

J. S. BACH'S KEYBOARD WORKS:
FROM PERFORMANCE TO RESEARCH

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ДЕЛА Ј. С. БАХА ЗА КЛАВИЈАТУРНЕ ИНСТРУМЕНТЕ:
ОД ИЗВОЂЕЊА ДО ПРОУЧАВАЊА

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АБСТРАКТ

Practice-led research in classical music has tended to deal with specific and limited case studies, examining in detail the ways in which one musician's individual responses to a work or genre can lead to a new understanding of that object, and assessing the different forms of knowledge generated. This project discussion however deals with a complete corpus created over one composer's lifetime, Bach's works for clavier, and looks at the very many different aspects of musical understanding – including pedagogy, technique, compositional practice, performance practice, attribution studies and organology – that can be enriched by hands-on engagement with a substantial and high-quality repertoire.

KEYWORDS: J. S. Bach, keyboard music, performance practice, research, pedagogy.

АПСТРАКТ

Проучавање уметничке музике вођено праксом, по правилу је усмерено на конкретне и ограничене студије случаја, у којима се детаљно истражују начини на које индивидуалне реакције музичара на дело или жанр могу

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довести до новог разумевања предмета, те испостављају различите врсте тако створених сазнања. Међутим, ова расправа се бави комлетним корпусом створеним током живота једног композитора – Баховим делима за клавијатурне инструменте – и сагледава бројне аспекте музичког разумевања, укључујући педагогију, технику, композициону и извођачку праксу, студије ауторства и органологију – које може обогатити практичан рад на обимном репертоару високог квалитета.

Кључне речи: Јохан Себастијан Бах, музика за клавијатурне инструменте, извођачка пракса, истраживање, педагогија.

INTRODUCTION

Any subject that relies on data in order to undertake research, such as musicology, has to engage with the problem of incompleteness: full information for analysis is rarely available, even within one corpus.² With increasing digitization of scores and the increased use of coding systems, it may one day be possible to (for example) provide a complete chronological typology of cadence structures in Haydn. But the questions asked of this data are most fruitfully originated from direct engagement with the scores,³ and this often means from those who engage most intimately with such representations of the musical text – the performers. The project described here shows how a performer perspective can generate direct research questions, and how some of these questions would not have arisen without such a perspective. Much practice-led research in classical music has tended to deal with specific and limited case studies,⁴ but the Bach project discussed here deals with a very substantial and complete corpus created over one composer's lifetime. Through performance of Bach's *clavier* works, issues lying within the very varied fields of pedagogy, keyboard technique, compositional practice, performance practice, attribution studies and organology arose, and have been the stimulus for about a dozen published articles and essays.

The issue of 'completeness' – here, of the surviving Bachian canon – is an important one, as it provides the background to a problem that has been troubling both the humanities and social sciences for some while, particularly in respect to a theoretical grounding of observation: the relationship between the particular and the universal. No artistic corpus is uniform – composers write differently at different times and places, for different performers and venues, for different scorings and so on – but

2 This is described as the 'against the world' problem in Burrows and Love 1999: 156–157.

3 See Francis Knights and Pablo Padilla, *Computational Analysis and Musical Style* (forthcoming).

4 See, for example, Doğan-Dack 2015. Early music repertoire has not been a major part of the debate to date.

there is nevertheless often a strong compositional 'voice', even if chronological divisions are imposed upon it (for example, Beethoven's 'late' period) by later scholars in order to make sense of a developmental narrative. Without knowing every possible musical component of every Beethoven work, what observations enable us to meaningfully describe what Beethoven 'is'? Or why it sounds like 'Beethoven'? The obvious answers lie in headline features that the ear can assimilate easily – melody, harmony, musical rhetoric and so on – but this leaves out many smaller components that also contribute. Contextualizing these specific components – the 'particular' – into the sense of compositional identity – the 'universal' – is not easy, but such engagement can be quite revealing. It can be positive as well as negative: Palestrina always does this, Byrd never does that. Even the observation of one such small feature can lead to the asking of these fundamental questions.

Numerous performers have written on music since the Middle Ages, but the bifurcation between composers and performers that started in the 19th century and accelerated and further divided in the 20th century has sometimes led to a gulf of understanding between those who create music, who study music and who perform music (composer, musicologist, performer). In the early music world, revival pioneers from Arnold Dolmetsch onwards were forced to become their own scholars, in order to access, edit and understand manuscript and other sources, and there is a strong tradition of professional performers writing about music. However, when they do this, the perspective is often pedagogical rather than self-reflexive (see Kirkpatrick 1987, Valenti 1990, Troeger 2003, Booth 2010), and the knowledge transmitted is intended to help a prospective student understand the context and technical components of a repertoire or style rather than explain how the writer/performer gained and assimilated that knowledge themselves. The formal authorial voice of a text is probably a necessary component in such cases, by way of reinforcing the expertise and credibility of the writer, but it tends to blur the sources of knowledge obtained, and any ambiguities and doubts about the interpretation of the information presented.⁵

