s exercises was limited to 60 hours at the outset of the preparation process, with 20 hours given to the first movement, 15 to the second, and 25 to the third. This weighting of the time given to preparing different movements was chosen after discussions with supervisors and two colleagues, who have all learned and performed this concerto. All were in agreement that the final movement represented the greatest technical challenge and therefore required the greatest amount of practice time.

After the case study was completed, the weighting was found to be 24 hours on the first movement, 7 hours on the second movement and 31 on the third movement for a total of 62 hours, which corresponded closely with the target weightings of practice time spent on each movement. The full concerto was then performed with orchestra as the first formal recital for this research.

This high number of practice hours reflects the fact that Ševčík’s work deals primarily with gaining technical mastery of the solo violin part. In Chaffin and Imreh’s study, the subject took 30 hours to prepare for a professional recording a 3-4 minute movement of a Bach piano concerto, which is deemed to be ‘moderately difficult’. Considering that Brahms’s work lasts 40 minutes and is considered amongst the most difficult in the solo violinist’s repertoire, 60 hours may in fact be a conservative amount of time to achieve technical mastery of the part. Due to the approximation of practice times during the data collection phase and interruptions during some practice sessions, the final amount of recorded data was found to be almost 62 hours when tallied. Data were collected using a combination of audio/video recordings of the application of the exercises and reflective verbal comments during practice. This data was then reviewed in combination with a practical analysis of the score, in order to elucidate and extrapolate the strategies and processes underlying the construction of Ševčík’s work. The overall effectiveness of his method was also assessed, and the work was reviewed in the context of literature concerned with expert practice to determine whether it is itself representative of expert practice.

25 Paul Wright, Shaun Lee-Chen and Alex Isted.
26 Chaffin and Imreh, p. 45.
The second phase of research involved applying Ševčík’s op. 18 in another repertoire genre. This second stage began with the second recital, which consisted of performing Schubert’s quartet in full as first violinist with three other professional musicians. With the eventual creation of the exercises in mind, different practice strategies arising from the case study were experimented with during the initial learning stages of the work and utilized in the final stages of preparation for performance.

This was followed by the creation of a set of technical exercises, based upon the first violin part of Schubert’s quartet, again modeled on Ševčík’s use of the Brahms Concerto in his set of analytical studies. Due to the expansive nature of Schubert’s composition (it comprises of fifty percent more bars of music than the Brahms Concerto) and the scope of this project, it was deemed unrealistic to endeavor to create exercises for every bar, as Ševčík did with his set of exercises for the Concerto. Instead, the most significant technical challenges in Schubert’s composition were identified and systematically addressed. This systematic, targeted approach has been demonstrated by others, such as Chaffin and Imreh\(^\text{27}\) and Miklaszewski,\(^\text{28}\) as an effective approach to developing practice techniques that are used by expert performers in preparing a new work.

The creation of the technical exercises was informed and shaped in collaboration with the input of a supervisor, who is also familiar with the processes and strategies inherent in Ševčík’s method. In addition to this guidance, some of the exercises created in the second part of this study were tested with tertiary level students. This was done in the early stages of creating the exercises in order to check the applicability of the method. The participants were given a period of two weeks prior to the workshop to engage with the exercises, and were asked to record the time spent on the various sets of exercises. As well as audio/video documentation of the workshop, the participants were interviewed in order to facilitate feedback that could improve the effectiveness of the exercises. The final phase of this second stage of research assessed the effectiveness of this approach by analyzing a selection of excerpts from the technical exercises for Schubert’s work and demonstrating how Ševčík’s method can not only be easily applied to individual parts in the string quartet genre, but adapted to address unique technical concerns inherent in the string quartet parts. Further discussion considers the

\(^{27}\) Chaffin and Imreh, p. 48.
\(^{28}\) Miklaszewski, p. 102.
adaptability of the method in broader terms, including its applicability to the group rehearsal setting.

*Equipment:*
All video recording was done using an iPhone 4 (720p) and iPhone 5 (1080p). Audio was captured using MiC by Apogee, which is a studio quality condenser microphone, designed for use with iPhone. The technical exercises created in the second part of the study were notated using a 2011 MacBook Pro and 2015 iMac using Sibelius 7 music notation software.

*Recitals:*
The programs for the recitals comprised Brahms’s *Violin Concerto in D Major,* and Schubert’s *String Quartet No. 15 in G Major.* Both recitals had important functions in the greater context of the research. The performance of Brahms’s concerto with orchestra, served as the final test of the effectiveness of Ševčík’s op.18. The second recital, presenting Schubert’s quartet, took place prior to the creation of the exercises, in accordance with findings arising from the case study of Ševčík’s work. While the recording was not reviewed, the process of learning and performing the work served as the expert-knowledge base that facilitated the creation of the exercises. Following these two recitals, the lecture recital was held, which combined elements of all of the research encompassed by this project.

*Limitations:*
Upon initial reading, it might seem that the methods and procedures used for this project will lead to highly subjective findings. However, due to limitations regarding what can effectively be covered in the scope of the study, an unavoidable choice must be made between sampling many participants with a limited amount of detail or sampling one participant and obtaining a much richer set of data, albeit with the potential for subjectivity in the data collected. This choice can be seen in other existing research in the field, and as such this study is consistent with others in this regard. In addition, difficulties associated with engaging multiple expert-level performing musicians, who are typically quite time poor due to the nature of the profession, made the former option unsuitable for the study. Taken in consideration with the highly practical nature of the research, it seemed logical to opt for the latter in order to obtain a qualitatively rich data set.
The exercises created in this study for Schubert’s G Major Quartet are not as comprehensive as those done by Ševčík for the Brahms concerto in his op. 18. This is due to the scope of the research, the length of Schubert’s work and the careful application of the methodology employed. Limitations on scope also made meaningful testing of my own exercises difficult. As such, this study was focused towards qualitative exploration of existing research as a basis for the exercises rather than a retrospective quantitative analysis. However, some of the exercises were tested on tertiary students in order to gain a measure of objectivity. While the results seemed to affirm the effectiveness of the exercises, these findings should be viewed as indicative rather than conclusive. While the approach taken in the study has largely achieved its objective of addressing a perceived lacuna in the training of individuals for string-quartet performance, it is not viewed as the only effective course for achieving this goal.

Additionally, the focus on individual skill training of a group phenomenon (string quartet performance) naturally leaves unanswered questions as to the ultimate viability of the exercises created in this study. It became apparent during the study that while the small-scale testing indicates that the created material is an effective initial step in addressing the lacuna central to the study, the potential for the same approach to be applied in group contexts such as group rehearsals presents itself as a logical and highly promising next step. However, limitations in scope, as mentioned above, prevented this next course of action from being undertaken.
Chapter 2: Comparative Analysis of Issues Involved in String Quartet Performance

Generally speaking, the pedagogy of string quartet playing is an under-developed field and in its infancy when compared with the pedagogy of violin playing, a field and tradition that is now centuries old. The reason for this reveals itself when considering the role of the string quartet throughout music history. Baillot’s seminal *L’Art du violon*, first published in 1835, provides a useful insight into contemporary views on the role of the quartet violinist as compared to sonata and concerto playing. According to Baillot, the sonata represents ‘a sort of concerto stripped of its accompaniments,’ which gives the violinist ‘the occasion to let his power shine.’29 In the concerto, ‘the violin must develop its entire power’ and is ‘designed to move a great number of listeners… calling for a larger theater.’30 Contrasting this, the violinist in the quartet ‘sacrifices all the richness of the instrument to the general effect… whose appealing dialogue seems to be a conversation among friends sharing their sensations, feelings, and mutual affections.’31 This view is particularly difficult to comprehend for the modern musician when considering that Baillot’s violin treatise (1835) was published less than a decade after Beethoven’s final quartet (1827), and that much of the quartet repertoire to date was used in violin classes at the Conservatoire National in Paris.32

Yet it was almost half a century later before these late quartets of Beethoven began to be fully appreciated by musicians and concert-goers, when Joachim’s quartet was both performing in Berlin and abroad and demanding compositions for his quartet from his friend Johannes Brahms.33 Towards the end of the nineteenth century, composers were again conceiving quartets with public performances in mind (as Beethoven had done in 1810), with a further development at this time being a revival of virtuoso writing in the first violin part (after Spohr and his predecessors).34 By the Second World War, the string quartet as a compositional form had completed its transition ‘from its domestic

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30 Ibid., p. 480.
31 Ibid., p. 479.
32 Ibid., pp. 486-9.
34 Ibid.
environment into the concert hall," with contemporary composers including Bartók and Schoenberg dedicating their compositions in the medium to concertizing quartets such as the Pro Arte and Kolisch. Despite this ascension of the string quartet as a medium worthy of the concert hall, 'methods designed to assist string quartet students acquire the techniques and understandings necessary for the performance of “standard” literature [remain] few in number.'

Blanche’s dissertation Selected Etudes for the Development of String Quartet Technique: An Annotated Compilation, with its review of the most significant literature regarding string quartet playing, represents one of the most important contributions in the field of string quartet pedagogy. In her study, Blanche expresses her view that 'individual technique is a prerequisite for the development of string quartet technique.' Furthermore, she states that 'the study of string quartet must not be confused with developing individual technique' and that 'technical areas must be worked out on an individual basis.'

The following discussion will explore the merit of Blanche’s views regarding the individual technical development prerequisite for string quartet study, by conducting a comparative analysis of selected literature on both solo violin playing and string quartet playing. It will explore the extent to which these two types of violin performance share a relationship with respect to technical and stylistic considerations, and evaluate whether a single approach drawn from solo pedagogy can be effectively applied to both, or if and when a specialized, distinct approach is called for in quartet playing.

While there is a large body of work relating to the development of violin technique and style, there has been little that critically examines the skills necessary in order to establish a successful career as a performing chamber musician. The literature relating to the development of technique and style in string quartet playing, in addition to being

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36 Griffiths, pp. 177-8.
38 Blanche, p. 2.
39 Ibid., p. 121.
40 Ibid.
much smaller in scope than that for solo violin playing, is somewhat limited in its level of detail and, therefore, in its usefulness as a training tool for aspiring professionals. This is due to the amateur/student focus of some of the texts, such as Blanche\textsuperscript{41} and Norton, and the conversational manner employed by Blum\textsuperscript{42} and Fink and Merriell\textsuperscript{43} in their work. Furthermore, there is very little research that compares the development of technique and style in solo and chamber music playing beyond the most basic level.

The framework of this discussion follows that of Blanche’s study, which serves as a point of departure from which to compare the most pertinent technical and stylistic challenges involved in string quartet playing. These challenges are: intonation, timing, tone colour, balance, articulation and ensemble. Excerpts from the quartet and solo violin repertoire will be used to illustrate the analysis of these challenges, and further discussion will address extra-musical problems inherent in the string quartet genre. In addition to providing a useful model for this discussion, Blanche’s work is also well suited as the point of departure for a discussion of chamber music pedagogy, since it contains a review of the most important chamber music literature. However, while Blanche’s dissertation begins by addressing those skills she identifies as being the most ‘accessible,’\textsuperscript{44} this study will address each topic in order of the importance accorded them by respondents in her study. This will be done in order to shift the discussion away from the perspective of the amateur/student, reflected in much of the chamber music pedagogy literature, aiming instead towards professional-level expert performance.

**Intonation**

Of the technical challenges noted above that are addressed by Blanche, intonation is identified as the most important challenge facing players in a string quartet. Indeed, Norton suggests that ‘no combination of instruments more severely tests the accuracy of the players’ intonation than the string quartet.’\textsuperscript{45} Aside from issues arising merely from the tempered fifths in which the four instruments are usually tuned (often resulting in a

\textsuperscript{41} Blanche, p. 2.
\textsuperscript{43} Irving Fink and Cynthia Merriell (eds.), *String Quartet Playing: With the Guarneri String Quartet* (Neptune City: Paganiniana Publications, 1985).
\textsuperscript{44} Blanche, p. 13.
large discrepancy between the E-string pitch of the violins and the C-string pitch of the viola and cello), the greatest challenge arises from the lack of a single stable intonation reference point for the group. When playing with piano, the reference point is of course the piano, which has fixed intonation (of equal temperament). In concerto playing, the collective pitch center of the orchestra functions as the reference point for the soloist’s own intonation. However, in the string quartet setting, there is a less clearly fixed reference point for intonation. Coupled with this is the interchangeable role of the individual’s part in the group between melodic and harmonic functions (which both Blanche and Blum refer to as ‘linear’ and ‘vertical’ functions46). The achievement of consistent group intonation depends on the ability of each individual to temper pitches according to their linear or vertical function. Arnold Steinhardt, first violinist of the Guarneri Quartet, summarizes this well, stating that ‘the difficulty in quartet intonation is to determine the degree of freedom you have at any given moment.’47 This process of role evaluation is a foundational feature of string quartet playing: as well as being the source of the greatest challenge to performers, it is also a potential resource in achieving group expression.

The intentional tempering of pitch is employed to great effect by musicians of the highest caliber, and in performance contexts this is often referred to as ‘expressive intonation’. Its use by string quartets has been documented by Johnson,48 who empirically measured the variation in intonation of leading notes from a selected passage of Beethoven’s String Quartet in F major Op. 135, through the analysis of recordings of twenty-five of the world’s leading string quartets. As well as showing that there are many ways in which to temper the passage that are acceptable to the listener’s ear (evident through the pitch variance between various quartets as measured by Johnson49), this research suggests that certain groups actually tempered these intervals in the same way. This is remarkable for the fact that these fine gradations would only be truly noticeable to the most acutely refined musical ear, demonstrating an irrefutable link between group intonation and musical identity amongst highly trained quartets. The

46 See: Blanche, p. 31 and Blum, p. 28.
47 Blum, p. 28.
49 Ibid, p. 85.
following example included by Blum (Ex. 2.1) effectively illustrates this process as employed by the Guarneri String Quartet:

One could cite endless examples of expressive intonation at work. It’s really a habit of playing. For instance, in the slow movement of Beethoven’s Opus 18, No. 1, close semitones—in this case drawn upwards—increase the sense of expressive tension... such passages would lose their eloquence if played with equal-tempered intonation.\(^{50}\)

Ex. 2.1: Blum, p. 29

![Musical score image]

The above challenges regarding intonation are rarely mentioned in the pedagogical violin literature. Bronstein’s concept of ‘visual intonation’ (visualizing the distance between any two notes on the instrument before playing them\(^{51}\)), which is based on ‘before the fact’\(^{52}\) knowledge, is potentially counterproductive in a quartet setting as it does not allow for the constant flexibility needed to adjust intonation to that of other players on the spot for string quartets.

On the other hand, one of the most useful approaches to intonation in quartet playing is, in fact, that of the famous violin pedagogue Galamian, who suggests that ‘the building of good intonation rests mainly on the sense of touch in combination with the guidance

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\(^{50}\) Blum, pp. 28-9.


\(^{52}\) Ibid.
of the ear. More importantly, Galamian highlights the importance of spontaneous adjustment, saying that ‘an intonation adjustable to the needs of the moment is the only safe answer to the big question of playing in tune.’ However, Galamian does not suggest how these adjustments might be made in a string quartet setting by four players simultaneously. Despite this, he does acknowledge that ‘a performer has constantly to adjust his intonation to match his accompanying medium.’

Also, there are methods for teaching the violin such as Louis Spohr’s *Violin School*, Baillot, Kreutzer and Rode’s *Méthode de Violon*, or even Wieniawski’s *Etudes-Caprices*, op.18, which utilize an accompanying line throughout. Whilst not as complex a texture as a quartet that has three additional voices, the addition of the accompanying line serves to begin training intonation both in vertical and horizontal contexts in string chamber music settings.

Common rehearsal techniques used for addressing intonation in quartets include building chords (which involves isolating problem chords and tuning them first with two group members, then three and finally all four), and reducing dynamics (which makes impurities in intonation easier to detect).

Léner and Blanche go some way further in addressing the issue of intonation with the ensemble etudes their publications contain, which consist mainly of playing scales together, both in unison and simply harmonized variants. But while these etudes are well suited to developing foundational aspects of intonation in a string quartet, they fail to address more advanced issues such as diminished/augmented chords, tone clusters and dissonant harmonies. Balance and tone colour also heavily influence intonation in a quartet setting, with weak low-register/strong high-register group dynamic balance a

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54 Ibid, p. 22.
55 Ibid.
56 Ludwig Spohr, *Violinschule* (Vienna: Bei Tobias Haslinger, 1832).
59 Norton, p. 178.
60 Ibid.
common source of intonation problems that neither text acknowledges. Also absent from both texts, and more challenging still, is the treatment of intonation in unrelated keys or where complex modulatory passages are juxtaposed, such as can be frequently found in the most challenging string quartet repertoire.

The difference in approach to intonation that is required to play such passages, whether in solo or quartet genres, is highlighted by Ex. 2.2 and Ex. 2.3.

Ex. 2.2: *Chaconne*, from Bach’s *Partita for Solo Violin No. 2 in D minor*, BWV 1004 (measures 201-208)

Ex. 2.3: *Adagio molto*, from Bartók’s *String Quartet No. 5*, sz. 102 (measures 10-24)
In the Bach *Chaconne* (Ex. 2.2), the main technical hurdle is the demand on the left hand in terms of the agility required to execute the passage with accurate intonation. It should also be noted that the arpeggiated nature of the passage means that only one note is sounded at any particular time in performance of the passage. Contrasting this, the technical demands on the agility of the left hand, in regards to the execution of the required pitches, are much lower in the excerpt from Bartók’s quartet (Ex. 2.3). Despite this, the tempering required on repeated notes and the necessity to create the right tone and balance\(^62\) in order to execute the passage with accurate group intonation makes this seemingly simple excerpt equally if not more challenging to play in tune for the violinist than the preceding example. More importantly, as this example suggests, there are special factors involved in string quartet intonation, requiring quartet-specific skills that are not specifically addressed by the solo violin pedagogical literature.

**Rhythm**

Galamian asserts that ‘Tone, pitch and rhythm are the basic elements of all music.’\(^63\) Having dealt with pitch (intonation), the next biggest challenge to quartet playing, according to Blanche’s respondents, is rhythm. Both Blanche and Galamian replace the term ‘rhythm’ with ‘timing’, as this allows for the inclusion of closely related

\(^{62}\) See: Blum, pp. 34-5.

\(^{63}\) Galamian, p. 3.
subcategories, such as tempo considerations, use of rubato and tempo manipulation (used to execute *ritardandos* and *accelerandos*). In the interest of clarity and consistency, this study will also refer to the broader subject of rhythm and tempo as ‘timing’.

Galamian writes:

Musical timing means the actual sounding of the notes in the exact rhythmical pattern and the exact speed required by the music. Technical timing means the making of the necessary movements of both left and right hands at the exact moment and precise speed that will insure correct musical timing. These two things, musical timing and technical timing, will sometimes but not always coincide… The musical timing is, of course, the deciding factor. If it is to be perfect, it presupposes correct technical timing of each hand by itself and a correct coordination between the two for any rhythm, any speed, or any required change of speed.\(^{64}\)

Again, while Galamian’s text does not directly discuss timing in the context of chamber music, the ideas presented within can be interpreted and applied to the quartet setting: Members of a string quartet must have complete control over their own technical timing in order for the group to be able to engage in musical timing effectively and successfully. However, such an application of Galamian’s views is highly experiential and would not be obvious to an individual developing the individual skills required for chamber music performance.

Of the chamber music literature, Blanche deals with the issue of timing in string quartet playing most effectively. In addition to providing rehearsal strategies, which are supplied by her respondents (such as breaking the quartet into sub-groups and playing phrases against constant fast notes\(^{65}\)), Blanche’s etudes *IV-A* and *IV-B* contain an effective approach to developing uniformity and accuracy in rhythm between members of the string quartet. The etudes achieve this by passing simple rhythms firstly between individuals (in *Etude IV-A*) and then in pairs (in *Etude IV-B*). It is worth noting, however, that in *Etude IV-B*, the first violin is never paired with the viola and the second violin is never paired with the cello. Blanche also meaningfully discusses the concept of ‘inner pulse’, describing it as a ‘mental control over the pulse,’\(^{66}\) which enables the quartet to ‘re-establish the original tempo no matter how many tempo variations they make within a movement.’\(^{67}\) Norton’s discussion on tempo and timing is

\(^{64}\) Galamian, p. 23.
\(^{65}\) Blanche, p. 47.
\(^{66}\) Ibid., p. 44.
\(^{67}\) Ibid.
also useful as he addresses tempo selection (suggesting the importance of ‘familiarity’ and ‘experimentation’\(^{68}\)) and more general aspects relating to timing (such as ‘give-and-take’,\(^{69}\) sudden tempo changes and their relation,\(^{70}\) and “feeling” a tempo\(^{71}\)), providing examples relating to each and how to execute them successfully. This approach is also adopted by Flesch, but to a greater extent. He discusses the variation in slightly different tempo markings (such as comparing *andante* with *andantino*), and although this focuses mainly on the solo violin repertoire, his inclusion of chamber music examples demonstrates both that he is aware of the repertoire and that he deems it challenging enough to include in his discussion of technique and style.\(^{72}\)

Much like the issue of intonation, the more advanced aspects of rhythm are not represented or discussed in the chamber music literature. One such aspect is polyrhythms, consisting of ‘the simultaneous (as opposed to successive) presence of two different rhythmic or metric streams.’\(^{73}\) This rhythmic aspect is arguably the most difficult to treat in the string quartet setting, as there is the possibility for four different rhythms or metric streams to be presented simultaneously, with each rhythm having only one player to represent it, but no conductor to maintain an overall reference pulse. While there are examples of polyrhythms in the solo repertoire, the level of complexity is comparably simpler (the same can be said of orchestral repertoire, where as a string player, one usually plays as part of a whole section, which aids individual rhythmic security). The following examples from Sibelius’s *Violin Concerto in D Minor* (Ex. 2.4) and Bartók’s fifth quartet (Ex. 2.5) illustrate this point:

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\(^{68}\) Norton, p. 50.
\(^{69}\) Ibid., p. 59.
\(^{70}\) Ibid., p. 62.
\(^{71}\) Ibid., p. 60.
Ex. 2.4: Adagio di molto, from Sibelius’ Violin Concerto in D Minor, op. 47 (measures 32-36)

While an accurate rendition of this passage requires careful working out, once the coordination of the left hand has been achieved, there is little difficulty executing the passage in a concert setting, with the solo violin left to its own devices by the rhythmically passive orchestral accompaniment. Contrasting this is this example from Bartók’s quartet:

Ex. 2.5: Scherzo: alla bulgarese, from Bartók’s String Quartet No. 5, sz. 102 (measures 41-48)
In this passage, the performers are grouped in pairs (violin 1 with cello, and violin 2 with viola), which play duple and triple rhythms simultaneously. In performance, not only is a tight cohesion with the pairing quartet member required, but the two opposing pairs must have an intimate knowledge of each other’s line in order to comfortably execute the complex group rhythms to a high level. Combined with the extreme tempo marking as indicated by Bartók, this example illustrates a high level of rhythmic complexity for both the individual and ensemble. While it can be said that there are pieces in the solo repertoire which require a highly advanced sense of individual timing, the added challenge of group awareness and coordination required for musical timing in chamber music settings such as this compounds the challenge.

**Balance**

The concept of ‘balance’, in a string quartet setting, is encapsulated well by the following excerpt from Blanche:

String players can play the same tone on their instrument in several different positions. (The exceptions are those notes in first position on their lowest string, as well as notes on their highest string above fourth position.) The colour of each of the tones will be different depending on the string and playing position chosen. String players can even play the same tone on the different instruments of the quartet and have very similar or very different colours depending again on position and string choice. This ability to be
homogenous and heterogeneous simultaneously is a special characteristic of the string quartet. No other instruments can do this.\textsuperscript{74}

While respondents in Blanche’s study regarded balance as the third most crucial aspect of quartet playing,\textsuperscript{75} the issue is dealt with by Blanche and others\textsuperscript{76} in an imprecise manner. In fact, Blanche does not address the issue of balance at all directly, although references to it appear in an unconnected way in different parts of her study.

Of the twenty etudes and excerpts that comprise Léner’s method, only his Example V\textsuperscript{77} makes any reference to what could be considered a multi-layered texture (in almost all of the other examples, he specifically calls for a uniformity in balance, both dynamically and texturally). While Fink and Merriell go to some length describing six perceived levels of tone production as identified by the Guarneri Quartet,\textsuperscript{78} they do not discuss methods for how tonal balance might be achieved in a string quartet. However, they acknowledge the crucial importance of tone colour as well as volume with regard to balancing the four voices of the quartet, stating that ‘one of the most important concepts in string quartet playing is that of tone colours. A prime consideration at every moment of playing is the tone production of the individual instruments and of the instruments as a whole.’\textsuperscript{79} As such, this study will treat the issue of balance in broader terms, and discussed on the basis of tone production, including discussion of tone colour, texture and use of vibrato. In this way, the issue of balance can be related more easily to the technical and stylistic elements of solo violin playing.

Tone colour, also referred to as ‘timbre’, is defined by the Oxford Music Online as ‘that which distinguishes the quality of tone or variety of one instrument or singer from another.’\textsuperscript{80} While Galamian identifies three main factors in relation to tone production (being the speed, pressure and “sounding point” of the bow\textsuperscript{81}), Blanche goes further and rightly identifies a fourth factor: the ‘choice of position.’\textsuperscript{82} Further, Blanche and

\textsuperscript{74} Blanche, p. 53.
\textsuperscript{75} Ibid., p. 9.
\textsuperscript{76} Fink and Merriell, Blum, Léner, and Norton
\textsuperscript{77} See: Léner, , p. 6.
\textsuperscript{78} See: Fink and Merriell, pp. 74-5.
\textsuperscript{79} Ibid., p. 71.
\textsuperscript{81} Galamian, p. 55.
\textsuperscript{82} Blanche, p. 54.
Galamian best treat the importance of tone production and outline effective technical methods for developing it (although Flesch provides examples of some different colours and how to execute them\textsuperscript{83}). Galamian suggests that in combination with the use of a varied and flexible vibrato, a complete control of tone production variables ‘can yield an infinitely diversified palette of the most varied character, color, and quality of sound.’\textsuperscript{84} Similarly, Blanche asserts that ‘mastering control and variation over the four sound variables is... essential for manipulating tone colour within the quartet.’\textsuperscript{85}

Further clarification of the term ‘tone colour’ is needed, to give clarity to the issue and requirements of balance in a performance context. Norton suggests that ‘color, understood in the general sense of the variety and interest of a work, includes dynamics.’\textsuperscript{86} Further, he believes that ‘the two are almost inseparable, and they are constantly interactive, often one and the same.’\textsuperscript{87} With this in mind, the excerpts selected for discussion include tone colours from both ends of the dynamic spectrum, both loud and soft.

The following excerpt from the first movement of Dvořák’s Violin Concerto in A minor (Ex. 2.6) represents the loud end of this spectrum:

Ex. 2.6: Allegro ma non troppo, from Dvořák’s Violin Concerto in A minor, op.53 (measures 123-125)

The broadness of bow strokes required for the soloist to maintain an appropriate balance with the orchestra is typical for to concerto playing and one that would also suit a passage such as the following from Beethoven’s String Quartet in E-flat Major (Ex. 2.7):

\textsuperscript{84} Galamian, p. 63.
\textsuperscript{85} Blanche, p. 61.
\textsuperscript{86} Norton, p. 89.
\textsuperscript{87} Ibid.
Ex. 2.7: Poco adagio; Allegro, from Beethoven’s String Quartet in E-flat Major, op. 74 (measures 240-245)

The following excerpt from Ysaye’s Sonata No.2 for Solo Violin (Ex. 2.8) is useful in the context of this discussion as it captures, to some extent, the two ends of the dynamic and colour spectrum best suited for use in quartet playing. The **pp** used here, in a solo setting, allows for the performer to play as soft as he/she dares, without a loss of clarity, while the **ff** calls for the strongest, most resonant tone available to the player.

