

Suite, Suite Phylogenetics

Michael Charleston and Zoltán Szabó

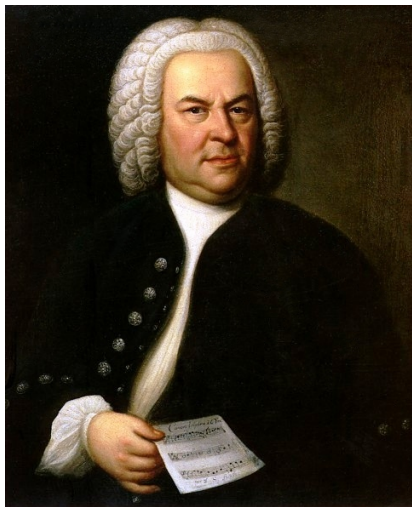


THE UNIVERSITY OF
SYDNEY

`michael.charleston@sydney.edu.au`

November 5th, 2014

J S Bach



Johann Sebastian Bach was born in Eisenach into a musical family, on 31st of March 1685, and died 28th July, 1750.

In between, he was a prolific composer, and, while he was less appreciated for this during his life, he has since become recognised as one of the greatest composers of all time.



The cello suites

The six suites for unaccompanied cello were written by Bach around 1717-1723, when Bach was the Kappelmeister in Köthen.

There are hundreds of recordings of these, but, perhaps surprisingly, there are also 107 different *versions* of the suites.

How can this be?



The cello suites

The six suites for unaccompanied cello were written by Bach around 1717-1723, when Bach was the Kappelmeister in Köthen.

There are hundreds of recordings of these, but, perhaps surprisingly, there are also 107 different *versions* of the suites.

How can this be? It was the practice of Bach's wife Anna Magdalena that she would transcribe her husband's work by hand, to a neater version, which was used for performance.

Once that was done, further copies could be made.

6
Sixtes a

Violoncello Solo
sempre

Basso
composées

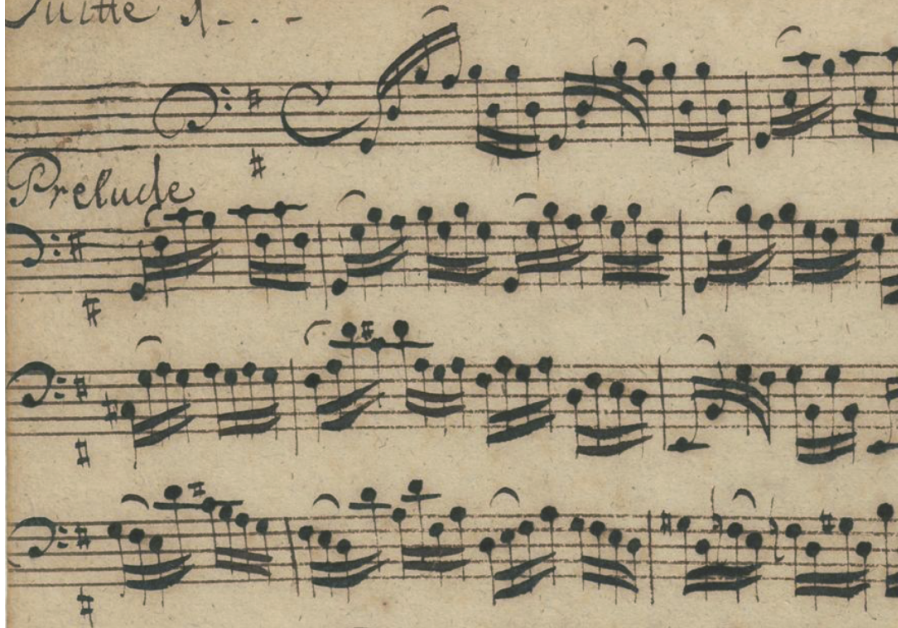
par

F. J. L. Bach.

Maître de Chapelle.