REPERTOIRE AND INSTRUMENT

From his mid-30s, Bach started collecting many of his works in fair copy sets of six or multiples thereof, possibly even revising some with a view to making sure that bar number tallies for sets were adjusted according to numerological principles (see Tatlow 2015). While the process was not completed, or at least fair copies of some sets may not have survived (for example, the flute sonatas), it is the keyboard and organ works which include many of the uncollected miscellanea. The reasons for this are probably varied: some were early works that he did not consider worthy, or were

5 Similar issues are doubly relevant when assessing the historical treatise writers who have formed the greater part of our understanding of music from before the 19th century: how much did they really know, and how far is it applicable? See Knights 2019a.

awaiting revision; some were probably of the wrong scale (the Preludes & Fugues in the Well-tempered Clavier appear to have had a length limit); and some he may have mislaid. We know of pieces which only survived due to very limited circulation amongst former pupils or collectors, for example. This raises the interesting question as to what Bach might have considered his 'complete' clavier works to comprise,⁶ and indeed whether he would even have approved of performances and recordings of works such as the Suites in A minor BWV 818/818a and E^b BWV 819/819a: both of these were 'French suites' that did not make it into his final set of six. Bach seems to have been an excellent judge of his own works in making his collections, and allowing for particular one-off works such as the Chromatic Fantasia & Fugue BWV 903, that leaves many single preludes, suites, fantasias and fugues remaining. Among them are many pieces of great quality, but also many lesser works. Given Bach's serious concern about revising his music to bring it up to standard (an entire chapter of Forkel's 1802 Bach biography is entitled 'Bach the Reviser of His Own Works', David and Mendel 1998: 474–476), which is often forgotten when we use only his final versions today, it may be the case that he would have objected to the lesser works being performed, as being unrepresentative of his highest standards. The moral question of whether a composer 'owns' his own works in perpetuity is unanswerable at this distance in time, but certainly exploring every note of Bach's surviving clavier music allows that particular canon to be put into context, and an understanding of his musical development, compositional technique and performing practices to be refined.

This project arose as a follow-up to a final-year undergraduate course I taught a few years ago, on Bach's clavier and organ music. Although I knew the repertoire very well as a listener, teacher and record reviewer, I had actually learned relatively little of it myself, and so set out a plan to cover all of the keyboard (that is, non-organ) music over a period of four years. The programmes were divided into groups of approximately 60 pages of score each (without repeats, average duration worked out at a little over a minute per page), and the 21 resulting recitals took place between Spring 2017 and Autumn 2020.⁷ By happy coincidence, that meant it was possible to perform one concert on the very day of Bach 333rd birthday (a programme reflecting the composer's numerological interests (see Tatlow 2015), consisting of music entirely in triple time, in three flats or sharps, in three sections or in three parts, plus BWV 333 and the Canon at the Third from the Goldberg Variations); and to give a performance of the Wilhelm Friedemann Bach Book, 300 years to the day since the composer began the manuscript on 22 January 1720. At the beginning, there was no intention to do any writing as part of the project, but hands-on engagement with the

6 This would presumably have included at least the *Clavierübung* I, II, the Goldberg Variations, the 48, the English and French Suites and Partitas, the Toccatas, the Art of Fugue and the Inventions & Sinfonias.

7 For the sake of variety, these recitals alternated with others from three ongoing projects using early keyboard instruments (harpsichord, virginals, spinet, ottavino, fortepiano and organ), including the complete Fitzwilliam Virginal Book, a sequence of 40 German Baroque clavichord programmes and a contemporary music series; see www.francisknights.co.uk.

music, and queries about some of the ideas presented in the standard narratives of Bach, led to almost continuous note-taking and eventual publications. This research could and would not have arisen without the performances.

The recitals grouped works by genre as far as possible, allowing that larger sets had to be split: *Clavierübung* II, the Goldberg Variations, the French Suites, the Art of Fugue and the Inventions & Sinfonias were single concerts each, while the 48 was divided into five (Book 2 is longer than Book 1), and the English Suites, Partitas and Toccatas were split between pairs of concerts. Playing in sets allows for a greater understanding of the internal structures, as for example in the six Partitas, where Bach makes a point of varying the content (eg six different types of Sarabande) through the collection as widely as possible.

In terms of attributions (see Knights and Padilla 2021), a fairly broad approach was taken; after careful examination, a number of pieces from the Neue Bach Ausgabe volume *Keyboard Works of Doubtful Authenticity* (Bartels and Rempp 2008) were included in the series,⁸ but none from its *Keyboard Works attributed to J. S. Bach* (Bartels and Rempp 2008a). One near-canonic suite, the Präludium et Partita del Tuono Terzo in F BWV 833, was discarded. Although this appears in the Möller Manuscript (Berlin Staatsbibliothek Mus.ms.40644), a very important early Bach source, not one of its movements seemed to me to contain any Bachian fingerprints, despite the copy and attribution coming directly from the composer's older brother Johann Christoph (Schulenberg 2006: 35–38).⁹