Ex. 2.8: Les Furies, from Ysaye’s Sonata No.2 for Solo Violin, op.27 (measures 66-70)

In Fink and Merriell, the Guarneri Quartet suggests that a ‘solo type of tone quality while playing softly is one of the most important aspects of quartet playing’\(^8\) (one should note that in this quote the phrase ‘solo type of tone quality’ refers to the concerto style mentioned earlier). Further, Blanche states ‘no matter what [tone colour is

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\(^8\) Fink and Merriell, p. 18.
there must always be “core” [substance or center] to the sound so that it is clean and penetrating,"\(^{89}\) as seen in the following excerpt from Beethoven’s String Quartet in E minor (Ex. 2.9). In terms of balance, due to the lack of harmonic and melodic movement, the articulation of the rhythm becomes paramount and thus a clean, penetrating sound incorporating a ‘solo type of tone quality’ is well suited to this passage:

![Ex. 2.9: Allegro, from Beethoven’s String Quartet in E minor, op.59 no.2 (measures 224-35)](image)

Thus in regard to dynamics, expert performance of string quartets requires the same extremities found in both concerto and solo violin repertoire.

\(^{89}\) Blanche, p. 61.
In relation to both solo and chamber music playing, all of the literature considers vibrato as integral to tone colour and, therefore, balance. Of the texts relating to solo violin pedagogy, Galamian, with a detailed and effective developmental approach, and Flesch, representing a broader conceptual discussion and containing a helpful problem-solving guide, represent between them an extensive treatment of the development of a flexible and varied vibrato. Both of their texts highlight the importance of using finger, wrist and arm movements for vibrato. According to Galamian, ‘perfect vibrato’ requires a mastery of all the components (type, width, speed and intensity) and the ability to change ‘from one type of vibrato to another in gradual transition with subtlety and smoothness so that no line of demarcation will be apparent.’⁹⁰ Similarly, Flesch states that ‘a perfect vibrato is produced by the combination of the finger, hand and arm movements.’⁹¹

The same, detailed treatment of vibrato in a string quartet context cannot be said to exist in the chamber music literature. Blum does acknowledge the three types of vibrato already discussed, as well as the need for variety in use of vibrato, and indicates common deficiencies in the use of vibrato. These deficiencies include vibrating after the note has started and neglecting vibrato when it is not convenient to use it, for instance on the fourth finger or before a shift.⁹² More significantly, Blum recognises the usefulness of senza vibrato as a means of creating tone colour in a string quartet setting (though it is just as useful in the genre of solo violin playing).⁹³ Interestingly, based on work with the Guarneri Quartet, Fink and Merriell seem to contradict this last point, stating that ‘each note should be vibrated and fit in with what is going on with the rest of the quartet.’⁹⁴ This could be due to a change in philosophy regarding the use of vibrato within the quartet. Again, Léner’s exercises make almost no mention of vibrato and would be of little use in the development of a varied, flexible approach to vibrato in a group setting. This issue is somewhat addressed by Blanche, whose études are well served to this end. Despite these inconsistencies, the relationship between the genres of solo violin playing and quartet playing, in terms of vibrato, is a strong one with much common ground, well summarized by Norton when he writes:

⁹⁰ Galamian, p. 37.
⁹¹ Flesch, p. 39.
⁹² Blum, p. 36.
⁹³ Ibid., pp. 38-40.
⁹⁴ Fink and Merriell, p. 19.
The slight variations in intensity or speed used so spontaneously in solo playing may with excellent effect be made use of in the four voice texture—with by agreement, of course, and according to the sense of the passage and the proportionate importance of the voices.95

Having analyzed the components contributing to balance within a string quartet, timbre, dynamics and use of vibrato, the larger question of balance can now be addressed. In terms of performance, the technical and stylistic means of achieving balance in a string quartet are equally or more demanding than that of the soloist balancing against an orchestra. This view is supported by the Guarneri quartet. Arnold Steinhardt states that ‘playing quartets demand(s) the soloist’s broad stroke and the delicacy of a miniaturist.’96 Further, Michael Tree, violist of the Guarneri String Quartet, believes that their quartet are ‘often called upon to do things that someone playing a Wieniawski concerto doesn’t have to do, and those things happen to be among the hardest to achieve on the instrument: playing in an imitative manner, finding the ideal degree of colour, cutting through textures.’97

The difficulties associated with the application of balance in performance are well attested by Abram Loft, who was the 2nd violinist of the Fine Arts Quartet for 25 years. According to Loft, balancing a solo line in the quartet contains some degree of difficulty, as he suggests:

Any and every voice in the ensemble can be given the solo role. That function may pass to you suddenly and stay only briefly before moving on to another part. If your solo continues a melody that began in another part, play so that the line proceeds consistently. Your voice may be offering a sudden contrast-rhythmic and/or temperamental in nature-to the surrounding musical terrain. Be ready to assume the new character.

Two or more lines can be prominent, side by side. Here, each voice has to satisfy its own melodic requirements without stepping on the heels of the other. Also a single solo voice can be opposed by an equally prominent duet or trio of parts in the rest of the ensemble. In such case, the group solo has to be worked out separately, then balanced as a whole to leave enough elbow room for the other, individual solo.98

This rapidly changing role between soloist and accompanist, which thus requires rapid balance changes, is illustrated in the following example from Haydn’s Quartet in D Minor (Ex. 2.10)

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95 Norton, pp. 175-6.
97 Bllum, p. 9.
Loft characterizes the challenge associated with the excerpt well, stating that ‘in such writing, the idea of four equal players is again of the essence; the musical ball passes from hand to hand so quickly that each member of the team must be ready to shift from accompanist to soloist role at a moment’s notice.’

The difficulties associated with balance in the string-quartet setting are perhaps best exemplified by the following excerpt taken from Schubert’s String Quartet No. 15 in G Major (Ex. 2.11), which is the focus of the exercises created in this study. Here, Schubert’s contrapuntal prowess is clearly on display, with each individual part consisting of thematic material heard at different stages of the movement, seamlessly combined to create a complex, multi-layered texture. To achieve balance in this excerpt requires masterful control of dynamics, purposeful utilization of vibrato across parts, and precise colouring of tone to different degrees in each part in order to successfully address problems of balance arising from the extremities of range and the vastly different articulations between players:

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99 Loft, p. 53.
Example 2.11: Allegro molto moderato, from Schubert’s String Quartet No. 15 in G Major, D887 - op. post. 161 (measures 343-401)

While many of the techniques associated with achieving balance in the quartet setting are addressed in the solo literature, it is clear that the solo literature does not adequately equip the individual quartet violinist with all the skills necessary to meet these challenges. The nature of the challenge is not associated with learning new technical skill sets, but adapting and expanding the skill sets discussed in the solo literature and applying them in new ways. Because of this, contrary to Baillot’s view, in actuality string quartet performance requires a flexibility of technique that exceeds the demands of concerto and sonata performance.

**Articulation**

In the context of this discussion, articulation is ‘the degree to which each of a succession of notes is separated in performance,’\(^{100}\) which ‘on stringed instruments... relies on the type of bowing.’\(^{101}\) While Galamian’s text detailing the different arm articulations...
movements he considers as the basis of all bowing technique is undoubtedly helpful,\textsuperscript{102} it is perhaps Flesch’s text that gives the most keen insight into the multitude of bow strokes contained in violin playing. The first volume contains a well-detailed analysis of the many bow strokes common to violin playing of all genres (such as legato, détaché, spiccato, martelé, etc.), including diagrams specifying the optimal area for the execution of these strokes and examples from the violin repertoire.\textsuperscript{103} More meaningful to this discussion is the second volume, which focuses on ‘artistic realization’. In it, Flesch builds upon the first volume material with specific examples and applications of articulation from a performance perspective.\textsuperscript{104} Remembering that this work belongs to the genre of violin pedagogy, it is significant to note that a large proportion of the examples Flesch used come from the quartet repertoire, something that is largely unprecedented in solo violin pedagogy literature even to this day. This will be discussed further below. Flesch offers quartet-specific advice such as; ‘in the string quartet also, in separated passages which appear simultaneously in several instruments, the détaché is given preference over the springing bow, because the use of the latter seriously compromises exactness of execution’\textsuperscript{105} and also; ‘the use of the martelé-staccato, even in the strict chamber music style, at times produces an uncommonly charming impression.’\textsuperscript{106}

Both Norton and Loft’s texts contain a similarly useful treatment of the many varied bow strokes, with the greatest elucidation coming from the musical examples with accompanying information on specific execution and the resulting colours they achieve. Of particular use is Norton’s discussion of accompanying figures and the way the articulation must be varied depending on the style, tempo and balance considerations of each example.\textsuperscript{107} Blanche broadens the subject area of articulation into a wider discussion concentrating on ‘inflection,’\textsuperscript{108} arguing that ‘in the string quartet, inflection is produced through articulation; articulation is determined by the bow,’\textsuperscript{109} and extending this rationale as the basis for the etudes focusing on ‘the production of bow

\begin{itemize}
  \item See: Galamian, pp. 47-51 & pp. 64-92.
  \item See: Flesch, vol. 1, pp. 63-80.
  \item See: Flesch, vol. 2, pp. 34-41.
  \item Flesch, vol. 2, p. 36.
  \item Ibid., p. 37.
  \item See: Norton, pp. 143-161.
  \item See: Blanche, p. 102.
  \item Blanche, p. 102.
\end{itemize}
strokes by the group."\(^{110}\) While Blanche’s etudes are well suited to developing the different types of strokes in the group, there is little room for flexibility and experimentation with the stroke, since it is always done as a group unison exercise (the same can be said for Léner and the examples XV and XVI). Also, the wider topic of ‘inflection’, as defined by Blanche, critically fails to include tone colouring and use of dynamics, exemplified when she argues that ‘the study of inflected accompaniment is not related to dynamic balance.’\(^{111}\) As a result, unlike Loft and Norton, Blanche’s treatment of articulation seems ambiguous and lacking in detail, and includes no specific advice on execution of strokes in a performance situation.

It is John Dalley, second violinist of the Guarneri Quartet, who provides the most helpful advice when considering articulation in a quartet setting: ‘the bow is a many-faceted tool and should be used as such. It’s helpful not to constrict yourself to conventional ways of doing things. Take, for instance, a spiccato stroke; it can be played in various ways with varying effect.’\(^{112}\) One could speculate that the term ‘conventional’ is used by Dalley in this context is a reference the traditional training model focusing on solo repertoire; the freedom he advocates relates to the many different functions articulation has in a quartet setting, such as being a solo voice, an accompanying figure, or even as part of a contrapuntal line.

There are bow strokes that call for specialized articulation that are more common in one setting than they are in the other, such as the ricochet stroke, prevalent in the solo violin repertoire. The following excerpt from Niccolo Paganini’s Caprice No. 9 in E major (Ex. 2.13) is one such example that requires agility in the right arm coupled with an agile and secure left-hand in order to execute the extremities of register and extended hand position:

![Example 2.12. Paganini, Caprice No. 9 in E major, op. 1 (measures 83-86)](image)

\(^{110}\) Blanche, p. 102.

\(^{111}\) Ibid., p. 115.

\(^{112}\) Blum, p. 54.
However, the following passage from Bartók’s quartet (Ex. 2.13), requiring the same ‘ricochet’ technique, contains a significant technical and stylistic challenge not found in the excerpt of Paganini or any other work in the solo genre. The difficulty here lies in absolute control of the slow speed while executing the ricochet stroke, which represents as significant a technical demand as that of the much faster Paganini (Ex. 2.12), while maintaining consistency in sound quality and length of note. Note only must the individual player achieve this, but it must be executed uniformly by all quartet members simultaneously:

Ex. 2.13: Andante, from Bartók’s String Quartet No. 5, sz. 102 (measures 23-31)

This is by no means an isolated occurrence, as articulated by Arnold Steinhardt in the following reflection on learning Mendelssohn’s String Quartet in A minor (Ex. 2.14):

Along with the musical challenges that the Mendelssohn presented, I found myself running into unexpected problems. The quick, light, running notes of the third movement, the Intermezzo, were very difficult for me. I could play them up to tempo loudly, but when I attempted the passage lightly, as the composer intended, the notes came out unevenly. All the concerto playing in the world had not prepared me for this kind of bow stroke.\[113\]

\[113\] Steinhardt, pp. 92-93.
Example 14: Allegro di molto, from Mendelssohn’s String Quartet in A minor, op. 13 (measures 27-37)

Another example of such a bow stroke can be found in the Scherzo of Schubert’s quartet (Ex. 2.15). Again, the excerpt is characterized by a very soft dynamic level, with the added difficulties of accents and constant transitioning between detaché and staccato bow strokes in a very fast tempo, Allegro vivace, all of which must be executed uniformly and simultaneously by the quartet players:
Ex. 2.15: Scherzo, from Schubert’s String Quartet No. 15 in G Major, D887 - op. post. 161 (measures 3-8)

Another example taken from this movement contains similar challenges (Ex. 2.16), but adds an extra level of complexity as the piano accented staccato stroke is juxtaposed with a vigorously broad fortissimo détaché, resulting in a much higher level of difficulty:

Ex. 2.16: Scherzo, from Schubert’s String Quartet No. 15 in G Major, D887 - op. post. 161 (measures 41-45)

Thus, whilst a relationship exists between articulation techniques discussed in solo violin playing and string quartet playing, a single approach to applying these in performance is not adequate to address the challenges faced by the string quartet player. The comparison above suggests that while the majority of strokes used for solo repertoire are appropriate in the string quartet setting, there exists a need for the study of
bow strokes and articulations that are unique to the string quartet which are not found in solo violin repertoire.

**Ensemble**

It is in the area of ensemble that the relationship between the solo pedagogy literature and that on string quartet playing is weakest. The challenge of ensemble (‘the precision with which a group plays together’\(^{114}\)) ranked third among the respondents in Blanche’s study. According to Blanche, ‘good ensemble is contingent upon control over two basic techniques: precision in simultaneously or staggered [passing] beginnings, endings, attacks, and releases of tones,’\(^{115}\) and ‘dynamic balance among the four parts within the compositional textures apparent in the string quartet repertoire.’\(^{116}\) As dynamic and textural balance has already been discussed, we will now focus on the first aspect described above by Blanche. This examination will go beyond just technique to include extra-musical issues crucial to this issue. The most significant of these extra-musical concerns in the performance of string quartets is undoubtedly the use of non-verbal communication, which includes, but is not limited to, the commonly known concepts of ‘leading’ and ‘following’.

Perhaps the most marked difference between solo violin and chamber music playing is the individual and collective awareness required for successful performance. While some would argue this awareness and cooperation is vital to concerto or other kinds of solo playing, the reality is that in professional settings, the responsibility for ensemble between soloist and orchestra largely falls on the conductor, a role entirely absent in string quartet playing. The solo violin literature fails to discuss matters of ensemble almost entirely. Chamber music literature, however, contains much useful discussion on the matter. Norton suggests that ‘the first requisite for good ensemble is that each player shall have the sense of the whole. This he can only feel by listening to the others- constantly.’\(^{117}\) The importance of this kind of heightened awareness is hard to overestimate, a view shared by Norton who asserts that ‘only by remaining acutely aware of what is being done about him can he be sensitized to the necessary degree.’\(^{118}\)

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\(^{114}\) Sadie (ed.) quoted in Blanche, p. 75.

\(^{115}\) Blanche, pp. 75-76.

\(^{116}\) Ibid, p. 76.

\(^{117}\) Norton, p. 22.

\(^{118}\) Ibid.
Blanche provides a somewhat elementary but useful etude (Ex. 2.17) to assist in developing group ensemble technique at the early stage of rehearsal, suitable for students or amateurs:

Ex. 2.17: Etude VI-A, from Blanche, p. 81

Léner’s treatment of ensemble, as with other technical aspects already discussed, is lacking in meaningful discussion, although the last four examples (all from the quartet repertoire) of his method contain various degrees of ensemble challenges. His example XVIII, an extract from the first movement of Beethoven’s String Quartet in E. Minor Op. 59 no. 2 (1806), is perhaps the best example of this, as Beethoven’s use of silence and complex interweaving of the melody between the players of the quartet requires a highly developed set of ensemble skills to execute.
It is important to recognize that the essence of the issue, group interaction\(^{119}\) and communication, is indeed extra-musical and warrants discussion. In terms of group interaction, the issue of leadership, not just in performance, is central to successful performance for the string quartet genre. In the past, ‘a quartet led by the first violinist was the rule rather than the exception.’\(^{120}\) However, the opposite can now said to be true. One such quartet, which has a philosophy of shared leadership, is the Guarneri Quartet. Their view on musical leadership is expressed in Fink and Merriell as follows:

Each instrument must, at various times, take the lead and set the style, the pace, even the mood of the moment. At such times that instrument must take the leading role while the others must sublimate and match whatever the lead is doing. Each player has to be ever alert, acutely aware and responsive, supporting and sometimes leading! The string quartet is a most demanding form in which to participate. There is absolutely no room for deadwood—either in performers or performance.\(^{121}\)

The cellist of the quartet David Soyer goes further, usefully clarifying that:

What we’re attempting to do, really, is to play together, and not follow. And there is a difference... the difference in sound is that there’s a greater vitality. When it succeeds, it’s very successful. When it fails, it’s a much greater disaster.\(^{122}\)

The kind of communication that is crucial for this type of group ensemble is, like leadership, non-musical in its essence. As Davidson and Good (2002) suggest, non-verbal communication may be identified as ‘the moment-by-moment process of co-operation between and feedback to and from co-performers and audience is necessary in order to co-ordinate the production and reception of the performance.’\(^{123}\) While Davidson and Good identify the main forms of non-verbal communication, such as ‘gestural marking of exits and entrances’\(^{124}\) and the ‘marking of dynamics,’\(^{125}\) the

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\(^{120}\) Steinhardt, p. 94.

\(^{121}\) Fink and Merriell, p. 15.

\(^{122}\) Ibid, p. 22.


\(^{124}\) Ibid, p. 197.

\(^{125}\) Ibid.
treatment of these forms of communication by Seddon and Biasutti\textsuperscript{126} is more useful in this context. From their discussion, two levels of non-verbal communication in performance become clearly identifiable. The first level of communication, labeled as communication through cooperation, consists of ‘employing body language, facial expression, eye contact, musical cues and gesticulation.’\textsuperscript{127} However, even more important is the second category, which Seddon and Biasutti label as communication through collaboration. They suggest that in this form of non-verbal communication, ‘musicians achieve empathetic attunement and take creative risks, which can result in spontaneous musical variations.’\textsuperscript{128} This strongly suggests that the use and effectiveness of non-verbal communication is the limiting factor of both the ensemble of the quartet, and more significantly the expressive and spontaneous potential of a given quartet in a performance setting. This notion of empathetic attunement is perhaps a way of explaining the concept of the ‘fifth presence,’ suggested by Blum,\textsuperscript{129} in which the music being created by the quartet ‘becomes more than the sum of its parts.’\textsuperscript{130}

**Discussion**

Having discussed the main technical and stylistic performance challenges in the string quartet genre, as identified by respondents in Blanche’s study, it is now time to examine the relationship between the pedagogical literature on solo violin playing and that on chamber music in broader terms. There are areas in which the technique and style of solo violin playing share a strong relationship with that of string quartet playing, such as tone production, bowing and vibrato. While Galamian does not address the string quartet genre specifically, his holistic treatment of violin technique provides clues about the adaption of techniques from solo violin playing to quartet playing at the highest level. His treatment of intonation is a good example of this. However, this study has shown that in other areas, additional skills are required for professional string quartet performance and are not represented in the solo violin literature. These relate to ensemble, articulation and intonation.

\textsuperscript{127} Ibid., p. 125.
\textsuperscript{128} Ibid.
\textsuperscript{129} See: Blum, pp. 168-170.
\textsuperscript{130} Blum, p. 168.
More significantly, there appear to be some critical contradictions between the literatures of solo violin and string quartet playing. These contradictions center on the common philosophy that occurs throughout the literature regarding chamber music pedagogy. Blanche articulates this philosophy when she states that ‘individual technique is a prerequisite for the development of string quartet technique.’

To this is added her view that ‘the study of string quartet must not be confused with developing individual technique’ and that ‘technical areas must be worked out on an individual basis.’

These views are questionable for two reasons. Firstly, the primary focus of violin pedagogy is undoubtedly on concerto and solo repertoire. This is evidenced through the fact that the works included by Flesch and Bronstein in their respective performer’s analyses only contain violin concertos, violin and piano sonatas and works for solo violin (with Flesch’s use of chamber music examples limited to his discussions).

Secondly, this study has shown that the solo violin pedagogical literature does not in itself contain an effective treatment of many of the specific technical and stylistic challenges involved in string quartet performance. Further, concerto and solo violin repertoire do not comprehensively represent all of the skills that are required in expert performance of string quartets.

This being said, it is clear that Galamian is aware of the technical demands of expert string quartet performance, stating that ‘complete mastery over the technical equipment is not only necessary for the soloist... [but also] in playing chamber music, [in order to] coordinate his playing with that of the other members of the group.’ However, he does not discuss in any detail how to transfer and adapt violin technique to the demands of string quartet repertoire and group performance. Similarly, while Flesch includes examples of chamber music in his discussions of technique (of which the majority are in fact from the string quartet genre), he only discusses these applications of technique in contexts where a strong relationship with solo violin playing can be demonstrated, such as an individual’s skill in tone production, bowing and articulation. He doesn’t deal with other, quartet-specific issues such as ensemble and group intonation. Indeed, absent from the pedagogical literature on solo violin playing is discussion of matters such as intonation and ensemble in a quartet setting. In addition, this comparative analysis has shown that a solid understanding of quartet-specific skills (such as

131 Blanche, p. 2.
132 Ibid, p. 121.
133 Ibid.
134 Galamian, p. 5.
intonation in a group setting, ensemble, balance and non-verbal communication) directly impacts the expressive potential and performance level attained by a given string quartet.

That a lacuna exists in terms of pedagogical literature with regard to these quartet-specific performance challenges is well attested in comments by the Guarneri Quartet. The violist, Michael Tree, states that ‘the amount of technical control and variety of nuance that’s needed [in quartet playing] is greater than what one normally finds in the solo repertoire.’135 Further, first violinist Arnold Steinhardt provides a typical case exemplifying this lacuna in development. He was himself a student of Galamian, who, in Steinhardt’s opinion, ‘could teach a table to play the violin.’136 Yet despite this, it is clear through Steinhardt’s reflections as a student with Galamian, that there were some gaps in his training to that point in his development. On relating his first experiences in a quartet setting, he remembers thinking ‘and just how does one actually play together? This subject was hardly touched upon in all my years of violin lessons.’137

This creates a situation where an aspiring chamber musician requires specialized individual training in order to be able to contribute to the development of a successful string quartet, but the primary training environment (individual instrumental lessons) does not provide this kind of specialized individual training. As discussed above, nor is there specific focus on how to gain these skills in either body of literature. While specialized, tertiary-level training programs are now available, they are almost exclusively at a postgraduate level and are structured for already established groups, and thus are generally not designed to train individuals with the skills they need to function effectively in a group setting.

This pedagogical lacuna impacts on a great number of violinists, even at a tertiary level. This is due to the fact that ‘conservatories and music schools still use the nineteenth-century model – students are apprenticed by master teachers in whose hands they place their future,’138 in which ‘the material (studied) is almost exclusively solo repertoire.’139

135 Blum, p. 9.
136 Steinhardt, p. 29.
137 Ibid, p. 23.
According to Reimer, study of chamber music parts in this setting is ‘usually left to the initiative of the student.’\textsuperscript{140} This observation is true even of the most eminent contemporary violinists, such as James Ehnes. A seasoned chamber musician and prolific performer worldwide with decades of experience professionally performing string quartets, he similarly could not recall having ever studied a quartet part in a lesson with a teacher.\textsuperscript{141} It is little wonder Blanche states that ‘valuable time is wasted during coaching sessions in which private lessons on individual technique are the focus of attention.’\textsuperscript{142} It goes some way to explaining why the majority of coaches surveyed by Blanche ‘believed that the study of chamber music received much less attention than applied music and orchestra repertoire and as such could not adequately prepare students for careers in chamber music performance.’\textsuperscript{143}

Equally pertinent is Blanche’s finding that ‘non-musical skills are also necessary in the string quartet’. While the importance of non-verbal communication has been identified,\textsuperscript{144} this by no means encompasses the complete range of non-musical skills required in quartet playing. There has been much study done on other non-musical issues associated with quartet playing. This includes research done by: King,\textsuperscript{145} Murnighan, J. and Conlon,\textsuperscript{146} Young and Colman,\textsuperscript{147} Cotter-Lockard\textsuperscript{148} and Tovstiga, Odenthal, and Goerner.\textsuperscript{149} Issues that arise from this body of research include: 1) the

\textsuperscript{139} Ibid., p. 15.
\textsuperscript{140} Reimer, p. 16.
\textsuperscript{141} See Appendix F: ‘Ehnes Interview Transcript’, p. 13.
\textsuperscript{142} Blanche, p. 121.
\textsuperscript{143} Ibid, p. 119.
\textsuperscript{144} Seddon and Biasutti, p. 125.
importance of democratic process in group decision-making,\textsuperscript{150} 2) leadership and stability,\textsuperscript{151} 3) the ‘paradox of the second fiddle,’\textsuperscript{152} 4) ‘conflict vs. compromise’\textsuperscript{153} and 5) ‘generative teams’.\textsuperscript{154} Steinhardt contextualizes these issues well stating that:

One mustn’t forget that in developing a quartet, personal qualities play as an important a role as musicianship; the two can’t be easily separated. Each of us has to be strong enough to exert his leadership, strong enough to endure the constant criticism of his colleagues, and strong enough to let go of cherished ideas when they don’t coincide with majority opinion.\textsuperscript{155}

Ultimately, ‘paramount is the ability to relinquish personal ego for the good of the ensemble,’\textsuperscript{156} a sentiment which contains the basis for a study in its own right.

Returning to the technical challenges that are present in the quartet literature, but not addressed by solo violin pedagogy, it is important to try and get to the crux of the issue, so that solutions can be proposed. Recalling the earlier discussion of challenges involved with intonation, articulation, etc., the nature of these challenges is often not about learning new skills, but adapting and applying existing skills in new or different ways. Further, the majority of current training models are focused on solo material, which fail to develop the flexibility and variety in technique required for elite chamber performance. Such adaptability becomes even more crucial when considering that individual technique only serves as the prerequisite for group technique, and more importantly, group expression. For instance, four individuals only able to execute a type of bow stroke in four different ways will never achieve a unified sense of articulation, and thus fail to express anything as a whole. Thus, in order to address the identified lacuna, a specialized approach focused towards equipping the individual with the technical flexibility and extra-musical skills crucial to string-quartet performance is required.

Summary

While Blanche is right in suggesting that ‘individual technique is a prerequisite for the development of string quartet technique,’\textsuperscript{157} she fails to identify the lacuna that exists in

\textsuperscript{150} Young and Colman, p. 17.
\textsuperscript{151} King, p. 279.
\textsuperscript{152} Murnighan and Conlon, pp. 175-6.
\textsuperscript{153} Tovstiga et al., p. 223.
\textsuperscript{154} Cotter-Lockard, p. 179.
\textsuperscript{155} Blum, p. 7.
\textsuperscript{156} Blanche, p. 122.
\textsuperscript{157} Ibid., p. 2.
the individual training of violinists in the string quartet setting. This lacuna relates to the comprehensive understanding of the technical and stylistic demands of string quartet performance at the elite professional level, which is outside the scope of the existing literature for both solo violin and string quartet pedagogy. These demands include a specialized approach to intonation and articulation, and a highly developed set of non-musical skills and factors that arise in ensemble playing.