Mitte *f* - - -

Prelude





Copying music by hand

Is hard! It is highly repetitive, laborious work and there is lots of room for error.

Is permissive. . . like the secretary having the power in meetings over what was said, music can be *interpreted*. . . *corrected*. . .

From Anna Magdalena's version, three more hand copies were made, before the printing press took over.

As of 2014, there are now 107 versions including those original copies, . . . but Bach's original is lost.

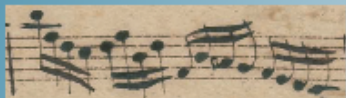
The versions are all different.

Sources of "error":

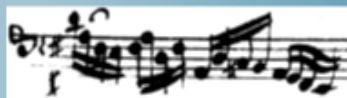
- copying error
- corrections
- interpretations
- additional guidelines

1st Suite in G Major, Praeludium - bar 28

Anna Magdalena Bach



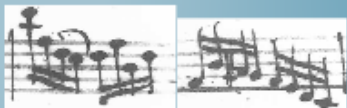
J.P. Kellner



Anonymous (Westphal)



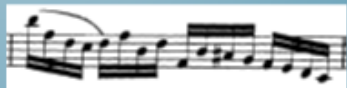
Anonymous (Traeg)



Janet et Cotelle (1st ed.)



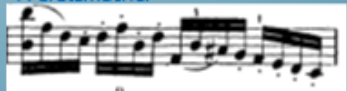
J.J.F. Dotzauer



W. Stade



F. Grützmacher





On playing Baroque music

It's worth understanding how Baroque music was written — while music from the period is known for its florid ornamentation, the details of what ornaments were actually played, were not on generally the manuscript: much of the choice of *how* to play a given piece was left up to the musician.

This includes such things as

- bowing
- fingering
- dynamics (changes in volume)
- accents
- ornaments (mordents, turns, trills, “grace notes” (appoggiaturas and acciaccaturas))



Recent manuscript is more guided

As a rough rule of thumb, musical manuscript has become more *prescriptive*:

- The performer will play a *mordent* here, not a trill!
- He or she will begin the crescendo *here* and not later,
- and then have an accented attack here, and then . . . a *pause* . . . and so on.

Also, performers' versions can become popular and others may wish to emulate them — thus, more detailed instructions are invaluable here (audio recording not being available!).

Some musical terminology

A few rudiments



What is manuscript music

Just in case you don't read music (show of hands please)

- Music is represented in varying levels of depth on manuscript: some versions show just pitch and duration, but others go into (volume) dynamics, acceleration (*accelerando*), deceleration (*decelerando*)
- Annotations are commonly in Italian (they are for much of these suites);
- The types of annotations can be broken into several types:
 - ties and slurs** — how the transition between notes is to be played
 - accents** — how notes are attacked




Ornaments

Trill — alternate rapidly between the indicated note and the one above (in the scale):




Turn — hit the note, go above, go back, go below, and go

back: it looks like this: Musical notation for a turn: a treble clef staff showing a quarter note on G4, followed by a quarter rest, then a quarter note on A4, a quarter note on G4, and a quarter note on F4, all with a tilde symbol (~) above them.

and would be played like this:



Grace Notes — the *appoggiatura* and the *acciaccatura*, which are very short and very very short notes played just prior to the “main” one.

Mordent — a little like a very short trill, Musical notation for a mordent: a treble clef staff showing a quarter note on G4 with a mordent symbol (a wavy line) above it.



Our initial data

There are now *107 printed versions* of the suites (including the most recent appearing in 2014).

We could not encode every suite, every version (we don't have them all), or even every movement in a single suite, because it's laborious and slow. . .

We selected one movement, the D minor Allemande from Suite II, BWV 1008, and just 12 versions to encode at this stage.