The secondary source material in English was very familiar at the start, having been used for teaching for years, but a search for recent material proved very useful. As well as the essential *New Bach Reader*, David Schulenberg's *Keyboard Music of J. S. Bach*, and specific repertoire volumes by Peter Williams, David Ledbetter and Ralph Kirkpatrick (David and Mendel 1998, Schulenberg 2006, Williams 2001, Ledbetter 1987, Kirkpatrick 1987), three new books were particularly stimulating: Richard Jones on *The Creative Development of Johann Sebastian Bach*, Peter Williams' *Bach: A Musical Biography* and Robin A. Leaver's *Companion to Johann Sebastian Bach* (Jones 2007, Williams 2016, Leaver 2017); the latter is an invaluable digest of the state of Bach research. References to all these and many other books were then organized and presented as a short guide for the benefit of other players (Knights 2020: 32). Following this, an edition had to be chosen. The choices were between Urtext copies without fingerings, and the project started using the Neue Bach Ausgabe (Bärenreiter), but soon transferred to the Henle series after working with its exemplary copy of Book 2 of the Well-tempered Clavier. The reasons were as much practical as scholarly: the Henle volumes are more clearly printed on better paper, with fewer page turns and more informative critical commentaries.

8 It is very surprising that no Critical Commentary is included in this volume.

9 Schulenberg seems inclined to accept it. For a discussion of stylistic development in Bach's earliest keyboard music, including the dubious Neumeister Chorales, see Knights and Padilla, forthcoming.

All the concerts were performed on the clavichord (a first, for a complete cycle),¹⁰ the most common domestic keyboard instrument in 18th century Germany (see Brauchili 1998); and in the spirit of performances from before the invention of the public ‘keyboard recital’ in the late 18th century, they were presented on a small scale, with an audience of listeners who were expert in Baroque music.¹¹ The historical conceit imagined here was of a complete Bachian cycle performed to the composer by his pupils in the 1740s, bringing together all the clavier music he had written in the previous half-century. The venues were nearly all very small, maintaining a sense of domestic intimacy, and allowing the clavichord (a quiet but very expressive instrument) to sound out well.

Perhaps surprisingly, the concept of ‘interpretation’ as such did not arise as a separate idea; after a lifetime listening to (and especially, reviewing) this music, clear ideas about the parameters for tempo, articulation, dynamics, ornamentation and so on were already very well formed; the concern was the application of fingering and other performance techniques to make these a reality.

The clavichord used was a fine copy by Dennis Woolley (1993) of an instrument built by Johann Adolph Hass (c.1720–c.1773/6) in Hamburg in 1763, the original of which is now in the Russell Collection at Edinburgh University.¹² The 1763 Hass is in excellent playing order,¹³ and has been copied successfully many times. Although this particular instrument dates from after Bach’s death, the original design, by Johann’s father Hieronymous Albrecht Hass (1689–1746 or later) was very similar, and the 18 or so surviving FF–f3 unfretted clavichords of this model by both father and son vary in length only between 170 and 176cm (Boalch 1995: 365–376). The earliest is from 1732, and is already a fully worked-out design from the period of (for example) Bach’s mature clavier works. A close comparison I was able to make by giving recitals on the 1742 instrument in the Bate Collection, University of Oxford and the 1763 copy, confirms their great similarity in terms of tone, touch and response.¹⁴ The Hass family instruments (including their very large harpsichords) were often highly finished, expensive and complex, using exotic materials such as mother of pearl and tortoiseshell for the keys; it is likely that they would have been well out of Bach’s price range, but something he might well have coveted. The only element of query as regards a suitable clavichord for Bach is the use by Hass of 4’ strings in the bottom octave and a half; C. P. E. Bach did not like these,¹⁵ but we do not know that his father would have concurred.

An examination of the changes in Bach’s clavier style between 1700 and 1750 leads to further speculation about the instruments he used and had access to. The estate inventory at his death notes that he had five harpsichords (*clavecin*) of various

10 Richard Troeger (clavichord) began an excellent recorded cycle on Lyrichord in 1999, but it ceased after only four volumes; See Knights 2020b for details.

11 All the concerts were by invitation, and free.

12 See Whitehead 1996; https://collections.ed.ac.uk/mimed/record/15366?highlight=*.*.

13 See Knights 2020b for a list of recordings.

14 At other times I have also tried the original 1763 Edinburgh Hass and another Hass of 1761.

15 Noted in a letter to Johann Nikolaus Forkel in November 1773.

sizes, two lute harpsichords and a spinet, and that three 'clavichords with pedals' had previously been given to the young J. C. Bach (David and Mendel 1998: 251–252). How long he had all these instruments and what they were used for is unknown,¹⁶ but they give no information about his previous collection. For example, his earliest work specifying a two-manual harpsichord is *Clavierübung* II (1735);¹⁷ did he himself even own a double before that date,¹⁸ or was its acquisition the inspiration for this collection and the subsequent Goldberg Variations (1741)? Many of his earlier works use full-voiced chords, rather in the manner of Kuhnau's keyboard music, in an attempt to produce what looks like a big tone – see BWV 832, 903 (octaves in the bass), 922, 923, 944, 963, 992, 993 etc – while the later works focus more on formal contrapuntal clarity. Large chords are less effective and indeed less necessary on an instrument like the clavichord, with its possibility of dynamics instead, and so is it possible that this change is related not only to the development of Bach's stylistic thinking, but also to the instruments he preferred to work on? Although Forkel's statement that Bach 'liked best to play upon the clavichord', considering it 'the best instrument for study, and, in general, for private musical entertainment' (David and Mendel 1998: 436) has been disputed for obvious reasons by generations of modern harpsichordist recitalists since Landowska (Knights 1990), it could be the case that Bach actually conceived his earlier *clavier* works for the harpsichord, then moved to the clavichord as wider-compass unfretted instruments became available in the 1720s.¹⁹