While this researcher agrees with Blanche’s view that ‘technical areas must be worked out on an individual basis,’\textsuperscript{158} it is contradictory for Blanche to also suggest that ‘the study of string quartet must not be confused with developing individual technique.’\textsuperscript{159} This comparative analysis suggests that the acquisition of specialized string quartet techniques and performance skills must be incorporated in the study and development of individual technique. Thus, there is a need for a specialized pedagogical approach for aspiring professional string quartet violinists, along with soloists and orchestral players, in order for them to acquire these specialized skills. Having detailed the nature of this perceived lacuna, the next question that arises is how can these specialized individual quartet skills be trained? Are there any existing models that can be utilized? In order to meaningfully address these concerns, the following chapter will explore the nature of expertise acquisition, through the lens of the well-documented link between deliberate practice and expert performance.

\textsuperscript{158} Blanche, p. 121.  
\textsuperscript{159} Ibid.
Chapter 3: Expert Practice, Expert Performance and Expertise

Acquisition Research

In the context of this study, the acquisition of the specific individual skills required for effective chamber music performance is considered analogous with the acquisition of expertise. The acquisition of expertise is currently an area of much contention among researchers, epitomized by the special edition of the journal, Intelligence, in which many viewpoints are presented. The current contention can be described as a conflict in determining the most critical factor/s involved in the acquisition of expertise.

Essentially, this conflict is based on the notion of nature vs. nurture. On the nurture end of the spectrum, Ericsson’s ‘expert-performance framework’ argues that ‘new cognitive mechanisms are gradually acquired during the extended period and they mediate the superior performance, thus leading to qualitative differences in structure compared to untrained performance.’ Under this framework, expert performance is defined as ‘consistently superior performance on a specified set of representative tasks for a domain without any age conditions.’ The focus of the expert performance approach is to explain the ‘structure and acquisition of expert performance,’ with the central finding that ‘deliberate practice is the most promising proximal variable with a plausible mechanism for explaining change (improvement) of performance.’ Under this framework, the term deliberate practice is defined as ‘a highly structured activity, the explicit goal of which is to improve performance.’

Opposing this are the arguments that favour the nature side of the spectrum. The ideology behind this is essentially expert performers are ‘born, then made,’ rather than

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162 Ibid., p. 83.
163 Ibid., p. 97.
164 Ibid., p.83.
‘made, not born.’ Whilst most researchers advocating this position acknowledge the importance of deliberate practice in the acquisition of expertise, some go as far to suggest that ‘deliberate practice does not explain all, nearly all, or even most of the variance in performance in chess and music, the two most widely studied domains in expertise research.’ Instead, they point to heritable genetic factors such as basic cognitive abilities, general intelligence and behavioural traits (including enjoyment and motivation) and their interaction with environmental factors as being more crucial in expertise acquisition. For example, Plomin et al. argue that genetic factors account for ‘more than half’ of the difference in reading ability in their study. Further, they are of the opinion that expert performance is not qualitatively different than that of the general population, but the expression of genetic factors within a smaller sample group, a concept labelled as ‘the abnormal is normal.’ Dissatisfied with Ericsson’s framework for qualitative expert practice research, the researchers more interested in the influence of genetic factors through analysis of quantitative data call for long-term research that incorporates practice along with other factors such as motivation and intelligence.

Ultimately, the most complete framework for exploring the nature of expertise acquisition contains elements from both sides of the spectrum. Simonton encapsulates this well with his interpretation of the notion of ‘talent’:

So-called “talent” for exceptional creativity in a particular domain is not a single coherent and fixed entity. A specific talent for mathematics or for music is not presumed to exist. Instead, talent is defined using one portion of the “reduced

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167 Ibid.
170 Plomin et al., p. 55.
form equations” that specify the relation between the endogenous variables of creative performance (CP) and deliberate practice (DP) and the exogenous variables of genetic factors (GF, latent) and environmental factors (EF, observed), with cognitive ability (CA) and dispositional traits (DT) as intervening variables.172

Despite these contentions, there are a few salient points central to the acquisition of expertise that neither side can refute. Firstly, that expert performance is unattainable without some form of practice. Fox et al., for example, found in their quantitative study that practice allowed the ‘least gifted’ participants to surpass the initial performance levels of the ‘most gifted’ participants.173 Secondly, the skills and abilities required to gain expertise vary according to the domain. As such, findings related to specific cognitive abilities and their genetic heritability in the acquisition of expertise in a particular domain (for example chess) may not carry the same weight in other unrelated domains (for example sports).

This is even truer when considering the determinative factors of expert performance across different domains. Expert chess players, for example, are given expert status upon reaching a rating of 2000 under the ELO ranking system. No such system ranks or measures expert performance in musicians. In practice, a musician’s performance in concert is qualitatively measured, in a highly subjective and personal manner. The importance of domain-specific research into the acquisition of expertise is especially relevant for musicians, as the motor and perceptual systems required for music performance ‘show great adaptability in response to extended practice,’174 helping experts to expand memory capacity and serial reaction time.175 As such, in the context of this study, an investigation into the link between deliberate practice and expert performance presents itself as the most promising avenue for improving training resources related to chamber music performance.

174 Ericsson, p. 81.
175 Ibid., p. 82.
Definition of Terms

Before conducting this investigation, some clarification of terms is required. After reviewing the research regarding the acquisition of expertise, it became clear that many of the critical terms, including ‘deliberate practice’ and ‘expert performance’, have become ambiguous due to the vast array of approaches and studies employing them in the literature. In regards to expert performance, this study subscribes to the earlier definition offered by Ericsson; ‘consistently superior performance on a specified set of representative tasks for a domain without any age conditions.’\(^{176}\) In regards to the term ‘deliberate practice,’ this study will use a different interpretation. Instead of ‘deliberate practice,’ the term ‘expert practice’ will be used. Instead of representing ‘a highly structured activity, the explicit goal of which is to improve performance’\(^{177}\) as defined by Ericsson, the term ‘expert practice’ in this study is defined as ‘practice concepts, skills and/or strategies employed by expert performers which facilitate expert performance.’

Problem Solving

Problem solving is identified in the literature regarding expert practice as integral to its implementation as a preparation for performance. The fundamental thought processes of problem solving, in regards to music, can be usefully defined by drawing on the work of Smith\(^{178}\) and using some of the characteristics he suggests are indicative of ‘higher order thinking’\(^{179}\) (as is done by Lammers\(^{180}\)). These are:

- problem identification;
- problem definition;
- problem analysis;
- diagnosis;
- alternative generation;
- evaluation.\(^{181}\)

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\(^{176}\) Ericsson, p. 83.

\(^{177}\) Ibid., p. 97.


\(^{179}\) Ibid., p. 366.

\(^{180}\) See: Wil Lammers, pp. 13, 15.

\(^{181}\) Smith, pp. 366-7.
Smith defines problem identification as ‘becoming aware of the existence of a problem or situation that bears improvement.’ In Lammers’s study into factors affecting performance proficiency, he found a strong relationship between technical ability in performance and the ability to identify errors in practice. Similarly, in their ranking of graduate and advanced-undergraduate pianists, Duke et al. found that the ability to accurately identify errors was one of three key abilities that separated the three highest ranked pianists, according to the tone, character and expressiveness of their retention tests.

For the processes of problem definition, problem analysis and diagnosis, it is useful to include discussion on the role of the teacher in expert practice. Most would agree that teachers are crucial in fostering the development of individuals and that individual instruction with a teacher is more effective than group tuition. Further, the role of the teacher is especially important earlier in the developmental process, as less advanced students may not be effective evaluators of their own performances and practice habits. But this does not adequately describe the role of the teacher in expert practice, as it does not deal with the exemplary student, one who is engaging in expert practice. Ericsson et al. argue that, to this end, the role of the teacher is to foster ‘individualized diagnosis of errors, informative feedback, and remedial part training,’ as well as to inform the students how to practise between lessons. Lammers somewhat supports this view, stating that ‘the first goal of problem-based learning should be for students to discover, through direct instruction from the teacher, what the goal of the learning should be’ and that equipping students with problem solving skills ‘should produce an awareness of success.’ However, in actual practice, as indicated by the literature, teaching students is not so straightforward.

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182 Smith, p. 366.
183 Ibid.
186 Lammers, p. 9.
187 Ericsson et al., p. 367.
188 Ibid., p. 368.
189 Lammers, p. 73.
190 Ibid., p. 75.
Lammers touches on an interesting dichotomy that arises from this, of which the teacher in his study is seemingly unaware. Whilst the teacher in Lammers’s study provides the students with effective practice strategies, she critically omits the ‘when, how, or where’ of their employment during practice. That is to say that the teacher in Lammers’s study equips her students with the knowledge required to engage in problem solving, but not how to use it effectively. Lammers’s resulting conclusion identifies a need for further research into ‘problem-based teaching strategies,’ a viewpoint which is shared by Weidenbach and Duke et al. Weidenbach offers a potential explanation for this dichotomy, suggesting that practice strategies are not commonly defined and understood by teachers, who do not adequately tailor these strategies to individuals, leaving the burden on students to discover their own best method.

Thankfully, there are practical texts aimed at equipping violinists with practice strategies, and more crucially illustrating how they can be applied during practice. The two most noteworthy are those by Wulfhorst and Fischer. Although aimed at orchestral violinists, Wulfhorst’s exhibition of practice strategies applied to excerpts taken from the orchestral repertoire provides a clear example of how practice strategies can be employed to improve performance. However it is Fischer’s work, suitably entitled Practice, that contains a much more comprehensive approach to explaining a wide range of practice strategies and suggesting how they can be applied to multiple excerpts from the solo violin repertoire. However, while these texts organize practice strategies into separate sections and discuss how they can be applied to specific excerpts, neither text uses a complete work to demonstrate how it can be systematically worked through using a variety of different practice strategies. Such a demonstration would in itself serve as a powerful example of expert practice, as we will see in Chapter

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191 Lammers, p. 70.
192 Ibid.
194 Duke et al., p. 319.
195 Weidenbach, p. 295.
The individualized approach to problem solving in music is a central theme in the associated literature. Essentially, this represents the thought process of alternative generation, as defined by Smith. In addition to generating alternate definitions, diagnoses and problem-solving strategies, Smith states that the most important aspect of alternative generation is to generate ‘candidate solutions,’ which requires ‘creative thinking.’ The teachers surveyed in Weidenbach’s study share the belief that experts are in fact characterised by their individual problem solving. Further, Lammers reasons that before a problem can be meaningfully solved, the individual must first engage with that problem. Ultimately, ‘each part of practice represents a unique performance problem and may, therefore, require a unique solution.’ This not only relates to the individuality of solutions within the context of a given passage or piece, but the individuality of each player who endeavours to learn them. As such, it would stand to reason that the ‘problems’ that each performer encounters in the preparation of any work may be unique to them, and thus require a unique solution.

The effect of alternative generation in practice on improving performance is demonstrably strong. Bryan and Harter, in their study of ‘problems connected with the acquisition of the telegraphic language,’ observed that it was only those that engaged in alternative generation that achieved the highest levels of performance. Ericsson et al. also make this observation in their own research, pointing to alternative generation as being responsible for improving performance, and attributing a lack of alternative generation to a lack of improvement. This link between a lack of improvement and inadequate practice strategies is also present elsewhere in the literature. The examiners in Lammers’s study attribute a lack of performance proficiency of the participants to an

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198 Smith, p. 367.
199 Ibid.
200 Weidenbach, p. 295.
201 Lammers, p. 70.
202 Ibid.
205 Ericsson et al., p. 367.
inability to effectively apply ‘practice strategies in a problem-solving manner.’

Similarly, Duke et al. suggest that the efficient use of problem-solving skills not only leads to lasting solutions, but is the defining attribute of attained expertise.

Evaluation is the final thought process indicative of expert problem solving. Lammers makes a direct correlation between ‘effective performance’ and an ability to make ‘in flight’ decisions, involving the constant monitoring of playing relative to the performers own standards. In a musical context, Miklaszewski describes this process in further detail in his case study of a pianist preparing a work for performance, suggesting that frequent changes in the goal of practice are strongly linked with the process of self-evaluation. This strategy, labeled by Miklaszewski as a ‘means-end analysis,’ is considered to be ‘one the most effective in complex problem solving.’

Despite the apparent importance of self-evaluation in the context of problem solving and hence expert practice, it is not a particular focus in the literature regarding expert practice. This is evident from King’s article discussing the study of ensemble rehearsal. In it, she proposes a framework based on three principles: ‘structure’, ‘collaboration’ and ‘techniques’. Crucially, she is one of the few to acknowledge the importance of evaluation, suggesting a further category be created to discuss methods used for both individual and group self-evaluation during practice.

Quantity vs. Quality

Having thus explored the thought processes of expert problem solving and their application to expert practice in a musical domain, other issues central to a deeper understanding of the nature of expert practice must be addressed. Perhaps the most contentious of these is the importance of quality versus quantity of practice for the attainment of expertise.

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206 Lammers, p. 62.
207 Duke et al., p. 319.
208 Lammers, p. 77.
209 Miklaszewski, p. 107.
210 Ibid.
211 Lindsay and Norman quoted in Miklaszewski, p. 107.
Ericsson et al. argue that performance ability is directly correlated to the amount of deliberate practice accumulated.\textsuperscript{213} The investigation into problem solving has already shown that strategies used in practice greatly affect the level of performance that is subsequently achieved. However, all of the studies that suggest this were conducted within a small timeframe (Duke et al. for example analysed practice done within a 24hr time period). Ericsson et al., surveying practice estimates over entire lifespans, assert that the accumulative amount of practice done as being the defining factor in expert performance.\textsuperscript{214} As well as describing the acquisition of expertise as ‘a life-long period of deliberate effort to improve performance in a specific domain,’\textsuperscript{215} they conclude that ‘the effects of short-term training cannot be readily extended to the effects of orders of magnitude more practice.’\textsuperscript{216}

These assertions are not widely accepted throughout the rest of the literature. Williamon and Valentine, for instance, are of the opinion that researchers should look beyond quantity of practice in consideration of the acquisition of expert performance.\textsuperscript{217} Duke et al., in their study of practice behaviour and its relationship to the retention of performance skills, show that the quality of practice is more determinative of performance than the amount of practice done.\textsuperscript{218} This is demonstrated by the fact that performance levels attained by their participants were found to be unrelated to the amount of time spent practising and that the top-performers learned the passage in the same amount of time as the others.\textsuperscript{219} However, while Duke et al. use this to further their own argument, that quality of practice is more important than the quantity of practice, the opposite could also be argued. The fact that it took both the highest achieving pianists, as well as the lower achievers the same amount of time to learn the fragment of music used in the study, would suggest that time is a constant variable that is a prerequisite for performance at any level.

\textsuperscript{213} Ericsson et al., p. 370.
\textsuperscript{214} Ibid., p. 386.
\textsuperscript{215} Ibid., p. 400.
\textsuperscript{216} Ibid.
\textsuperscript{218} Duke et al., p. 315.
\textsuperscript{219} Ibid., p. 318.
It is in the work of Sloboda et al.\textsuperscript{220} that we can perhaps find a way to reconcile this apparent dichotomy. Their study endeavours to expand on the research of Ericsson et al. by increasing the accuracy of the practice estimates from a young age, as well as studying musicians with various levels of proficiency. In general, their findings closely match those of Ericsson et al. Significantly, they find that ‘the instrumentalists with the highest skill levels not only practiced more, but devoted a larger proportion of practice to scales and technical exercises.’\textsuperscript{221} However, they also determine that the highest achievers were distinguished by accumulating the required hours of practice in less overall time.\textsuperscript{222} This finding supports the claims made by Duke et al., as it suggests that it takes the same total accumulated hours of practice to achieve a certain standard, regardless of general ability.

This concept of ‘required hours’ becomes key in elucidating the relative influence of amount of practice time versus the quality of practice in the acquisition of expert performance. Rather than arguing that quantity or quality of practice are opposing forces, further consideration must surely include the possibility that what characterizes the practice of expert performers is their ability to practice efficiently over extensive periods of time. Thus, expert performance is not determined by either time or efficiency of practice alone, but by the close harmony of these aspects.

\textbf{Practice Structure}

‘Structure underlies every practice session,’\textsuperscript{223} and is shown by the literature to be a key consideration in expert practice, in both broad and narrow terms. In the broader context, Miklaszewski, Wicinski, Chaffin and Imreh, Chaffin et al., King, and Williamon and Valentine all acknowledge the significance of structural awareness in preparing a new piece for performance. All of these (excepting possibly King) suggest that practice when preparing a new piece for performance contains three distinct stages: ‘getting knowledge’\textsuperscript{224} of the piece; doing the ‘hard work’\textsuperscript{225} in overcoming technical

\begin{footnotesize}
\textsuperscript{221} Ibid., p. 302.
\textsuperscript{222} Ibid., p. 300.
\textsuperscript{223} King, Collaboration and the Study of Ensemble Rehearsal, p. 11.
\textsuperscript{224} Miklaszewski, p. 96.
\textsuperscript{225} Wicinski quoted in Miklaszewski, p. 96.
\end{footnotesize}
challenges; and forming a ‘final version’\textsuperscript{226} of the interpretation. However, there are important strategies within these stages that the literature shows as being indicative of expert practice and thus performance.

As well as becoming more familiar with the piece, there is one characteristic in the first stage of practice that the literature suggests is crucial to expert performance. This is the selection of crucial ‘performance features,’\textsuperscript{227} which the performer deems as needing attention in eventual performance, and focusing initial periods of work towards increasing fluency and technical security of these features. In Miklaszewski’s study, the subject singled out a particular section based on its technical difficulty as a performance feature. However, Chaffin and Imreh, and Chaffin and Logan suggest that such features can be multi-dimensional in nature, pertaining to basic (or technical), interpretive or expressive factors.\textsuperscript{228} Perhaps the most significant benefit is the association between performance and memory.\textsuperscript{229} Chaffin and Imreh assert that ‘the effects of basic and expressive performance features in the first learning period’\textsuperscript{230} later served as ‘memory retrieval cues’\textsuperscript{231} during performance. Further, they suggest that the practice of these performance features is a characteristic behaviour of expert performers.\textsuperscript{232} The research of Chaffin et al., which shares a close relationship with that of Chaffin and Imreh, cite ‘the ability to make snap decisions that anticipate later developments’\textsuperscript{233} as being another behavioural trait of expert practice.

The second stage of preparation is a particular focal point of the literature regarding expert practice, which calls for the use of problem solving strategies in order to solve the technical challenges that are present in the work. The literature identifying practice strategies used by musicians has almost exclusively used pianists as subjects (Chaffin et al., Miklaszewski, Duke and Simmons, Lammers, Williamon and Valentine), and as a result, the piano-focused strategies outlined in these studies have limited relevance to this more general discussion of expert practice in musicians. This being said, there are two practice strategies in particular, common in the research literature, which are of

\begin{itemize}
\item \textsuperscript{226} Miklaszewski, p. 96.
\item \textsuperscript{227} Chaffin and Imreh, p. 42.
\item \textsuperscript{228} See Chaffin and Imreh, pp.42-43; and R. Chaffin and T. Logan, p. 116.
\item \textsuperscript{229} Chaffin and Imreh, p. 61.
\item \textsuperscript{230} Ibid., p. 58.
\item \textsuperscript{231} Ibid.
\item \textsuperscript{232} Ibid., p. 67.
\item \textsuperscript{233} Chaffin et al., p. 487.
\end{itemize}
significance to all musicians. These are the use of tempo variation (Lammers, King, Miklaszewski, Chaffin et al., Duke et al. and Gruson) and segmentation (Lammers, King, Miklaszewski, Chaffin et al., Duke et al., Williamon and Valentine, and Gruson).

The use of tempo variation as a strategy in expert practice can simply be described as ‘playing alternately in fast and slow tempi.’ Multiple studies (including Miklaszewski, Chaffin and Imreh, and Gruson) observed that tempo reduction often coincided with sections of particular difficulty, and that the tempo increased over time as technical challenges were engaged with and eventually mastered. This trait shares a close relationship with the use of segmentation, which was perhaps the most effective strategy identified in the literature.

The process of segmentation in expert practice can be defined as the ‘organization [of practice] into episodes of work during which the same short passage is played repeatedly separated by runs in which these short passages are connected with their neighbours.’ The use of segmentation in expert practice by musicians is summarized well by Miklaszewski. In his study, he observed that ‘the formal units of the composition seemed to exist in some independent way in the musician’s mind. Their sequence, fixed in both the composer’s notation and the final performance may be altered for practicing purpose.’ As such, King not only suggests that segmentation plays a pivotal role in giving structure to practice sessions, she also opines that segmentation is the quintessential practice strategy.

234 Lammers, p. 48.
235 King, Collaboration and the Study of Ensemble Rehearsal, p. 15.
236 Miklaszewski, p. 107.
237 Chaffin et al., p. 473.
238 Duke et al., p. 317.
239 Gruson, p. 106.
240 Lammers, p. 64.
241 King, Collaboration and the Study of Ensemble Rehearsal, p. 15.
242 Miklaszewski, p. 107.
243 Chaffin et al., p. 473.
244 Duke et al., p. 318.
245 Williamon and Valentine, p. 372.
246 Gruson, p. 107.
247 Miklaszewski, p. 107.
248 Chaffin and Imreh, p. 50.
249 Miklaszewski, p. 106.
250 Ibid.
The benefits apparent in the literature resulting from the effective use of segmentation in expert-level practice are considerable. Williamon and Valentine found that the implementation of longer practice segments in the second stage of practice led to more convincing performances, with the use of these larger segments indicating that technical challenges had been overcome, allowing the pianists in the study to focus more on interpretative and musical elements for performance. For Miklaszewski, the gradual lengthening of practice segments was also associated with a shorter amount of time spent practising each segment. The flow-on effect is well encapsulated in the following passage from Williamon and Valentine:

Musicians, for instance, who are forced to correct many errors in their practice will, on average, stop more frequently to correct those errors and, thus, have shorter practice fragments. Conversely, those who have fewer errors will be able to play through the composition more fluently and employ longer practice segments. To achieve such fluency, those musicians would have needed to overcome the basic, technical demands of a piece. Based on this idea, one may suggest that they would be freer to develop, implement and refine their music ideas and the ways in which those ideas are communicated to audiences. Hence, accumulating more of this type of practice should enhance the quality of performance.

This phenomenon is well documented in the literature, with Chaffin and Imreh noting a ‘shift in the focus of practice across the three learning periods from basic to interpretative dimensions.’ Practice done in this final stage of learning is thus focused on the combination of performance features identified in the first stage and the technical fluency resulting from the second, with the practice segments lengthening to the extent that entire sections and indeed full-runs are incorporated. In this way, the focus becomes on enhancing musical expression and finalising the interpretation for performance.

**Repetition**

Before considering two other factors in expert practice, one final strategy used in practice should be mentioned: the use of repetition. The literature regarding expert practice suggests that repetition on its own is an inadequate strategy. Trowbridge and Cason, Chaffin and Imreh and Bryan and Harter are in agreement that repetition alone does not lead to improvement in performance levels.

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251 Williamon and Valentine, p. 371-2.
252 Miklaszewski, p. 107.
253 Williamon and Valentine, p. 367.
254 Chaffin and Imreh, p. 57.
255 Wicinski quoted in Miklaszewski, p. 96.
Alternate methods of practice

In addition to this investigation of deliberate and expert practice, alternate practice methods have also been described.\textsuperscript{256} Whilst not central to the investigation into expert practice, the potential benefits from the use of alternate practice methods are worth noting. The two methods that will be touched upon here, silent reading and the use of recorded models, are the two alternative methods that, according to the literature, appeared to provide the greatest benefit.

One of the central findings in Rubin-Robson's research into the memorization of keyboard music by skilled pianists, was that of silent reading, also known as mental practice and allied to the method referred to in other fields as 'visualisation'.\textsuperscript{257} This technique allowed a piece to be practised with an amount of 'vividness' comparable to actual performance.\textsuperscript{258} Further, in subsequent research she describes the benefits of this method of practice as providing a 'pause that refreshes',\textsuperscript{259} allowing for a more considered approach towards identifying and correcting errors free of the constraints of continuous rhythm.\textsuperscript{260} Rosenthal et al. found this to have a positive effect on the performance of rhythms when tested in a combination of learning styles, including modeling, singing, silent analysis and free practice.\textsuperscript{261} In addition to this, they determined that practice using a recorded model alone (i.e. without additional practice

\begin{itemize}
  \item Rubin-Rabson 'VI', p. 599.
\end{itemize}
on the instrument) was ‘about as effective’ as practice on the instrument.\textsuperscript{262} Morrison found the use of recorded models increases the amount of time students spent practising.\textsuperscript{263} Despite this, the literature is clear in asserting that the use of alternate methods are most effective when combined with physical practice, and that this leads to the highest levels of performance.\textsuperscript{264}

**Neuroscience and Expert Practice**

Having investigated behaviours and strategies indicative of expert practice, this discussion will now focus on the juncture of music-pedagogy research and neuroscience, also known as ‘neuropedagogy’ or ‘neurodidactics.’\textsuperscript{265} Generally speaking, the exploration of neuroscience and music is a relatively new but promising field of research. Due to the limited scope of my own research, the literature in this field has not been directly addressed in this investigation into expert practice. However, there are some general findings that help to give credence to the largely theoretical nature of the existing research into expert practice.

Firstly, there is a universal principle arising out of the field of neuroscience: the notion of ‘use it or lose it.’\textsuperscript{266} Put simply, the brain is naturally plastic and areas such as the sensorimotor map can be reorganized with training.\textsuperscript{267} Conversely, brain maps left unused are appropriated by more active surrounding areas.\textsuperscript{268} This of course relates directly to the concept of repetition in practice. However, while it supports earlier discussion that suggested that repetition of mistakes leads to poorer performance, this concept also suggests that the repetition of optimal states of performance leads to a greater probability of future optimal performance. Further, it suggests that expert performance must be done often in order to sustain it. In addition, the habituation of tasks leads to greater efficiency that, in turn, makes more resources available for more future tasks.

\textsuperscript{262} Rosenthal et al., p. 254.
\textsuperscript{263} Morrison, p. 21.
\textsuperscript{264} See: Weidenbach, p. 290, Ericsson et al., p. 370.
\textsuperscript{266} Norman Doidge, The Brain that Changes Itself (Melbourne: Scribe Publications, 2008), p. 59.
\textsuperscript{268} Doidge, p. 61.
complex tasks. In this way, deliberate practice can be seen as a cumulative acquisition of increasingly complex skills that eventually allows for the attainment of expert performance.

Even more significant is the finding arising from Braun and Bock, that experience and structured learning optimizes the functional capacity of the sensory, motor, cognitive and emotional systems of the brain. This includes the limbic system, which is also responsible for our in-built reward system. The implications of this for arguing the potency of expert practice are considerable. Not only does this strongly suggest that high-quality practice informs optimization of the key systems in the brain responsible for music performance, but our ability to learn new skills is heavily influenced by the systems and strategies that have already been learned. This calls into question the notion of talent mainly due to genetic factors. More significantly, it suggests that optimal training strategies can be learned. Thus, the learning strategies of talented individuals can be matched—or indeed exceeded—by others not deemed to be otherwise ‘talented.’