We (that is, Zoltán) painstakingly transcribed 12 versions into Sibelius software and exported these as pdf.¹

¹We looked at using MusicXML and automatically doing this but it was awful



Reference, 1992

D Minor Suite, Allemande

J. S. Bach

5

9

13

17

21

The image displays a musical score for the Allemande from the D Minor Suite by J.S. Bach. The score is written in bass clef with a key signature of one flat (B-flat) and a common time signature (C). It consists of six staves of music. The first staff begins with a treble clef and a key signature change to one sharp (F-sharp). The score includes various musical notations such as eighth and sixteenth notes, rests, and trills. Measure numbers 5, 9, 13, 17, and 21 are indicated at the start of their respective staves. The piece concludes with a double bar line and repeat dots.



Anna Magdalena, 1727

D Minor Suite, Allemande

J. S. Bach; Anna Magdalena Bach MS cca 1727

5

9

13

17

21



Anna Magdalena, 1727

D Minor Suite, Allemande

J. S. Bach; Anna Magdalena Bach MS cca 1727

5

9

13

17

21



Bazelaire, 1920

D Minor Suite, Allemande

J. S. Bach ed. Bazelaire 1920

Lourd et expressif

f *rall... a Tempo* *mf*

5 *rall... a Tempo* *f*

9 *ff* *mp* *p* *mf* *cresc.* *f* *rall... a Tempo* *rall...* *f*

13 *mf* *rall... a Tempo* *p* *cresc.*

17 *f* *p* *rall... a Tempo* *cresc.*

21 *mf* *mp* *cresc.* *rall... a Tempo* *rall...*



Bazelaire, 1920

D Minor Suite, Allemande

J. S. Bach ed. Bazelaire 1920

Lourd et expressif

f *mf*

rall... a Tempo

rall... a Tempo

ff mp p mf cresc. f f

mf p cresc. p

mf mp cresc. rall... a Tempo rall...



Beisswenger, 2000

D Minor Suite, Allemande

J. S. Bach

The image displays a musical score for the Allemande from the D Minor Suite by J.S. Bach. The score is written in bass clef with a key signature of one flat (B-flat) and a common time signature (C). It consists of six staves of music, with measure numbers 5, 9, 13, 17, and 21 indicated at the beginning of their respective lines. The notation includes various rhythmic values, accidentals, and articulation marks such as trills and slurs.



Daffel, 1879

D Minor Suite, Allemande

J. S. Bach ed. Dörffel 1879

The image displays a musical score for the Allemande from the D Minor Suite by J.S. Bach, as edited by Dörffel in 1879. The score is written in bass clef with a key signature of one flat (B-flat) and a common time signature (C). It consists of six staves of music, with measure numbers 5, 9, 13, 17, and 21 indicated at the beginning of their respective lines. The notation includes various rhythmic values, accidentals, and articulation marks such as trills and slurs. The piece concludes with a double bar line and repeat dots.



Dotzauer, 1826

D Minor Suite, Allemande

J. S. Bach

A musical score for the Allemande from the D Minor Suite by J.S. Bach, as transcribed by Carl Czerny in 1826. The score is written for a single bass clef instrument in D minor, 3/4 time. It consists of six staves of music, with measure numbers 5, 9, 13, 17, and 21 indicated at the beginning of their respective lines. The notation includes various musical symbols such as slurs, ties, trills (tr), and dynamic markings like 'II' and 'tr'. The piece concludes with a double bar line and repeat dots.



Kellner, 1726

D Minor Suite, Allemande

J. S. Bach; Kellner MS 1726

The image displays a musical score for the Allemande from the D Minor Suite by J.S. Bach, as found in Kellner's manuscript (MS 1726). The score is written in bass clef with a key signature of one flat (B-flat) and a common time signature (C). It consists of six staves of music, with measure numbers 5, 9, 13, 17, and 21 indicated at the beginning of their respective lines. The notation includes various rhythmic values, accidentals, and articulation marks such as trills and slurs.