PEDAGOGY

The first goal of the series was learning the complete Well-tempered Clavier, on the basis that after this compendium, all of Bach's other technical demands would seem relatively straightforward. For an early keyboard specialist, the major difficulty is remote keys (very little harpsichord music strays outside four sharps or flats), so the decision was made to group the works by key rather than book, and work towards the extreme sharps and flats in the fourth and fifth programmes. In addition, a formal study-structure scheme was devised, which was then written up (Knights 2018), with suggested times for the benefit of amateur players with variable levels of technical skill and practice time; between three and five months per concert was suggested. The order of preparation for each unit was as follows: 1. Analysis of the score

16 See Francis Knights, 'J. S. Bach as instrument collector' (forthcoming).

17 The two manuals are needed for the notated *forte* and *piano* dynamics only, not for any hand-crossings, and thus work well on the clavichord too.

18 He would of course have had access to institutional double-manual harpsichords throughout his career. Forthcoming research by Leonard Schlick indicates that two-manual instruments were much more common in 18th century Germany than previously thought.

19 Early examples include the FF-d³ Johann Christoph Fleischer (1723) now in the Drottningholm Museum Theatre (Boalch 1995: 316–317), which is only a little smaller than the Hass clavichords described above.

and background reading; 2. Fingering; 3. Basic learning; 4. Improving problem passages; 5. Familiarity and revision; and 6. Preparation for performance, each of which was described in detail. This kind of structure²⁰ is especially useful for those without regular access to a teacher, and the point was made that there had to be a purpose: 'Each unit *must* end with a performance of some kind: this is the goal that defines the end of a unit, and is absolutely vital' (Knights 2018: 26). As well as the structured learning system proposed, a list was made of the individual technical components in the music, which included the following: interleaving of voices; independent moving parts within one hand; metrical arpeggiation and patterns; reading double sharps and double flats; clarity of trills and ornaments; trills on weak fingers; extended trills; wide-range arpeggios; wide leaps; hand crossing; hand rotation; playing quickly; complex chromaticism; performing in the free fantasia style; voicing large chords; wide stretches; cantabile and legato style; consistent and clear articulation in fugue subjects; overholding techniques; and playing in up to five voices at once. The idea that a new technique (such as hand crossing) only needs assimilating once is not quite true, as such techniques will feel different according to style, key and so on.

The principal challenge for the 48 is fingering; there was no contemporary method and little precedent for fingering in remote keys, and the lack of fingering in Bach's pupils' copies is intriguing. In the 1754 Obituary written by C. P. E. Bach and Agricola, Bach's own fingering abilities are described in some detail:

All his fingers were equally skillful; all were equally capable of the most perfect accuracy in performance. He had devised for himself so convenient a system of fingering that it was not hard for him to conquer the greatest difficulties with the most flowing facility. Before him, the most famous clavier players in Germany and other lands had used the thumb but little. All the better did he know how to use it (David and Mendel 1998: 306).

The point about use of the thumb is very important, and there are numerous instances where Bach has the player using that digit on a black key; in fact, throughout the two Books there are many instances where the composer virtually forces the student to make the right choice. Thus, the only way of learning workable fingering for the 48 is to learn the 48 itself, and perhaps this is why J. S. Bach (unlike C. P. E.

20 The method was successful, and used for all subsequent concerts, with the additional refinement that sections one and two were overlapped, so that the start of each recital learning process, fingering and so on were ready in the next score. My own learning times for each programme turned out to be three weeks ordinarily, with four weeks for the Art of Fugue and the 48, and five weeks for the Goldberg Variations. Ton Koopman (2009: 27) notes in his complete Bach organ set that 'doubtful' works required 'more extensive preparation than other pieces which are technically much more difficult'. The reason is likely that they do not use the familiar hand shape vocabulary that is built up playing the mainstream Bach repertoire; and I find the same holds true of genuine Bach works which use patterns he never returned to, such as the very chromatic Allemande from the Suite in Eb BWV819a and the Bb Fugue on a theme of Reincken BWV 954.

Bach) did not feel the need to write a keyboard method. Learning the music actually teaches the technique, a reversal of later keyboard pedagogical methods using technical etudes and the like in order to be able to learn the repertoire.

Players' hands are all different sizes, and keyboards vary too (for example, it is harder to play with good tone in extreme sharp and flat keys on the clavichord, as the finger has to be kept nearer the front of the key, due to the position of the balance pin), but it would be possible to produce a worked-out fingering guide to Bach from the experience here, even if it would not be applicable to every player and instrument.²¹ One point of note was that so-called 'early fingering' (as used in the 16th and 17th centuries, and taught for white-note scales by Bach in the Wilhelm Friedemann book of 1720 [Plath 1979: 4] and noted as normal by C. P. E. Bach too in 1753 [Bach r/1974: 46]),²² is often extremely useful in counterpoint where one part is held and another moves scalically: in (for example) a rising right-hand scale, paired fingers 3-4 3-4 are used, with the longer finger leading. An example occurs in the final bar of the very first Fugue of the Well-tempered Clavier (Book 1), right hand.