Equally significant is the importance of the reward system for learning in general. Psychologists and biologists regard play as inseparable from learning. Further, the importance of emotion and mood in learning is difficult to overestimate. Research has demonstrated that successful engagement in problem solving mediates the release of ‘drugs of reward’ in the brain that modulate mood, such as dopamine, serotonin and noradrenalin. This means that learning not only makes individuals happy, but also highlights the importance of emotion for advanced associative learning. Of further interest in this context is that ‘mild stress’, resulting from ‘effort and labour’, is equally

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269 Edwards and Hodges, p. 13.
271 Ibid., p. 45.
273 Braun and Bock, p. 41.
274 Ibid.
important in the process of learning.\textsuperscript{275} As a result, the brain learns most effectively when it experiences a mix of emotions: the mild stress of encountering a problem, and the release of mood elevating neurotransmitters resulting from their successful solution.\textsuperscript{276}

This suggests that constantly monitoring the degree of challenge during practice (i.e. how and when to apply practice strategies) is crucial to engaging the reward system in the brain and regulating mood during practice.\textsuperscript{277} Considering this, it is little surprise Braun and Bock find that the brain can easily be de-motivated by behaviours and experiences, such as monotone drilling, frequent experience of failure and disappointment, destructive and inconsequent criticism, punishment and humiliation.\textsuperscript{278}

Braun and Bock’s research discussing the formation of memories is also critical to our understanding of how expert practice influences the brain. Essentially, new memories are ‘labile’ and susceptible to being disrupted before they transition into a more stable state (‘consolidated’).\textsuperscript{279} Retrieving a consolidated memory within 24 hours serves to reconsolidate the memory and facilitate its storage in long-term memory.\textsuperscript{280} Of more interest in relation to expert practice is that short-term memories can easily be corrupted and even overwritten if left unconsolidated.\textsuperscript{281} Further, Braun and Bock suggest that the retrieval of stored memories should be conceived as a ‘reconstruction of stored templates,’ rather than the ‘downloading of identical copies.’\textsuperscript{282} As such, it is assumed that the consolidation and reconsolidation of memory occurs every time the memory is retrieved.\textsuperscript{283}

Not only does this support the hypothesis that the performance of a skill will only ever be as good as the deliberate practice done refining that skill, but also it suggests that each performance of that skill is, in effect, a new interpretation of the stored memory that can thus be altered either positively or negatively each time the long-term memory

\textsuperscript{275} Braun and Bock, p. 41.
\textsuperscript{276} Ibid.
\textsuperscript{277} Ibid., p. 42.
\textsuperscript{278} Ibid.
\textsuperscript{279} Ibid., p. 43.
\textsuperscript{280} Ibid.
\textsuperscript{281} Ibid.
\textsuperscript{282} Ibid.
\textsuperscript{283} Ibid.
is retrieved. In practical, musical terms, it suggests that a highly trained skill, such as accurate intonation on the violin, is not guaranteed to improve as a result of accumulating extended amounts of practice utilising sub-optimal practice strategies and structures such as repetition alone. Again, for this to happen, continuous, effective and accurate practice must be sustained to increase the likelihood of optimal performance.

Neuroscientific research has also highlighted the degree of individuality inherent in expert practice. Primarily, this is due to the influence of personal cognitive and emotional evaluation on the selection of information.\textsuperscript{284} Essentially, this means that two people presented with the same situation will react differently due to differences in prior training of their brains.\textsuperscript{285} This affirms earlier discussion that the problems encountered by the individual may be unique to them, and that the most effective problem-solving strategies need tailoring to the individual by the individual, such as Smith’s ‘candidate solutions.’\textsuperscript{286} Thus, expert practice is an activity that requires individual engagement, and its specific processes will differ to some degree from person to person.

Although research into the learning of motor skills may be promising, as Altenmüller and McPherson suggest, it is important to note that our understanding of sensorimotor learning and its effect on the brain is at present incomplete.\textsuperscript{287} The brain scans used as data in much of this research do not provide an explanation as to the processes involved in the learning of skills, but merely illustrate links between human behaviour and resultant activity in the brain.\textsuperscript{288} Further, the measures shown in these scans do not reveal whether the neuronal activity is excitatory or inhibitory.\textsuperscript{289}

This becomes especially significant when considering that in adults, inhibition ‘is a general principle of maturation in the nervous system,’ with around 90% of synaptic connections in the brain being inhibitory.\textsuperscript{290} This fact is not discussed in current expert practice literature and its deeper implications in this context are worth further

\textsuperscript{284} Braun and Bock, p. 47.
\textsuperscript{285} Ibid.
\textsuperscript{286} Smith, p. 367.
\textsuperscript{288} Altenmüller and McPherson, p. 129.
\textsuperscript{289} Ibid.
\textsuperscript{290} Ibid., p. 128.
consideration as it suggests that motor skill learning is less concerned with parts of the body which are involved in performing the skill, than learning how to inhibit neighbouring parts of the body that are not required for the skill.

The neuroscientific investigation of the transition from guided slow movements to very fast movements in motor skill learning correlates with multiple violin-focused texts that detail practice strategies (including Fischer,\textsuperscript{291} Wulfhorst,\textsuperscript{292} and Gerle,\textsuperscript{293}), in suggesting that a combination of fast and slow tempos should be used in the early stages of learning new repertoire.\textsuperscript{294} Primarily, this is due to the assumption that these two different types of movements are produced in different areas of the brain, the slower using steady sensory control, and the faster without on-line sensory feedback.\textsuperscript{295} This being said, Altenmüller and McPherson also acknowledge the importance of practising difficult movements precisely in a ‘guided slow tempo’ in order to facilitate automatisation.\textsuperscript{296}

Practice structure is also addressed by Altenmüller and McPherson. Concurrent with earlier discussion of segmentation, they advocate shorter practice segments when the difficulty of the material being practised increases. A new idea, however, is their insight concerning the programming of movement sequences, which occur ‘mainly in the breaks after playing and during sleep.’\textsuperscript{297} They recommend that, in addition to shorter practice segments, difficult material should be accompanied with longer breaks during practice.\textsuperscript{298} Further, they emphasize the importance of sleep on the learning of new repertoire, which they suggest is of equal importance to all instruments regardless of ability.\textsuperscript{299}

\textsuperscript{291} Fischer, p. 2.
\textsuperscript{292} Wulfhorst, vol.1, p. 45.
\textsuperscript{294} Altenmüller and McPherson, p. 134.
\textsuperscript{295} Ibid.
\textsuperscript{296} Ibid.
\textsuperscript{297} Ibid., p. 139.
\textsuperscript{298} Ibid.
\textsuperscript{299} Ibid.
Equally pertinent are the damaging effects of ill-structured or excessive practice, which include actively worsening learned motor programs and a lack of attention leading to a higher probability of errors that become stored in procedural memory.  

Again, these findings concur with earlier discussions on the structure of practice. Similar to the literature already addressed, Altenmüller and McPherson also assert that ‘as [with] all skilled human motor activities, practicing is largely based on procedural knowledge. How to practice and when to stop practicing is best learned by experience.’ Thus, the responsibility of monitoring practice falls on the individual. Further, the importance of emotions in modulating practice behaviours, a point raised by Kreutz and Lotze, suggests that both the habits and structures involved in constant practice play a major role in the overall effectiveness of individual learning.

Finally, neuroscientific research may shed new light on more traditional views expressed in existing practice research. Recalling earlier discussions regarding the learning of new repertoire, many researchers such as Miklaszewski, Wicinski, Chaffin and Imreh, and Williamson and Valentine were in agreement that the learning of new repertoire is loosely grouped into three stages, with the individual’s musical interpretation focused upon only in the final stage. This view however, may not reflect the best method for preparing new repertoire. Consideration of the importance of emotion in practice may allude to more effective approaches. In addition to modulating practice behaviours, some researchers contend that emotion precedes cognition. As Kreutz and Lotze put it, ‘the origins of attention control are difficult to conceive of in the absence of affect.’ This may mean that the emotion associated with a musical context precedes the execution of the motor skills that characterize its realisation in performance. As such, the final interpretation in performance may only be able to be practised once the emotions attached to the music have been recognised. Thus, a focus on developing the emotions that the performer intends to convey in a particular piece may be more important than is currently acknowledged in current practice research. Of course, this cannot happen without prior knowledge of the piece. Considering this, in three-stage practice it may be more efficient for a focus on emotional response to the

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300 Altenmüller and McPherson, p. 140.
301 Ibid., p. 139.
303 Ibid., p. 148.
music to precede the second stage of ‘doing the hard work’ in addressing the technical difficulties of the piece. This was observed to a limited extent in Chaffin et al., with the subject of the research observed practicing musical elements such as dynamics and phrasing early in the preparation of a new work for performance.\textsuperscript{304}

The idea that ‘art begins where technique ends’\textsuperscript{305} is also challenged by neuroscientific research. Rather than opposing each other, Wager and Feldman assert that emotion and cognition should be viewed as ‘synergistic partners... each shaping the direction of the other,’\textsuperscript{306} a view supported by Kreutz and Lotze who state that ‘cognitive and emotional networks are closely interconnected even within the same anatomical regions.’\textsuperscript{307} While this synergy between emotion and cognition has been established for some time in the field of neuroscience,\textsuperscript{308} its representation in expertise acquisition research is comparably thin. Although it is beyond the scope of this research to investigate the role of emotion in practice further, it is a topic worthy of inclusion in expert practice research, although its exploration will undoubtedly prove challenging going forward, not least because of the individual differences in emotional responses to music performance.\textsuperscript{309}

While the advent of neuroscientific exploration into musical processes in the brain has already yielded many significant findings, it is important to acknowledge the limitations of this type of research, especially with regard to neurodidactics as applied to expert practice. Firstly, we must consider Gruhn and Rauscher’s view that ‘the qualitative dimension of learning cannot be read from brain activation.’\textsuperscript{310} While research may give deep insight into the processes of the brain, it does not represent in itself a tool with which to meaningfully assess particular teaching strategies or methods as applied

\textsuperscript{304} Chaffin et al., p. 483.  
\textsuperscript{305} Leopold Auer, Violin Playing as I Teach It (New York: Frederick Stokes Company, 1921), p. 154.  
\textsuperscript{306} Wager & Feldman Barrett quoted in Kreutz and Lotze, p. 148.  
\textsuperscript{307} Kreutz and Lotze, p. 154.  
\textsuperscript{309} Kreutz and Lotze, p. 160.  
to expert practice. Further, while neural correlates can be discovered, they do not necessarily indicate a casual connection.\textsuperscript{311} As Gruhn and Rauscher suggest, neuroscientific data ‘cannot provide educators with concrete rules and prescriptions for learning. Learning is always domain-specific, and music learning is its own domain.’\textsuperscript{312} More than this, the neuroscientific data highlights the individual nature of motor skill learning and the formation of long-term habits through interacting with one’s own environment and emotional experiences.

**Summary**

Expert or ‘deliberate’ practice, as represented in the literature, is a complex and multifaceted activity, focused on the processes of producing expert performance. It has been inextricably linked to the use of problem solving skills, including problem identification, problem definition, problem analysis, diagnosis, alternative generation, and evaluation.

In musical contexts, this investigation has identified many characteristics indicative of expert practice. The ability to accurately identify errors is one that has been shown to be crucial in expert practice. The role of the teacher in expert practice has been shown to be similarly important, with their vital function found to be the effective teaching of problem solving strategies to students, and fostering the ability of their students to apply these strategies effectively, in an individualized manner through the use of creative thinking.\textsuperscript{313} The importance of alternative generation has also been identified as a key characteristic of expert practice, as it allows for greater success in attaining higher levels of performance compared to those relying on mere repetition.

The relative importance of quality of practice and the amount of time spent practising are also addressed. While the literature appears to be preoccupied with assessing whether quality or quantity is the more determinative variable, this investigation concludes that expert performance is achieved through a combination of both high quality (expert-level) practice, which is done over an extensive period of time (as suggested by Ericsson et al.\textsuperscript{314}).

\textsuperscript{311} Gruhn and Rauscher, p. 268.
\textsuperscript{312} Ibid.
\textsuperscript{313} Smith, p.367.
\textsuperscript{314} Ericsson et al., p. 370.
Practice structure is also an essential component of expert practice. Multiple texts agree that expert performers structure the learning of a new work into three distinct periods in preparing the work for performance, though whether this is the most effective model is called into question by recent neurological research. Despite this, the fundamental practice strategy that has been identified as being used effectively by expert performers is undoubtedly segmentation.

Under the traditional model for learning new repertoire, the first period is marked by the selection of ‘performance features’, shown by the literature to be crucial in the successful memorization of a work. The second stage, in which the mastery of technique becomes the main focus, is characterized in expert practice by the gradual lengthening of practice segments. The shift in focus through these three periods leads towards a largely interpretive emphasis in the final period, resulting in practice runs of the whole work. The use of alternate practice methods, such as mental practice and recorded models, whilst not critical to expert performance, has also been shown to contain potential benefits, with some limitations.

Neuroscientific research relating to expert practice has also briefly been addressed. While this body of research provides empirical support for much of the theoretical findings in the expert practice research literature, it also challenges some other aspects of this. Most significantly, the neuroscientific research highlights the role and importance of emotion in expert practice and expert performance, a concept that is almost completely absent from the expert practice literature. The neuroscientific literature also suggests that musical expression should be practiced early in the learning of a new work for performance.

When considering the complexity and extensive breadth of skills and information that expert performance contains, it is no surprise to find that it is this knowledge base that ultimately defines expert practice. As Hallam suggests, ‘practice will only become purposeful and self-determined when the pupil has a range of “task oriented strategies” to draw upon.’ The same can be said about expert performance. Sloboda states that ‘expert performance “is the result of the interaction of specific knowledge of this piece alone with general knowledge acquired over a wide range of musical experience.”’

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315 Hallam quoted in Lammers, p. 23.
316 Sloboda quoted in Miklaszewski, p. 97.
Indeed, Ericsson suggests that ‘what distinguishes expert performers is mostly more and better-organized knowledge, which had to have been acquired.’ In this way, it can be argued that any prescribed knowledge, built using principles evident in expert practice, is by definition contributing towards expert performance. The following case study using Ševčík’s J. Brahms: Konzert D-Dur, op. 18 will evaluate both whether his prescribed approach effectively equips the performer with the expert-knowledge prerequisite for expert performance, and investigate if the exercises themselves correlate with the literature regarding expert practice.

317 Ericsson et al., p. 397.
Chapter 4: Case Study of Ševčík’s Op. 18

Otakar Ševčík, who lived from 1852-1934, remains as one of the most influential pedagogues in the history of violin playing. Aside from producing some of the best players of their time, such as Jan Kubelík and Efrem Zimbalist, his most enduring influence is undoubtedly the prodigious amount of published technical material related to violin playing. This material continues to be utilized in some way by virtually every classically trained violinist (as well as other string instrumentalists). However his later op. 16-26 (labeled as ‘Analytics’ by Christian318), consisting of technical exercises targeted towards specific repertoire, are less well known and rarely studied. Their relative obscurity can be attributed to two main factors, a lack of availability and an enduring criticism of Ševčík’s perceived abstract and unmusical pedagogical philosophy. Initially published towards the end of his life, the Analytics were not widely available in libraries, and the few copies that existed were predominantly passed down from teacher to student.319 This lack of circulation can perhaps be linked with prevailing attitudes towards Ševčík and his students, voiced most strongly by the equally important pedagogue Carl Flesch, himself a contemporary of Ševčík. His labeling of Ševčík’s exercise-based approach to pedagogy as a medicine, beneficial in small doses and lethal if used excessively,320 has been quoted and perpetuated by Ševčík’s critics ever since. In regards to the Analytics, Flesch was even less reserved in his views, stating:

I condemn unconditionally the preparatory exercises for different violin concertos published by Ševčík during the last years of his life. I consider them most dangerous with regard to the development of the musical components of a personality.321

More recently, both the availability and attitudes towards Ševčík’s Analytics appear to be changing. In addition to their re-issue by Lauren Kaiser Publishing, beginning in 2010,322 much of the Analytics are now freely available through the Petrucci online

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319 Ibid.
320 Flesch vol.1, p. 115.
321 Ibid., p. 117.
music library (IMSLP.org). Further, modern pedagogues are not only prescribing them to their students, but consider them to be highly effective.\footnote{Christian, pp. 4-5.}

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Ševčík describes his op.18 as ‘elaborate studies and Analysis bar by bar to J. BRAHMS CONCERTO IN D-MAJOR with revised solo voice and complete piano score.’\footnote{Otakar Ševčík, Op.18 J. Brahms: Konzert D-Dur (Brno, Czech Republic: Ol. Pazdírek, 1930), p. 1. Available from: IMSLP. Accessed on 9 September, 2011.} His preface to the work states ‘an analytical study of the separate parts of a work is essential to guarantee a safe reproduction of the whole. Only by these means technical, dynamic and other effects are to be gained.’\footnote{Ševčík,, p. 3.} Further, Ševčík views this approach as a ‘criterion’\footnote{Ibid.} for developing and sharpening the musical development of the individual. Ševčík reasons that studying the ‘separate interval and analytic studies’ thus allows the performer ‘an inspired, absolutely perfect and ideal execution, rid from technical difficulties.’\footnote{Ibid.} This indicates that Ševčík conceived the exercises with expert performance in mind.

Ševčík also seems to be masterfully aware of the role of the teacher in his conception of these exercises. Not only does he acknowledge the importance of fostering the need for individuality in solving problems and effecting musical interpretation, he critically acknowledges that the efficacy of his exercises is determined by the ability of the performer to engage with them meaningfully. This is evident from his stating ‘good will, perseverance and zeal are the soul of the work.’\footnote{Ibid.} Further, he remarks on the first page of the exercises proper ‘it lies entirely with the pupil to treat each section according to its grade of difficulty resulting from it.’\footnote{Ibid., p. 5.}

The edited solo part, which is integral to the work, consists of nineteen pages. The exercises far eclipse this in terms of quantity, consisting of a monumental eighty-six pages in volume. This equates to four pages of exercises for every page of the solo part! Considering that the solo part also contains the orchestral tuttis, the level of detail inherent in Ševčík’s exercises becomes immediately clear. Indeed Ševčík considers this level of detail to be a particular strength of the exercises, stating ‘the scrupulousness of
the analysis shall not frighten the player, but rather awaken in him a desire for solving further problems, thus enabling him to distinguish the better the nature of the musically beautiful in its subtlest components.\textsuperscript{330} This is concurrent with the findings of much of the research discussed earlier, including that of Chaffin and Imreh,\textsuperscript{331} Miklaszewski\textsuperscript{332} and Williamon and Valentine,\textsuperscript{333} who suggest that solving technical difficulties early in the process of preparation affords a more fluid and musically expressive interpretation in performance. In addition to this, the sheer volume of material is strongly indicative of the use of alternative generation, regarded by Smith as characteristic of higher order thinking and shown by the literature to be crucial in the implementation of expert practice.

In terms of engaging with the work in a practical sense, Ševčík provides the following instruction: ‘Each section of the concerto should be played only when one has finished its relative study.’\textsuperscript{334} By looking at the studies themselves, we can see that each ‘section’ in fact consists of around one to ten bars. This represents the use of segmentation by Ševčík, shown by the literature to be perhaps the most important technique used in expert practice. Further, each set of exercises can clearly be shown to evidence the key concepts indicative of higher order thinking through: problem solving; problem identification; problem definition; problem analysis; diagnosis; alternative generation; and evaluation. Even from this brief initial perspective, the parallels between the literature regarding expert practice and Ševčík’s op.18 are demonstrably strong.

\textit{Ševčík’s Op.18: A Multimethod Case Study}

Having investigated the nature of expert practice as represented by the literature, and demonstrated the links between this literature and Ševčík’s op.18, it is now time to present the findings of the case study of Ševčík’s work. The procedure employed in this case study was aimed at both experiencing the exercises first hand, as well as exposing the inner-workings of the decisions behind their construction. As such, a multimethod structure presented itself as the most appropriate with which to carry out the case study. The first phase involved engaging with Ševčík’s op.18 for 62 hours, during which

\textsuperscript{330} Ševčík, p. 3.
\textsuperscript{331} Chaffin and Imreh, p. 57.
\textsuperscript{332} Miklaszewski p. 107.
\textsuperscript{333} Williamon and Valentine, p. 367.
\textsuperscript{334} Ševčík, p. 5.
verbal reports were made. Following this, audio/video recordings of this initial phase were reviewed using reflective practice, both of which represent the main body of data for the case study. The reflective notes were also reviewed in combination with analysis of the exercises themselves. In this way, an individual perspective, shown to be critical to the undertaking of expert practice, could be combined with a more subjective analysis of the material to create the richest data set with which to evaluate Ševčík’s method.

Generally speaking, the case study revealed a complex, multi-faceted integration of many of the principles and strategies arising from the investigation into expert practice, in many cases on a much more advanced level. When considering the larger structure of the work, Ševčík’s op.18 represents a prescribed, complete volume of expert practice as applied to a single piece of music. This in itself is unique to the body of literature regarding expert practice. However, the way in which the characteristics and strategies that define expert practice are employed in a systematic manner represents a much more significant achievement and provides a window with which to gain a deeper understanding of expert practice as a whole.

During the initial phase of the case study, it became clear that there were discernable patterns in the general construction of the exercises, as well as when particular practice strategies were employed. As such, the findings presented here are structured in the same way. Firstly, the principles guiding the construction of the exercises are identified and discussed, before the most effective practice strategies are similarly identified, and their use discussed with the aid of examples taken both from the practice data and the score itself.

**Principles underlying the Ševčík method**

There are three main principles that guide the construction of Ševčík’s op.18. They are the reduction and isolation of technical challenges, the saturation of solutions and the consolidation of work done. This approach exhibits many of the characteristics indicative of ‘higher order thinking’335 as defined by Smith, including problem identification, problem definition, problem analysis, diagnosis, alternative generation and evaluation. However, while both Fischer336 and Wulfhorst337 address the isolation

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335 Smith, p. 366.
336 See ‘Doing one thing at a time’ in Fischer, p. V III.
and reduction of technical challenges, the degree to which the principle is applied in Ševčík’s exercises warrants further discussion. Further, Ševčík’s use of alternative generation throughout the exercises suggests a magnitude of complexity beyond any examples that can be found in the literature. As such, Ševčík’s use of alternative generation in this case study is instead more aptly labeled a saturation of solutions. Finally, Ševčík’s application of practice strategies for the purpose of consolidation represents a new area for discussion in relation to expert practice.

Reduction and isolation of technical challenges/Segmentation of repertoire

In the previous chapter regarding expert practice, Ševčík’s use of segmentation in the construction of the exercises was noted. However, his use of segmentation merits more detailed treatment. Generally speaking, Ševčík uses each set of exercises to target a particular technical challenge. That is to say, the segmentation of the solo part is not arbitrary, but instead governed by particular criteria. The first criterion to be discussed is related to the technical challenges inherent in the solo part. Ševčík often uses particular technical challenges as the overall basis for a whole set of exercises. Within this, he isolates each technical challenge and treats it with its own separate set of exercises.

The following passage (Ex. 4.1), appears in the 1st movement of the Brahms’s Violin Concerto in D, the subject of Ševčík’s op.18:

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337 See practicing ‘one thing at a time’ in Wulfhorst, vol.1, p. 42.
Ex. 4.1: Allegro non troppo, from Brahms’s Violin Concerto in D major, op.77, ed. O. Ševčík (measures B 69-71)

Using the reduction and isolation principles, Ševčík creates the following exercises (Ex. 4.2):

Ex. 4.2: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 14

By analyzing the content and sequence of these exercises, Ševčík’s use of reduction and isolation begins to reveal itself. First of all, one should note the extensive use of double bar lines. Ševčík uses this symbol to demarcate a single practice segment: that is, the amount to practice without break or pause. In the context of this discussion, these double bar lines represent each technical element reduced to its most basic form, and isolated with its own exercise. In this instance, Ševčík indicates the technical challenge being analyzed as being a ‘sixth with octave.’\textsuperscript{338} The first practice segment, in Ex. 4.3, tunes the first sixth independently, isolates the shift to the next sixth, then tunes that sixth independently, then isolates the next shift, before combining the tuning of the two sixths, together with the shift between them.

\textsuperscript{338} Ševčík, p. 14.
Ševčík then repeats this process beginning with the last sixth from the first practice segment and adding the next sixth in the sequence from the solo part (Ex. 4.4):

The next segment then combines transitioning between the sixth and octave, before returning to the figured patterning of the solo part (Ex. 4.5):

This level of detailed reduction and isolation of technical challenges is characteristic throughout Ševčík’s op.18.

Particular technical challenges are not the only criterion Ševčík uses in deciding how to segment the solo part. Ševčík also segments the solo part using overall difficulty as a criterion for devising a set of exercises. Generally speaking, as the overall difficulty of the solo part increases, the amount of material from the solo part covered in each set of exercises decreases. This is clearly illustrated by considering the following passage from the third movement of the concerto (Ex. 4.6) and its accompanying exercises (Ex. 4.7):
Ex. 4.6: Allegro giocoso, ma non troppo vivace, from Brahms’s Violin Concerto in D major, op.77, ed. O. Ševčík (measures D1-10)

The technical challenge contained in this passage relates to the rapid tempo at which the passage is played, and the extensive range covered by the continuously ascending arpeggios, some of which require extensions. This being said, these difficulties are fairly uniform across the passage, with the final few bars between D8-10 containing the highest level of difficulty. However in his use of segmentation, Ševčík groups the first nine bars together as one set of exercises, seen here:

Ex. 4.7: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 68
The final bar, which we have established as having the same technical concerns as the rest of the passage, is treated with its own set of exercises (Ex. 4.8), which are of comparable length:

Ex. 4.8: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 68

It should be noted that this set of exercises is one of a very few contained in the entirety of Ševčík’s op. 18 which contains an alternate fingering. This could perhaps explain why this bar has its own extended set of exercises. However, this point serves to further the argument that Ševčík decided on some level that this bar warranted closer scrutiny than surrounding bars, as alternate fingerings could have been just as easily applied to the surrounding bars, in fact to any other bars contained in the work. However, this is not the case. Later in the analysis, the close relationship between the fingerings used and the efficacy of the exercises will be further discussed. This all suggests that Ševčík regarded the bar of D10 as more difficult than the other bars in the passage, and so segmented the solo part in greater detail.

The third criterion used by Ševčík for segmentation of the solo part relates to his employment of particular practice techniques and strategies, pertaining to three different outcomes: either a micro-level exploration of intonation, the technical mastery of a particular passage or the consolidation of technical ability and fluency achieved by
earlier sequences of exercises. These techniques and strategies will be categorized later in this discussion, but for now, the following exercises (Ex. 4.9) will be used to illustrate this point:

Ex. 4.9: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 69

This set of exercises is situated directly after the two sets that were just discussed, pertaining to bars D1-10. It covers the most demanding part of the passage, and it should be noted now that the previously separate bar of D10 is incorporated with the rest of the passage. The notes appear in sequence as per the solo part, and the only variation in this set of exercises comes from the bowing employed. That is to say, there is no isolation or reduction of technical challenges in the left hand, and considering the bowing of the solo part (which is slurred six to a bow), the variations denoted by Ševčík are not written with the aim of furthering right hand technique. Exploration and engagement with these exercises revealed them to consolidate the technical gains made from playing through the earlier exercises, at once combining technique learned from different sets of exercises and consolidating them into larger sequences. This represents the employment of larger practice segments by Ševčík and also reveals further insight into the method of construction and purpose of his exercises.

Using these three criteria in conjunction with the larger chronology of the exercises, a clear method of construction reveals itself. Firstly, Ševčík employs the most basic
exercises possible, which explore the intervallic relationships of the solo part in their purest form, independent of rhythm, with the aim of elucidating the intonation of the passage. Then, Ševčík targets separate technical challenges with their own sets of exercises, before consolidating these into larger segments and employing methods aimed at consolidating the technique required for their expert performance. In this way, the systematic and multidimensional nature of segmentation used by Ševčík far exceeds the current level discussed in the literature to date.

**Saturation of solutions**

As previously discussed, alternative generation has been identified as a key characteristic of expert problem solving. Similarly to his use of segmentation, Ševčík employs this principle in a more complex and targeted manner than is discussed in the literature. The literature cites creative thinking as crucial for crafting candidate solutions, which is representative of alternative generation. Wulfhorst outlines practice strategies such as variation of rhythm, practicing one thing at a time, varying strokes, dynamics, metrical scheme and articulation and exaggerating challenges, which could all be categorized as alternative generation in practice. Fischer however, is much more exhaustive in his discussion of practice techniques, with 250 practice methods that include examples taken from the solo and concerto repertoire. However, the manner in which Ševčík uses alternative generation goes even further, and as such warrants a more descriptive term.