Markevitch, 1964

D Minor Suite, Allemande

J. S. Bach ed: Markevitch

♩ = 63

5

9

13

17

21



Norblin, 1824

D Minor Suite, Allemande

J. S. Bach ed: Norblin 1824

Allegro

5

9

13

17

21



Schroeder, 1888

D Minor Suite, Allemande

J. S. Bach ed. Schroeder 1888

Allegro moderato

f *dim.*

5 *f* *tr*

9 *sf* *mf* *cresc.* *sehr breit* *f*

13 *dim.* *p*

17 *cresc.* *f* *p* *sehr breit* *p*

21 *cresc.* *sehr breit*



Schroeder, 1888

D Minor Suite, Allemande

J. S. Bach ed. Schroeder 1888

Allegro moderato

f *dim.*

5 *f* *tr*

9 *sf* *mf* *cresc.* *sehr breit* *f*

13 *dim.* *p*

17 *cresc.* *f* *p* *tr* *p*

21 *cresc.* *p* *sehr breit*



Starker, 1970

D Minor Suite, Allemande

J. S. Bach ed: Starker 1971



Starker, 1970

D Minor Suite, Allemande

J. S. Bach ed: Starker 1971



Westphal, late 18thC

D Minor Suite, Allemande

J. S. Bach; Westphal MS late 18th cent.

The image displays a musical score for the Allemande from the D Minor Suite by J.S. Bach. The score is written in bass clef with a key signature of one flat (B-flat) and a common time signature (C). It consists of six staves of music, with measure numbers 5, 9, 13, 17, and 21 indicated at the beginning of their respective lines. The notation includes various rhythmic values, accidentals, and articulation marks such as trills (tr) and slurs. The piece concludes with a double bar line and repeat dots.



The alignment is trivial. . .

At least in contrast to molecular phylogenetic data, the “sequences” here are basically already aligned.

- The bar lines are homologous;
- The duration and placement of most of the melodic notes are unchanged (though some harmonic notes are changed);
- Ornaments are usually unambiguously placed.

Listen and follow

Cue up a recording



Bars 0 – 8

def

AM

Ba

Be

Da

Do

K

M

N

Sc

St

W



Bars 9 – 16

def



AM



Ba



Be



Da



Do



K



M



N



Sc



St



W





Bars 17 – 24

def		
AM		
Ba		
Be		
Da		
Do		
K		
M		
N		
Sc		
St		
W		



Notes

Bowing: Two versions of these 12 (Dotzauer and Starker) give their own bowing instructions; the rest don't, and so these aren't very useful as characters.

Fingering: While fingering is generally left up to the player, it's sometimes useful to have have as a suggestion — this was also left out.

Dynamics — most versions leave them out. Some indicate *crescendi* and *diminuendi* but can differ in where they start and finish: these were merged where possible.

Ornaments: mostly these were unique to each version (singletons or parsimony uninformative).