A further unexpected observation from performing the Well-tempered Clavier is that Bach mutates the fugue subject - that is, the statement in the original key, not the answer - quite often; this is not something that is mentioned (or would be approved) in fugue theory texts. A good example occurs in the Eb Fugue from Book 1, where in bars 28-29 the first note of the subject is a tone lower, and tied back over the barline. The purpose seems to be to disguise the entry, and a look over all the fugues in the 48 shows that such changes of pitch or rhythm occur no fewer than 38 times (Knights, forthcoming). Further examination suggests fifteen different categories of changes, including lengthening or shortening the first note, changing tonality, rhetorical interruption and so on. That the fugue subject, the building block of the entire piece, is not inviolate is itself interesting, but it also has implication for Bach's compositional method: the structure of a fugue (exposition, episodes, modulations etc) is assumed to be planned on paper so that the subject can be placed first and the additional counterpoint built around it. But the composer seems willing to compromise the integrity of the subject *after* those other parts are created - in the D minor Fugue of Book 1, bars 34-35, the subject is even partly in the major.

Following on from these technical studies of the 48, a more detailed account was made of the earlier Inventions & Sinfonias as a result of the performance (Knights 2019). These two sets were put into final form when Wilhelm Friedemann was about ten, and the composer's manuscript Preface explains the dual purposes, for student performer and composer: "to learn to play clearly in two voices" then "deal correctly and well with three obbligato parts", as well as learning how to develop good musical ideas and "a singing style of playing." What is not evident from modern editions²³ is that two thirds of the works also involve reading the alto clef, an additional im-

21 Throughout the entire project, I only found one bar it was impossible to finger satisfactorily with the method developed: the Prelude in E minor, Well-tempered Clavier (Book 2), bar 30, right hand.

22 It was unchanged in the 1787 edition.

23 An exception is Pickett 2004.

portant skill. The works have been an important part of piano pedagogy since the 19th century, but without ever explaining what specifically was being taught. A close analysis of the score shows just how much needs to be assimilated: matching figuration patterns in both hands; continuous semiquaver movement; division of the inner voice between two hands; scale patterns of more than an octave; leaping down with the RH 5th finger; leaping up with the LH 5th finger; long trills; trills against a moving part; broken thirds; parallel thirds and sixths in one hand; broken chord patterns and figuration; one held and one moving voice in one hand; chromatic scales; wide leaps and stretches; arpeggios of more than an octave; part crossing; legato; two against three; syncopation; fast demisemiquavers; double sharps and flats; complex ornamentation and much else.²⁴ This list absolutely validates Bach's own method of making these works an early goal of study, and it is worth noting that the full benefits only come if both sets are learned complete.²⁵ It also removes the element of personal preference: when you can choose which pieces to learn, it will often be those for which one's technique is already sufficient - few students choose to learn a difficult piece just because of its difficulty.

THE ART OF FUGUE

One aspect a player becomes very aware of in keyboard music is hand stretches, where more than an octave is asked for. Although physical keyboard compass varied slightly in Bach's Germany, between different regions, types of instrument and makers, the composer's usual practice was to make the octave span the normal limit (that is, after all, why the keyboard octave is the size it is), with an occasional ninth and an even rarer tenth at cadences. This is information well 'known' to the fingers, and deviations from it are noticeable. An interesting case arises in the Art of Fugue (Knights 2020a), which has generally been accepted as a keyboard work for many years, since the writings of Donald Tovey and Gustav Leonhardt (Tovey 1931; Leonhardt 1952). As with the problematic A minor fugue in Book 1 of the 48 (see below), some sections of this ask for 'impossible' stretches, a fact which is glossed over. In reality, the Art of Fugue cannot be played on a single keyboard unless the player has very large hands indeed; the posthumous published edition also includes an organ chorale prelude, *Vor Deinen Thron*, and an arrangement for two keyboards of the second pair of mirror fugues. Experience with the ongoing recital project meant that the mirror fugues and chorale were performed separately as part of a clavichord duet concert, and the solo clavichord Art of Fugue was given as Contrapunctus I–XI, XIV plus the four canons. The completion supplied at the end of the Henle edition (Moroney 1989: 69) was also omitted, and this tied in with a further piece of related research, described next.

24 In Knights 2019 all these components are identified by specific bar.

25 This is one of the justifications of 'completist' projects; as expressed by Damian Thompson in a different context, "The most perceptive performances of Beethoven's sonatas tend to come from pianists who play all of them" (Thompson 2020: 36).

Computational tools have developed sufficiently that they are able to process symbolic music data meaningfully, and have many applications, such as in attribution studies. The comparison problem is that works by the same composer can be quite varied, and a sufficient corpus is needed to compare (for example) an anonymous 18th century German fugue with other known repertoire to have any chance of a plausible identification result. The systems used can be simple enough to be considered robust,²⁶ but *Contrapunctus XIV* offers another way of comparing reconstructed music to actual Bach (Paz, Knights and Padilla, forthcoming). There are some two dozen completions of the *Art of Fugue*, of varying levels of success, but they all tightly use Bach's existing material and contrapuntal structures to try and produce a seamless finish to the concluding fugue. By measuring the shape (intervallic rise and fall) of the individual lines and comparing them with the surviving 239 bars of *Contrapunctus XIV*, the closeness of the various completions can be measured. This does not of course directly correlate with any guaranteed sense of artistic or contrapuntal success, but does show which scholars have been able to create lines that are very similar to Bach's own. Using a mathematical method called Information Theory, it can be demonstrated that Tovey's 1929 completion (Tovey 1929) holds up well, but is eclipsed by the recent Zoltán Göncz version (Göncz 2006).