In the examples outlined by Wulfhorst, the material being practiced remains in the same sequence (the three forward, two back technique is perhaps an exception to this, although technically the sequence of fingers used is kept, even if it is backwards). This is largely true of Fischer also, although techniques such as ‘testing, relating, comparing,’ experiment to a small degree with alteration of the source material. However, Ševčík’s use of alternative generation is not governed or restricted to treating the material being analyzed as it appears in its original form. He often crafts exercises that require the performer to execute material in different combinations and acquire skills that are surplus to the technical demands of the original passage. As such, Ševčík’s use of alternative generation is more aptly described as the provision of a saturation of solutions.

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339 See Wulhorst ‘var. zz’, p.48.
340 Fischer, p. 207.
This principle of saturation of solutions is integral to Ševčík’s method and is present throughout his op.18. It is most easily illustrated by considering the following passage (Ex. 4.10), taken from the first movement of the concerto:

Ex. 4.10: Allegro non troppo, from Brahms’s Violin Concerto in D major, op.77, ed. O. Ševčík (measures D12-8)

In my own preparation of the work for performance, this passage was one of the most difficult, a view that Ševčík clearly shared. This is illustrated by the extensive treatment the passage is given in his op.18, in which he prescribes three pages worth of exercises to treat this one short passage.

The technical difficulties of this passage arise due to alternation between tenths and sixths, while maintaining the extended hand shape required to execute this through a series of shifts. This being said, the hand shape is constant (the intervallic relationship of the fingers through the passage remains the same), and the shifts are almost constant (upwards a perfect fourth, except for the shift to the lower e on the second note of bar 17). Also, the sequence of interval patterns and extensions is repeated.

From the beginning of this set of exercises, Ševčík’s approach of providing a saturation of solutions is evident. Consider the beginning of the passage once more (Ex. 4.11):

Ex. 4.11: Allegro non troppo, from Brahms’s Violin Concerto in D major, op.77, ed. O. Ševčík (measures D12-4)
And now the first exercises provided by Ševčík (Ex. 4.12):

Ex. 4.12: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 19

While the exercises begin in sequence with the solo part, by the fifth bar, one can clearly see that, although still based on the material of the solo part, the exercises appear in a sequence different to that in the solo part. This process also appears on page 20 of the exercises, which requires the performer to execute an extensive set of double stopping variations based on the solo part in sequences that do not appear in the solo part, as seen in the following example (Ex. 4.13).

Ex. 4.13: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 20

This is one of many such challenges Ševčík includes in his exercises, which are not explicitly present in the solo part. Another technique is to require the performer to execute different rhythms on each string, posing coordination challenges that again are not present in the solo part (Ex. 4.14):

Ex. 4.14: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 20

This strategy of providing different combinations and technical challenges is openly acknowledged by Ševčík on page 21, who prefaces the second set of exercises with the simple statement, ‘In another order’.

This provides strong evidence that Ševčík not only used material out of sequence in order to help solve technical challenges, but to provide a saturation of solutions in order to give the performer a wealth of information that is aimed at achieving technical
mastery. The effect of these exercises applied in practice in this research was to ‘teach the hand the distance between all of the intervals, not just the ones present in the line, that being the tenth and the sixth, provid[ing] the hand with all of the relationships between all of the fingers so it has more than one reference point... add[ing] security.’\(^{341}\) This added security persisted from the short-term learning of the work using Ševčík’s exercises until the final performance. Upon reflection, the effectiveness of this saturation principle was most evident in performance. It was in this high-pressure situation, when the added security afforded by a knowledge base in excess of what is required in the moment, that the performance could feel somewhat easy and under control.

Again, Fischer is aware of this concept\(^{342}\) but it is not directly addressed in his examples with any comparable level of detail. The saturation of solutions used by Ševčík throughout these exercises relates to all aspects of violin playing, including shifting, extensions, individual finger coordination in the left hand, intervallic relationships, rhythm, string crossing, articulation and bowing direction.

**Consolidation**

The concept of consolidation is not new to the realm of problem solving, but it has failed to be addressed directly by existing research regarding expert practice of musicians. In Ševčík’s method, consolidation is clearly integral to the overall effectiveness of the method. From the performer’s perspective, exercises with a focus on consolidating work already done have a dual function. Firstly, they contextualize what can seem at times the abstract nature of the exercises. Especially during the first reading, it can at times be difficult to understand how particular exercises apply to the source material. Take the following exercises for example (Ex. 4.15a):

\(^{341}\) Appendix B, ‘clip-2013-03-12 12;17;56 A nonT sp7,9 svk42’, Practice 12-03-13, p. 58.

\(^{342}\) See: ‘What are the practice methods for?’ in Fischer, p. VII.
Ex. 4.15a: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 56

Taken out of context in this way, it is difficult to assess which part of the Brahms Concerto these exercises may be aimed at improving. Simply by adding in the practice segments either side, this ambiguity is somewhat resolved:

Ex. 4.15b: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 56

More crucially, Ševčík almost always ends each set of exercises with a close representation of the passage they apply to (Ex. 4.15c):
The second function of consolidating exercises, and equally significant, is the way in which they help the performer to evaluate the effect of the earlier technical exercises. Effectively combining all of the technical work into a larger segment, which is heavily based on the source material, allows the performer to assess which technical challenges have been solved effectively, and identify those that require further refinement. This evaluative quality is most strongly exhibited by the bowing variation style of exercises, already mentioned above, which will be examined in more detail in the following discussion of Ševčík’s practice strategies. For now, a simple reminder of this style of exercise and its close resemblance to the solo part is enough to demonstrate this point. Thus, the following passage (Ex. 4.16), taken from the final movement of the concerto, accompanied by the corresponding exercises using the ‘bowing variation’ practice strategy (Ex. 4.17):
Smith regards evaluation as critical to his more substantive framework for problem solving\textsuperscript{343} and King acknowledges the importance and potential of evaluation as an area for more detailed research in the future.\textsuperscript{344} My experience of this type of exercise strongly corresponds to these sentiments, acting both as powerful positive force in consolidating gains made by the more analytical exercises as well as highlighting areas that need further improvement.

\textsuperscript{343} Smith, p. 364.

\textsuperscript{344} King, p. 15.
**Practice Strategies employed by Ševčík**

Having established the principles underlying Ševčík’s approach to expert problem solving, it is now useful to discuss particular techniques present in Ševčík’s exercises that are representative of expert practice. Whilst some techniques are present in the literature, it is worth noting that Ševčík’s op.18 predates all of these sources by a considerable margin.

**Intervallic technique**

The intervallic style of exercise is integral to the Ševčík method. Ševčík considers this type of exercise to be ‘indispensable for precise intonation.’\(^{345}\) It is the most extensively applied type of exercise in Ševčík’s op. 18. It consists of a reduction of the original material into a sequence of repeated intervals, grouped under a constant rhythm. Take for instance the opening of the Concerto (Ex. 4.18), with the corresponding exercises (Ex. 4.19) that reduce the passage into a sequence of intervals, independent of rhythm:

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Ex. 4.18: Allegro non troppo, from Brahms’s Violin Concerto in D major, op.77, ed. O. Ševčík (measures B7-14)

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\(^{345}\) Ševčík, p.5.
This type of exercise embodies Ševčík’s principle of the reduction and isolation of technical challenges. In many ways, the intervallic exercises serve as the foundational basis for the entire work. This is mainly because the more analytic exercises aimed towards technical mastery and which exhibit advanced utilization of expert problem-solving techniques, soon to be detailed, are always preceded by this style of exercise.

Having practiced this style of exercise extensively during the data collection phase in the case study, I experienced considerable positive effects. As Ševčík suggests, this technique excels at improving intonation of a passage. By practicing the intervals that make up the solo part, each note is essentially tuned to the one after, which serves as a reference point for the note after that, and in this way, a passage is slowly built up as a succession of finely tuned intervals. The removal of rhythm allows for the total attention of the performer to be focused towards the tuning of the intervals, a feature that is further amplified when combined with the use of other practice strategies such as repetition and strategic use of dynamics. The net effect is that it allows the ear to accurately hear the ideal or most pure intonation, which in turn serves as a reference point for later exercises that begin to facilitate mastery of technique.

The other feature of the intervallic exercises that warrants discussion is their treatment of shifting. It is in the intervallic exercises that Ševčík predominantly addresses this technical aspect that is fundamental to violin playing. Generally speaking, this is done using a two-tiered approach. The first style of shifting exercise practices the shift in a...
slow tempo (the same tempo of the repeated intervals that constitute the surrounding exercises), before the second approach practising the same shift in a much faster tempo. An example of this two-tiered approach first appears on page ten of Ševčík’s exercises (Ex. 4.20):

Ex. 4.20: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 10

The first bar of the example practices the shift slowly under a slur, putting the emphasis on the tuning the shift. This actually serves a dual purpose by also informing the kinaesthetic memory as to the required distance to execute the shift accurately. The second bar then practices the shift in double the speed (over the space of a quaver instead of a crotchet as is in the first bar of the example). While the slur is included so that the shift can be heard, my experience is that the use of the ear during the faster shift is of secondary importance. To be more specific, listening to the shift above all else did not lead to optimal results. Instead, the most benefits came from ‘performing’ the shift with the muscles, i.e. relying on kinaesthetic memory rather than reacting with the ear. This transfer of focus is prompted by the fact that in Ševčík’s exercises, the note after the shift is repeated. This second playing of the top note then serves as the point of evaluation for intonation. Critically, this means that evaluation only happens after the shift has been performed using muscle memory. This represents a highly advanced technical treatment for shifting, far ahead of its time. This is due to the fact that Ševčík’s approach seemingly recognises neuro-scientific principles associated with motor-learning discussed earlier, particularly in relation to the difference in executing slow and controlled, and ballistic movements, proven nearly 100 years later.346

In summary, the intervallic method serves as the first of the three critical stages which constitute the meta-construction of the exercises, representing the crux of Ševčík’s approach to expert problem solving: elucidate the ideal outcome, provide a saturation of solutions to all potential challenges using alternative generation, before consolidating the whole process. This fundamental reduction of the original material into a sequence of intervals, independent of rhythm and with special attention given to shifting, creates

346 Altenmüller and McPherson, p. 143.
an elementary and acutely developed understanding of the intonation of any given passage. This understanding then serves to facilitate technical mastery, which is developed in the analytical exercises by employing practice strategies that embody processes and principles of expert problem solving.

**Bowing Variation**

This practice strategy, already mentioned above, consists of a passage of the solo part, sometimes with minor alterations, repeated using a multitude of different bowings. Ševčík places this type of exercise as the last one before moving on to a new section. This is critical to its usefulness, as it contains no overt strategies in itself towards solving left hand technical challenges. In this way, it can be seen as having a consolidating effect. Engaging with this style of exercises, such as Ex. 4.21, revealed that the challenge in playing them comes from executing the different bowing patterns which Ševčík provides, almost none of which are used in performance of the concerto:

Ex. 4.21: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 39

The following excerpt from the practice data is one example of this type of exercise being played, after the more technically-focused exercises had been completed. This
excerpt begins with the most basic bowing, ‘as it comes’, meaning that the bow alternates between down and up on each successive note. Although the odd wrong note is played (due to the fact that this excerpt comes from the first reading of these exercises), note that most of the technical facility required to execute the passage has been acquired, resulting in a generally acceptable level of intonation. (AV Ex. 4.1a).

As the different bowings are introduced, there is a notable increase in breaks during practice, where I am stopping due to confusion caused by the different bowings. It is evident that this is the focus of the practice for two reasons. Firstly, the sequence of the left hand remains constant over the different bowings, meaning that the left hand is simply repeating what it has done in previous variations. Secondly, the accuracy of the left hand remains largely unaffected, i.e. that there are no left hand technical concerns during this excerpt of practice (AV Ex. 4.1b).

The effect of this practice strategy cannot be fully explained by viewing the practice data alone. The perspective gained from experiencing and engaging with this type of exercise adds further insight into the benefits of this practice strategy. By altering the bowing in each successive variation, the mental focus is actually shifted away from the left hand and towards the right, effectively leaving the left hand execution to function in a manner comparable to ‘autopilot’ on an aeroplane. Considering that such subconscious execution can only happen after the passage is acutely familiar to the performer, it becomes logical that Ševčík leaves this type of variation until the end before moving on to a new passage. Leaving the execution to the subconscious part of the brain also has the effect of amplifying any shortcomings in the left hand technique, as the execution resultantly becomes heavily reliant on kinaesthetic memory, with almost all conscious effort focused towards playing the correct bowing. This allows the performer to effectively evaluate the extent to which technical issues have been solved.

**Rhythm Bowing**

This technique consists of isolating double-stopping passages and bowing them out using the rhythm of the solo part. Take for instance the following passage from the first movement from the concerto (Ex. 4.22), and the accompanying exercises utilizing rhythm bowing (Ex. 4.23):
When playing this type of exercise, the coordination of the left hand is quickly improved, as the fast rhythm of the bow requires similarly fast chordal changes in the left hand in order to keep good coordination. Further, this exercise also serves to strongly embed the rhythm of the passage by subdividing into small units with the bow. The following video example consisting of the exercises in Ex. 4.24, demonstrates how this rhythm bowing technique, combined with a reduction of technical challenges which Ševčík uses in the preceding exercises, results in rapid technical mastery of the passage during the first reading of the exercises. (AV Ex. 4.2a):

Ševčík finds additional ways to implement this technique, by alternating the rhythmic units and reducing the triple stops to double stops, providing a quick and effective method of gradually increasing the difficulty to achieve mastery of the triple stops. This is evidenced in the passage from the concerto (Ex. 4.25) and the accompanying exercises (Ex. 4.26):
Note that in (AV Ex. 4.2b), the intonation is not of a high level throughout all of the exercises. This suggests a degree of skill learning during the exercises, i.e. that it was not within my existing knowledge base to be able to play this passage accurately at the beginning of the example. However, as I continued to play through the exercises, the gradual escalation of challenge throughout allowed for the required technical skills for this passage to be efficiently refined with each new exercise. As a result, the final exercise, which represents the passage as it appears in the solo part, is played with a great deal of technical control on the first attempt. As the video data suggests, the technical demands of playing the rhythm bowing strategy actually exceed those of the solo part in this instance. This is mainly because the solo part has rests, which allow more time for the required adjustments to be made. Thus after playing the ultimate rhythm bowing exercise, the solo passage is comparably easier.

A third use of this practice strategy is to play consecutive double stops in the exercises when they only appear as broken double stops in the solo part, as a method for improving intonation. The clearest example of this appears in the second movement (Ex. 4.27):
Here the passage can be seen as consecutive broken octaves, which Ševčík alters to consecutive octaves utilizing the rhythm bowing in the accompanying exercises (Ex. 4.28):

For these exercises, Ševčík stresses that ‘all fingers move, also at the following broken octaves.’\footnote{Ševčík, p. 56.} This is most likely suggested to keep the whole left hand together as a single unit, again with the aim of improving intonation. The alternation of short fragments of rhythmic octaves in blocked and broken form (indicating a high level of difficulty) allowed me to first hear and thus feel the correct tuning of the octaves in their blocked form, before playing them broken as they appear in the solo part. This also ensures that the fingers are both shifting the correct amount as in their broken form, only half of the octave can be heard effectively during the shift (AV \textbf{Ex. 4.2c}).
These examples illustrate the effectiveness of the rhythm bowing strategy in facilitating technical mastery. From a personal perspective, the advantages of this technique are considerable. Firstly, the simplification of the bowing into small and regular rhythmic units allows much more awareness to be shifted towards the left hand execution. As the rhythmic units in the bow are small, the speed of the left hand execution required to cleanly coordinate both bow and left hand is relatively high. This effectively mixes greater and lesser challenge requirements, which enables new challenges to be quickly mastered. When combined with the reduction and isolation principle shown to be prevalent in Ševčík’s method, the result is a powerful strategy well suited to technical challenges such as consecutive double and triple stops. An added advantage of this technique is that it strengthens the rhythmical base of the passage it is applied to. Perhaps for this reason, Ševčík often employs rhythm bowing when the source material contains dotted rhythms. I found this strategy to be so effective that I began to incorporate it into my own practice and apply it to material in the concerto which Ševčík did not. Interestingly, the passage to which it is applied contains both double stops and a dotted rhythm (AV Ex. 4.2d).

**Anchoring**

Anchoring is used by Ševčík as a method for improving intonation of a passage, as well as teaching extensions and double-stopped shifts. It is important to make the distinction between general intonation, or in-the-moment intonation (pertaining to a particular note or double stop), and intonation of a passage which considers the intonation of the notes contained in the passage in relation to each other. In the exercises improving passage intonation, anchoring consists of using a finger as a reference point with which to tune the other notes of the passage.

The following excerpt from the first violin entry in the concerto (Ex. 4.29) consists of a series of broken and unbroken double stops:

Ex. 4.29: Allegro non troppo, from Brahms’s Violin Concerto in D major, op.77, ed. O. Ševčík (measure B18)
Notice that the anchoring of the first finger is carried over as a method for securing the intonation when playing the solo part. The exercises (Ex. 4.30) expand on this technique:

Ex. 4.30: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 7

Using the first note (F above middle C) as the anchor, the subsequent notes of the passage are tuned against the ‘anchor’ note, which facilitates a clear sense of the intonation of each note in relation to each other. As a result, the passage gains a strong and coherent pitch center.

A second use of anchoring in Ševčík’s exercises is for treating double stopping shifts (Ex. 4.31):

Ex. 4.31: Allegro non troppo, from Brahms’s Violin Concerto in D major, op.77, ed. O. Ševčík (measure B86)

Here again, the anchored note in the exercises is used as a reference tone for the shifting finger. One could argue that anchoring the first finger is required to play this passage, but Ševčík includes anchoring on all three strings in the exercises, not just on the lowest string as the passage requires. This allows the double-stopped shift to be practiced as single string shifts with multiple reference tones, again highlighting Ševčík’s main principles of the isolation and reduction of technical problems and a saturation of solutions. Further, the final two bars utilize double anchoring, with the fingers on the D and E strings anchored, and the finger on the A string having to move independently. Again, this results in a saturation of solutions and a level of challenge in the exercises (Ex. 4.32) in excess of the passage on which they are based (AV Ex. 4.3a):
The third use of anchoring, which is worth discussing, stems from the personal experience of using this type of exercise, and relates to extensions. In the exercises, Ševčík uses anchoring to help the performer develop accurate extensions. In this instance, it is more the physical aspect of the anchored note that serves to improve technique, rather than the audible reference point, which the previous examples of anchoring provided. This fits well when one considers that extensions are a largely physical technical challenge, requiring the fingers to extend into unnatural and unusual shapes. By using the anchor as a physical rather than audible reference point, the hand is taught the extension through kinaesthetic memory rather than using reference tones to find the intonation. This physical aspect is clearly evident in the following example taken from the second movement (Ex. 4.33):

Ex. 4.33: Adagio, from Brahms’s Violin Concerto in D major, op. 77, ed. O. Ševčík (measures 43-5)

For this passage, Ševčík uses the first finger as the anchor, suggesting the performer keep the finger on the string between the first and second extension, serving as a physical reference point for the whole passage. This continues on from the exercises (Ex. 4.34), which make extended use of anchoring to help create the muscle memory of each individual extension:
The result is a highly accurate rendition of the solo passage at first reading \( \text{AV Ex. 4.3b} \).

In summary, Ševčík’s anchoring technique is a very useful practice strategy in two separate contexts. The first context is in using the anchored finger as an aural reference point for the tuning of double/triple stopped passages, and the second is to use the anchored finger as a physical reference point with which to train extensions. While not used as extensively as some of the other practice strategies discussed here, anchoring still proved to have a positive effect on the author’s attaining technical mastery of Brahms’s Concerto.

**Added Rest/Rhythmic Alteration**

This technique is closely linked in with the principle of segmentation and use of repetition. In essence, it consists of segmentation of the solo part with a persistent underlying rhythmic pulse or tempo. As such, it provides a method for either running larger, technically complex passages in a simplified, controlled manner or analyzing particular runs or passages in a highly detailed manner. Each rest represents an opportunity for the performer to both assess the segment just played and prepare for the next segment in the passage. In this way, it allows passages to be executed in a succession of small, high intensity practice fragments. Ševčík uses this technique in a myriad of ways in order to treat many different technical challenges.

Perhaps his most common use of this technique is in analyzing arpeggios. The following arpeggio (Ex. 4.35) appears in the third movement of the concerto:
Ex. 4.35: Allegro giocoso, ma non troppo vivace, from Brahms’s Violin Concerto in D major, op.77, ed. O. Ševčík (measures B13-4)

When applying the added rest technique to arpeggios, such as in Ex. 4.36, Ševčík also employs repetition and overlapping between segments to provide a highly detailed and thorough treatment of all shifts, string crossings and extensions, which are inherent to the playing of arpeggios on string instruments:

Ex. 36: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 65

These exercises begin with a simple segmentation of the arpeggio, each of which is played in both ascending and descending versions.

This a good example of Ševčík’s saturation of solutions principle in action, as the solo part contains the arpeggio in its ascending version only. The segments overlap each other, gradually ascending and later descending at the rate of one note per segment. The five-note version then increases the tempo, but breaks the direction into only ascending and later only descending. Combined with the repetition of each section four times as directed by Ševčík, the result is a comprehensive, segmented, high-intensity approach to teaching the complex chain of movements required to execute the passage at performance tempo. The following excerpt from the practice data is taken near the end of the 62 hours spent on the exercises and illustrates the continued potency of the practice strategy (AV Ex. 4.4a).
The next example helps to illustrate the flexibility of the added rest strategy as used by Ševčík. While the earlier example demonstrated how the strategy could be used to practice particular runs or passages in minute detail, here it is used to break a larger, complex passage into a collection of smaller, easily digestible practice segments. This example also shows that this practice strategy is as applicable to scale passages as it is to arpeggios, both of which are present in the following passage of the first movement (Ex. 4.37):

Ex. 4.37: Allegro non troppo, from Brahms's Violin Concerto in D major, op.77, ed. O. Ševčík (measures D63-E1)

The accompanying exercises (Ex. 4.38) clearly show how the rests are added to break the technically complex passage into smaller fragments, largely keeping the rhythmic relationships within the passage intact:

Ex. 4.38: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 27

This has the effect of allowing the performer to play the passage at a fast tempo, in small segments, with the rests allowing time to both assess the segment just played, and mentally prepare for the segment to come. The next example from the practice data shows this well, with the challenge of the exercises slightly above my ability to sight-read them. Despite this, I am able to meet the technical challenges of the exercises.
which then translate to a relatively fluent run of the passage on the first attempt, despite some reading errors (AV Ex. 4.4b).

This technique is one of the most common throughout the exercises, and the examples taken from the practice data show it to be effective at both analyzing complex passages in minute detail, as well as allowing large segments to be practiced in a controlled, accurate manner. Both of these applications can be found in the exercises accompanying the following excerpt (Ex. 4.39) taken from the third movement of Brahms’s Concerto:

Ex. 4.39: Allegro giocoso, ma non troppo vivace, from Brahms’s Violin Concerto in D major, op.77, ed. O. Ševčík (measures A19-26)

This passage contains a combination of challenges, including rapid and asymmetric string crossing using a short off-the-string articulation, shifting upwards and downwards and the use of extensions. It proved to be one of the most troublesome passages to prepare for final performance, and as such, the exercises associated with it (Ex. 4.40) were some of the most often practiced during the case study:
As is the case with the previous examples, Ševčík combines the use of the added rest technique with repetition to allow the performer more than one attempt at particular segments, while keeping the feeling of playing a larger section due to the ostinato rhythm. I found these exercises to positively affect intonation, string crossings and articulation of the stroke. The following excerpt from the data shows initial practice of the solo part, which is marked by inaccurate intonation and frustration that is clearly visible. Following this, the exercises in Ex. 4.40 as well as the subsequent bowing variation exercises were practised. The audio video example is marked by an ever-improving ability to identify and correct errors, which culminates in a much-improved run of the section at the end (AV Ex. 4.4c).

From the performer's perspective, this practice strategy is invaluable for aiding the technical mastery of arpeggiated and scalic passages. As already described, the succession of small, high-intensity segments, played over an ostinato allows for rapid and accurate training of the sometimes extremely fast motor skills (i.e. shifts and extensions) required to play such passages in the performance tempo. As the neuroscientific literature suggests, early practice of such explosive movements at a fast speed is crucial for eventual performance.348

348 Altenmüller and Mcpherson, p. 134.
Further, this style of exercise/practice strategy proved to be useful after the initial time spent on Ševčík’s op.18. In fact, I used this style of practice strategy consistently until the eventual performance of Brahms’ work. Again, this type of practice correlates strongly with findings arising out of neuroscientific research, especially in relation to the accessing of learned skills from ‘stored memory’. The neuroscientific literature suggests that each time the memory is accessed the short-term neurological networks are also activated and that each rendition of the stored memory is treated as a new interpretation. In this way, the short, high-intensity segments that characterize this practice strategy allows for effective evaluation of the most rapid and difficult passages. Thus, mixed with runs of the passage itself, this type of practice facilitates and helps to maintain a high degree of technical mastery over virtually any conceivable passage.

**Use of Dynamics/Accents**

Ševčík’s use of dynamics, much like other techniques, is multi-faceted. As can be expected, much of the exercises are marked with dynamics that correspond to the solo part. However, the more interesting use of dynamics and accents in the context of this investigation relates to when Ševčík uses dynamics and accents in the exercises that differ from their corresponding passages in the solo part. The data revealed that Ševčík’s use of dynamics in this way serves to highlight critical technical or musical aspects, in order to help the ear easily digest and develop secure intonation.

Before this type of employment of dynamic is outlined, it serves to illustrate the strong correlation between the dynamics of the solo part and their corresponding exercises. One obvious example (Ex. 4.41), appears near the beginning of the first movement:

Ex. 4.41: Allegro non troppo, from Brahms’s Violin Concerto in D major, op.77, ed. O. Ševčík (measures B19-21)

Beginning in forte, the dynamics of this passage simply consist of a gradual diminuendo, arriving in piano by the end. As the exercises for this passage cover many

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349 Braun and Bock, p. 43.
more bars, Ševčík uses terraced dynamics to represent the diminuendo, but the
dynamics of the exercises (Ex. 4.42) can be said to reflect those of the solo part,
similarly beginning in forte and finishing in piano:

Ex. 4.42: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 8

The repetition of these dynamics through the subsequent variations serves to reinforce
the dynamic contour of the solo part. Thus, the dynamics from the original material are
incorporated into the first reading of the exercises. This represents the incorporation of
musical elements (here the dynamics) in the technical analysis of the exercises. Having
engaged extensively with numerous exercises exhibiting a strong dynamical relationship
with the solo part, the effect of this use of dynamics is pronounced. This imbeds a
strong implicit knowledge of the dynamics of the original material that persist when the
mental focus is on technical elements. Recalling the three-phase stage of learning
repertoire outlined in the investigation into expert practice, musical elements such as
dynamics are not traditionally the focus of practice in the first two phases, labeled as
‘getting knowledge of the piece’ and doing the ‘hard work’ in overcoming technical
challenges.\textsuperscript{350}

The benefits of incorporating musical elements into the earliest stages of learning a
work are reinforced when considering findings arising from the neuroscientific
literature. Firstly, the automation of a task, such as the implementation of dynamics,

\textsuperscript{350} Miklaszewski, p. 96.
leads to fewer natural resources being needed for performance of that task.\textsuperscript{351} Thus, the earlier the dynamics of a work are habituated in its learning, the quicker and more efficiently they will be accurately incorporated into performance of the work. Even more significant is the relationship between emotive and cognitive evaluation. That is, emotion precedes cognition, with the former being critical in the execution of physical movements.\textsuperscript{352} As such, this would suggest that emotive and expressive musical elements,\textsuperscript{353} such as the use of dynamics in performance, have a strong effect on the performance of motor skills. Therefore, any practice focused on the performance of motor skills without incorporating musical elements, such as rote practice done in learning the work, is not representative of practicing the performance version of the work. Thus, the incorporation into the exercises of the actual dynamics used in performance has many far-reaching benefits and may represent a more efficient framework for learning repertoire, when compared with the traditional three-stage approach.