Entering the data

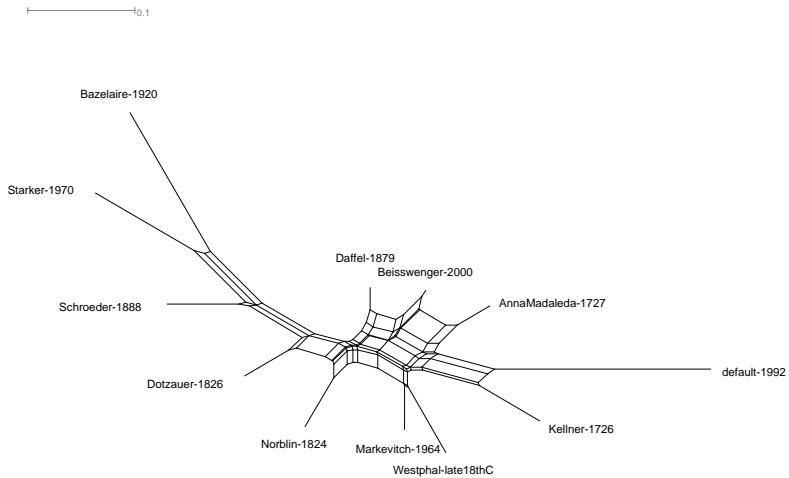
Sheet1

bar										
0	1					2				
slurs/ties	beat									
4	1	2		3	4	1	2		3	4
def										
A		1	1	1	1	1				
Ba		1	1	1	1	1	1	1		1 1 1
Be		1	1	1	1	1	1			
Da		1	1	1	1	1				
Do		1	1	1	1	1	1	1		
K			1	1	1	1	1			
M		1	1	1	1	1	1			
N		1	1	1	1	1	1	1		
Sc		1	1	1	1	1	1	1	1	1 1
St			1	1	1	1	1	1	1	1 1
W		1	1	1	1	1	1			

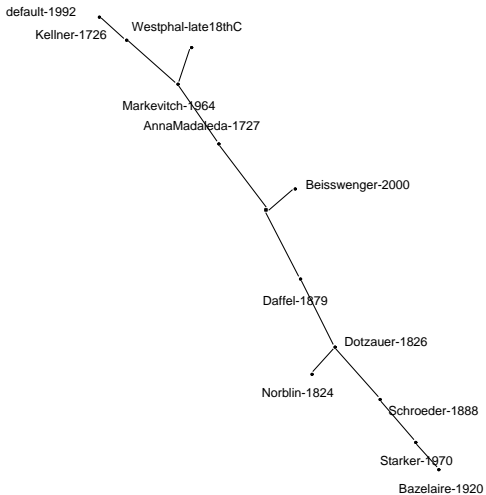


Our aligned data

Version	Dynamics	Ornaments	Slurs
default-1992	0000000000	0001100	0000000000000000000000000000000000
AnnaMadaleda-1727	0111111111	0001100	00101010101000000000000000000010101010
Bazelaire-1920	0000000000	1211120	00111110111010101010001111001110111110
Beisswenger-2000	0000000000	0001100	00101010101001000000000000001010101010
Daffel-1879	0000000000	0001110	00101010101000000000000000001010101010
Dotzauer-1826	0000000000	0001010	00101010111011000000000000000010101010
Kellner-1726	0000000000	0001100	00001110101000000000000000000010101010
Markevitch-1964	1000000000	1101100	00101110101000000000000000001010101010
Norblin-1824	2000000000	0101000	00101110111001000000000000000010101010
Schroeder-1888	0000000000	1021221	00101110101011011000010111001011101010
Starker-1970	0000000000	2302030	00001110111001011000001111000011101110
Westphal-late18thC	0000000000	1101100	00101100011001000000000000000010101010



|-----| 100.0





Comments

While it's early days yet,

- There's promise of interesting things to come;
- We can see some of the relationships that are consistent with what's known about the copying history
- There seems to be potential to recover an “original” — whatever worth that has. . .



Next Steps

So what do we need to do next?

- Encode more of the suites²
- See if we can recover the original
- Write software to enable musicians to select which version they want to play

²possibly through judicious application of undergraduate students

thank you

Questions and Comments



Thanks to I

Wikipedia for images:

- “Upper and lower modent notation 1” by Sbrools at en.wikipedia - Transferred from en.wikipedia. Licensed under Public domain via Wikimedia Commons - http://commons.wikimedia.org/wiki/File:Upper_and_lower_modent_notation_1.png#
- “Frontespizio Cello Suite” by Anna Magdalena Bach - http://xoomer.virgilio.it/alessandro_corti/images/Frontespizio_Cello_Suite.png. Licensed under Public domain via Wikimedia Commons - http://commons.wikimedia.org/wiki/File:Frontespizio_Cello_Suite.png#mediaviewer/File:Frontespizio_Cello_Suite.png
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Zoltán Szabó