PERFORMANCE PRACTICE ISSUES

A number of Bach's early works survive in sources that are very highly ornamented in the French manner, some of which derive from later copyists;²⁷ it is not certain how much this tradition has a direct line to Bach – there are very few early Bach autographs, for confirmation. While there certainly are examples of Bach providing highly ornamented alternative versions (e.g. the *Sinfonia in E^b BWV 791a*), there appears to be a difference in the amount and type of ornamentation used from the mid-1720s onwards, when he started to publish his *clavier* music. There, added decoration to individual notes gives way to complex notated patterns written out in full (see the *Sarabande of Partita No. 6 in E minor, BWV 830*, for example). There is thus a case to be made that Bach's ornamentation practice changed during his compositional lifetime, and in the spirit of the '1740s' approach outlined above, the decision was made to use throughout the type and quantity of ornaments from the later period.²⁸ This also seemed to work better on the clavichord, where excessive French-style decoration makes it more difficult to produce good tone – Hass clavichords are notorious in their demands in that respect (see Bavington 2019: 7–14).

26 See as an example the Formal Methods in Musicology project, <https://formal-methods-in-musicology.webnode.com>.

27 See for example the excerpts or scores included in Steglich (r/2008: 87); von Dadelsen (r/2009: 6); von Dadelsen and Ronnau (r/2009: 141).

28 This raises a very interesting question: did Bach play his early works in later years using the ornaments he had first envisioned, or in his current playing style, if these were different?

Performance of the English Suites led to an interesting tangential piece of research about Bach's cantatas (Knights 2020c). Observing while playing that Bach's binary-form dance movements nearly always end with matching broken-chord cadential patterns (all six Allemandes from the English Suites, for example), a parallel listening project working through all of Bach's cantatas²⁹ with scores in hand noted that recitative perfect cadences with obligato instruments were both generally harmonically plain but rather varied in layout. This resulted in a typology of all these 111 cadences, the purpose of which was to provide practical guidance to organists, many of whom (on the evidence of concerts and recordings) have been providing excessively florid continuo parts in Bach recitative. This is particularly useful for the many basso continuo parts which are unfigured, and hence where no guidance is given by the composer. The sometimes surprising results indicated what was appropriate voice-leading, and what level of dissonance was typical (for example, dominant 7ths and falling 7ths are relatively rare in minor keys). A comparison of the cantata texts being set for the cadences indicated that certain types of words evidently suggested melodic elaboration to Bach, and that decorated (as opposed to plain V-I) cadence chords were far more common in some keys than others, major and minor keys having some further differences also.

One interesting performance issue noted during the ongoing series was one of relative accuracy; as Bach's numerous finger-patterns and hand-shapes were ever more thoroughly assimilated, a 'backup' for mistakes started to appear. That is, where a note or pattern was misread in concert, the actual notes played would be replaced not by (for example) just one too high or too low, but by something else from the 'Bachian' finger-palette, which was often fitted sufficiently well that listeners were not aware of a mistake. The same process must surely support improvisation in historical style, as practiced by expert performers like Mikko Korhonen,³⁰ where a whole repertoire of unconscious patterns under the fingers can be drawn on; and it would of course have been true for Bach himself, in his own improvisations. A further manifestation of this unconscious activity occurred in the F major Prelude from Book 2 of the Well-tempered Clavier: in bars 5 and 61 the tenor voice has two crotchets, the first of which is tied over from the previous bar, but the same passage in bar 21 has a minim; despite the latter being a fourth lower, my fingers would routinely play the version from the other bars. Here, finger memory trumped reading the actual score.

One interesting set of works noted for consideration during the project were those which use occasional pedal notes.³¹ The usual distinction in Bach between organ and clavier works is that the former either have an obligato pedal part or a liturgical purpose (eg a chorale prelude). This leaves a small group of works which are unplayable as they stand on harpsichord and clavichord, but have been largely

29 Collected recording by the Vienna Concentus Musicus and the Leonhardt Consort, Teldec Classics 2564 69943-7 (2007), recorded 1971–1989.