Ševčík’s use of dynamics in his op. 18 is not limited to mirroring the markings found in the original material however. Ševčík’s more strategic use of dynamics represents the use of expert problem solving processes such as creative thinking and alternative generation. The first example of this shows how Ševčík uses dynamics to highlight particular parts of a passage, to develop and secure technical aspects. The following passage from the first movement (Ex. 4.43), contains quite detailed use of dynamics:

\textsuperscript{351} Edwards and Hodges, p. 13.
\textsuperscript{352} Kruetz and Lotze, p. 148.
The dynamics in the accompanying exercises (Ex.4.44) clearly contrast this, however, as they serve a technical rather than musical purpose. While the exercises begin with dynamics comparable to the solo part, by the second line discrepancies between the solo part and exercises are clearly visible. The first two bars of this line that alternate between forte and piano are an example of a particular type of dynamic strategy to be discussed later. Of more interest in these exercises is the alternation between piano and forte, with the sequence beginning from the fourth bar of the third line. A clear pattern emerges, with crescendos from piano to forte culminating with a semitone shift backwards on the first finger, before returning to piano to repeat the sequence. In this way, Ševčík uses dynamics to highlight this semitone shift on the first finger each time it occurs. The loud dynamic makes the intonation of the shift very obvious and by securing the intonation of these shifts, the intonation of the larger passage is secured.
Further on in the exercises, the dynamics change slightly. In the third bar of the fifth line, the shift is marked under fortissimo, while the shift in the fourth bar is marked with \textit{a fp}. The reason for the difference in dynamic marking relates to the type of shift. The first shift is done on the same finger, like all the shifts before it, and so maintains the previous pattern. However, in the fourth bar, the shift requires a change of finger; in other words, the finger used after the shift is different to the finger used before the shift. This is the critical distinction that warrants a change in dynamic marking. The execution of \textit{a fp} in the bowing arm requires a marked release of pressure on the string. This same release of pressure is critical to successfully executing this type of shift. Therefore, by marking the shift with a fortepiano, it helps to facilitate the physical processes required for accurate and controlled shifting.

Again, this strategy has a basis in findings arising from neuroscientific research, in relation to the ambidextrous nature of motor learning. As Altenmüller and McPherson claim, ‘the motor cortex of the untrained hand is, at the same time, contributing to motor learning,’ due to the fact that ‘a movement can be learned with one extremity and
performed with the other.'\textsuperscript{354} Considering this, by imitating the physical movements critical to successful shifting, through demanding \textit{fp} of the bowing arm, Ševčík’s exercises actually utilize the sensorimotor cortex of both hands simultaneously to accelerate the motor learning associated with the shifts.

This use of dynamics is not an isolated case, as can be shown by the following passage from the second movement (Ex. 4.45), and the accompanying exercises (Ex. 4.46).

\begin{quote}
\textbf{Ex. 4.45:} Adagio, from Brahms’s Violin Concerto in D major, op.77, ed. O. Ševčík (measures 34-5)
\end{quote}

Similarly to Ex. 4.44, the first shift to the A on the fourth note of this excerpt is done all with one finger, as is the next to the G sharp on the down beat of the next bar. However, the final falling shift between the B octaves requires a change of finger.

\begin{quote}
\textbf{Ex. 4.46:} Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 53
\end{quote}

As seen before, there is a crescendo to the first and second shifts using one finger, while the shift requiring a change of finger is marked with a \textit{sf}. As in \textit{fp}, this dynamic accent requires a release of pressure in the bow arm to execute. However, the dynamic remains loud. This may be due to the loud dynamic marking of the solo part, as well as a way of hearing the large distance required by this shift. Combined with the downwards and upwards versions, the \textit{sf} also highlights the intonation of the Bs in both octaves, again providing the ear with a clear sense of the intonation.

The next example of Ševčík’s strategic use of dynamics (Ex. 4.47) expands on an excerpt from already discussed exercises:

\textsuperscript{354} Altenmüller and Mcpherson, p. 131.
In this instance, Ševčík contrasts major and minor tonalities with extremities in dynamic. Again, such an application of dynamics helps to delineate the difference between the two tonalities in the context of the whole passage. That is to say that the strategic use of dynamics serves to facilitate aural development and strengthen intonation.

Ex. 4.48, taken from the final movement, represents a clearer example of this type of strategic dynamic application:

Here the solo part clearly alternates between major and minor modalities. As can be expected, Ševčík uses dynamics to delineate this difference in tonality in the exercises. These exercises (Ex. 4.49) begin by establishing alternating dynamics within both the major and minor tonalities, before using dynamic contrast to highlight the changing tonality from the second line onwards. With the addition of the C sharps, Ševčík uses accents to delineate the change between major and minor tonalities, again with the function of highlighting the critical information required by the performer. Here, as before, Ševčík codifies the different modalities with different dynamics:
The final example of Ševčík's strategic use of dynamics demonstrates that this can be applied in conjunction with his process of segmentation. The following passage from the solo part (Ex. 4.50) appears near the end of the concerto.

This passage can be considered as an embellished figuration of broken octaves, as is the case in Ševčík’s exercises for the passage (Ex. 4.51). In these exercises, which use a combination of overlapping and segmentation, Ševčík uses accents to focus the attention of the ear to the tuning of each octave. On top of this, each bar has a hairpin towards the top of each segment, and the whole passage has a gradual crescendo from piano to fortissimo. Combined with the use of hairpins, this complex use of dynamic markings, absent in the solo part (which is marked forte throughout), creates a clear hierarchy within each bar in order to help guide the ear of the performer towards accurate intonation. This hierarchy is shaped towards the top octave in each bar (the climax of each hairpin), which is the new technical challenge in each subsequent bar, with the gradual crescendo from the bottom to top ensuring that the most attention is paid towards the top of the passage rather than the bottom. This gradual crescendo may also be included by Ševčík to counteract a common weakness in many players: a tendency to become more tentative in execution as one plays higher up the string. This example truly shows the multi-faceted, strategic use of dynamics in Ševčík’s exercises, utilized as a tool for highlighting particular features within a passage, with the aim of
improving and securing intonation. Such a complex strategic employment of dynamics cannot be found elsewhere in the literature on expert practice.

Ex. 4.51: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 85

The strategic employment of dynamics as described above, is one of the most potent and effective practice strategies contained within Ševčík’s op.18. While analysis serves to identify how and why Ševčík employs dynamics in the exercises, again it is through engaging with the exercises that a full understanding of the effect of this use of dynamics is gained.

Simply speaking, Ševčík uses dynamics throughout the exercises to manipulate the attention of the ear. In this way, not only does the dynamic variation maintain interest and continually engage conscious effort, but highlights critical information for the performer in a way that shows strong parallels with the process of error identification, shown by Duke et al. to be a distinguishing factor of the three highest-ranked pianists in their study.\textsuperscript{355} By highlighting the critical information for the performer, it not only represents the contribution of expert-knowledge to the performer, but it serves to create a framework for the passage it is applied to, upon which a technically secure performance can be reliably built.

While this effect is most easily experienced first hand, it can be understood from an outside perspective. The following excerpt from the practice data, (AV Ex. 4.5), which contains the material from Ex. 44, helps to illustrate this effect. However, one must listen to it from the performer’s perspective, as if one is practicing the passage.

**Repetition**

Ševčík employs repetition extensively throughout his exercises. Although the expert practice literature suggests that repetition on its own does not lead to an increase in

\textsuperscript{355} Duke et al., p. 318.
ability or performance, Ševčík uses repetition as a way of consolidating improvements made through earlier exercises. Thus, when employed in tandem with analytical or strategic methods of practice, repetition can become a useful practice strategy.

This point is easily shown in the examples already discussed, and the presence of a significant amount of repetition in them. The most obvious of these is the example used earlier in the discussion of consolidation, labeled here as Ex. 4.52. While the bowing changes with each variation, the left hand repeats the whole passage exactly the same with each variation. Again, repetition is used in conjunction with the variation of bowing. The position of these exercises, after the analytical saturation of solutions has been worked through, reinforces the idea that in Ševčík’s exercises repetition is a strategy used for consolidation, rather than an end in itself.

Ex. 4.52: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 69

The next example (Ex. 4.53) is taken from the discussion of Ševčík’s use of dynamics. This example combines repetition with both dynamic contrast and bowing variation to consolidate the different tuning between the major and minor versions of the arpeggio in the solo part:
Ex. 4.53: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 74

Further, when utilized in conjunction with heavy segmentation, Ševčík’s use of repetition in Ex. 4.54 creates short, consolidated and overlapping fragments that facilitate technical mastery of a difficult arpeggio from the final movement of Brahms’s Concerto (Ex. 4.55), the effectiveness of which has already been illustrated in AV Ex. 4.4a:

Ex. 4.54: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 65.

Ex. 4.55: Allegro giocoso, ma non troppo vivace, from Brahms’s Violin Concerto in D major, op.77, ed. O. Ševčík (measures B13-4)

Finally, combined with the added rest technique, repetition is used to deconstruct a technically complex and rapid passage from the final movement of Brahms’s Concerto (Ex. 4.56) into fragments that are much easier to execute and evaluate effectively (Ex. 4.57):
Ex. 4.56: Allegro giocoso, ma non troppo vivace, from Brahms’s Violin Concerto in D major, op.77, ed. O. Ševčík (measures A19-26)

Ex. 4.57: Ševčík, J. Brahms: Konzert D-Dur, op. 18, pp. 61-2

It is worth considering one additional example of Ševčík’s use of repetition that exemplifies its use as a means of consolidation. This example (Ex. 4.58) comes from the closing stages of the concerto:

Ex. 4.58: Allegro giocoso, ma non troppo vivace, from Brahms’s Violin Concerto in D major, op.77, ed. O. Ševčík (measures K22-4)
The technical elements of this passage consist of broken double stops in a figured pattern, with shifts occurring every half-bar. Ševčík uses bowing variation in the process of alternative generation for these exercises (Ex. 4.59):

\[Ex. 4.59: \text{Ševčík, J. Brahms: Konzert D-Dur, op. 18, pp. 86-7}\]

However, the use of repetition is the most interesting feature of these exercises. Ševčík alternates between repetitions of the double stops as they appear in the solo part (broken) and in their most basic form. With the bowing variation over the broken version, the repeated unbroken version serves as a type of ostinato throughout the exercises, consolidating the intonation of the double stops, with the tuning being much easier to hear in the unbroken version.

This is reinforced by the addition of dynamics. The figured version is marked piano, while each time the unbroken double stops are marked mezzo forte, again aiding the ear to make tuning as easy as possible. Ševčík also overlaps the segments so that each shift is given equal treatment. From the performer’s perspective, I found this to be an effective strategy, reporting during practice that the double stopping ‘ostinato’ figure consolidates the hand shape required for consistent execution across the whole set of
exercises. This effect can be observed in AV Ex. 4.6, which consists of the practice of the exercises in Ex. 4.59 preceding the verbal report referenced above. During this excerpt, the repeated double stops serve as a foundation with which I fine-tuned the intonation of the exercises. Notable in this example is the speed at which errors are diagnosed and rectified, the effectiveness of which can be attributed to this specialized use of repetition.

In this way, Ševčík creates a methodical, comprehensive treatment of technical challenges using repetition as one aspect of the process. As the literature on expert practice suggests, although repetition alone does not constitute an effective practice method, the use of repetition in conjunction with other practice strategies (bowing variation, rhythmic alteration and segmentation) typifies the process of alternative generation, in which repetition is then contextualized as a strategy indicative of expert practice.

**Coordination Exercises**

This practice strategy is one of Ševčík’s most common for treating double stops. In essence the coordination exercises consist of repeated double stops under a single bow stroke, where the fingers on each string play different rhythms. It first appears as its own set of exercises on page fourteen (Ex. 4.60):

![Ex. 4.60: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 14](image)

The preface to these exercises indicates their function as developing the ‘independence of the fingers.’ Engaging with this type of exercise on many occasions throughout the case study revealed them to excel at their desired effect. The label ‘coordination
exercises’ in fact stems from the high level of coordination required of the fingers just to execute the exercises.

Ševčík’s use of this type of exercise in his op. 18 is inextricably linked with the concept of creating a saturation of solutions, detailed earlier. Typically, Ševčík isolates a sequence of two consecutive double-stops from the original material and treats this as a practice segment, which is then the basis for a set of exercises consisting of almost every possible permutation derivable from that particular sequence. The best example of this is in the following passage from the first movement of Brahms’s Concerto (Ex. 4.61), earlier outlined in discussion of the ‘saturation of solutions’ principle:

Ex. 4.61: Allegro non troppo, from Brahms’s Violin Concerto in D major, op.77, ed. O. Ševčík (measures D12-8)

This time however, the full extent of the permutations Ševčík includes in the exercises (Ex. 4.62), warrant inclusion to illustrate this point:
The effects experienced during practice of this style of exercise were considerable. As intended, these exercises efficiently develop the independence of the fingers, crucial to accurate double-stopping. More significantly, the high level of coordination required to execute this type of exercise consistently is in most cases well in excess of the technical
demands required to perform the original material, resulting in the facilitation of technical mastery. Related to the excess technical requirements inherent to this style of exercise is the effect of providing a saturation of information for tuning the double stops from the original material. By playing all of the different permutations in the exercises, the performer gains a strong grasp of the intervallic relationships of all of the double stops and their tunings, not just the versions that appear in the original material.

Looking once again at Ex. 4.61, the original material used as the basis for the exercises in Ex. 4.62 consists of a series of tenths and sixths. In the exercises however, the performer is required to play not only tenths and sixths, but also thirds and even consecutive fingered octaves. The overall effect when performing the original material after the exercises is that the original material seems comparatively simple. This not only increases performance confidence, but also equips the performer with a highly detailed understanding of the harmonic material underpinning the original material and a highly developed sense of intonation. The following video example (AV Ex. 4.7) demonstrates these effects well. The first part of the example shows the difficulties in initial reading of the first seven bars of the exercises, which are characterized by the frequent stopping due to coordination errors and poor intonation. Then, the accompanying passage from the recital shows the sense of technical ease imparted due to the technical mastery afforded by the exercises, reinforced by the highly accurate intonation in the overall execution of the passage.

As with other practice strategies, Ševčík tailors coordination exercises to the passage of the original material to which it is applied. In the following passage from the last movement (Ex. 4.63), there are elements of the coordination exercises present in the original material, with moving double stops alternating between the A and E strings:

Ex. 4.63: Allegro giocoso, ma non troppo vivace, from Brahms’s Violin Concerto in D major, op.77, ed. O. Ševčík (measures H23-6)
In response, Ševčík mimics this alternating motion in the accompanying exercises, presented here as Ex. 4.64. In this case, the alternating motion between strings is instilled into the performer through the exercises:

Ex. 4.64: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 76

When combined with the coordination challenges in this type of exercise, the technical challenges of the original material seem comparably simple. Far from an isolated example, this tailoring of exercises to the original material is of course the overarching concept at the core of Ševčík’s op.18.

Discussion
The first point worth discussing at this juncture relates to the methodology used to conduct this case study. While the importance of both the conceptual perspective of the literature and the analytical perspective of Ševčík’s work provided much of the context and detail of the investigation, the importance of the practical perspective should not be overlooked. In fact, it is my opinion that the practical perspective was the most critical factor in identifying and elucidating a deeper understanding of the work and its underlying principles and processes. This belief stems from the fact that Ševčík’s op. 18 is itself a practical work, i.e. it was conceived as a work to be played, not analyzed theoretically. As such, any investigation into its effect must therefore be based upon practical engagement with the work. I believe that many of the most interesting and significant findings of this investigation, such as the effect of the practice strategies and the highly systematic structure based on the reduction of technical challenges, their mastery and subsequent consolidation, would not have been as clear had I not engaged with them practically.
These beliefs are well grounded in the qualitative research literature, more specifically in relation to the genre of action research. Dick describes action research as a ‘cyclic’ activity, which ‘alternates between action and critical reflection.’\textsuperscript{358} Crucially, it is the researcher that experiences the change resulting from this activity.\textsuperscript{359} Further, when applied in pedagogical contexts, this type of research involves the application of findings in order to improve future practice.\textsuperscript{360} These factors combined have made this an approach that is highly attractive to educators.\textsuperscript{361}

Ultimately, the suitability of employing this approach to the case study of Ševčík’s op. 18 is easily relatable to findings arising from research regarding expert coaching in sports. Of primary interest in this context is the suggestion that ‘expertise is largely based on experience.’\textsuperscript{362} Thus, in order to create my own exercises utilizing Ševčík’s approach, implicit knowledge and experience, shown by sporting literature to be critical to expert coaching, had to have been acquired.\textsuperscript{363} In this way, the methodology used in this case study served to both gain a deeper understanding of the principles and characteristics of expert practice evident in Ševčík’s op. 18, while also equipping me with the experiential, implicit knowledge required to effectively function as an expert teacher in creating the exercises for Schubert’s work, to be discussed in the next chapter.

Having established the strength of the methodology in this case study, the most pertinent consideration becomes the overall effectiveness of the Ševčík method. With regard to this, there can be little doubt that the exercises contained in Ševčík’s op. 18

\begin{thebibliography}{99}
\bibitem{359} Ibid.
\end{thebibliography}
represent a comprehensive method of expert practice designed to facilitate the technical mastery of Brahms' Violin Concerto in D Major, op.77. Furthermore, this investigation into Ševčík's op. 18 suggests it shows a strong link with the employment of practice strategies and principles indicative of expert practice. Ševčík's op.18 demonstrates a deep and meaningful application of expert practice principles, expanding and developing these to a greater extent than can be found in existing research or publications. Considering that Ševčík's work prefaces much of this research by more than fifty years, this raises the question: why is there no mention of Ševčík's work in the expert practice literature?

This question is even more pressing when one considers the many benefits of using Ševčík's method. Chief among these relates to the learning of new works or skills and challenges it poses our current understanding of the most effective way to learn a new work, such as Wicinski's three stage model. Although this method has been extensively used, it may not, in fact, be the most efficient or effective model. This may be related to the perspective of the practice approach, which is highly personal and individual, with limited scope for external input. This does not accord with the literature regarding expertise acquisition, which clearly identifies the importance of a mentor or teacher in achieving expert performance, especially in the initial stages of learning.

It is in the initial stages of learning a work, or 'getting knowledge' as labeled by Wicinski, that Ševčík's studies provide the greatest benefit to the performer. Interestingly, their use in this initial stage of learning challenges current modus operandi, which are often considered as standard practice amongst teachers across almost all music tuition. Under this existing model, the student initially spends time learning a new work away from their teacher, only presenting it for their teacher once they have achieved a base level of competency. The reason for this may be a general pedagogical attitude that it is a waste of time for a teacher to teach a student a new work before they are able to play through at least smaller sections of the whole work. Thus, the student is left both musically and technically to become familiar with the work, independently and in isolation.

364 Miklaszewski, p. 96.
365 Ericsson et al., p.398.
However, if the prescribed exercises by Ševčík, such as his op.18, may be considered as fulfilling the role of a teacher in this initial stage of learning, the traditional role of the teacher in learning a new work is changed. The teacher's prior expertise and knowledge of the piece (in this case Ševčík) becomes the basis on which the performer then learns the work, rather than the other way around. Having learned the Brahms Violin Concerto using Ševčík's op.18 as part of this case study, it is clear that this approach to learning a new piece has considerable benefits. Instead of the established three-phase preparation of the work for performance, I experienced a more streamlined two-phase period of preparation.

The essence of these benefits can be related back to the first aspect of expert problem solving, the identification of errors. Under Ševčík's model, all potential technical challenges that may cause error and the skills required to meet them are not only considered in Ševčík exercises, but the identification and mastering of these challenges are the fundamental focus of the work. Ševčík's extensive use of alternative generation applied to repertoire represents a preemptive approach to the identification of errors. Further, by including expressive markings from the original work, such as dynamics and articulation, Ševčík effectively combines all three phases of the traditional model into the initial reading of the exercises. Ševčík's exercises simultaneously and immediately familiarize the performer with the musical material of the work being studied, providing a saturation of solutions to any technical challenges before they arise, while also embedding an understanding of the musical elements of the score.

This inclusion of musical aspects into the initial phases of learning a work is highly significant when considering earlier discussion regarding the impact of emotion on learning arising from the neuroscientific literature. In particular, the suggestion that emotion and cognition are synergistic partners strongly indicates that emotional affects (i.e. musical intent) should be included in the earliest stages of learning a work. Having engaged with Ševčík's op. 18 for a considerable period in the initial phase of learning the Brahms Concerto for performance, my experience of the exercises closely matches these findings. More specifically, I experienced a rapid familiarization with this technically complex work, in a manner that was different to the process I normally would have used. In the three-stage practice model, I would usually have focused on technical aspects first, trying to impart musical intent after I felt comfortable with the

366 Kreutz and Lotze, p. 148.
technical challenges. This approach is based on the commonly held belief that ‘art begins where technique ends.’

Conversely, using the Ševčík approach, the technical execution was born from musical intent, as musical elements were present in the practice throughout the first stage of learning. Rather than feeling that musical expression changed technical execution in performance, one served to strengthen the other and the two could not be separated. This was followed by a second stage that included finalizing bowings and fingerings and the continual refinement of the final interpretation for performance. Thus in Ševčík’s approach, the interpretive focus of the final phase of learning a work under the traditional three-phase model is instead incorporated into the initial familiarization with the work, as well as during the period spent mastering technical challenges.

The notion of focus or attention during practice is not a new idea, but Ševčík’s strategic manipulation of the performer’s focus during practice is of further interest. It has been my experience that engaging with Ševčík’s exercises has had a strong, lasting impact on my own practice habits, in particular to the way in which I focus attention during practice. Earlier discussion of practice strategies, such as bowing variation and coordination exercises, revealed how particular exercises could focus the attention in unexpected and unusual ways. For instance, the bowing variations were particularly good at shifting my focus away from the left hand and towards the right arm, with the resultant effect of triggering subconscious execution in the left hand. Further, the saturation of solutions afforded by applying coordination exercises to double-stopping passages resulted in the sense of a comparably simple execution of the associated original material.

The result of this approach is that the attention during performance was largely free from technical concerns, and this created a strong sense of general awareness in performance, allowing for more expressive freedom and a sense of connection with the conductor and orchestra. Experiencing this process has led me to become more aware of my attentional focus during practice, with the strategic manipulation of attention becoming a particular goal of my own practice. This increased awareness is of particular significance when considering the discussion of quartet-specific challenges, such as non-verbal communication and group technique (intonation, rhythm etc.). These challenges, characterized by multifocal demands on individual awareness, require the
vast majority of a player’s attention in any given moment. Thus, the heightened awareness afforded by subconscious technical execution arising from a process that includes manipulation of focus during practice could be a powerful tool enabling expert performance in chamber musicians.

Paradoxically, it is the source of the greatest strength in Ševčík’s approach to learning a new work that is also its greatest weakness. Whilst the exercises are highly effective at solving technical challenges inherent in the work, they are designed around Ševčík’s own fingerings and bowings. As such, any changes made to Ševčík’s fingerings or bowings to be used in the final performance can limit the usefulness of the exercises. This being said, the significance of this drawback is small and much of the time the exercises can simply be played with the different fingerings and bowings to achieve the same effect. The deployment of alternate fingerings in some of the exercises and multiple bowing variations, already discussed, attest to this.

A nother limitation of the exercises relates to the notion of assumed knowledge. In this context, assumed knowledge refers to knowledge and skills required to perform the work being studied that are not addressed by the exercises. It is my opinion that the amount of assumed knowledge is significant, but can be accounted for. In the investigation into Ševčík’s op.18, the nature of the assumed knowledge remains constant throughout. Whilst the left hand challenges are systematically addressed, the articulation and bow strokes are often bypassed. There are exercises that help to develop certain strokes or facilitate difficulties such as string crossings, and Ševčík does make a point of marking in the exercises the articulation and where in the bow they should be played. But there is little or no targeted use of the many practice techniques he otherwise applies to left hand challenges. As a result, after completing the investigation into the exercises, the left hand technique required to perform the concerto seemed more secure on the whole than that of the right hand.

It is my opinion that the primary reason for the left-hand focus of Ševčík’s op. 18 lies within the work of Brahms itself. Generally speaking, the difficulties encompassed within Brahms’s work can be characterized as predominantly concerned with left hand technical ability. Whilst sustaining long obligato phrasing is undoubtedly a primary requirement for an emotionally powerful performance of the concerto, the work does not contain some of the more advanced bowing techniques that can be found in the rest
of the violin repertory. Thus, according to the targeted approach used by Ševčík as discussed earlier in this chapter, the stress on left-hand technique inherent to the concerto is equally expressed in Ševčík’s exercises. This view is informed by considering some of Ševčík’s other analytical exercises, written for Bazzini’s La Ronde des Lutins op. 25. This well-known showpiece features ricochet bowing, an advanced bowing technique that is entirely absent from Brahms’s concerto. As detailed by Christian, Ševčík’s exercises dealing with Bazzini’s work resultantly deal specifically at length with developing and refining this bow stroke. Despite the level of assumed knowledge perceived in Ševčík’s op. 18, my experience of extensively engaging with the exercises suggests that the targeted, specific nature of the exercises not only helps to solve any technical challenges but also serves to efficiently equip the performer with a foundation of initial knowledge of Brahms’s concerto.

When considering all these factors, the efficacy of Ševčík’s op. 18 in preparing Brahms’s violin concerto for performance in the case study for this research is substantial. Ševčík’s preemptive approach to solving technical challenges, combined with the myriad of practice strategies and purposeful sequencing of the exercises, results in a demonstration of expert problem solving that goes beyond discussion of this in expert practice research literature, and which challenges assumptions regarding the role of the teacher in learning a new work. This unparalleled display of expert problem-solving strategies, approaching one hundred years of age, is even more significant when compared with the much more recent neuroscientific literature. The strong correlation between findings arising out of this body of research and Ševčík’s exercises suggests that he had an understanding of neuroscientific principles far ahead of his time. Whilst there are limitations in Ševčík’s work, such as a rigid approach to fingerings and bowings, solutions to these can easily be developed and applied in practice, using the techniques identified from engaging and analyzing Ševčík’s exercises.

In fact the methodology and strategies underpinning Ševčík’s op. 18 that have emerged from this analysis reveals why Ševčík chose to use this preemptive approach to a selection of other advanced solo repertoire for violin, which is the apparent universality of the approach. The fact that the exercises are directly tailored towards the repertoire they are applied to means that the approach is relevant to potentially every work in the repertoire of the violin. However, while Ševčík limited his own application of his method to solo violin repertoire, its potency and universality not only makes it relevant
to the performance of chamber music repertoire (as is the aim of this study), but indeed to any repertoire on any instrument, with appropriate adjustments. The most significant potential of this approach however, occurs when the individual stops reading exercises on the page and begins to apply the aforementioned principles in conjunction with diagnostic skills and imagination. This closely reflects the findings of research on expert practice, which suggest that using candidate solutions, or solutions tailored to the individual by the individual, is one of the highest forms of expert problem-solving.367 Further, a recent study posited that the most effective practice in musicians not only utilizes practice strategies, but employs diagnostic skills in how and when to apply these strategies.368

In this way, the true potential for any prescribed practice method written for targeted repertoire as an effective teaching tool, such as Ševčík’s op.18, is not reliant upon its ability to solve each and every technical challenge inherent in the work upon which it is based. Instead, its success is ultimately determined by its ability to help the performer diagnose challenges specific to both the individual and the piece and then solve them through the application of candidate solutions. This does not however render the use of preemptive problem solving through prescribed exercises redundant. It merely shifts their function towards providing the performer with a meaningful set of examples as a departure point from which they can create their own candidate solutions.

Having explored the nature of expert practice in Ševčík’s op. 18 and its practical application to the preparation and performance of the Brahms Violin Concerto, the ultimate phase of the research, the creation of a new set of exercises based on the first violin part of Schubert’s String Quartet No. 15 in G, op. post. 161, will be analyzed. This analysis will explore the suitability of Ševčík’s approach as a model for the creation of these exercises, and their ability to address critical aspects of the role of the individual performer in expert chamber-music performance that have been inadequately treated in the literature on chamber music performance.