30 See for example Korhonen 1997.

31 For a detailed discussion, see Knights 2020d.

ignored by organists as they are usually included in editions of the clavier works: pieces that require an intermittent or very occasional pedal part, such as at the end of a fugue. None of them appear to need a 16' pedal, and the majority (while not precisely dateable) seem to come from around 1710-1715. Not all sources even mention the word 'pedal', or comment in any way on the impossible stretches for the left hand. The options for performance are the use of a third hand; a pedal harpsichord or clavichord (see Speestra 2005); putting the unreachable notes up an octave; using the 'stick in mouth' technique described by Charles Burney (see below); or the use of an instrument with pedal pulldowns (a small pedalboard connecting to the lowest notes of the manuals by cords or trackers).³² The eight works fall into two groups, those requiring just a few pitches at the end (Fugue in A minor BWV 865 from *The Well-tempered Clavier*, Book 1, Fugue in C major BWV 946, Fugue in A major BWV 949, Fugue in A major BWV 950), and those requiring a wider range of pitches (Fugue in D minor BWV 948, Sonata in D major BWV 963, Aria Variata BWV 989, Capriccio in E major, BWV 993). Both groups seem closer to clavier than organ in terms of style (for example, dense left-hand chords in BWV 993, arpeggios in BWV 948). While BWV 948 looks like an organ fugue for the most part, it concludes with two entire pages of wide-compass demisemiquaver arpeggios that modulate wildly, rather in the manner of the clavier *Fantasia* in A minor BWV 922; it also requires top c#, which was not available on most organs. The apparent pedal part is rather unusual in its demands, and resembles no known Bach organ or clavier fugue in its layout here; see Example 1.



Example 1: Bach, Fugue in D minor BWV 948, bars 64–66

By way of an applied musicology experiment to follow this up discussion of these 'occasional' pedal parts, the 'stick in mouth' method (option four) was tested. This was referred to by Burney as an evident absurdity: Bach "was so fond of full harmony that, besides a constant and active use of the pedals, he is said to have put down

32 In performance, the third option was taken, apart from BWV 948, which was omitted as impossible without a proper pedalboard.

such keys with a stick in his mouth as neither hands nor feet could reach”,³³ and has so been treated by later writers, but what if it had some basis in fact? While hardly seeming necessary for the organ, with its additional pedals, it could be applied to the harpsichord and clavichord, and was tested using a long and thin wooden spoon of 35cm, which could be easily held between the teeth. The conclusion was that it was very difficult to use on a touch-sensitive instrument like the clavichord, with issues of balancing the tone and volume with the notes played by the hands, but that it could work on harpsichord. It is probably too inelegant to use in a normal recital, and angling the head to reach the low bass notes with the stick means the music cannot be seen while doing it, but it is not actually impossible as a technique. Accurately hitting sharps is much harder than naturals.

FURTHER EXPERIMENTS

In addition to the 21 clavichord performances, four other concerts took place by way of appendix: a repeat of one of the ‘48’ programmes on the new organ of St Edmundsbury Cathedral, demonstrating the easy transferability of the music between various keyboard instruments (there are at least five complete recordings of the ‘48’ on organ); a second complete performance of the Goldberg Variations on harpsichord, including those two-manual variations which cannot be comfortably be played on the single keyboard of the clavichord; a duet recital on two clavichords with Dan Tidhar of the Art of Fugue, including the two-keyboard versions of the mirror fugues; and a special sightreading concert early on. In this last, an invited audience was invited to pick works at random from supplied collections of pieces by Bach, Böhm, Buxtehude, Reincken and others distributed among them. The purpose of this was twofold: to see what it was like for an audience to knowingly hear a sight-read recital, and for the performer to experience the pressures of playing at *prima vista*. Much of the music was straightforward, and the experiment appeared to work well; it was not evident that there was much additional tension for either player or listeners caused by concern about misreadings or slips happening, probably because we were ‘among friends’. This was all done in reference to an anecdote in Forkel’s biography of Bach: at Weimar he told an acquaintance that he “really believed he could play everything, without hesitating, at first sight”. Nemesis came when the friend deliberately supplied a score with an unplayable passage, to which Bach responded, after failing to negotiate it successfully: “one cannot play everything at first sight; it is not possible” (Forkel, in Mendel and David 1998: 435). One assumes that Bach must have told this story against himself, for it to have become part of family lore. The essential point is that the German organist tradition placed

33 Charles Burney on Bach, *Rees’s Cyclopaedia*, Vol. 3, section 2, part 6 (1804). His original notebook comments (c.1772–c.1790) were “This Musician was so fond of Polyphonic Music & full harmony that besides a constant & active use of Pedals, he is said to have had a stick (some say a short Tobacco-pipe) in his mouth, by wch. he put down such notes as neither feet nor Hands cd. get at”; see Gilman 2014.

a considerable premium on the ability to sightread (and of course, to improvise), practice access to the instrument being problematic when an additional person or two were needed to work the bellows. In addition, the modest level of technical difficulty of early 18th century German keyboard music, and the lack of indications such as fingering in manuscript scores, leads one to ponder whether indeed many players simply read through the music domestically as best they could, by way of a kind of personal 'performance'.³⁴ Such an attitude is hardly possible with Bach's own music of course, which really does need learning; Forkel also notes that the compositions of Bach's contemporaries were all 'easier than his own' (ibid.: 435).

One additional skill in learning music is retaining it; it is hard to keep a fully-worked version of a Bach piece under the fingers without deterioration for very long, so an experiment was added to the project in which either Book 1 or Book 2 of the 48, the Goldberg Variations or the Art of Fugue, was played though alternately on the first day of every month. Some sense of decline could then be measured for works not kept up to concert standard by continued performance (a familiar problem for professional recitalists). The Goldberg Variations fared well, but some of the most intricate hand-crossing passages fell away and would have needed re-learning; and (as expected), the Preludes & Fugues in remote (and therefore rarely-used) keys did not do so well during the following year or two. The Fugues in C# (Book 1) and F# (Book 2) were particular victims; whether repeated performances would have embedded the finger-memory more strongly than for a single concert seems highly likely.

The performances of the 48 and of the many other miscellaneous preludes and fugues led to what is perhaps a quixotic editing project: a 'third' Book of the Well-tempered Clavier, assembled from the latter material (Knights, forthcoming a). Many of the miscellanea are high quality but not well known, and there seemed merit in collecting these together for the benefit of players; to fit the 24 major and minor keys, all were transposed by a tone or semitone,³⁵ and some additional material was also sourced from the unaccompanied violin and cello works. Perhaps the greatest value of the new collection is the fact that – unlike Bach's own Books 1 and 2 – the works in remote keys are deliberately short and easy, and thus ideal preparation for study of the real Well-tempered Clavier.

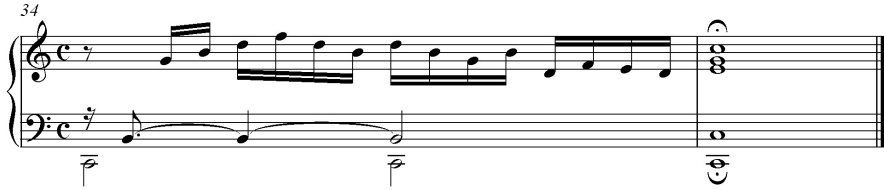
Various follow-up recital projects are now under consideration; an obvious one is the exact same repertoire but on harpsichord; and another is a complete performance of Bach's organ works. This second idea has a particular appeal: much of Bach's music for string and wind keyboard instruments utilizes a very similar technique (it was not until the 19th century that organ technique became clearly distinguished from piano technique, for example), yet there are both notational differences (especially with regard to the sustain of voices)³⁶ and differences in the use of the left hand in particular. The end of the first Prelude from Bach's *Well-tempered Clavier* (see example 2) shows one interesting notational example: the bass C minims in the penul-

34 We know very little of how thoroughly music was learned by non-professionals in this period.

35 As Bach appears to have done when compiling part of Book 1, at least.

36 For a discussion of editorial concerns about the tying of notes for different keyboard instruments, see Knights 2021.

timate bar are always tied in modern editions (sometimes without even mentioning it in the Commentary), to match the layout of the previous bar. On the clavichord at least, the written version works perfectly well; it might be done differently on organ.



Example 2: J. S. Bach, Prelude in C BWV846, bars 34–35

Overall, a detailed comparative study of the precise technical demands of Bach's clavier and organ works arising from performance would be most instructive.

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ФРАНСИС НАЈТС

ДЕЛА Ј. С. БАХА ЗА КЛАВИЈАТУРНЕ ИНСТРУМЕНТЕ: ОД ИЗВОЂЕЊА ДО ПРОУЧАВАЊА

(РЕЗИМЕ)

Пројекат описан у овој студији показује како извођачке перспективе производе конкретна научна питања у проучавањима руковођеним праксом, овде на примеру истраживања комплетног циклуса Бахових дела за клавијатурне инструменте, спроведеног од 2017. до 2021. године.

Дела су, колико је то могућно, груписана према жанру, уз пажљиво разматрање коришћених инструмената, нотних издања и услова извођења. Пројекат је започео циклусом Добро темперовани клавир, садржао је шест делова, од анализе до коначне припреме извођења, што је постало основом за педагошку студију. Уследила је дискусија о прецизним техничким компонентама двогласних и трогласних инвенција. По извођењу Уметности фуге настала су два истраживачка есеја, један о делу као композицији за клавијатурни инструмент (то је био закључак, али не постоји јединствена клавијатура), а други о различитим модерним завршецима последњег, незавршеног Контрапункта. Овде је заједнички рачунарски пројекат идентификовао завршетке који највише личе на Бахову музику у погледу вођења гласова и мелодијске контуре.

Извођачка пракса је била још једно кључно поље интересовања, укључујући и орнаментацију (различити рукописи из XVIII века, различите датације, нуде велики број различитих опција), повезивање баховских прстореда са извођачком техником и могућне утицаје на савремену импровизиациону праксу, као и повремену употребу педалних тонова у малом броју раних, за Баха нетипичних дела, где се сугерише да је композитор у том периоду имао инструмент с педалама које повлаче дирке.

Даљи практични експерименти спровођени су како би се тестирала интересантна прича Чарлса Бернија о Баху, који је „дирке повлачио наниже помоћу штапа у својим устима, а који није могао да дохвати ни рукама ни ногама“. Конечно, на додатним реситалима истражена је разлика између извођења Добро темперованог клавира на оргуљама и на клавикорду, вештина читања с листа (према сведочењима, Бах је могао да „свира све, без оклевања, на први поглед“), и идеја техничког урушавања наученог репертоара током времена. Већина тих истраживачких питања не би могла да се постави без извођачке перспективе. У том смислу, сасвим је јасна важност међусобног разумевања научника, уредника и извођача када је реч о њиховим различитим приступима.

Кључне речи: Јохан Себастијан Бах, музика за клавијатурне инструменте, извођачка пракса, истраживање, педагогија.