367 Smith, p. 367.
Chapter 5: The Application of Ševčík’s Method to the First Violin Part of Schubert’s Op. 161

Having identified and discussed both the lacuna in individual chamber music training and existing characteristics and models for expertise acquisition, the research question central to this research can now be addressed:

Does the prescribed model employed by Ševčík effectively help to bridge the lacuna in individual skill training required for expert-level string quartet performance when applied to individual parts of the string quartet repertoire?

In order to answer this question effectively, the larger approach taken in this study must be detailed. As mentioned in the opening chapter, an emphasis on action research has been chosen as the overarching approach to this study. This is in a large part due to earlier discussion of expertise acquisition research that strongly suggests that it is the combination of specific experiential knowledge combined with broad knowledge bases that ultimately defines experts in their respective fields. Thus, before Ševčík’s model can be applied, specific knowledge of Schubert’s quartet had to be attained. This knowledge base was acquired through the second recital of this study, concerned with the rehearsal and performance of Schubert’s quartet.

While initial work on creating the exercises had begun prior to the recital, the bulk of the final markings in the exercises can be said to be a direct result of knowledge gained from performing the quartet. Further, the refining of the exercises was also informed by the smale-scale testing which is discussed later in this chapter. Due to limitations, my own exercises created as a result of this study cannot be analyzed in the same amount of detail as that used in the analysis of Ševčík’s exercises, nor would such an approach be as fruitful in this researcher’s opinion. Instead, this chapter will endeavor to answer the research question, first by elucidating links between Ševčík’s model and the exercises for Schubert’s quartet, secondly by demonstrating how the exercises have been specifically tailored to address the challenges identified as crucial to expert chamber music performance (including discussion of small-scale testing), and finally by discussing the results of the approach.
To demonstrate the links between Ševčík’s model and the exercises created in this study, the most useful place to start is by looking for direct violinistic links between the two pieces used as case studies for this research: Brahms’s Violin Concerto and Schubert’s String Quartet No.15. Happily, such links exist. In fact, there is at least one instance where exercises written by Ševčík for Brahms’s work can be directly applied to the first violin part of Schubert’s work.

The following excerpt (Ex. 5.1), appears in the last movement of Brahms’s concerto, and the rapid shifting and extensions that it contains characterize its difficulties in performance:

Ex. 5.1: Allegro giocoso, ma non troppo vivace, from Brahms’s Violin Concerto in D major, op.77, ed. O. Ševčík (measure D10)

Ševčík treats this bar with the following exercises (Ex. 5.2):
Ex. 5.2: Ševčík, J. Brahms: Konzert D-Dur, op. 18, p. 68

Ex. 5.3, from the final movement of Schubert’s quartet, contains the same ascending arpeggio from Ex. 5.2 but with a different bowing:

Ex. 5.3: Allegro assai, from Schubert’s String Quartet No. 15 in G Major, D887 - op. post. 161 (measure 126)

Contrasting Ex. 5.2, which contains ascending and descending arpeggios, the Schubert passage contains only ascending arpeggios. Along with the technical difficulties associated with the Brahms passage, there is also a considerable additional challenge, a rapid downward shift occurring between each arpeggio. From this, the exercises in Ex. 5.4 have been extracted from the eighth bar of Ex. 5.2, and applied directly to the Schubert:
Let us now recall the principles underpinning the construction of Ševčík’s op. 18 exercises: the isolation and reduction of technical challenges combined with extensive use of segmentation; an incremental increase of challenge requirements; a saturation of solutions (alternative generation); and, finally, consolidation. These principles underpin the following exercises created for this bar from the first movement of Schubert’s quartet, here labeled as Ex. 5.5:

Ex. 5.5: Allegro assai, from Schubert’s String Quartet No. 15 in G Major, D887 - op. post. 161 (measure 125)

The exercises begin by isolating the technical challenges, i.e. the shifts and the extensions. The extensions are treated first (Ex. 5.6a) by finding the extended hand shapes, and then holding them silently without using the bow for ten to twenty seconds:

Ex. 5.6a: Lucas O’Brien, Exercises for the 1st Violin Part of Schubert’s String Quartet No. 15 in G Major, D887 - op. post. 161, p. 34

Then the shift is practiced in a slower speed than the extensions (Ex. 5.6b). Placed alongside Ševčík’s treatment of similar material (Ex. 5.6c), the similarities are demonstrably strong:
Following this, the use of alternative generation provides a saturation of solutions that allow for practising the extensions in different combinations (Ex. 5.6d), with the final version incorporating the shift and the extension together. Again, strong parallels can be drawn with Ševčík’s exercises (Ex. 5.6e), taken from Ex. 5.2:

Finally, both ascending and descending versions are played in a slower tempo, consolidating the segment (Ex. 5.6f):
Ex. 5.6f: Lucas O’Brien, Exercises for the 1st Violin Part of Schubert’s String Quartet No. 15 in G Major, D887- op. post. 161, p. 34

To finish the sequence, the rapid shift downwards that separates each arpeggio in the Schubert passage is practised from the bottom up and then back again (Ex. 5.6g), further utilizing the principles seen in Ševčík’s Op. 18 of isolation, reduction of technical challenges and alternative generation:

Ex. 5.6g: Lucas O’Brien, Exercises for the 1st Violin Part of Schubert’s String Quartet No. 15 in G Major, D887- op. post. 161, p. 34

The same approach is then applied to the other arpeggios constituting the passage from Schubert’s quartet (Ex 5.7). In this set of exercises, the most difficult version of this ascending arpeggio found in Schubert’s quartet is treated with a large number of technical exercises, which represents a high degree of segmentation and a saturation of solutions (beginning in measure 57 of Ex. 5.7). This is consistent with Ševčík’s approach in addressing the challenges of bars D1-10 in the final movement of Brahms’s concerto, in which the final bar (D10) is treated using almost as many exercises as the nine bars preceding it (D1-9).³⁶⁹

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³⁶⁹ Ševčík, p. 68.
Ex. 5.7: Lucas O’Brien, Exercises for the 1st Violin Part of Schubert’s String Quartet No. 15 in G Major, D887- op. post. 161, pp. 34-36

Maintain Hand Frame

*) Hold the notes simultaneously in the left hand without using the bow arm, for around 10-20 seconds.

**) Practice with and without pivot-shifting to inform personal preference.
It is important also to note that it is not only the general structure of the Schubert exercises that is built upon the principles of Ševčík’s op. 18. Crucially, the practice strategies used to master the technical challenges are those identified in the case study of Ševčík’s work. For example, the Ševčík examples above utilize heavy rhythmic alteration, as well extensive use of anchoring to improve the shifting and extensions that characterize the passage. Accordingly, the exercises in Ex. 5.7 also utilize rhythmic alteration combined with extensive use of anchoring to master the same technical challenges. This mirroring of structure, principles and practice strategies as used by Ševčík’s in his op.18, is not an isolated occurrence, but instead can be said to permeate my own method.

Having demonstrated the links between Ševčík’s model and the Schubert exercises, the next step towards addressing the research question is to focus on examples which represent a departure from Ševčík’s own approach, and which are focused specifically towards developing individual skills deemed as crucial for expert performance of Schubert’s quartet. This pertains to the inclusion of exercises for bowing techniques, an area largely missing from Ševčík’s op. 18. Although exercises explicitly developing right arm technique are not featured extensively in Ševčík’s op.18, the same principles used by Ševčík elsewhere (such as those detailed in Christian’s study), guide the construction of bowing-focussed exercises created in this research.

The following set of exercises deals with a particular stroke that is required in the Scherzo movement of Schubert’s quartet, contained in the following excerpt (Ex. 5.8). The focus in this instance is not on the repeated quavers of the first bar, but rather the crotchets in the second bar. Executed in my recital with a down-up-up bowing pattern, this figure appears all over the movement:

Ex. 5.8: Scherzo, from Schubert’s String Quartet No. 15 in G Major, D887 - op. post. 161 (measures 3-4)

![Ex. 5.8: Scherzo, from Schubert’s String Quartet No. 15 in G Major, D887 - op. post. 161 (measures 3-4)](image)

The interpretation by my group in performance was to keep them on the string in order to increase control between these crotchets and the rapid quavers without staccato
markings. Keeping the crotchets on the string in this manner, however, increases the difficulty in executing them with a crisp clear articulation, and it is this technical challenge that the exercises are focused on improving in Ex. 5.9:
To completely isolate this challenge, these crotchet segments were extracted and collected together, so that they could be treated as a single set of exercises with one focus. Additionally, to further reduce the challenge for the performer, the bowing
patterns of the exercises are practised without use of the left hand, in that only open strings are played. Further, rhythmic alteration, a common strategy used by Ševčík, is utilized to focus the attention of the performer to each of the three notes that make up each fragment, at different times. By preceding each of the accents with a longer note value, it allows the performer time to plan ahead and execute each accent in a mindful, controlled manner.

To understand the reasoning behind the decisions made during the construction of these exercises on a deeper level, it is worth further discussing the difficulty associated with the articulation. Ultimately, it is not just the speed, but also the marked dynamics, that makes this stroke difficult in performance. Throughout the movement, this stroke is never played above a piano dynamic level. Keeping the clarity of the articulation in combination with the rapid tempo and sudden dynamic changes makes consistent execution of the stroke difficult. If we consider the crux of the challenge to be a combination of soft and fast articulation, using very little bow, then we can apply the method of construction used by Ševčík in treating such technical challenges: that is, to segment the challenge and begin with it in its most reduced or simple form, and to gradually increase the challenges associated with the exercises.

To achieve this, instead of fast and soft, as written in the Schubert score, the exercises begin slow and loud. Each fragment using the stroke is played with entire upper half of the bow, which makes the player engage the same muscle groups as the stroke requires in performance, albeit in a much more physically vigorous manner. The performer must then repeat the exercises so that a total of six versions are played, with each subsequent version using less bow and a softer dynamic. As marked in Ex. 8, the 6th and ultimate version of the exercises will thus be done in pianissimo. In this way, the challenge associated with the performance version of the bow stroke can be systematically developed and mastered by the performer by incrementally increasing the challenge associated with practising the exercises. This mirrors the methodology of Ševčík, who masterfully controls the challenge requirements throughout his op. 18.

Also worth noting is that there are bars that are exempt from the dynamic change, as highlighted in Ex. 5.10a&b, which serve an important function:
Ex. 5.10a: Lucas O’Brien, Exercises for the 1st Violin Part of Schubert’s String Quartet No. 15 in G Major, D887- op. post. 161, p. 26

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Detached

(fff - - - - - - - - - - - - - - - - - -)
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Ex. 5.10b: Lucas O’Brien, Exercises for the 1st Violin Part of Schubert’s String Quartet No. 15 in G Major, D887- op. post. 161, p. 26

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787 Tallone

(fff - - - - - - - - - - - - - - - - - -)
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As mentioned earlier, rapid dynamic changes impose one of the bowing difficulties of the movement. In Ex. 5.11, the performer must play rapid fortississimo quavers with almost no transitional break for the piano staccato crotchet stroke that follows:

Ex. 5.11: Scherzo, from Schubert’s String Quartet No. 15 in G Major, D887 - op. post. 161 (measures 41-45)

As such, this challenge has been included in the exercises. While this challenge does not exist in the first reading of the exercises that are played fortissimo, each subsequent version in which the overall dynamic level is reduced results in a larger dynamic difference between the fortissimo bars as shown in Ex. 5.10a&b and the bars that surround them. This is another example of incremental increase in challenge requirements, modelled on Ševčík’s op.18, which is incorporated into these exercises. By varying the tempo during practise, the performer is able to utilize a further variable with which to increase or decrease the challenge associated with playing the exercises.

The next exercises to be discussed provide another example of how the principles underlying Ševčík’s op.18 can be applied to right arm technique. The excerpt of Schubert’s quartet on which they are based, shown here as Ex. 5.12, is from the first movement of Schubert’s quartet:
The technical difficulty of this passage stems from the coordination, speed and control required to execute the passage accurately. Texturally, the passage is quite exposed for the first violin, as the other voices play a much simpler homophonic line in a much lower register. Despite this, the passage shown in Ex. 5.12 is ultimately a secondary voice. As such, the passage requires a high level of clarity with secondary voicing (in this case a very soft pianissimo dynamic) which must be sustained for an extended period of time. This combination of challenges typifies the multidimensional difficulties contained within advanced string quartet repertoire for violinists. Aside from these bowing challenges, the sporadic and wide-ranging nature of the passage adds a considerable amount of left hand complexity.

The left hand complexity in this passage is treated with its own set of exercises beginning in bar sixty-seven, but we will now focus on the exercises designed to teach the bow stroke, shown here as Ex. 5.13:
The first challenge addressed in these exercises is coordination. As with Ševčík’s exercises, the initial principle to be applied in Ex. 5.13 is the isolation and reduction of technical challenges. The essence of the challenge is the speed of the stroke and the alternating bowing direction of each note. As such, the exercises begin with long bows, which teach the direction of bow used for each note (i.e. the first ‘A’ is played up, the second down etc.). In the final triplet version of the stroke, this seemingly obvious information is critical to even and measured strokes in performance, and matches the directions when playing a single note. This approach has strong parallels with Ševčík’s intervallic technique, but instead of reducing the original material into a series of repeated intervals to treat intonation, the bowing stroke is here reduced to its most basic form to improve coordination.

After addressing the difficulties associated with directional coordination, the subsequent exercises (Ex. 5.14), endeavour to efficiently increase the speed and consistency at which the triplet stroke can be performed:
Ex. 5.14: Lucas O’Brien, Exercises for the 1st Violin Part of Schubert’s String Quartet No. 15 in G Major, D887- op. post. 161, p. 7

For bowing coordination

In these exercises, multiple practice strategies are employed that are derived from Ševčík, including rhythmic alteration, alternative generation, strategic use of accents and a saturation of solutions. However, while these strategies are applied largely to facilitate left hand mastery in Ševčík’s exercises, here they are combined in new ways, and with a different structure (these are not the ultimate exercises associated with this passage), in order to facilitate the mastery of the bow stroke.

Once the challenges associated with the stroke have been isolated and addressed, the final exercises (Ex. 5.15) consolidate the gains made from their predecessors. This is in essence the same process framework used by Ševčík, but the techniques used to achieve this represent an application of Ševčík’s approach not found in his op.18:
Ex. 5.15: Lucas O’Brien, Exercises for the 1st Violin Part of Schubert’s String Quartet No. 15 in G Major, D887- op. post. 161, p. 8

For string crossing

While marked as being ‘for [the] string crossing,’ these exercises also serve to consolidate the bow stroke itself. Recalling discussion of consolidation in Ševčík’s op.18, one of the most critical processes that Ševčík’s exercises target is the player’s ability to effectively evaluate the current performance level of the technical challenges associated with the exercises. As such, the exercises in Ex. 5.15 isolate the bowing arm from the left hand in order to improve the performer’s ability to evaluate the quality of the bow stroke in the context of the passage. Thus, the pattern of the different strings in these exercises matches the pattern required for the performance of the passage. When the exercises in Ex. 5.13-15 are considered together as a larger set, the result is a method of construction closely modelled on Ševčík’s that utilizes many of the same practice strategies.
Another example of exercises focused on improving bow strokes critical to expert chamber music performance pertain to the \textit{fzp}> motif that appears throughout the second movement of Schubert’s quartet (Ex. 5.16):

Ex. 5.16: \textit{Andante un poco mosso}, from Schubert’s String Quartet No. 15 in G Major, D887 – op. post. 161 (measures 1-2)

Performance of the quartet revealed the group execution of the \textit{fzp}> gesture to be one of the most pressing musical challenges of the movement. In the context of this discussion, this small excerpt, along with its associated exercises, serves to highlight a philosophical decision underpinning the method as a whole. Recalling earlier discussion of the literature on expert practice, particularly when considering findings arising out of neuroscientific research, suggests that prescribed methods are not universally applicable.\textsuperscript{370} Further, the chamber music literature indicates that unique individual technical skills must be acquired in order to develop string quartet technique.\textsuperscript{371} Consequently, a conscious effort was made in the creation of these exercises to avoid teaching a specific interpretation of a passage. Instead, the principle goal of the exercises is to teach a variety of approaches through fostering flexibility of technique, in order to enable each individual to adapt the stroke in performance to their own particular taste and interpretation.

This flexibility of technique is particularly valuable when considering the string quartet genre, as it not only addresses unique individual technical skills crucial to expert performance of string quartets, but also further prepares the performer to be able to adapt to group decisions in relation to performance of particular strokes. In this way, the potential limitations of a prescribed method are instead transformed into a vehicle for promoting the development of individually tailored candidate solutions, which as we have seen, represents the highest form of expert practice.

The following exercises (Ex. 5.17) utilize the classic ‘son filé’ style of exercise found in many violin treatises and books, including Baillot’s \textit{L’Art du Violon}, Galamian’s

\textsuperscript{370} Braun and Bock, p. 47.
\textsuperscript{371} Blanche, p. 12.
Principles of Violin Playing and Teaching and Flesch’s The Art of Violin Playing. Translated as the ‘spun tone,’ this style of exercise is widely regarded as one of the oldest and most useful for the study of tone production and bow control. Slightly adapted in this context, the exercises illustrate the flexibility of approach aimed at promoting individual experimentation and the use of candidate solutions:

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Galamian, p. 103.
Ex. 5.17: Lucas O’Brien, Exercises for the 1st Violin Part of Schubert’s String Quartet No. 15 in G Major, D887- op. post. 161, p. 21

This set of exercises is aimed at developing the "fpz>" stroke that appears throughout the movement. In performance, the articulation should not have a hard syllable, but should utilize as much weight as possible to achieve a deep and rich timbre. For advanced development of the stroke, the hairpins can be treated as a controlled variable. The variables involved in tone production (bow speed, sounding point, weight and amount of hair used) then become the focus of the hairpins. For example, one play through might vary the sounding point during the hairpins, while the next play through experiments with different bow speeds during the hairpins.

Once again, the construction of these exercises follows the principles used by Ševčík. The area to be scrutinized (the fpz> stroke) is first isolated and then simplified, and the technical challenge requirements are incrementally increased. This is achieved by...
gradually increasing the speed at which dynamic changes are made with the bow. The difficulty in performing the *fzp>* stroke is characterized by a sudden change in dynamic volume from piano to forte, followed by a gradual decrease in volume back to piano, all to be performed in a single bow stroke. This requires an advanced level of control of the essential components of tone production, the weight, speed, sounding point and amount of hair used. The exercises begin by establishing the two dynamic extremes, forte and piano, in a subito manner. Following this, the rate of dynamic change is varied throughout the exercises. While this rate of change begins with a whole bar in the third measure of Ex. 5.17, the subsequent exercises accelerate the rate of change, first uniformly (the increase and decrease in dynamic level are performed at the same speed), and later irregularly (the rate of increase and decrease in dynamic level are varied within each bow), as is required in eventual performance.

Further, the inclusion of inverted hairpins and variation regarding where the hairpins peak during the bar incorporates challenges into the exercises that are in excess of the performance version of the stroke. As such, they are further evidence of the use of alternative generation and a saturation of solutions. Of further interest in these exercises are the directions preceding them; more specifically, they introduce the idea that the hairpins in the exercises should be treated as a controlled variable. Thus, instead of increasing the dynamic in a general sense, the variables in tone production (weight, bow speed, sounding point and amount of hair) should each be used as a controlled variable in performing these hairpin exercises. Thus, the exercises do not promote a single method for executing the stroke, but instead awaken an advanced awareness of the numerous possible variations in performing the stroke so that each individual can tailor the stroke according to their own convictions. Thus the exercises equip the performer with an individual flexibility and control of technique that can facilitate a more homogenized group performance of the *fzp>* gesture.

This technical flexibility is also central to the exercises in Ex. 5.18, concerned with development of the syncopated bow stroke found throughout the final movement. The exercises begin with a direction as to the type of shape the stroke should be given, which, through experimentation and experience, was found to be optimal in preparing the work for performance. After refining the stroke on each string, and in turn with string crossings in both directions, a further set of exercises instructs the performer to practise the stroke with a multitude of different combinations of weight, bow speed,
volume and placement in the bow. As well as serving as another clear example of the aim of developing technical flexibility within the exercises, this was also motivated by the fact that almost all of the different combinations of this figure are required in performance of the movement:
Each stroke should contain a "see saw" motion, beginning with very little bow pressure at the top of the string, increasing in pressure towards the middle of the bow, and finishing with a slight lift of the bow. The bow is then placed back on the string before the next stroke.

*) This set of exercises should be practiced in different parts of the bow using a variety of different bow speed, dynamic and weight combinations so that the stroke can be executed in a multitude of different ways.
The stroke is then contextualized by applying the stroke (still without left hand) to two of the main thematic fragments that utilize the stroke in the first violin part of the Schubert Quartet, shown here as Ex. 5.19a & b. This also serves to consolidate work done on the stroke and helps the performer to assess whether they have developed the stroke enough to use it successfully in context:

Ex. 5.19a: Allegro assai, from Schubert’s String Quartet No. 15 in G Major, D887 - op. post. 161 (measures 1-3)

Ex. 5.19b: Allegro assai, from Schubert’s String Quartet No. 15 in G Major, D887 - op. post. 161 (measures 25-8)

The final set of exercises analysed illustrate how elements of group technique can be incorporated into the exercises. In this case, the musical goal in the recital performance was to create a gently rocking rhythmic lilt throughout the trio. In order to achieve this, a deeper understanding of the rhythm of the accompanying parts was required. Before investigating the exercises, we must first consider Ex. 5.20, an excerpt of the trio taken from the score:

Ex. 5.20: Trio, from Schubert’s String Quartet No. 15 in G Major, D887 - op. post. 161 (measures 1-8)
Throughout the trio, the melody, the off-beat accents and the top of the arpeggiated figure combine to establish a rhythmic ostinato which persists throughout:

\[ \frac{3}{4} \]

When rewritten under a compound time signature, this gives the ostinato a new implied emphasis on the second dotted crotchet beat of the bar, giving the musical effect of a gently rocking lilt, which was the goal stylistically for my group in performance.

\[ \frac{6}{8} \]

Restructuring the rhythm in this way gains credibility when considering that the tempo of the dotted crotchet beats of the Trio are usually slightly under that of the tempo of the Scherzo. However, to imbue the melody with this feel can be confusing considering the simple triple time signature used for the trio. To address this, a set of exercises was created (Ex. 5.21):
Ex. 5.21: Lucas O’Brien, Exercises for the 1st Violin Part of Schubert’s String Quartet No. 15 in G Major, D887- op. post. 161, p. 32

The following exercises are to teach the underlying rhythmic movement of the trio. These exercises should be alternated with the section as it appears originally, in order to highlight the rhythmic differences.

In the exercises (notated, like the score, with a simple triple meter), the ostinato is bowed out in every bar using a slight variation of Ševčík’s rhythm bowing technique. Whilst Ševčík uses this technique to delineate certain rhythms through subdivision, with the goal of improving rhythmic integrity and double-stopping intonation, here the
Technique is applied to imbue the underlying rhythm of the accompanying parts in the performer. Thus when the performer rehearses the passage with the quartet for the first time, they will not be put off by the rhythm of the surrounding parts, but will instead be immediately familiar with it.

The bowings in Ex. 5.21 are a result of incorporating this ostinato into the bowing while endeavouring to keep the bowing direction as close to performance as possible, allowing the performer to practice the ostinato whilst trying to maintain the expression and phrasing used for performance. The phrasing and expression are incorporated into the exercises by using the same dynamic and expressive markings as the original passage, in accord with Ševčík’s approach. Thus, all of the articulations and dynamics that appear in Ex. 5.21 are directly taken from the score. It is also worth mentioning that the lack of fingerings in these exercises was a conscious decision made in order to avoid an overly prescriptive approach, a point that is elucidated further in the discussion.

**Small-Scale Testing:**
As part of the creative process for writing exercises for the first violin part of Schubert’s work, small scale testing was done with two undergraduate students. The main purpose of this testing was to ascertain whether the findings distilled from the case study of Ševčík’s op. 18, namely the principles and strategies indicative of expert practice, were effective when applied in a different context performed by different people. While the scope of this research limited the scale of the testing, there are findings arising that bear relevance to the wider discussion of the effectiveness of the approach.

The testing consisted of two female participants, with a mean age of 18.5 and 1.5 years of tertiary level experience playing in string quartets (with approximately two years each worth of secondary school experience in addition to this). They were each assigned different passages taken from the first violin part of Schubert’s quartet and instructed to practise the excerpt only after practising the accompanying exercises I created, as in Ševčík’s instructions for his op. 18. After two weeks, during which one participant spent approximately three hours and the other spent approximately seven hours practising their respective exercises, a workshop was held, during which they played their individual passages with a string quartet (the same musicians with whom I later performed the work). The workshop was recorded using the same equipment as was
used in the collection of practise data. The participants were then interviewed in order to assess whether they had found the exercises to be effective, and to gain feedback about how to improve the exercises as the creative process continued.

The most significant finding arising from this small-scale testing was that the participants were not used to such a high level of segmentation in their own practice, with one remarking ‘I wouldn’t normally break [my practice] up this much.’ This being said, both participants saw the benefits of the degree of segmentation present in the exercises, acknowledging that they should incorporate this into their own practice. Further, both mentioned that they did not usually practise shifting in as much detail as in the exercises they were given. In addition, one of the participants found the inclusion of musical markings to be particularly helpful, responding that ‘it was good that you incorporated some of the accents and dynamics, [because] then I just didn’t have to think about it when I came to play it.’ All of these findings indicate that the normal practice habits of the participants did not reflect the level of detailed work and use of high-level problem-solving skills indicative of expert practice demanded in the exercises. This point was acknowledged by both participants while being interviewed, with one participant saying that ‘I probably need to do more fine-tuning in my practice and [the exercises] give you a clear system on how to do it so it worked really well for me.’

Interestingly, although the degree of detail in the exercises exceeded that of the participants’ normal practice, they were still able to link each set of exercises with its associated excerpt from the musical score with relative ease. This ability to associate the exercises with the source material also directly affected the participants’ evaluation of the usefulness of the method in general. For instance, one participant indicated that ‘with the string crossing exercise, at first I didn’t realize what it was for, but once I realized that it was used for the different fingering and that it applied to the first exercise, I used it more extensively and realized that it kind of made my coordination better because it got the string crossing really well.’ The other participant had a similar experience, indicating that ‘it took me a good go through the excerpt to realize what each was doing but then it was really obvious after I went back to the exercises.’

The one criticism of the exercises, which both participants voiced, related to questions about the performance tempo. Both participants indicated that they did not have a clear
understanding of what the performance tempi of their respective passages were after practicing the exercises. However, this criticism is most likely due to the fact that the participants were only provided with their respective excerpts and accompanying exercises, and as such did not have tempi marked on any of the material provided. Under normal circumstances, the tempo would be indicated on the source repertoire being analysed, at the beginning of each movement. As the researcher I accept responsibility for this omission, which would be easy to correct should any future testing be carried out.

Despite this, the issue of tempo selection is worth briefly discussing. In Ševčík’s exercises, there are very few tempo markings. In fact, he only gives tempo indications for the first set of intervallic and analytical exercises. It is unclear whether these tempi apply to the remainder of the exercises, but in my opinion, having engaged with them extensively, this is not his intention. Instead, I believe the tempo used should be dictated by the performer’s ability to play the exercises. This opinion is the result of having engaged with the work, where my first reading of each set of exercises was generally slow, with the tempo steadily increasing as I became more proficient with the exercises and the repertoire. This is in accord with Ševčík’s own view that ‘it lies entirely with the pupil to treat each section according to its grade of difficulty resulting from it.’ Thus, tempo selection functions as an important tool with which to manage effectively the level of challenge associated with practising the exercises. Further, leaving the tempo selection up to the individual further prompts them to tailor the exercises to their own needs, representing the incorporation of candidate solutions. Because of these considerations, I made a conscious decision not to include tempo markings in my own exercises.

When considering the wider thrust of this research, the applicability of the Ševčík model to individual parts of the string quartet repertoire, these limited results are mainly positive. Both subjects were asked if the exercises allowed them to focus more on group aspects when rehearsing the excerpt in context. The first participant responded that ‘I think it just helped me with the attention to detail because [if] I didn’t do any score study I wouldn’t have known that I had to play these accents and dynamics... I just didn’t have to think about it when I came to play it.’ While not explicit confirmation of a positive effect on group awareness, this response at least indicates that the

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373 Ševčík, p. 5.
incorporation of pre-existing expert knowledge of the piece into the exercises (the accents and dynamics), allowed the participant to focus on elements other than the detail in the score, which in itself is quite significant.

The second participant however, experienced a much stronger positive effect, indicating that it ‘definitely [helped how I played with the quartet], because I wasn’t stressing too much about my part, I could listen out to the other players, and once I got the interpretation of how I was meant to play it, with like the light bow strokes, I was really quick to apply it because I already knew the notes so I could just change and fit to the quartet how we were playing it.’ This response affirms earlier philosophical arguments that the most meaningful reason for applying prescribed practice methods, such as Ševčík’s op.18 and these exercises for the Schubert, to string quartet repertoire is that it equips individual performers with the flexibility of technique that is a prerequisite for the development of expert-level chamber music technique. This technical flexibility, facilitated by mastery of technical challenges through engagement with the exercises, is evident in the following excerpt of the workshop in which the participant is seen to adjust her approach, as indicated in the above quote (AV Ex. 5.1). In the first version of the passage, the participant plays according to her convictions. After being reminded of the pianissimo marking and being asked to try the passage again using less bow, the participant tries again. Finally, the participant is encouraged to play the passage in a faster tempo, which they are able to do successfully.

**Discussion**

The first point to discuss in relation to the creation of prescribed repertoire-focused exercises is the importance of specific knowledge of the piece, which is gained through the process of first performing the work. Having gained an insight into the method of construction underpinning Ševčík’s work theoretically and practically, it is clear that I would not feel confident in writing exercises for any violin repertoire without having first performed it. The justification for this view is well documented in the expert practice literature. Sloboda asserts expert performance as an interaction between specific knowledge of the piece being performed with general knowledge.³⁷⁴ Moreover, Ericsson et al. state that the distinguishing factor of expert performers is ‘more and better-organized knowledge, which had to have been acquired.’³⁷⁵ While it could be

³⁷⁴ Sloboda quoted in Miklaszewski, p. 97.
³⁷⁵ Ericsson et al., p. 397.
argued that exercises could be created for any piece without first performing it, I strongly believe that the relevance of such exercises to expert-performance would be limited, as the repertoire-specific expert knowledge gained through learning and performing the work proved to be a critical factor in the creation of the exercises for Schubert’s quartet.

Take for instance Ex. 5.3, the first example of Schubert’s quartet presented here. The point was argued that the same exercises written by Ševčík for the last movement of the Brahms could be transferred and directly applied to the Schubert with similar results. However, further investigation into the technical requirements of the passage from Schubert’s quartet revealed that additional treatment was necessary (for example the exercises teaching the large downwards shift separating each arpeggio). Further, there were countless decisions made during the creation of the Schubert exercises that were informed by having performed the work first. Ex. 5.20 is perhaps the clearest example of this, demonstrating how specific, experiential knowledge gained through performing the work informs the creation of the consequential exercises.

This point is even more pronounced in the genre of the string quartet than for solo repertoire. Whilst technical mastery over a certain passage in terms of left hand execution can be said to be largely independent of outside influence, the same cannot be said about the bow stroke used to play any given passage. Intimate knowledge of the most appropriate stroke for use in performance was gained and refined through rehearsal and performance in a group context. Thus, earlier examples outlining the development of bow strokes critical to performance of Schubert’s quartet could not have been conceived had I not first rehearsed and performed the work. It is in essence this piece-specific, prior knowledge, gained through expert performance and communicated using the principles and techniques of Ševčík that determines the efficacy of the exercises.

The use of editorial markings in the exercises, such as bowings and fingerings, also warrants further discussion. The case study of Ševčík’s op.18 revealed that the efficacy of the exercises was limited by Ševčík’s prescribed fingerings. Further, the literature on expert practice suggested that problems encountered in learning a work are different between individuals, and that the most effective practice made use of candidate
solutions, i.e. solutions tailored to the individual by the individual. While to some this may call into question the validity of creating prescribed exercises at all, the benefits of such an approach far outweigh these potential drawbacks. These benefits include an efficient mastery of individual technical challenges found in the repertoire to which it is applied; a greater technical flexibility specific to the piece, which in turn facilitates a higher level of group technique; manifestation of a more effective integration of musical dimensions earlier in the learning process; and an increased ability to focus on group aspects as a result of the saturation of solutions, so central to the Ševčík approach. The analysis of Ševčík’s work has highlighted the advantages of applying a saturation of solutions to any given problem, showing that any solution targeted to a problem is effective in helping overcome that problem, even if the solution does not replicate the way a passage is eventually performed. Also, the contribution of expert knowledge for the performer resulting from this approach, similar to the role of a teacher in expert skill acquisition, is in itself a further justification.

For this reason, the use of fingerings in the Schubert exercises was limited to exercises aimed at facilitating left hand mastery of difficult passages. Similarly, the use of bowings in the exercises was either to enhance this effect in the left hand, or for developing control of various challenging bow strokes. In other words, fingerings and bowings were modelled on the performance edition and only used in the exercises when critical to their construction and efficacy. In this way, performers engaging with the exercises should not see any editorial markings in the exercises created for Schubert’s quartet as prescriptive. However, if changes to fingerings and/or bowings are made to the performing edition, then considerations should be made to represent these changes by altering the accompanying exercises in relevant ways. Thus, the exercises follow earlier discussions of Ševčík’s exercises which suggest that prescribed practice methods should not been seen as a “one-size-fits-all” solution, but rather as a useful tool for facilitating efficient learning of new repertoire and fostering the ability of the individual to create candidate solutions, regarded by Smith as the most crucial problem-solving strategy and a particular focus of artistic professions.376

The clearest demonstration of these principles in my own exercises for Schubert’s G major quartet is again contained in the last example discussed in this chapter, Ex. 5.20. Written for the Trio of the third movement, of note in these exercises is the intentional

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376 Smith, p. 367.
omission of fingering, due to a lack of any substantial left hand challenges. My own fingerings used in performance could have been included quite easily, but were intentionally left out, as they are not crucial to the efficacy of the exercises. Multiple fingerings can be applied to these exercises without impacting their intended effect. Thus, the individual is free to apply the fingering solution best suited to them. This represents a very basic example of the generation of candidate solutions by an individual performer.

Perhaps the most pertinent finding arising from this process relates to Ševčík’s repertoire-focused exercises and their suitability to the genre of the string quartet. The Ševčík model seems ideally suited to addressing the lacuna in string quartet pedagogy, highlighted in Chapter 2, for high level training and the acquisition of technical facility required for expert performance of string quartets. Applying the Ševčík approach to advanced repertoire, such as I have done with Schubert’s quartet, allows it to perform a function comparable with that of the expert teacher. The key function of this is to equip the individual with the skills required to engage in expert problem-solving in a highly individualized manner (which includes how and when to employ these skills).

The flexibility of Ševčík’s approach, and the array of technical problems it has been shown to treat, effectively suggests that it could be adapted further towards other areas in the training of an effective and aware chamber musician. For instance, by employing a saturation of solutions, including solutions with technical demands in excess of the source material, a sense of ease in executing the original material is afforded. So much so, that in some cases, following extensive practice the execution can often be left to the subconscious (as is discussed in the analysis of the bowing variation practice strategy). Considering the demands on conscious focus during chamber music performance outlined above, the application of a saturation of solutions in the preparation process, particularly with regard to technically demanding passages, thus presents itself as a potent tool with which to enhance individual awareness within the group during performance.

As mentioned earlier, considerations such as ensemble, group intonation and non-verbal communication are essential to expert level string quartet performance. This study has already demonstrated how exercises can be moulded to teach the individual the rhythm of the accompanying parts, in this case using the rhythm bowing practice strategy (see
Ex. 5.20). In a similar way, Ševčík’s principles and strategies for expert problem solving can easily be adapted to a group setting to improve all aspects of the group’s performance.

For instance, employing the rhythm bowing practice strategy collectively as a group during rehearsal would be a simple but effective way of improving rhythm within the group. Or, selecting passages that present difficulties with group intonation and reducing them into a collective set of intervals, similar to the intervallic practice strategy used by Ševčík, could serve to improve group intonation when played together. In this way, I propose that further exploration of how to apply Ševčík’s practice methods during group rehearsal could strongly improve the cohesion of the group in aspects such as intonation and ensemble. Unfortunately, further testing of Ševčík’s methodology as applied to a group rehearsal setting was beyond the scope of this research, but may be an interesting avenue with which to extend the literature of expert chamber music performance in the future.

**Summary**

In summary, the Ševčík model of prescribed, repertoire-focused exercises has been successfully applied to technically challenging sections of the first violin part of Schubert’s String Quartet No. 15 in G Major, op. post. 161. Upon reflecting on the process, performance of the work used as the basis of the exercises was deemed as being crucial to their development and ultimate success. Whilst Ševčík’s model was undoubtedly the basis for the creation of exercises for Schubert’s work, key decisions separate my exercises from Ševčík’s own approach. Firstly, while Ševčík wrote exercises for each bar of Brahms’s work, the same was not done in my own exercises for Schubert’s work. This decision was made partly based on limitations in the scope of my research and, more importantly, as a result of an earlier investigation into the nature of expert practice, which suggests that generating candidate solutions is the most powerful practice technique.377 Thus, while the value of a prescribed set of exercises was found to be considerable in its ability to gain expert practical knowledge of a particular piece, as well as effectively substitute to a degree the role of the teacher in learning a new work, it seemed superfluous to create exercises for every bar.

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377 See: Ericsson et al., p. 367; Lammers, p. 75; and Smith, p. 367.
A high level of transferability has been shown to exist between the principles at work in Ševčík’s op. 18 and their incorporation into my own exercises for Schubert’s quartet. However, efforts were made in the creation of my own exercises to address one of the perceived limitations of Ševčík’s op. 18 exercises: a lack of focus on right hand technique. This was done by creating exercises specifically designed for developing key bow strokes required for performance of the quartet, by utilizing the same principles and techniques as those used by Ševčík in his op. 18. Decisions about the strokes used were made after performing the work, and not every violinist may agree with these choices. However, the format of the exercises are, as in Ševčík’s case, highly flexible, and performers wanting to use different strokes should have no problem in adjusting the exercises to their own performance choices. A nother approach taken in my exercises, not done by Ševčík, was to incorporate elements of the other quartet parts, such as rhythmic motifs, into the exercises. In the example discussed, this served two purposes: to prepare the performer for a potentially confusing rhythmic element; and to enhance the interpretation of stylistic elements in Schubert’s writing.

While this research focused on the role of the individual in the quartet, the creation of exercises for this purpose suggests that the approach of developing prescribed repertoire-focused exercises may be highly suited to use in a group setting. The flexible nature of this approach makes it ideally suited to treating the complex myriad of technical and musical problems that arise in high-level chamber music performance. It is envisioned that exercises for the group could be constructed which contribute expert prior knowledge, and target group-specific areas of difficulty, within a given work. Further, the practice strategies outlined in the investigation into Ševčík’s op.18 strike this researcher as a potentially potent array of strategies for solving and improving a vast array of problems that arise in preparation of a chamber work for performance. More significantly, they seem well suited to treating issues that have been found to be crucial and unique to the genre, such as group intonation and non-verbal communication. Whether this is indeed the case will be a promising avenue to pursue in future research.
Chapter 6: Conclusion

The string quartet medium has been a cornerstone of western classical music for centuries, developing in its technical demands alongside smaller-scale forms such as the solo sonata; and larger, such as the concerto with orchestra. The traditions of violin pedagogy have thus been evolving for centuries, with many well-known treatises describing the various aspects of elite violin performance.

In more recent times, the quartet has solidified its transition from the salon to the concert hall, with the string quartet becoming a viable career path for elite performers. By comparison with pedagogical work in solo and orchestral playing, the literature regarding the training of chamber musicians is still in its infancy. Not only are publications fewer in number, but also, the focus of the literature is largely directed towards amateurs and student ensembles. A comparative analysis conducted between these bodies of literature revealed that elite string-quartet performance calls for specialized individual skills and contains quartet-specific challenges left unaddressed by the pedagogical violin literature, and which are beyond the level of discussion of much of the existing chamber music training literature. While traditional violin training models contain many of the technical aspects required of elite chamber music performance, the comparative analysis also revealed a need for a flexibility of individual technique in excess of traditional violin training repertoire in order to address particular challenges inherent to the string quartet setting, including group intonation and balance. Extra-musical skills such as non-verbal communication were also identified as crucial to the effective functioning of the individual in the string quartet.

It is from this apparent lacuna that the central research question of this study was born:

Does the prescribed model employed by Ševčík effectively help to bridge the lacuna in individual skill training required for expert-level string quartet performance when applied to individual parts of the string quartet repertoire?

Broadly speaking, this study indicates that Ševčík’s model does serve as an effective initial attempt at bridging this lacuna. However it should be considered as one of many viable methods for attaining expert-level string quartet specific skills. Research into expertise acquisition is presently an area of some contention. On one side, Ericsson’s
framework suggests that qualitative exploration into deliberate practice is central to gaining a deeper understanding of expert performance. Contrasting with this are the researchers calling for a more quantitative approach, focusing on the impact of heritability and its interaction with environmental factors. While the influence of the latter is unquestionable, in the context of this study Ericsson’s approach presented itself as a more promising avenue for addressing the aforementioned lacuna. A detailed investigation into the nature of expert practice (as opposed to deliberate practice), defined in this study as the activity undertaken by elite performers in preparing new repertoire for the concert stage, revealed expert practice to be a highly structured and complex activity, requiring expert problem solving skills applied in a highly individualized manner.

Findings arising from more recent research exploring neurodidactics as applied to music pedagogy have implications that challenge our current understanding of expert practice and its effect on the acquisition of expertise. For instance, more detailed grasp of the self-reward system emerging from this body of research challenges current conventions regarding the origins and variables affecting factors involved in expertise acquisition such as enjoyment and intrinsic motivation. Currently ascribed to genetic and environmental factors, neuroscientific research implies that well-structured practice not only serves as its own motivation, but also provides internal rewards that are more powerful than external environmental rewards. Thus, the importance of practice structures and strategies in the acquisition of expertise may be significantly underrepresented in the literature to date.

Having explored the characteristics and strategies indicative of expert practice with a focus on the domain of music performance, a multi-method qualitative case study of Ševčík’s Op.18 J. Brahms: Konzert D-Dur was conducted. As the domain of music performance is practical in nature, the case study also focused on practical engagement with the exercises, over a period of around sixty hours, using action research methods. This is both significantly more practice than has been previously analysed in research into expert music performance, and represents a new approach in the research literature regarding expert performance in musicians. This new approach provided both a rich body of experience that informed the identification and description of the many processes, principles and strategies underpinning Ševčík’s work; and provided crucial experiential knowledge and understanding that facilitated the creation of the exercises.
for Schubert’s quartet. The findings arising from this investigation not only demonstrate strong parallels between Ševčík’s work and the literature regarding expertise acquisition, but consideration of the holistic and systematic construction of his approach places it uniquely in the field of expert practice in musicians as a practical demonstration of expert practice behaviours applied to complete repertoire. Further, while some of the strategies identified in Ševčík’s work are evident in other violin pedagogy material, there are strategies contained in his exercises such as ‘bowing variation’ and ‘coordination exercises’ that were found to be both innovative and highly effective. Evidence of self-evaluative strategies and the saturation of solutions aimed towards facilitating technical mastery were equally significant and new findings.

Perhaps the most significant finding arising from the case study of Ševčík’s work is that it challenges Wicinski’s widely accepted three-stage model for learning new repertoire. Ševčík’s prescribed exercises effectively function in the role of the expert teacher by contributing expert knowledge of the repertoire it is applied to, allowing for musical factors to be incorporated into the earliest stages of learning the work. This finding is particularly significant when considered in parallel with growing evidence from neuroscientific research that emotion precedes cognition. Thus, by including musical elements into the exercises, the performer enjoys a more streamlined learning process that equips them with performance experience incorporating musical aspects from the initial stages of practice, rather than only in the later stages as is the case in Wicinski’s model. The significance of this achievement is all the more pertinent when considering that Ševčík’s Analytics precede recent discoveries regarding the neuroplastic nature of the brain by almost a century. Further, this suggests that, although scientific research into expert practice is relatively recent, a strong understanding of the characteristics and strategies indicative of expertise acquisition has existed in the training of concertizing musicians for a much longer period of time.

The case study of Ševčík’s op. 18 provided the framework for the creation of a set of technical exercises aimed at facilitating individual technical mastery of the first violin part to Schubert’s String Quartet No. 15 in G Op. Post. 161. The creative process revealed that performing the work prior to creating the exercises was crucial in order to gain specific expert knowledge of the piece that could allow the devising of exercises able to function effectively in the role of an expert teacher à la Ševčík’s work. These exercises represent a highly original and unprecedented approach to the individual
acquisition of expertise prerequisite for elite chamber music performance. The application of Ševčík’s prescribed approach was found to be ideally suited to this purpose. Firstly, direct transferability was demonstrated between Ševčík’s work and the Schubert exercises. Secondly, analysis of excerpts from the Schubert exercises also demonstrated how Ševčík’s approach can be adapted to treat individual skills and technical elements crucial to chamber music performance. In particular, the saturation of solutions, a principle central to Ševčík’s method and strongly indicative of expert problem solving, was shown to be a powerful strategy when applied to the chamber music setting. Primarily, this principle is ideally suited to facilitating the flexibility of individual technique, highlighted in the comparative analysis as being crucial to elite chamber music performance. Further, the ability of the saturation of solutions principle to consciously manipulate mental focus during practice presents itself as a potent approach in providing the individual with the awareness and technical security required to engage with challenges inherent to the quartet setting: group intonation, issues of balance and the development of extra-musical skills including non-verbal communication.

Ultimately, small-scale testing of the exercises confirmed these findings, with both participants recruited for the study experiencing similar effects to those I experienced when engaging with Ševčík’s exercises. This included a strong transference to the participants through practicing the exercises of musical details present in Schubert’s work such as dynamics and articulation, allowing for them to focus more on the group-specific challenges in their first read-throughs of the material in a group setting. In this way, this study has not only affirmed Blanche’s view that individual technique is prerequisite to group technique, but has also demonstrated an effective approach for acquiring the unique individual skills required for the development of group technique using existing models.

The potential for further research as a result of findings arising from this study are broad. While very much in its infancy, the application of neuroscientific research techniques to the sphere of expertise acquisition has the potential to fundamentally change our understanding of expert practice and its influence on expert performance. While the scope of this research limited the degree to which this link could be explored, the development of the neuroplastic brain model has strong implications that at the least

378 Blanche, p. 2.
cast doubt on current debate surrounding the strenuous relationship between deliberate practice, heritability and environmental factors and their respective contributions towards expert performance. Further, existing neuroscientific research indicates that individual attributes currently ascribed to genetic factors, such as enjoyment and motivation, may be highly sensitive to change through expert-practice behaviours.

Expertise acquisition is not a zero-sum tug-of-war. Just as expert practice is a highly individualized and complex process, so is the acquisition of expertise. There is no magical formula that can be applied to each individual to achieve the same results. Rather than trying to identify a determinative variable in the acquisition of expertise, there may be more worth in recognizing the synergistic nature of the many variables involved, instead focusing on gaining a deeper understanding of each ingredient, so that the individual has the tools and resources available to them to determine their own best-method for attaining expertise.

From a personal perspective, the most enduring effects of this study will be the changes in my own practice behaviours as a direct result of practical engagement with Ševčík’s work. More than functioning in the role of a teacher, this approach, when engaged with mindfully, equips the performer with the knowledge required for them to become their own expert teacher, by fostering an awareness of which strategies and techniques are ideally suited to their own individual needs at any given moment. It is with this philosophy that the Schubert exercises were created. That is, rather than creating a comprehensive performing edition of the first violin part of Schubert’s quartet, the aim was to present a set of exercises that, when engaged with mindfully, will foster the development of individualized approaches to expert problem-solving in order to equip the individual with the skills and knowledge required for performing Schubert’s quartet. The potential for this approach to be further adapted is virtually limitless, with the application of prescribed technical exercises contributing expert knowledge of repertoire to the performer foreseeably being applicable to any instrument, given appropriate instrument-specific adjustments.

In the context of this study, a promising avenue for future research into elite string quartet performance, which could not be explored due to limitations on the scope of this research, is the application of Ševčík’s approach to the group setting, and investigating how it might be adapted to address the challenges inherent to the string quartet medium,
including extra-musical aspects such as non-verbal communication. For instance, strategic use of accents, utilized by Ševčík in a myriad of different ways to improve technical security and focus the attention of the ear, could be similarly applied in the group setting. By ascribing visual cues with the accents, requiring the individual to look at specific points within the group or even the rehearsal space, this approach could thus be adapted to improving group awareness and non-verbal communication.

Remembering that the distinguishing attribute of expert performers is a highly organized wealth of knowledge, which had to have been acquired,\(^{379}\) the potential benefits of widespread application of Ševčík’s approach to the string quartet repertoire are considerable. Firstly, the application of the approach to individual parts has been shown as an effective initial attempt at addressing the perceived lacuna in the individual training of aspiring chamber musicians, shifting the focus of chamber music literature towards expert performance. If applied in tandem with the group setting and to the breadth of the string quartet repertoire, a vast library of practical repertoire-specific expert knowledge could be brought into existence, enabling universal access to the resources required for the attainment of individual expertise in the performance of a range of different string quartets.

\(^{379}\) Ericcson et al., p. 397.

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LIST OF APPENDICES AND FILE DIRECTORY OF ACCOMPANYING HARD DRIVE

Appendix A: Video Recording of Practice of Ševčík’s Op. 18

New Event 1-03-13 - Day 1
  clip-2013-02-27 16;02;42.mov
New Event 1-03-13 - Day 2
  clip-2013-02-28 10;56;46.mov
  clip-2013-02-28 11;59;31.mov
New Event 1-07-13 - Day 3
  clip-2013-01-19 13;49;34.mov
  clip-2013-05-13 16;24;18.mov
New Event 1-07-13 - Day 4
  clip-2013-05-14 15;28;35.mov
  clip-2013-05-14 16;03;23.mov
New Event 2-07-13
  clip-2013-07-01 17;33;49.mov
New Event 12-05-13 - Day 3
  clip-2013-04-09 16;04;40.mov
  clip-2013-04-09 16;59;50.mov
New Event 12-05-13 - Day 4
  clip-2013-05-10 19;00;02.mov
New Event 13-04-13 - Day 1
  clip-2013-04-04 10;59;44.mov
New Event 13-04-13 - Day 2
  clip-2013-04-10 09;31;55.mov
Practice 1-02-13
  clip-2013-01-20 17;58;00.mov
  clip-2013-01-31 13;50;12.mov
  clip-2013-01-31 17;00;12.mov
Practice 3-04-13
  clip-2013-04-04 09;14;48.mov
  IMG_0924.MOV
Practice 4-02-13
  clip-2013-02-04 16;42;58.mov
194

IMG_0893.MOV

Practice 5-02-13
  clip-2013-02-06 15;22;20.mov
  clip-2013-02-06 16;10;47.mov
  clip-2013-02-06 17;09;50.mov
  clip-2013-02-06 18;13;52.mov

Practice 5-03-13
  clip-2013-03-01 17;19;39.mov
  clip-2013-03-01 17;52;28.mov
  clip-2013-03-01 18;17;00.mov
  clip-2013-03-01 19;17;24.mov
  clip-2013-03-06 12;06;33.mov
  clip-2013-03-06 12;59;56.mov

Practice 7-03-13 - Day 1
  clip-2013-03-05 12;04;06.mov

Practice 7-03-13 - Day 2
  clip-2013-03-06 18;29;39.mov

Practice 7-03-13 - Day 3
  clip-2013-03-07 11;57;27.mov

Practice 7-04-13
  clip-2013-04-05 15;52;00.mov
  clip-2013-04-05 16;43;41.mov

Practice 8-02-13
  clip-2013-02-08 09;35;07.mov

Practice 8-03-13
  clip-2013-03-08 10;04;00.mov
  clip-2013-03-08 10;54;02.mov

Practice 11-03-13
  clip-2013-03-11 14;01;50.mov
  clip-2013-03-11 14;59;18.mov

Practice 12-03-13
  clip-2013-03-11 16;33;46.mov
  clip-2013-03-12 12;17;56.mov
  clip-2013-03-12 13;28;58.mov
  clip-2013-03-12 14;02;14.mov
Practice 13-03-13
  clip-2013-03-13 12;08;55.mov
  clip-2013-03-13 13;00;27.mov
Practice 14-03-13
  clip-2013-03-14 10;12;41.mov
  clip-2013-03-14 10;57;23.mov
Practice 15-03-13
  clip-2013-03-13 13;51;19.mov
Practice 18-03-13
  clip-2013-03-20 13;01;44.mov
  clip-2013-03-20 16;14;39.mov
  clip-2013-03-20 16;17;47.mov
Practice 22-01-13
  clip-2013-01-24 13;01;57.mov
  clip-2013-01-24 13;51;07.mov
Practice 26-02-13
  clip-2013-02-21 15;10;04.mov
Practice 28-02-13
  clip-2013-02-27 13;08;33.mov
  IMG_0902.MOV
  IMG_0903.MOV
Practice 29-01-13
  clip-2013-01-29 16;40;31.mov
  IMG_0891.MOV
Practice Dec 27 pt 2
  clip-2012-12-27 14;09;11.mov
  IMG_0881.MOV
Practice Pt 1 17-01-13
  clip-2013-01-17 10;39;59.mov
  clip-2013-01-17 11;35;00.mov
Practice Pt 1 19-01-13
  clip-2013-01-19 11;54;40.mov
  clip-2013-01-19 12;52;07.mov
Practice Pt 1 20-01-13
  clip-2013-01-20 15;59;35.mov
Appendix B: Analysis of Practice Data

Data Analysis Complete.pdf
Data timings.pdf
Key For Data Analysis.pdf

Appendix C: Audio Video Examples

AV Ex. 4.1a-Bowing Variation.mp4
AV Ex. 4.1b-Bowing Variation.mp4
AV Ex. 4.2a-Rhythm Bowing.mp4
AV Ex. 4.2b-Rhythm Bowing.mp4
AV Ex. 4.2c-Rhythm Bowing.mp4
AV Ex. 4.2d-Rhythm Bowing.mp4
AV Ex. 4.3a-Anchoring.mp4
Appendix D: Recital Recordings
Lucas O’Brien DMus Recital 1 - Brahms Violin Concerto in D Major.mp4
Lucas O’Brien DMus Recital 2 - Schubert's String Quartet No.15 in G Major.mov
Lucas O’Brien DMus Recital 3 - Lecture Recital.mov

Appendix E: Ševčík Material
Brahms’s Violin Concerto in D major Op.77, ed. O. Ševčík.pdf
Otakar Ševčík, Op. 18.pdf

Appendix F: Interview Transcripts
Jahmes Ehnes Interview
Ehnes Info and Consent Package.pdf
Ehnes Interview Questions.pdf
Ehnes Interview Transcript.pdf
Small Scale Testing
Interview Questions for Participants.pdf
Participant A Interview Transcript.pdf
Participant B Interview Transcript.pdf
Participant Consent Form.pdf
Participant Information Sheet.pdf

Appendix G (Hard Copy): Exercises for the 1st Violin Part of Schubert’s String Quartet No. 15 in G Major D 887 - op. post. 161